

Display FOR Learning

MAKING AND USING
VISUAL MATERIALS

Ext. 327

Dryden Professional Books in Education

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Preface

The use of visual aids in teaching has become so thoroughly accepted—in theory at least—that no teacher or prospective teacher needs to be persuaded that “seeing expedites learning.” But all too many teachers, convinced though they are of the usefulness of visual materials, employ them in the classroom less frequently and less effectively than they might. Too many of them adopt a “Yes, but . . .” attitude: “Yes, but I haven’t the budget for a projector and slides.” “Yes, but I’m no artist and I can’t draw pictures.” “Yes, but where can I get the materials that I need?”

It is for these teachers that this book has been written. It is aimed at showing them as specifically and clearly as possible how to produce visual materials and how to use them in and out of the classroom. The reader will find simple instructions on how to draw stick figures, how to make models, how to mix paste, how to arrange a display case, and how to make and do countless other things that produce good display. But the reader who uses this book as a “recipe book” only is likely to overlook its two key points: (1) that effective visual materials do not require a large budget and can usually be constructed or improvised from materials available to every teacher, and (2) that the teacher’s artistic skill or talent is much less important than her common sense, her alertness to new possibilities, and her sincere interest in helping children learn. The reader who understands these two points is likely also to make use of the “how to” discussions, but she will be in a position to go far beyond them and to use her own resources in a way best suited to her specific problems.

It is impossible to name all the people whose ideas are reflected in this book. The book was begun at Teachers College, Columbia University, where Professors Max R. Brunstetter, Stephen M. Corey, Laura W.

VI · PREFACE

Drummond, and Paul Witt helped me organize the material. To each of these I owe great thanks—especially to Professor Drummond, who devoted many hours to helping me organize the project in detail. In its present form, the book reflects the helpful guidance of Edgar Dale, whose kindness I deeply appreciate.

M.E.

May 1952

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PART I

THEORY *of Display*

Why Use Display in Education?

What does the word *display* mean to you? The hardware counter in your local five-and-ten? An ethereal gown of pink nylon poised, glamorous, in the window of Bergdorf Goodman's Fifth Avenue shop? A brilliant billboard advertising this year's Ford? The gesture of a newly engaged girl as she raises her left hand to her hair?

Each of these is display. Each represents careful planning and arranging for the purpose of showing us something. The purpose behind the counter display of hardware is to show us what is available for sale. The purpose behind the shop window is to make each woman dream that she, too, could be more beautiful . . . if only she had that dress. The billboard's purpose is to repeat the name of Ford, to reinforce any favorable impression already present, to lead a potential buyer one step nearer to the purchase. These examples come from business; they are ways of advertising. And the gesture of the proud young girl, too, is advertising. She shows her diamond to advertise her happiness.

Display for advertising is a huge business, involving millions in annual expenditure. Store counters, shop windows, and billboards are only a few evidences of this new medium. Magazines present thousands of carefully designed displays to attract our attention and to influence our spending habits. All of us who use public transportation are visually bombarded with advice about products that supposedly will make our lives happier.

Television is bringing this visual bombardment into our own living rooms.

Display for advertising is a science as well as an art. Through careful research, advertisers are accumulating a great deal of information about the ways in which people react to what they see in displays. In universities, artists, psychologists, and research workers in other fields are analyzing the visual impact of such details as color, line, and texture and attempting to discover the words and pictures that create the greatest emotional and intellectual impact. In addition to the published research of the universities, there are the unpublished findings which advertising companies use to further the success of their own businesses. Just as the "Hooper-ratings" register the approximate popularity of radio and television programs, the Daniel Starch Company studies the readership of magazine and newspaper advertisements.

Display is a powerful new medium of communication. It is one of the "mass media" that can be used to educate, to propagandize, to sway the thoughts and acts of us all. The Communist government of the U.S.S.R. knows and uses its potentialities. Philanthropic enterprises such as the Red Cross and the American Heart Association make use of its persuasive force. And we are reminded each day of the power of display as used in advertising. That power can be put to use by anyone, for any purpose.

This book is about the educational use of this medium of communication. We shall discuss how planned display can help people to learn more effectively those things which they have to learn.

Display has long been used in education. Blackboards, bulletin boards, and exhibits have all helped people to learn. We shall plan for the further use of these and other display mediums. We shall try to adapt to educational purposes some of the techniques and principles utilized by artists, psychologists, and advertisers. And as we discuss the techniques and principles of display, we shall show how an understanding of this medium of communication will help people to use it wisely and judge it carefully.

Each of us is curious about something, and the satisfaction of curiosity is enjoyable. Perhaps you are curious to know what the center of the earth is made of; perhaps I am curious to know why some of my nasturtiums aren't thriving. If we could find the answers, we should be pleased—



pleased with the answers and pleased that our curiosity had been satisfied. When we have these answers, we are free to turn our curiosity to something else.

You may become interested in the application of atomic power to an investigation of the earth's core. I may become more curious about soils and fertilizers and botany. No matter how many cats curiosity allegedly kills, all of us are eager to learn, to absorb new facts, to recombine ideas into new understandings, to acquire new skills.

DISPLAY HELPS PEOPLE LEARN

As we learn, we find that the learning process itself involves some problems. We want this process to continue with the greatest possible ease and speed. We always want to learn efficiently and we would like, when possible, to learn pleasantly. But sometimes this isn't easy. Display may be able to help by boosting us over some of the obstacles in the process. How might display help us learn?

Display can concentrate interest and attention. One of the first problems faced by a learner is how to strengthen his attention and interest. All of us are interested in a great many things, and we find it rather difficult to put aside these interests of the moment in order to concentrate upon the one new idea or fact or principle that we want to learn.

But whether or not you are finding it hard to concentrate on these words, you did notice the drawings on this page. They attracted your attention in much the same way that they lead beginning students of Spanish to concentrate on the lessons they are learning.

Display can help us concentrate by brazenly attracting our attention. Bright colors, moving figures, unusual shapes, flickering lights—all these will make us look at display. Unique objects and models, surprising word combinations, amazing ideas—all these will keep us looking. Display can

work more subtly, too. It can show us something that is exactly pertinent to one of the ideas in our minds. It can emphasize this one idea so that we are more likely to eliminate competing ideas. We concentrate.

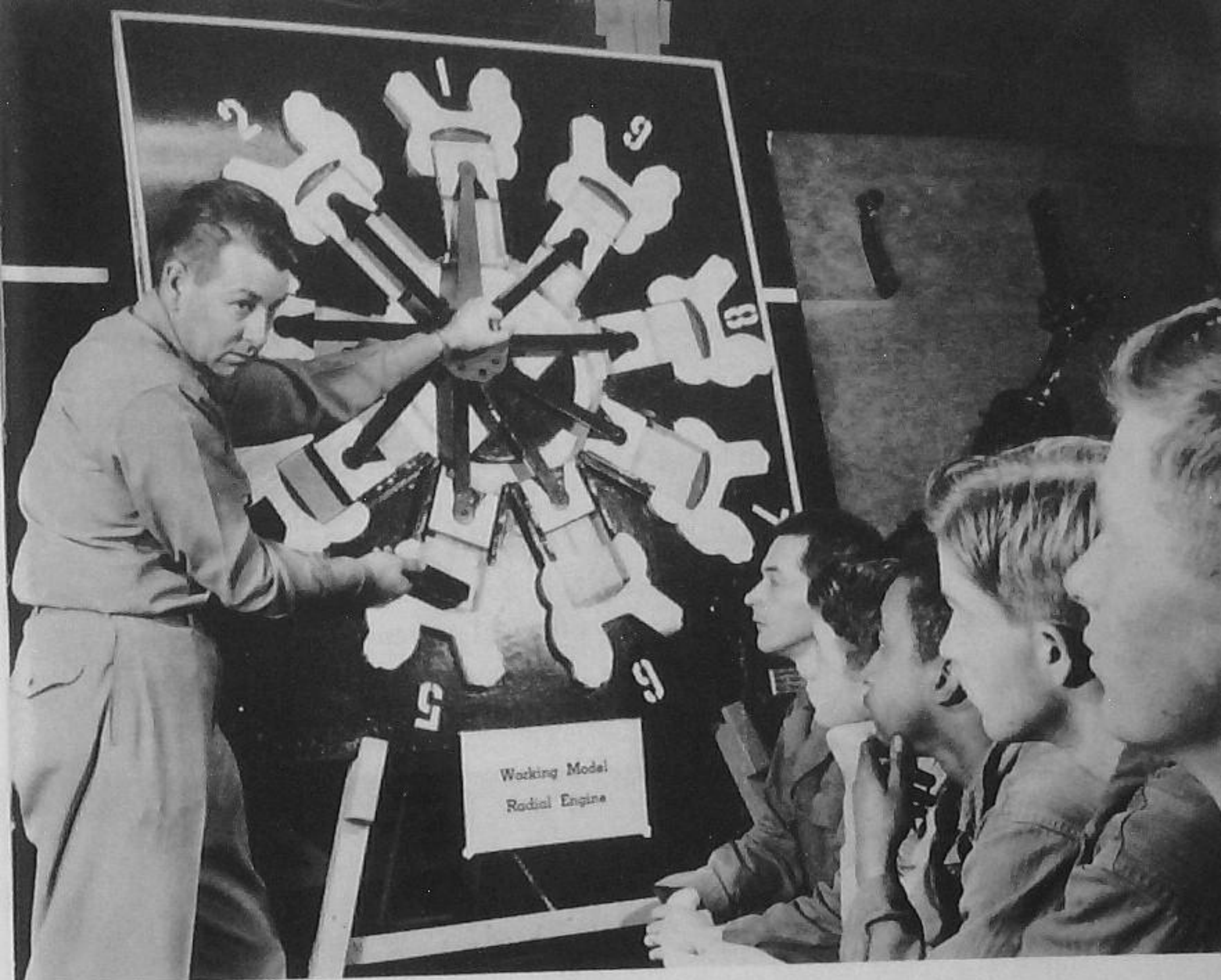
A display is somewhat like a theatrical production. In the theater, the producer, the director, and the stage manager plan to cause the person in the audience temporarily to suspend his critical expectations of reality and be swept along by the moods and the glamour until he feels as though he were a part of the action on the stage. On a much smaller scale, a good display does something like this. Careful planning and execution can help learners pull their interest away from the distracting realities of the moment and be carried along into new thinking experiences.

Display can show the basic structure of an idea. The mediums used for display—the billboard, the poster, the exhibit, and similar forms—require simplicity. Any details that are included must be quickly and easily comprehensible. The impact and the power of display come from this quick flash of communication.

The learner can often be helped when his problem is presented simply. If he can quickly see by means of a model how the pistons are arranged in a radial engine, he is more likely to study the various details that have been omitted. When he sees the general basis for this new idea, it is easier to understand the particulars. And he feels encouraged to undertake a learning task that appears to be fairly easy.

The person who arranges display selects the central theme and pares away the embellishments, the restrictions, the modifications, so that the idea is presented in its basically simplest way. This is one reason why display must be so thoughtfully considered and carefully executed—it tends to oversimplify and to underelaborate. Especially when we use display for education, we must take great care to see that our presentation still tells the truth—that simplification does not oversimplify. We must adapt for display only those ideas that can be presented truthfully through this abbreviating technique.

Display can explain abstract ideas by relating them to concrete things. The learner faces another problem as he tries to understand new ideas. Sometimes the idea seems dim and hazy, quite without relation to



things he already knows. Sometimes the new idea involves abstractions in time or space that seem too amorphous to be grasped.

Display can help here. For example, a child who is just getting acquainted with the number system might learn more easily through *structural arithmetic** than through the usual counting and memorizing drills. By working with blocks of different unit lengths, the child measures instead of counts. He *sees* the difference between 4 and 6. He *sees* the sum of 2 and 3. The concrete experience with the blocks helps the child to understand the abstractions of number.

Display can bring scattered ideas together to form new concepts. Numerous problems of understanding involve trying to form generalized concepts from the immediate experience. We are often blinded by the in-

*Catherine Stern, *Children Discover Arithmetic: An Introduction to Structural Arithmetic*, Harper and Brothers, 1949, p. 295.

cidents that happen every day, and we find it hard to see the central pattern in our lives. We don't see the forest for the trees. Learning is like that, too; we can't always grasp easily the principles and the central ideas because of the mass of detail we have been trying to absorb. Display can help to emphasize these central principles. It can act as a skeleton presentation of key ideas that lead easily to conclusions.

Look at this bulletin board, which shows how styles of expression influence the arts of literature, music, and painting. The person who observes this display would see that Edward Hopper and Arnold Bennett are both considered realists. He also sees how this creative style is related to other creative styles, how the same intellectual movements have been reflected in several of the arts. He has gained a conceptual understanding. He has seen the trees, and he also understands that they make up a forest.

DO YOU AGREE?

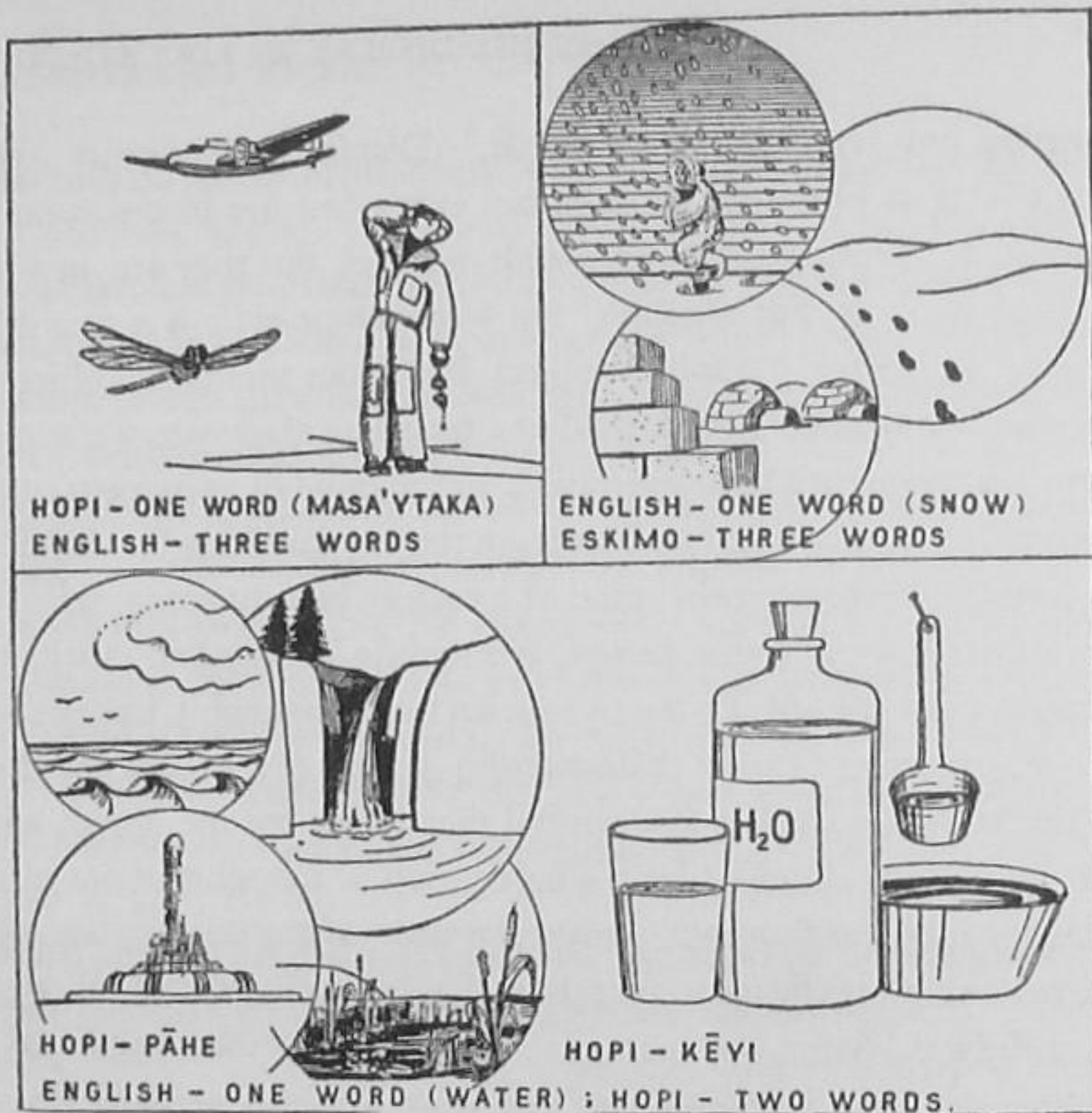
Romantic	Impressionist	Realist	Naturalist	Expressionist	Constructor
FITZGERALD	PROUST	BENNETT	DREISER	KAFKA	JOYCE
					
GAUGUIN	DEGAS	HOPPER	MARSH	VAN GOGH	PICASSO
GERSHWIN	DEBUSSY	DUKAS	BERG	RAVEL	SCHÖNBERG

Display can turn ideas into words. Display is a sensory experience. It affects us primarily through our eyes—but not in the same way that words do. True, we see words with our eyes, but they are, in a way, symbols of symbols. For example, the word *automobile* is a symbol for (literally, "stands for") a specific object. But in our minds that object can also be another symbol. In the mind of a traveling salesman, the automobile symbolizes essential transportation. In the mind of a city-pent couple, the automobile symbolizes freedom from the city and long Sunday drives in the country. Perhaps in the mind of a college boy, an automobile symbolizes a certain social status, as well as a mobile living room in which he can entertain his friends. To the technician on the assembly line, an automobile may represent expert craftsmanship as well as a weekly pay check. Thus, the word *automobile* is a symbol that stands for the object, which in turn is a symbol standing for a whole group of thoughts in our minds.

Display uses the symbolic power of words, of course, because words are the neatest, most efficient packages with which to express our thoughts. (In fact, Edward Sapir, the linguistic authority, says that words are the raw materials of our thinking, and that what we think actually depends upon the vocabulary and the grammatical construction of our language.) Display uses words as the focus, as the explanation of the idea behind the arrangement, because one of the central purposes of display for education is to help learners to translate and concentrate impressions and experiences into words.

But often display can build understandings more easily than can words. Through the seeing of actual objects or pictures of actual objects, the words that symbolize them acquire meaning. If you show children a hammer, a saw, scissors, pliers, and a screwdriver as you speak the names of these tools, the children will find it easier to attach the right meanings to the right words. And if you use each of these things, the children will be helped to learn the word *tool* and the concept for which it stands. Thus, when objects are seen in relationship to one another, conceptual patterns acquire meaning.

If you were learning the Hopi Indian language, the drawings that follow would help you see how experiences are classified differently in Hopi from the way they are in English. You would learn the word *masa'yataka*, and you would understand that the Hopis use the same word for all these



things that fly through the air. You might presume, then, that these people are not much concerned with flying things: they do not need to differentiate among them. You would also learn the words *pāhe* and *kēyi*, and you would understand that free-flowing, unconfined water is, to the Hopi, quite different from water confined by man in some small container.

Display can short-cut the symbolizing process somewhat: it can present actual things or visualized images of them with the minimal use of words. And then it can skillfully relate these sensory perceptions to the words that stand for them.

Display encourages expression. Anyone who looks at a good display is helped to learn. But the person who prepares the display is even more likely to learn. Undoubtedly learning comes out of the process of *absorbing* facts and principles, but it also comes out of the process of *expressing* these facts and principles. This becomes especially important when students develop their own displays.

We may think that we have learned all the skills needed for driving a car, but unless we actually try to drive, we can't be sure. The process of driving helps us to remember the suggestions that we have heard, helps us

to combine and organize the skills and relate them to one another and to the actual task.

If we have just seen a motion picture, the characters and the plot may be clear in our minds. But if we want to give a synopsis of it to someone who has not seen it, we go over it silently, reorganizing our memories, selecting the important events, trying to find the central theme and its meaning. And as we tell our friend about it, the pattern becomes clearer to us. We come to understand our experience more clearly.

The person planning a display goes through this same process. He has something to show people, but before he can do the showing, he must separate, select, and organize the several elements of the idea he wishes to show. He must fully understand his idea before he can successfully explain it to others. Like the actual doing involved in driving a car, like the telling involved in the synopsis of the motion picture, the showing of ideas to others involves the arranging of our thinking. Before we can "display," we must be able to organize ideas so that they may be shown to others in a related way for a certain purpose.

DISPLAY IS A METHOD OF COMMUNICATION

It has been said that one learns to do things by doing them. If you wish to learn to drive a car, you must drive a car. If you want to improve your ability to tell others about your experiences, you must practice telling others about your experiences. And if you show other people what you believe to be important through display methods, you are learning how to use display for showing ideas to others.

The great painters of our civilization have put onto canvas the feelings and thoughts that were important to them so that they might communicate with the rest of us. When we see the "Guernica" of Picasso, we understand something of what he felt about the preview to "blood, sweat, and tears" that was the Spanish Civil War. Few of us think and feel in the same way that Picasso does, but we do think and feel in ways that are just as important to us.

Although we may never be so expert in communicating ideas as Picasso, learning how to use display can nevertheless help us to communicate with one another. We communicate by talking and by listening, by writing and by reading. We can also communicate by showing things to

people and by looking at the things they show to us. All learning depends upon communication. The formation of our personality, the building of our character, our very "human" nature grows out of communication with our fellow men. By learning the language of display, we shall have one more way to communicate with others.

Not even the most gullible believe that the use of a certain face cream will insure marital bliss or that the use of a certain hair lotion can guarantee popularity with the ladies. But advertising display *is* largely responsible for our faith in nationally advertised merchandise. Truly, the buying public seems to be eating out of the hands of the advertisers. It is frightening to think that the same techniques could be used to influence, change, and control our actions on even more important matters.

As we learn to understand the language of display, we will be better able to discriminate among the many uses of display in our modern world. Children need to learn the techniques of display and to understand the sources of its power over their thinking if they are to grow into adults who can weigh accurately the evidence presented. Today's adults, too, need help here.

If, as seems likely, display grows to be an even larger part of our daily lives and even more of an influence upon our thinking, then surely an understanding of this method of communication will be indispensable for intelligent participation in our society.

We have defined a "display" as a careful arrangement of materials for others to see. And we have said that these displays can perhaps help people to learn because displays:

1. concentrate interest and attention;
2. show the basic structure of an idea;
3. explain abstract ideas by relating them to concrete things;
4. bring scattered ideas together to form new concepts;
5. turn ideas into words;
6. encourage expression.

We have also suggested that an intelligent understanding of the techniques of successful display can help people to communicate with their fellow men. A familiar acquaintance with these techniques can also, perhaps, protect people against being improperly swayed by their power.

2. How Do We Prepare Displays?

If display can be of great help to people who want to learn, we must take full advantage of its power. But behind the successful displays of the show window and of magazine and billboard advertising there lies a great deal of knowledge. The skilled artists who plan these displays have gained, through years of experience, an understanding of people's reactions to what they see.

Few of us are either skilled artists or psychologists. Nevertheless, whenever we plan to help people think, we are applying some of the suggestions of psychology. And if we understood more thoroughly some of the principles that artists use, our planning for learning might get better results.

In this chapter we shall try to develop a formula for planning display. We can state it briefly: *Understand your display problem; then translate it into visual symbols.* Perhaps it will be clearer if we break the formula down into successive steps, all leading to the creation of an efficient display for learning.

UNDERSTAND YOUR DISPLAY PROBLEM

Study the learners and their needs. Who are the people who will look at your display? Is your audience gathered together to learn some specific things? For example, is it a class of eight-year-old children who have trudged in to school from near-by farms? Or is it a group of local

businessmen at a Rotary Club luncheon? Such bodies of people have a common purpose and are working toward it as a group.

Are the people who will see the display individuals, strolling past the arrangement? Are they women shopping on Main Street who stop for a moment to look at the window that tells them of the work of the local "Red Feather" organizations? Or are they students who see the exhibit case in the school hallway as they pass between classes? These people view the display as individuals rather than as a group.

In any case, it is important to know precisely who your audience will be and precisely how they will look at the display. To learn this, we must try to put ourselves into the shoes of the viewers. This is the first step toward understanding the problem of a specific display. Now, if you were a seventh-grade boy, why would you be interested in looking at a display about better management of time? For one thing, you might wish that you could get through your after-school chores a little sooner so that you would have more time for a baseball game. A display planned to appeal to you might show the time for chores weighed against the time for play, and then present some short cuts that would help pare down the working time.

If you put yourself in the shoes of Mrs. Brown, whose children are all grown up and have families of their own, you would find that she has a special reason for being interested in her club work. It keeps her busy and creative; it gives her a feeling of status. She can be part of a group activity and can feel again that her opinions count for something. An appeal to her past experience, to her present need for belonging, might be a part of a display. If her club has been helping to solve community problems, the display could well point out a problem such as this: "Our town has only three doctors and five nurses." The discussion generated by the display might develop a plan whereby doctors could call on these capable, willing women for part-time help.

You need a clear understanding of the people you want to help and a clear idea of the ways in which they want to be helped. It is not enough to know *what* you want to teach; you need to know the person *whom* you want to teach. A successful advertising man phrases it somewhat differently when he says that people don't buy a newspaper; they buy

news. People don't buy circus tickets; they buy thrills, color, excitement.* For successful display you need to know exactly what your customers want to buy.

Define the purpose of the display. After you have thought about the person you are teaching and have appraised him as an individual with certain needs, you are ready for the second step toward understanding the problem of display. What have you to offer that might help him meet these needs? And why use display in making that offer?

You are a leader of a group. You may be a teacher, a scoutmaster, a Sunday-school teacher, a social worker in a settlement house, or a librarian. You may be in charge of a committee. At any rate, you are working with people in some clearly defined way, and you have something definite to offer. Probably you plan all your work by thinking of ways in which you can help to meet the needs of the people in your group, and display is no exception. All you have to do is to select the specific idea you wish to present.

There is no way to judge the effectiveness of a display unless we know what it is supposed to do. In Chapter 1 we discussed several of the ways in which display can help people to learn, but no *single* display would be likely to do all those things. You must decide exactly what you want to accomplish with each arrangement.

Perhaps you want to attract attention and to stimulate interest in a new idea. This is one of the things that display can do well. A clever bulletin-board arrangement of "candid" snapshots of the students around school might serve to develop active and vivid interest in the subject of "better looks through better posture."

Perhaps you want to use a form of display to explain abstract ideas in terms of reality. Nutritionists at the Massachusetts General Hospital in Boston do this very successfully by using food models. The patient may have memorized his new diet and may be trying hard to follow it after he goes home, but the written instructions seem too vague. For example, they tell him to eat a 4-ounce serving of lean meat for supper. He asks

*Kenneth Goode and Zenn Kaufman, *Showmanship in Business*, Harper and Brothers, 1947, p. 183.

himself: "How can I recognize a 4-ounce serving of meat? And what kind of meat can properly be called 'lean'?" Questions such as these are easily answered when the nutritionist displays on plates life-sized and life-colored models of foods. The models help the patient translate the words of his instructions into real meanings.

Perhaps the purpose of your display is to simplify a complex idea, to present the basic thread of the thought that seems to be twisted and knotted in the minds of your group. This might be the time to use the chalkboard.* Possibly you are explaining the theory of Arnold J. Toynbee, the British historian, that civilizations pass through a series of crisis periods, in which they meet certain challenges that may or may not be too much for them. Basing your ideas on the cartoon by Artzybasheff that appeared on the cover of the March 17, 1947, issue of *Time*, you can outline these crises by drawing a mountainside with sharp cliffs and tiny shelves. Little men are straining to gain the top. Some of them are resting on the terraces. Others are falling toward the jagged rocks at the foot of the cliff. Still others are clinging desperately to the steep inclines. Your chalkboard cartoon will make Toynbee's general theory easier to understand, even though it does not explain any of its details.

You may be planning to help your individual pupils express what they are learning. If each member of your class has studied a different wild flower, each of them might make a colored slide showing its leaves and blossoms. The process of transferring their knowledge to the drawing on the slide will help pupils to learn about the structure of the plant. This form of expression—communicating to others what each has learned—will reinforce in each the knowledge he has already gained.

A closely related purpose of display is to help an individual become a working, contributing member of his group. The feeling that he is liked and respected by the group is a necessary element in anyone's self-respect. When the individual is responsible for some particular display, he has been given a chance to stand in the limelight before his group. He can show his slide, exhibit his hobby, illustrate his report, create a poster

* Because so many blackboards are no longer black but are now green and gray and blue, we shall refer to them as "chalkboards."

to explain his project. He can have a legitimate reason for being the center of attention. This public display of his prowess makes him a more important person in his own mind.

The feeling that he fits in with his group is equally important to him. He not only needs to stand out as an individual; he needs to belong, to be one with his peers. When he takes responsibility for display arrangements, he can feel that he is doing his part. When he belongs to a committee that is preparing display, he feels that he fits into the group.

Whatever reason you have for using display, whether it is one of these we have discussed or some other reason, the success of your display will depend upon how clearly you understand precisely what you are trying to do. Not only must you know the *people* you would help, you must know *in what way* you propose to help them.

Plan for participation. The impact of a display will be strengthened if a person feels himself part of it. When he looks at the display, if his attention is caught by some statement that happens to mean a great deal to him, he'll feel that here is something for him, personally. This feeling of being involved with the display—which we call “participation”—is an important element in the effectiveness of a good display.

This participation is closely related to what psychologists call “identification.” You “identify” with the characters in an absorbing motion picture, play, or novel. You let yourself become the character and let him speak and act for you. For a little while the story lives, with you as its hero. This is the same feeling that prompts you to advise your friends, “Well, if I were you. . . .” It is the same feeling that makes you acutely uncomfortable when you see a little boy forget his “piece” during a piano recital. Identification is one aspect of participation in display. As you identify with the people pictured or the people the display is aimed at, you are more likely to learn.

To look at this participation in another way, we might compare the activity of a person's mind as he sees a display with his thought processes as he starts on a long motor trip. On the trip he is equipped with maps that show the numbered routes, and he watches for the numbers on the highway signposts. When he finds the right one, he joins in with the

stream of traffic and follows along the route that will take him a part of the way toward his destination. The same kind of process goes on in a person's mind when he sees a display. He has a problem, and the display acts as the highway signpost with the right number on it and promises an answer to the problem. He will "join up" with the display and follow it along, hoping that it will help him find his answer. This is what we mean by "participation."

This identification, this "joining up" that we call participation, does not just happen to the viewer. It must be planned for. We must try to achieve it through a careful analysis of our audience and a strategic plan for capturing their mental participation in some part of the display.

One way to get people to think is to ask them questions that almost *must* be answered. "HOW MUCH DO YOU WEIGH?" might head a chart of average heights and weights which backs up an exhibit of low-calorie foods. Any kind of chart on which people find themselves will get their thoughts involved in the exhibit. "WHERE ARE YOU?" or "WHAT'S AHEAD FOR YOU?" might well be the title of a bulletin-board chart showing the stages of family life.

Any kind of puzzle will catch the thinking attention of the viewer. The charade or the "guess who" kind of game will do it. Or perhaps you may write a brief message in Latin or French or German or shorthand, but not in English, and depend on the curiosity of the average person to make him translate it or find a translator.

Another way to lead people to feel a personal interest in a display is to offer something they can do. If they can push a button or pull a string, they'll watch with fascination while the display works for them. Any motion will catch their interest even though they are only passing by, and some action for which they can be responsible will keep them personally involved for some time.

A poster that includes a pocket with "handouts" will get attention at least three times: once when it makes its first impression; once when the viewer sees that there is something for him to take away with him; and once again when the "handout" repeats the message of the poster.

Some of these ideas are merely tricks for catching the attention of the viewer. But unless the display *does* involve the viewer in some way, it can-

not be successful. Participation is an important word—and a principle to use.

Who will plan display? The participation we have been talking about is the kind that is *planned for* by the person who sets up the display. The person who sees the display will *do* the participating. But even more effective for learning is the creative participation of the person who plans the display. He decides what to show and how to show it; he thinks about the display over a period of time.

Planning and producing displays involve not only collecting ideas and facts but organizing and combining these details into general concepts. If students do this collecting, organizing, and combining, they are accomplishing double learning: they are learning the concepts important to the unit of study and they are also learning the process of forming concepts.

Most of us agree that one of the purposes of education is to help each person to reach his own potentialities, both as an individual and as a member of his society. And most of us think that democracy is a good system for providing this kind of growth. If we wholly believe these things, we will encourage a democratic attitude in the schoolroom. The more the activities of the schoolroom can be planned by the children and carried out by them, the more democratic the atmosphere. Display can be one of these student-planned activities.

But is learner-planned display always the best? Possibly the practicing of democracy or the forming of generalizations is not of primary importance at a particular moment. Perhaps the task is simply the learning of the facts in the most effective way. In such a situation, the leader-planned display may well be most efficient. The leader could set up the display, and the time of the group could be spent in looking, listening, learning. A neatly arranged exhibit or a colorful chart can be important aids to learning no matter who has prepared them.

We must always consider the efficient use of time. Individual instruction is usually more efficient than group instruction, but there is not enough teacher time or student time to allow for it in every case. If a group meets only once a week, there will be little time for any student

display. Most scout groups, Sunday-school classes, parents' meetings, and extension classes would find this true. Although some kinds of learning are more effective for the individual through student-prepared display, the pressure of time means that the leader performs much of the display work.

Will you display *for* people? Or will you display *with* people? The answer must be yours. And it must come from your understanding of the needs of a specific group in a specific situation. If you take the initiative and do the planning and producing for your group, their learnings will be different from those they might gain if they did their own planning and producing. What kind of learnings do you consider important? Circumstances will determine your answer.

To summarize, display planned and executed by students can promote a democratic atmosphere in a classroom and can assist the student who does the preparation toward a better understanding of the concepts involved in the lesson. His participation in the display is of the most effective kind. On the other hand, leader-prepared display is often more efficient when time is limited. And through careful planning, a valuable amount of viewer participation can be secured. You will use both plans as you teach, choosing the one that will help you produce the most learning in your situation.

To understand your display problem, plan in these three ways:

1. *Learn all you can about your group*—the individuals in it and their hopes and needs.
2. *Think carefully about your specific purposes* in using a form of display.
3. *Work out a plan for viewer participation* that will grow out of the audience's needs and your purposes.

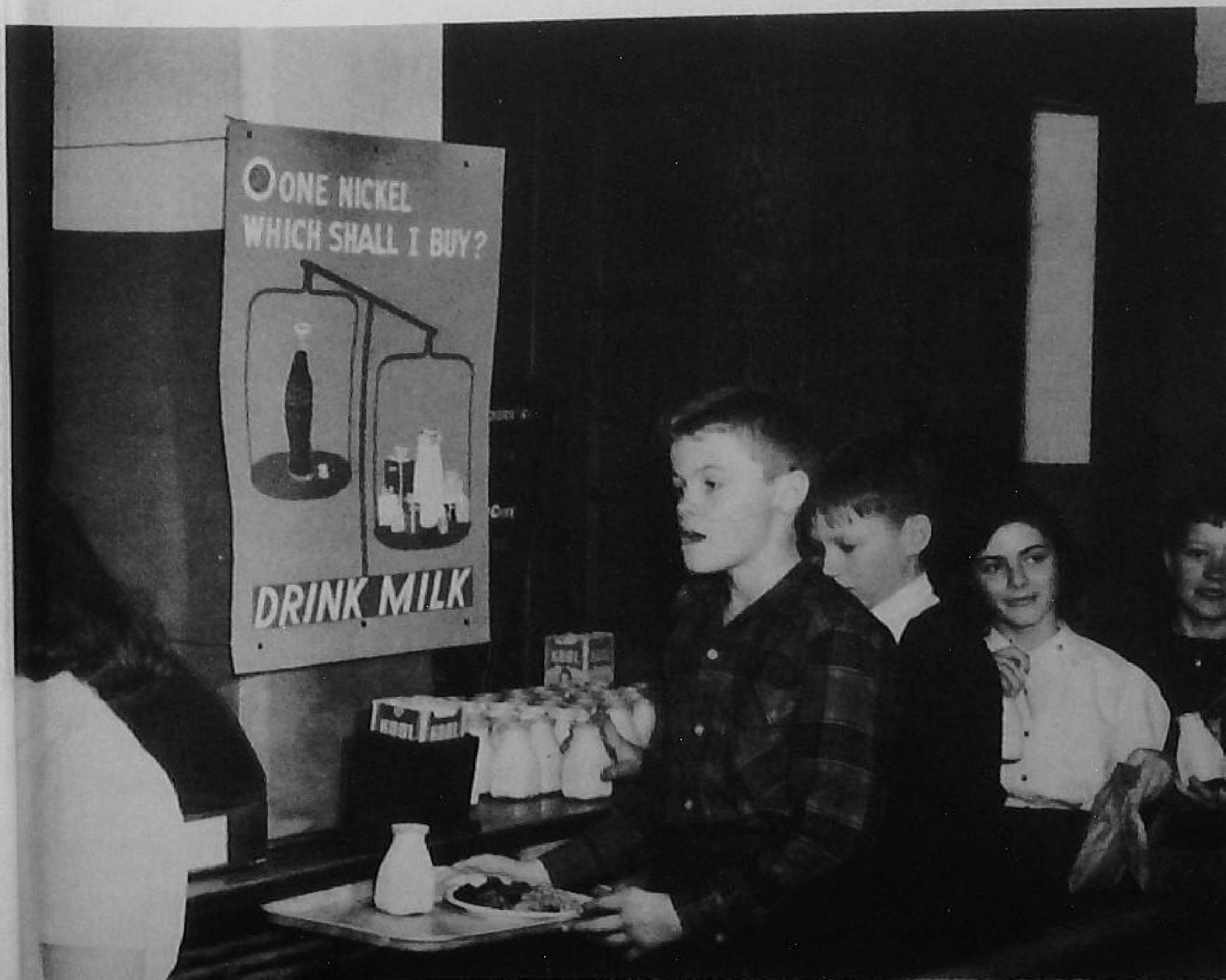
We have really been saying that, before you can help the learner take a step in any direction, you must find out where he is and start there. You use some idea with which he is already familiar and make it the eye-catcher, the headline that draws attention. You can follow up this eye-catcher with the ideas that best fit your purposes.

This first part of our formula for display—the understanding of your

display problem—merely states what you probably already know, for most teaching and learning progresses along these lines. It is the second part of our formula that may be new to you, the translation of your ideas into visual terms.

TRANSLATE THE PLAN INTO VISUAL SYMBOLS

As you think through the three steps suggested for understanding your problem, you probably will think of some way to “visualize” it—to translate it into visual symbols. For example, assume that you know that your junior-high-school children have to make up their minds every lunch period whether they will buy milk or “pop,” and you want to help them to see that they get much more for their money when they buy milk. We have already accomplished the first two steps in the process of understanding the problem of the display. You take the third step when you decide to headline the idea: “ONE NICKEL TO SPEND, WHICH SHALL I BUY?” For if your display is set up where the children can look at it while



they stand in the cafeteria line, they will actually be making up their minds as to which drink to buy. And the display that catches their immediate attention will enlist their thinking participation.

As you considered these three steps, you might have thought of balancing the two drinks, "weighing them before choosing." The scales might be the scales of health, and the bottles of milk and pop might be placed on the scales together with little gift packages with large labels saying "energy," "strong bones," and so forth. Then, of course, the bottle of milk with its several "gifts" would weigh much more than the pop with its solitary gift of "energy."

The idea for turning the problem and its answer into visual symbols may arrive like the flash of the cartoonists' electric light bulb. Or it may grow slowly and naturally as you think through your problem. Perhaps you will develop several ideas from which to choose the one most appropriate and effective.

But if, after all your thought, no single idea seems to stand out as a really good visual way of presenting your theme, you can still go ahead with our formula, hoping to find a suitable idea. As you think through the next three steps, you will be helped to translate the plan into visual symbols.

Select the materials. The materials that you show, like the ideas for display we have been talking about, range from concrete to abstract.

Normally the most concrete kind of material for display is the *actual object*. A book about soap carving is its own best press agent if the aim of the display is to get a library patron to borrow the book. Specimens of soap carving alongside the book show the prospective borrower exactly what he can learn to do.

Models are a somewhat less concrete material for display. Models are three-dimensional representations of reality. Being substitutes, they always differ from their originals in some way. For example, a doll is a small, inanimate, and simplified model of a child or an adult. A model of the anatomy of the human eye, on the other hand, may be larger than life and much easier to study and understand than the thing it represents.

Pictures are important for display. A photograph or a drawing of an object may be the next best thing to the actual object, even though it lacks

the third dimension and can show the object from only one angle—the photographer's or the artist's.

Cartoons are pictures that simplify details. Political cartoons, the comics, the illustrated jokes of the magazines—we might almost call these cartoons models of pictures. These simplified drawings are certainly more abstract than pictures or the object itself, but often they can help people to understand concepts because they simplify details that might otherwise stand in the way.

Graphic drawings also help people to grasp ideas. Bar graphs, area charts, patterns, diagrams, or architectural blueprints can be used to explain many kinds of ideas—again through simplification.

Almost all our displays use *words* in some form. Advertising artists call the accompanying words the "copy." Our copy may consist of two or three words used as a label, or of a long paragraph. In any case, we shall think carefully about what we wish to say, and we shall plan the lettering or the typing or the handwriting so that it is easy to read. Sometimes the words we want to display are not part of the copy but are part of an *announcement* or a *notice* to be posted. Often we want to publicize *clippings* and *pamphlets*. These materials can be presented in such a manner as to attract readers and can also be displays in themselves.

This brief listing of some materials merely illustrates the steps we suggest as part of the formula for successful display. In order to turn your plan into visual symbols, you must consider carefully the available materials and plan their use according to your purposes.

Perhaps one of these materials will *be* the display, without anything added. A picture or a model can be used alone. But if you plan to combine several of these materials into one display, you will need to consider the second step in this part of our formula.

Plan the design. Whenever you show something to someone else, you want him to see a particular quality or aspect of it. And unless you point out that quality, you can't be sure that he will notice it. Since you can't always stand alongside your displays to say, "Look here! This is the important thing to see!" you must make use of other means to achieve the same result. We have talked about making the display tie as closely as possible to what the person is already thinking. We have found that by

drawing his attention directly into the display and making him feel as though he were actually a part of the arrangement, we can capture his concentrated attention.

Planned design can help you show people what to see in a display. Such elements of design as line and color can help to guide the viewer's eyes and attention. They can help him see the order and sequence of the ideas presented; they can help him arrive at the conclusions that are intended.

For example, consider again the problem of showing children the value of milk as compared to pop (see p. 21). How have we planned the design to reinforce our message?

First, we have taken advantage of the habit in western civilization of reading from left to right, in blocks arranged from top to bottom. We have placed the copy that we wish to use for attracting attention and enlisting participation in the top left corner. And we have tried to arrange our materials so that the eye is led through the design logically until it finishes its "reading" at the lower right corner. There we have put the "clincher," DRINK MILK!

We have used *line* to help us in several ways. Lines are used to represent the scales and the little packages that symbolize gifts of good health. Line is also used to help the eye travel through the poster, the diagonal line at the top of the scales carrying the eye to the right and also down. By concentrating the detail (the many figures and words) beside the milk bottle, we have helped the eye to stay there longer and so to spend more time considering milk.

We have used *color* to help us put across our point by emphasizing the whiteness of the milk, which contrasts better with the gray background than does the dark red of the pop bottle. The brightly colored packages draw attention to the milk. By using white for the lettering of the copy at the top and the bottom of the poster, we have emphasized the milk through repetition of its color.

Choose the medium. Some people approach the problem of display from an angle quite different from the one we have been suggesting. They begin with this step: If Mr. Williams has just been appointed chairman of exhibits for his church, his problem seems to be centered in that

great glass case standing in the foyer. He starts with the case as his focal point and tries to think of things to put in it.

We would suggest that Mr. Williams remember that his exhibit case is really but a means to an end, a medium through which he can accomplish something. We believe that he should start his thinking with a consideration of the *people* who will see the exhibits, and go on from there to define his problem. Then he will probably come up with several fresh ideas for helping some of these people to prepare the exhibits. So many other ideas will probably come from them that the case will be filled easily, as well as the bulletin boards, the walls, and the hall tables, and all these objects will be used as mediums for accomplishing certain purposes.

No matter whether Mr. Williams begins as we suggest—with the problems of his audience—or with the specific medium he intends to use, there are certain kinds of materials and some kinds of ideas that fit one medium better than another. Let us look briefly at some mediums for simple display and compare their uses.

This book itself is a form of display. It is carefully arranged to show something to you. Any printed page does this to some extent, especially when it uses visual symbols less abstract than words, such as photographs or drawings. The medium of the printed page is not available to most of us, because of the technical difficulties and costs of reproduction. But other, simpler methods of reproduction can be used. The hectograph, the mimeograph, the silk screen—all these can help us use the *duplicated page* as a medium for display.

Probably the most commonly available medium for display is the *chalkboard*. Almost anywhere that groups meet, a chalkboard is to be found. It is particularly useful for immediate problems. It can keep up with the thinking of the group, acting almost as a group memory for the ideas that are developing. It can be used readily for simple drawings that explain or emphasize.

Handmade slides are useful in other ways. We have noted that they can be used by individual children to express their knowledge about wild flowers. But the unique potentialities of the slide come from its ability to record visual ideas in a compact and relatively permanent way. Photographs, drawings, graphs, typewriting, handwriting—all these and other

materials may be displayed by means of the slide. Whereas the chalkboard records for a few minutes or a few days, the slide can be used for months and years.

The *poster* is perhaps the most closely related of all our display mediums for education to the display mediums of advertising. Our poster is quite similar to the magazine page or the billboard. It can be pasted up or tacked up almost anywhere. It carries its message by itself, requiring neither a projector nor an operator. This very independence makes it imperative that the poster have power and drama in its presentation. The poster will stand alone and state its message alone.

A *bulletin board* can be simply a temporary poster. Instead of being arranged in permanent form through paste and paint on a large card or paper, the materials are temporarily clipped or tacked in place on a more or less permanent wall surface. In this way, the bulletin board has all the advantages of the poster and can be used in the same spectacular manner.

However, the bulletin board is more commonly used to present many kinds of articles, each with its own idea. The same two-dimensional materials we have mentioned—pictures and drawings—can be pinned up for all to see. The bulletin board acts as a medium for presenting clippings from newspapers and magazines, for posting announcements, for showing booklets and other small articles. It, too, is a temporary kind of display and is best used for materials of temporary importance.

The *exhibit* offers the opportunity to expand display into the three-dimensional world. Here we show actual specimens, models, all kinds of objects in arranged display. We can present a slice cut out of life by placing real materials in realistic situations. Or we can exaggerate and distort reality to point up our purpose. Not only do we have the added power of visual depth and perspective, but we often can make use of dramatic lighting and of mechanical animation.

Each of these display mediums has certain unique advantages. Each is suited to specific purposes. As you follow through the formula we have suggested for planning display, the most suitable medium will probably define itself as a consequence of your purposes, your people, your participation plan, your materials, and your design.

To translate the plan into visual symbols, use these three means:

1. *Carefully select the materials* you wish to use for carrying out your plan.
2. *Use the principles of design* in arranging your materials so as to help them make their points.
3. *Choose the most suitable display medium* for carrying out your over-all plan.

These three suggestions form the basic organization of this book. You probably need no further help in thinking through the first part of our formula for display. After all, you know your people and you are sure of what you are trying to teach them. Hence this book is planned to help you chiefly with the second part of the formula, the translation of your plans into visual symbols.

We can again compare successful display with a dramatic production. Both are prepared for a carefully defined audience. Both are planned to accomplish a specific purpose, although the drama may be somewhat less didactic than an educational display. Both involve a high degree of audience identification and participation. The dramatic production uses the "materials" of scenery, dialogue, libretto, orchestration, costumes, actors. These correspond to the materials of display: the objects, pictures, copy, and so on. The dramatist, the director, and the designers of settings and costumes arrange and manipulate their "materials" so as to fulfill their purposes most effectively. You do the same kind of thing when you make use of the techniques of design and put color, line, texture, shape, and size to work for *your* purposes.

The successful dramatic production may reach the public through any one of several mediums—the radio or the motion picture, the stage of an opera house, or the stage of a little theater far from Times Square. Your display, too, can reach your audience through any one of several mediums—the duplicated page, the poster, the slide, the chalkboard, the bulletin board, the exhibit.

PART 2

MATERIALS *for Display*

The Real Thing and Its Models

If you want to learn how the UN works, it would be a good plan to go to New York and see it in operation. If you want to learn just how the Red Sox operate as a team, it would be helpful to watch them play a game. For most of us the natural way to learn something seems to be through observation.

But we can always learn more if we look at something that has been especially arranged so as to teach us some specific thing. The UN does its own work; if we learn from watching it, our learning is quite incidental to the operation of the UN.

On the other hand, display is arranged *especially* for people to see. If the Red Sox wished to display their teamwork, they would not play an ordinary game but would set up situations in which fielders and basemen, pitcher and catcher, could perform together. They would probably stop the action every now and then to explain a play, and perhaps they would go through some plays in relatively "slow motion."

When we display for learning, the simplest thing to do is to show an actual object and then explain how it fits in with the idea we are trying to teach. An adolescent Tungus from eastern Siberia would find baseball much easier to comprehend if he could look at, touch, and use a baseball, bat, and glove. We attach meanings much more easily to real things than we do to abstract ideas. The American flag has a more immediate and practical effect around the world than does the term "democracy."

MANY THINGS CAN HELP YOU TEACH

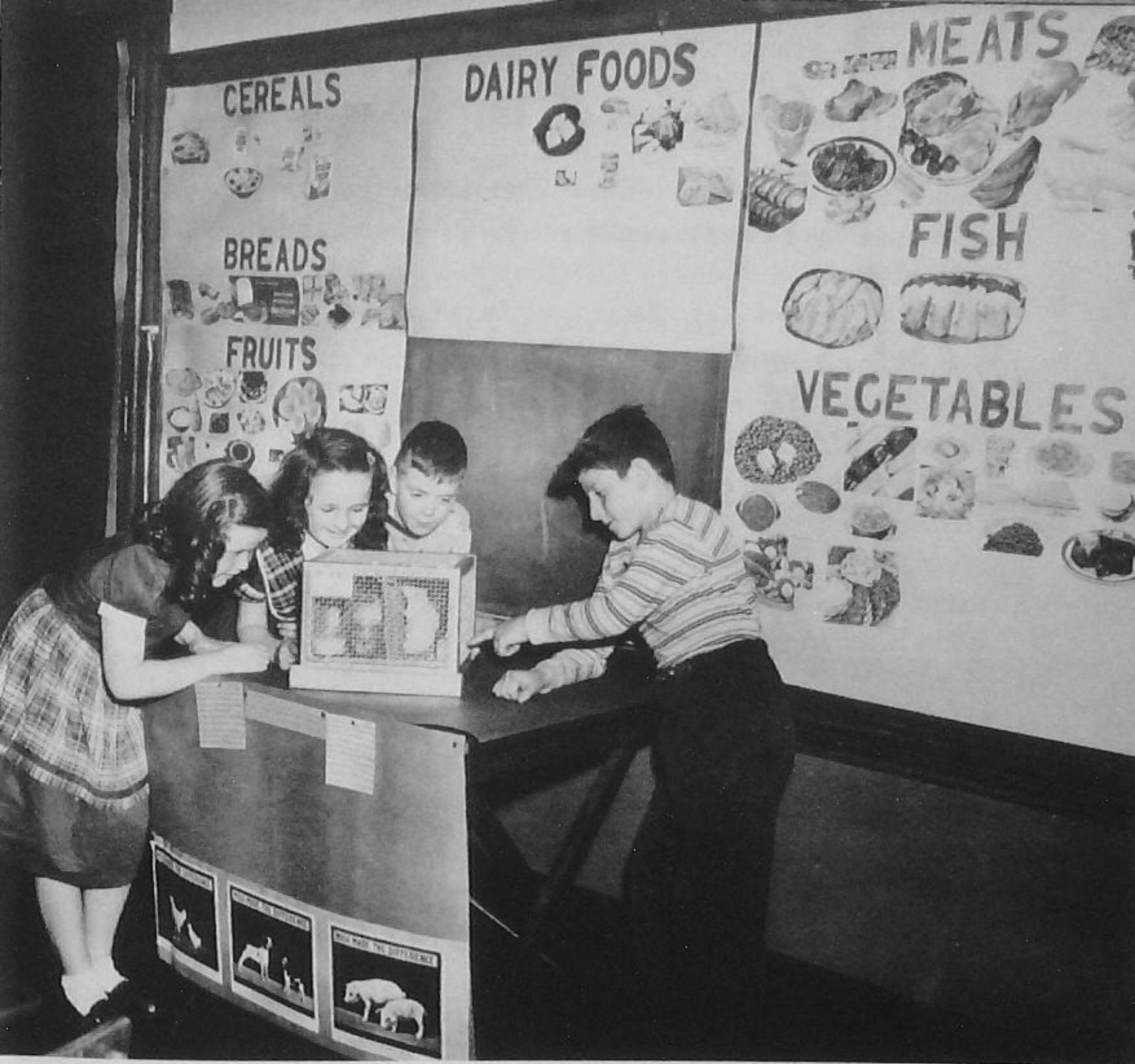
You know of some real things that can be used to help people learn about your particular subject. You have used these things over and over. There is no need to tell the biology teacher that it is easier to learn how frogs grow when the book information is supplemented by a group of black wiggly tadpoles growing up into frogs. But perhaps people who are not biology teachers need to be shown that animals can very successfully help them teach.

If your group wants to show some of the conditions they consider important to family happiness, they might put on exhibit a couple of kittens with the title "WHAT MAKES YOUR PETS HAPPY?" Then on the wall behind them they might add drawings and labels that display some of the needs: security, comfort, companionship, play, love, regular care. The last line, in large letters, could say, "EVERYONE IN YOUR FAMILY NEEDS THESE SAME THINGS." While the kittens romp and play in the sawdust in their large box, the words above can help the people looking at the display to think about the way they treat their pets and perhaps about the way they treat the rest of their family.

The tadpoles and the kittens merely point out the possibilities that are open to us if we stretch our imaginations a bit and try to think of real things to put sparkle into the eyes of our learners.

Perhaps your students are interested in making bread. An exhibit can show some of the steps in the process and something of the action of the yeast. The measured ingredients and the equipment are placed together. Then glass bowls of dough in various stages of rising are placed in proper sequence. Finally a shaped loaf rising and a baked loaf complete the display. By simple explanatory labels the whole process is made understandable. The yeast really acts, and the dough really rises, and the students can't help learning.

Books also are "real things" even though they are actually a collection of word symbols. Books can "sell" themselves quite well if we give them a bit of help. The French Revolution will make more sense to your learners if they read some historical novels or biographies of people who lived during that time. Show them the books, and they will be more likely to turn the pages. Of course, you'll do more than just show the books—you'll tell



These children of the Baxter School (Somerville, Mass.) are conducting a rat-feeding experiment. Having the actual animals in the classroom creates interest in animal life and in experimental methods, as well as in proper diet.

about the people, some amusing incidents in their lives, some serious problems they faced. But you won't just tell about them either; you'll have real objects—the books themselves—on hand to show.

A group of girls and boys who earn their spending money as baby sitters may become interested in children's books. They have to read the bedtime stories, and they are wondering what kinds are best and why some seem to be preferred by the younger children. A display of the

Golden Books or other inexpensive picture stories could be arranged, and the boys and girls could discuss those which seem to be favored by their small charges.

Ask for help. If you are a teacher searching for real things to add richness to the understanding of your learners, don't be timid about requesting loans. The grandmother who still has her hand-woven and embroidered heirloom tablecloth from the "old country" may be pleased to let her grandson bring it to class, and he may be pleased to bask in its reflected glory. If you are studying the Colonial period of the United States, you may be able to borrow a collection of coin-silver dowry spoons. The romantic story of their construction and their life would add much to the words in the history books and to the photographs of Williamsburg, too. People who have hobbies are usually glad to share their enthusiasm with others. Don't be afraid to ask for their help.

Find new opportunities for using real things. Perhaps you should form a new habit. Every time you or someone in your group refers to an actual object, stop and think. Would learning take place more quickly and easily if that article were brought in for the group to see? If the answer is yes, then you can take steps toward getting it.

Of course, not all the things you talk about that would bring a "yes" answer are suitable for bringing into the classroom. If you are discussing a steel plant, you can't bring it to the group, though you might conceivably take the group to it. But if you are talking about granite or leaves or lizards, typewriters or electric irons or connecting rods, Florentine flasks or Dover egg beaters or dowels, bringing one to class is both useful and feasible. Whether you bring the object to your group or take the group to it, the concrete reality will help the learners to understand the ideas associated with the actual thing.

MODELS MAY BE BETTER THAN THE REAL THING

Often when we ask ourselves, "Would the real thing be a help to my students as we study this subject?" the answer is "yes," but the difficulties of getting this real thing into the classroom make it impractical. Your

students might learn a lot about the earth if they could sip a magic drink, as Alice did in *Alice in Wonderland*, and grow even bigger than Alice did—big enough to hold the world in their laps and look it over. But they can't, of course, and so instead they use a globe, a model of the earth, that reduces it in size and simplifies its details.

Learning situations such as this one call for models. Some models are exact replicas of the real thing and differ only in material or size. Some

By seeing real objects in a museum, these girls get a much clearer picture of Eskimo life than they would by merely reading about it. As they adapt the style of an Eskimo garment to modern dress, they may also be learning that, in some ways, all people are alike.



are simplified or edited in some way. Some symbolize rather than represent the real thing. Models are three-dimensional substitutes for reality.

Children often use models in their play. They have no difficulty in using a doll as a model of a child or in pretending that their little toy truck is the big black coal truck. To them the sandbox easily turns into a terrain of hills and valleys and roads. They can express their feelings about their world by the way in which they set up small models of trees, stores, houses, automobiles, and people. A trained therapist would be able to read in this "play" certain symbolic acts that suggest what the child is thinking and feeling about the real world, so close is the unreal world of models to the real world of the child.

Why do children use these models? Often because they want to use some real thing scaled to their own size. The little girl who likes to help mother with the ironing would have a hard time with a regular iron, but with her own model iron and board she can do a good job on the handkerchiefs. Perhaps they use very small models in order to give themselves the feeling of being adult—being big and all-powerful, that is. But chiefly models are more convenient than the real thing.

Student-made vs. ready-made models. Ask any ten-year-old boy what he knows about models and he'll be off on a discussion of balsa wood and struts and camber. Precisely detailed model airplanes help teach the principles of aeronautics, and the engine-propelled models that fly on a leash demonstrate those principles. But the less precise models that children make themselves may teach those same principles even more efficiently.

Shall we show our students models that are already prepared, or shall we urge them to build their own? When people express facts they have learned, the act of expressing helps them to remember those facts, and the building of a model will be a way of expression. The boy who constructs his own models of the World War I Spad, the World War II Mustang, and the Thunder-Jet will have an introduction, through his interest in mechanics, to some of the history of the twentieth century. He will also get some idea of aerodynamics and of advances in airplane design. He is not especially eager to learn abstract rules, but he does want to see how



Why did these students make their own model of this town? What have they learned by doing this that they would not have learned in some other way?

rules work. And, too, he likes to make things; he likes to use his new dexterity with his finger muscles.

But if a class in college physics is studying aerodynamics, would you suggest that each student build model airplanes? Probably not. If the students could see each of these models, perhaps see them actually flying in a wind tunnel, they would learn just as much as or more in less time than if they built the models themselves. At this period of late adolescence, students are much more willing to deal with abstractions. They can learn quite well from watching a model without having constructed it.

The decision, then, will depend on the lesson to be taught and the reason a model is being used. If you wish to stimulate creative efforts, to exercise finger muscles, or to teach a process of construction that will later be used to build a real thing, then you may encourage students to build models. If you wish students to *express* what they have learned, a model may be a suitable medium for that expression. But, if the model is going to show a process or an object merely as a basis for other learnings, save

the time of the student and show him a completed model. Models should assist people to learn, not impede the process. As we discuss various types, think *why* you want to use a specific model on a given occasion.

Models of things from the past or the future. In some circumstances, the passage of time prevents the use of a real object or specimen. Life in ancient Greece would be clearer to students if they could walk through the Acropolis as it was in 400 B. C. Since that is impossible, a model of the buildings on the hill or of the Parthenon alone is certainly an effective visual substitute.

Students of history or of art may build a scale model of the Parthenon.

This woman is getting a look into the future—her future kitchen.



Heavy cardboard from grocery cartons can be cut into walls and pediments and roofs. Cardboard with a corrugated surface can be rolled to form pillars, and layers of cardboard can form the Doric capitals. Painted white to simulate marble and with colored drawings simulating the sculpture, the model will be quite effective. For a more elaborate Parthenon, white soap can represent the marble that is carved into pillars and sculpture and that forms the walls and the roof.

A look into the future, like a look into the past, is very necessary for builders of every kind. Architects commonly prepare a scale model of the proposed building so that their clients can visualize it more easily.

Amateur architects find that models help them in visualizing space relationships. People who are planning to build their own homes with concrete or pumice blocks for the exterior walls can build a very realistic model using loaf sugar as the blocks. By using flour-and-water paste or glue as the mortar and laying the blocks carefully, they can begin to get an idea of the process of brick laying. They can think out, as they build the model, the construction techniques which the real house will require.

When they have installed cardboard for plywood or plaster on the interior walls, put in cellophane glass, indicated the electrical and plumbing systems, and hinged the cardboard doors, they will have a very good idea of their dream house. They can check on closet space and traffic flow. If there seems to be insufficient space along the living room wall for the piano, changes can be made in the model and then in the plans. It is much easier to change a model until it seems right than it is to tear down partitions in a real house.

For this same reason other builders use models. If the members of a group have decided to build bookshelves in their room as a project in the arithmetic class, building a scale model first will help them see what the shelves will look like and will provide additional practice in arithmetic skills.

A student making a tailored suit often finds it practical to make up a model first, exact in every detail except that muslin substitutes for the wool fabric. Changes can be made in the muslin until perfection of fit is achieved, and then the muslin can be used as a pattern for cutting the expensive wool.

Models that reduce the size of things. Models may be precisely accurate except in size or they may be considerably simplified. A model of a locomotive may be an exact duplicate in miniature—a tiny steam engine that speeds along its tiny track under its own power—or it may be a wooden toy that a two-year-old pushes around the nursery. Either could be used to help people learn, but probably not the same people or for the same purposes.

The loaf-sugar model house described on the preceding page can be furnished with models, too. A bridegroom will be much happier about the process of arranging furniture in his new home if he and his bride try out the possible arrangements with tiny models instead of by laboriously moving pianos, sofas, and chairs. Students working with interior decoration find miniature furniture of great help. It can be made from paper or cardboard, or small wooden pieces may be purchased in sets. An even simpler way to make "models" of the furniture is to cut out their floor-plan shape and then to move these pieces of paper around on a plan of the room. If both room and furniture are cut to scale, this process helps one to visualize the space relationships within the room.

The globe which is a model of the earth does more than reduce its size to visually manageable proportions. It leaves out many details, and it adds to the earth certain things that aren't really there, such as parallels and meridians. It is a model used to teach general ideas. A relief map does this same kind of job. The masses of land and water, the heights and depths, are shown clearly even though in miniature, but the smaller details of vegetation and topography are usually ignored.

How to build terrain models. Perhaps the simplest relief map or terrain model is the sand-table map of the primary grades. Local landscape can be modeled in a rough fashion. Country children can map their neighborhood and show the home of each member of the class. Children who live in the city can map the transportation routes that lead into the city. Tiny trees, buildings, automobiles, trucks, animals, fences—all can take their places. Blue paper cut to the shape of rivers, lakes, and bays can be placed flat on the sand. Thus a temporary model helps the group to learn.

Another very simple method for making a temporary terrain model is to place crumpled newspaper on a table in the approximate position of

the hills or mountains you wish to represent and then to cover the newspaper mounds with a large sheet of rather soft cloth to represent the covering of surface earth over the more solid newspaper "rocks." You can squeeze the paper down or plump it up to make the hills and dales more accurate. To be sure, this model will be very rough; it will be a most temporary thing, used perhaps to point out the route for a hike or the location of a stream or spring or abandoned well. When you are through with it, the cloth can be folded away, ready for another model at another time.

For more permanent relief maps you will need more durable materials. Members of the Future Farmers of America might construct scale models of their farm land so that they could plan for contour planting or decide on the best positions for the future house and the barns. They could survey the land themselves to find the actual contours and then draw a scale map of the area. Or they could send 20 cents to the U. S. Geological Survey, Washington 2, D. C., for such a map. Topographic maps are available for almost every area in the United States and its possessions. Each represents an area of several square miles and gives information of three kinds. Water symbols are printed in blue; relief symbols, such as contour lines, are printed in brown; culture symbols, such as roads, houses, railways, and boundaries, are printed in black. On the back of each map is a careful explanation of the map and how to read the symbols and the scale.

If you work from one of these topographic maps, it is not difficult to build an accurate scale model. First you will have to draw an enlargement of the section you wish to map, showing contour and water edges. The map may be placed in an opaque projector (sometimes called a Balopticon) and projected on a large sheet of paper. Then the lines are drawn in carefully on the large sheet, following the shadow lines projected from the topographic map. Or, if no projector is available, you can draw a grid of lines on the original map and then a correspondingly larger scale grid on the large piece of paper.

When you have prepared the drawing in the size you want your model to be, you must translate these lines into three-dimensional shape. A simple method is to cut the contours from the heavy corrugated cardboard used in grocery cartons. These shapes can then be stacked up in the right

position. The only refinement necessary, if you want to be quite accurate, is to make sure that the vertical scale is the same as the horizontal scale. Often, of course, it is more effective for teaching purposes to exaggerate this vertical scale.

For some models this cardboard-layer method is as far as you need go. But a professional finish can be obtained by spreading some kind of solid mixture smoothly over the "steps." Papier-mâché mixtures work very well as fillers, and strips of paper toweling can be pasted on to smooth the surface. Here is a recipe for a smoother, more durable mixture:

1 pt. ordinary sawdust
1 pt. plaster
1 cup school library paste

Dissolve paste in just enough water to thin slightly. Add plaster, then sawdust, and knead until the consistency of tough dough. Smooth onto model.

When the model is set, surface details can be added for realism. A thin coat of glue will hold coffee grounds to represent freshly ploughed earth, or sand and dirt to represent themselves. Sawdust can be colored green by dropping a spoonful of green poster paint into a bowl of it and working the color in with the fingers. This green sawdust will be grass or bushes or woods, depending on the scale of your model. Moss or sponge rubber carved into shapes may be used for trees. Water areas can be painted suitable colors of blue or green and covered with a clear lacquer or varnish to give a gloss. Flour can be snow. Cotton tape can represent roads. Your own ingenuity will suggest many other symbolic materials.

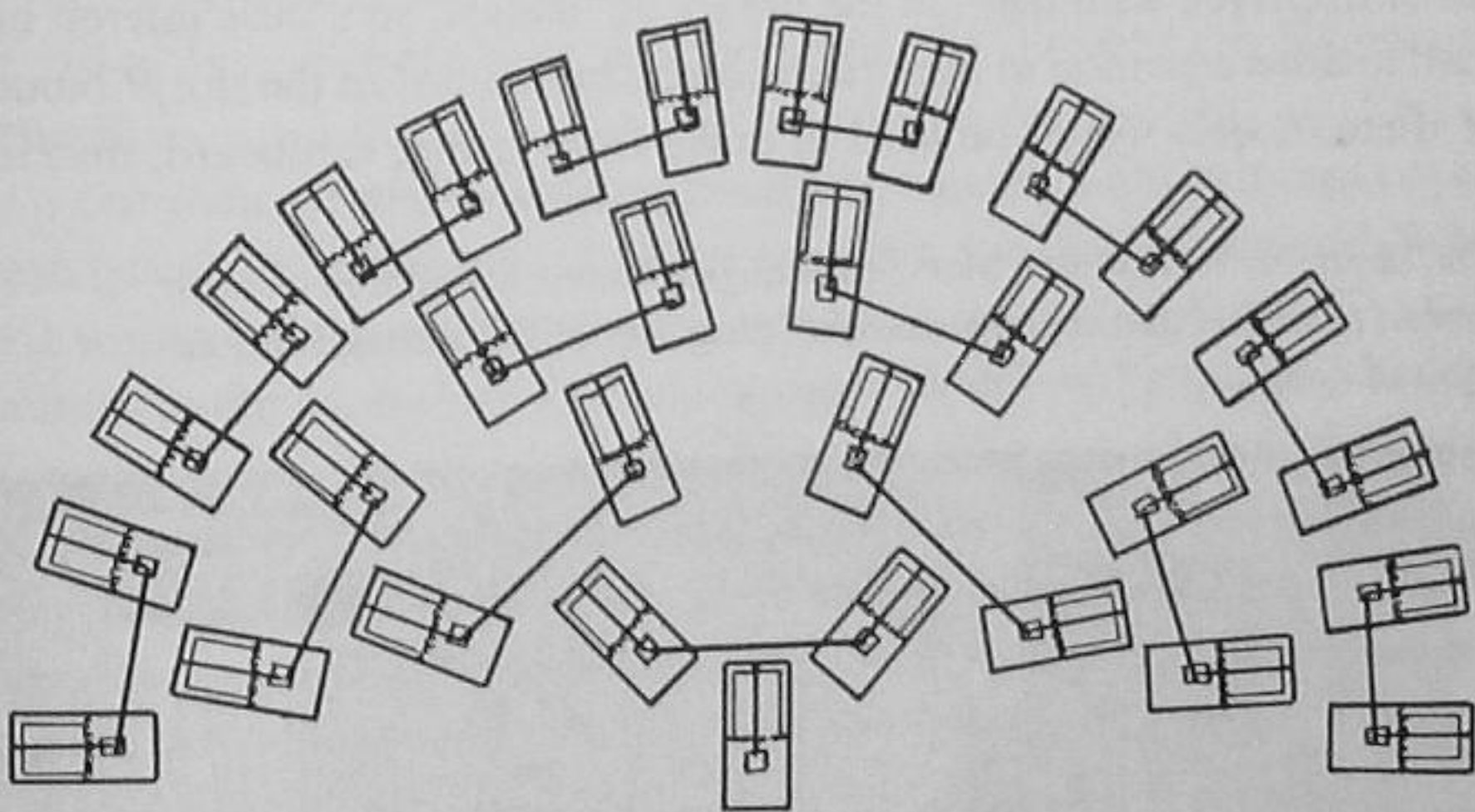
Models of things too small to examine. The University Museum of Harvard displays one of the world's most unusual collections of models, the famous glass flowers. True in color and in botanical detail, the enlarged models are delicately molded in glass. They are arranged in evolutionary sequence from the simplest to the most complex. Each year thousands of botany students admire the precision and beauty and learn from the scientific accuracy of these models.

We cannot all use these glass flowers, nor can we duplicate their accuracy in our own models. But there are many tiny things which we can model for our students and so help them to see and understand the details.

By looking at models made of wooden balls and sticks, chemistry classes can see how some scientists visualize the way in which molecules are formed from atoms. If you don't have these special balls and sticks, a child's "tinker toy" set can substitute nicely, and you or the students can build molecule arrangements, from the simple H_2O to the elaborate $\text{C}_{12}\text{H}_{17}\text{N}_4\text{OSCl}\cdot\text{HCl}$, the formula for thiamine.

At Washington State College, students can see (and hear) a model that demonstrates nuclear fission as it is used in making an atomic bomb. The chain reaction is illustrated by the use of mousetraps.

A model to illustrate nuclear fission as employed in the atomic bomb is based on a chain reaction which exactly doubles its rate as it progresses. The first trap activates two traps, each of these activates two more, etc., until a



total of thirty-one traps have been sprung. The chain carrier is the "tail" of a trap which strikes a cross bar attached to the triggers of the next two traps. Small lead balls may be attached to the tail of the traps to represent the neutrons which are ejected and initiate the fission of the next atoms. Two No. 10 corks, one red and one green, are placed on top of the trap after it is cocked to represent the fission fragments. These corks are commonly thrown to the ceiling and rear of the lecture room holding 150 students.*

*W. H. Slabaugh, "A Lecture Demonstration of Nuclear Energy," *Journal of Chemical Education*, 25, p. 679.

A group studying community sanitation may enjoy making enlarged models of disease-bearing insects, such as the mosquito and the house fly. They can learn some entomology, too, as they make wings of cellophane, legs of wire, bodies of papier-mâché or soft wood. Models such as these may become part of the permanent display materials of a science department.

Models of things from faraway places. We learn about other peoples and other lands as we study history and geography and anthropology, but we live their lives with them as we read a good novel. If we are helping others learn from novels, we can explain details through models. What models might we use with *Ivanhoe*, *A Tale of Two Cities*, *Rickshaw Boy*, *The Way West*, *Mutiny on the Bounty*, or *Kabloona*, either displayed with them in the library as "teasers" to arouse interest or used to draw attention to important objects mentioned in the story? None of these models would be hard to make from string, cardboard, match-

The library in Winchester, Mass., encourages interest in children of other lands (as well as getting over another "plug" for milk) through this exhibit of dolls.

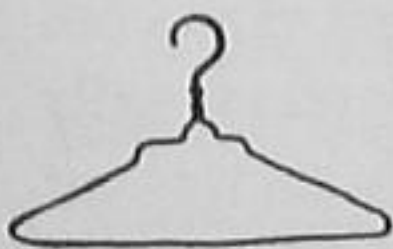


sticks, aluminum foil, cloth, loaf sugar, glue, and a variety of paints. But *you* will have to decide whether you or your learners will do the constructing or whether you should try to borrow a professionally made model.

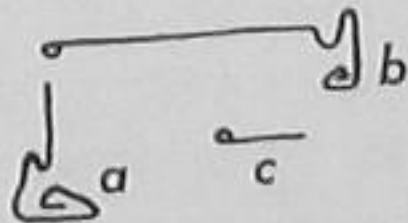
Models to explain difficult concepts. When we try to explain complicated concepts, such as "spiral," we usually find ourselves gesturing in the air to try to help our listener "see" what we mean. We are really constructing imaginary models in the air. Actual models can help with these complicated ideas.

Certainly the space relationships of solid geometry, for example, are easier to understand when the learners can work with actual cones, cubes, and spheres. And plane geometry makes sense more easily if learners work with clear plastic or celluloid cut into circles, triangles, and squares. Wire or string can represent lines, and the proof of a theorem can be demonstrated.

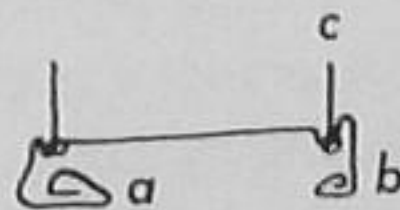
The solar system, as another example, is surely a difficult concept to understand. Why is it night in Virginia when it is day in Yunnan? Why is it winter in Minneapolis when it is summer in Buenos Aires? You can gesture in the air and try to explain, but a model will explain it better. Remove the shade from a lamp and move an apple around the light globe at the same angle at which the earth revolves around the sun. Or, better yet, construct a model using round wooden beads and coat-hanger wire to demonstrate that the earth can turn on its own axis and still move around the sun. You can add our moon, if you wish, and other parts of our solar system too. Your model will explain how it operates.



Start with a wire coat hanger.



With pliers, cut and bend it into these pieces.



Assemble and adjust so that "a" and "b" will stand alone.



Use wooden beads for sun and earth. Revolve earth and keep correct axis with hand.

Models to show working parts. The model of our solar system shows working parts, in a way. It reduces the size of the system so that we comparatively microscopic humans can see the system itself instead of seeing merely the effects of its operation. Many other operating things cannot be understood easily because, for one reason or another, the working parts are not clearly visible. Models help us to see these parts.

Clinical thermometers are difficult for some people to read. An enlarged model of a clinical thermometer made out of cardboard, marked accurately with the degrees, and with a silver ribbon simulating the mercury, would help one to see clearly these details. The cardboard could be shaped into the triangular form of the thermometer to add another detail that would help the "carry-over" from model to reality in the minds of the learners.

Students of human anatomy, whether in medical school or in high-school biology, know how useful models can be. The eye, the digestive organs, the brain, and many other parts of the body can be shown in detail. And certain sections can be removed so that sections beneath them can be seen.

These anatomical models are usually made in the round—that is, in true three-dimensional shape. Cross-section models are also very useful. A cross section of the head, a model that opens at the center of the face, can show the various spaces in the throat, the mouth, and the nose used in making certain sounds as we speak or sing. The Margaret Sanger Clinic in New York uses a cross-section model of the female pelvis to show the positions of the organs.

A variation of these cross-section models are those with cut-away sections. Models of automobile engines are sometimes made with a cut-away section so that the interior workings of the pistons and valves can be seen in operation. A refinement of this cut-away model is occasionally found at automobile shows: an engine constructed with transparent windows at strategic points so that we can see the flow of the oil throughout the engine while it is running.

Transparency makes some other objects seem like models. A glass double boiler shows very clearly how the boiling water heats but at the same time protects ingredients in the upper half. Through the unfrosted

glass of the heat lamp we can see the thick filament and understand how ordinary electric light bulbs work.

Models with a touch of the fantastic. Perhaps you wish to use a model purely for amusement. You may have no desire to explain anything. You want the model merely to attract attention. And that won't be difficult. People like to look at models, perhaps because it's fun to compare them to reality.

"Paper sculpture" is the name given to three-dimensional models that are made from paper and bits of scrap materials. Intricately fashioned designs are sometimes used for advertising and for store-window display, and the delicacy and precision that can be achieved with paper is amazing. But the ideas and many of the techniques are simple, and the novelty of their shapes can easily help us to attract people to our displays. The sculptures are like three-dimensional cartoons. They are supposed not to look exactly like reality but to be merely a rough representation. And they need not be fully rounded out but can show merely a suggestion of form. (See pp. 48-49.)

The sculpturing is achieved by folding, bending, and cutting paper. If you follow the simple directions for making a sculptured face, you will see how easy it is. You and your group can have fun with paper, using old candy wrappers and bits of colored and textured papers and string and scraps of cloth. Sculpturing takes time to produce, but it does draw attention. In fact, it may draw attention *away* from any information you are trying to give. Hence you had better keep your sculpture simple and be sure that it is appropriate. Plan it to help, not compete with, the rest of your display.

The childhood toy, the peep show, is a type of model in which miniature objects are arranged to simulate reality. The same kind of idea may be adapted for our use. If the glass doors of an exhibit case are painted over with washable calcimine, except for a tiny window in the center at the eye level of the viewer, the whole inside of the case can become a magical fairyland. It could employ fantasy and unusual effects to get across its point. The exhibit space may be divided, with two peeping windows. One peephole may carry the sign "IS THIS THE WAY WE LOOK

HOW TO MAKE

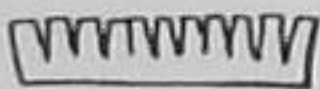
1. Block out the face and features on flesh-colored paper.



2. Cut out white eyeballs and blue or brown pupils. Paste to the face.



3. Cut a fringe of eyelashes.



Slit the face along the top of the eyeballs and insert the fringe, pasting at back.

4. Cut eyebrows. Mark a heavy pencil line lengthwise on the back. Crease along the curved line to shape. Paste on.



5. Cut the lips and mark their center curve with a heavy pencil line on the front. Shape into curves. Curl the bottom



lip over a round pencil to shape it. Cut a slit in the face; paste in.

6. Cut two slits where sides of nose will be. Cut nose, allowing flaps.



Shape nose by creasing down the center:



or by curving:



or by double creasing:



Insert the flaps in the slits in the face and paste them at the back.

7. Cut simple hair shapes, fringing the edges or curling up strips.



The directions given will make this face. By varying the features, the shapes of faces, and the colors and textures of paper, these and other faces can be made.



PAPER - SCULPTURE FACES

To add more form to the faces, paste them to smaller cardboard ovals. For a short, round face, use a shorter oval backing, pasting only at top of head, eyes, and chin.

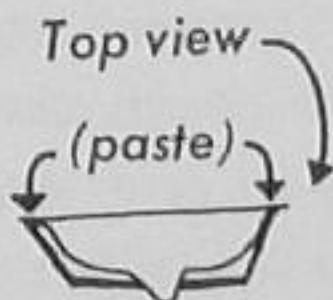


The forehead and cheeks will bulge out.

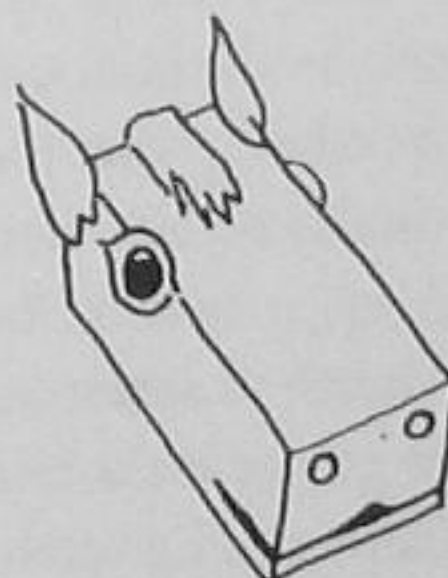
Oatmeal boxes can be the foundation for other faces, such as this Santa Claus.



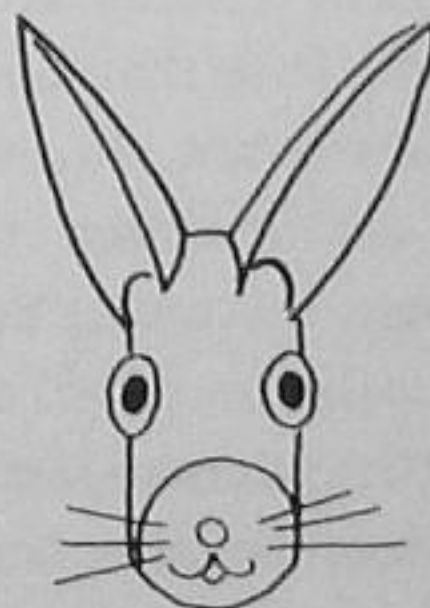
For a long, slender face, paste it to a narrower oval backing, pasting only at the sides. The face will curve out down the center.



Other small boxes can become animal heads.



Brown paper sacks make good foundations for faces—to be worn as masks or to form part of a display.



TODAY?" and reveal inside a gloomy world with slumped, crooked people. The other may carry the invitation "LOOK LIKE THIS TOMORROW" and reveal a bright, cheery world with erect, high-standing people, all with excellent posture. The sign in the back of the peep-show display may say, "GOOD POSTURE MAKES THE DIFFERENCE." The little people may be stick figures made from pipe cleaners, or paper dolls cut out for the occasion. The whole effect would be amusing; yet it would gladly teach.

MOCK-UPS

A mock-up is a kind of model in that it is also a substitute for reality. It substitutes where the details of the real thing are too complicated to understand. Children learning to tell time can use a real clock face with real hands and can move the hands through the hours themselves. This mock-up uses the real face and hands of the clock, but the element of time is "edited" out. That is, time is speeded up so that the children may see how minutes make hours, and hours make days.

In this "editing" lies the difference between a true model and a mock-up. The model *represents* reality and substitutes for it in several ways. The mock-up *is* reality, but reality that is to some extent rearranged, edited so that it is easier to understand. The real clock face is there, but the motive power is the child's own hands instead of wheels and springs.

Mock-ups can be used where you wish to abridge a process in order to make it easier to comprehend. If you are showing how the wiring system of a house works, you can fasten all the details to a long panel, the wire from the outside threading through an actual meter, then through a real fuse box, then to real switches and real lights and real wall plugs. You can show the conduit, the insulators, the way the system travels between the walls. You can overload the circuit until a fuse blows out. It is reality modified and abridged: modified because the real details are placed on a board instead of in the walls of a house, abridged because the length of the wires is much shorter than in an actual house.

A mock-up can help people learn how a hot gas flame makes a refrigerator cold. It can help show the tools and the steps in the process of making a carved leather belt. The *Saturday Evening Post* has prepared

a series of mock-up displays showing the letters, rejection slips, and manuscripts in the process of writing a short story, from the initial idea through the various steps of writing and rewriting, to the final acceptance and revision. Together with a similar series in advertising techniques these "case histories" are being used in some 850 schools. Write to Educational Services, The Saturday Evening Post, Philadelphia, Pa., if you wish to borrow such a display.

Whenever you are teaching a complicated process, ask yourself: Would a mock-up help? Would it help you explain a mechanical device? Could you show how a piano makes its music by showing a single key—its lever system, its felt-padded hammer, its own steel "string"? Could you show the way the pedals operate to change the tones? A mock-up includes only *parts* of the process but those real parts help teach the whole.

THESE THINGS CAN HELP YOU TEACH

In this chapter we have been talking about real things and careful imitations of real things. We have suggested some of the ways in which they help people to learn. Now let us summarize the reasons for using objects, models, and mock-ups.

All these things can *attract interest and attention* to themselves and to the lesson they are trying to teach. They differ from the read-write, listen-speak routine of communication. The novelty is appealing. They present a kind of a puzzle which the learner tries to solve. He says, "Here is something unusual. I wonder what it is, what it means."

These things can *promote student participation* in the lessons. If Jerry brings his stamp collection to class to illustrate the geography lesson, he will incidentally (it's incidental to him, but not to his teacher) learn more geography. And his classmates will learn more, too, than they would from merely reading the names of places in a book.

These things can *give a learner a chance to express* what he is learning. If Joan shows her group a rare moth she has caught and tells them about it, she will be reviewing and reorganizing what she knows in order to tell all the important facts. The sand-table maps and the model airplanes also help people to express and so learn.

Models and mock-ups are in some ways more useful than objects which they represent. They *show some selected aspect of the whole in a simple, elemental way*. We have seen that models substitute for objects that are removed from us in space and time, that are too large or too small or otherwise too confusing to be examined easily. Each time we construct a model, our purpose is to show some specific aspect of the original object. The globe shows how the earth is shaped and the relationship of the land masses and the oceans. The models of molecular structure show in a symbolic fashion our conception of the arrangement of atoms. The mock-up of the electrical wiring of a house shows, in an edited form, the way it actually works.

In each of these, the specific aspect selected to be shown has been abbreviated or abridged in some way so that it becomes easier to understand. Many details are omitted; only those necessary to the lesson are retained. Models and mock-ups help people learn by making the learning task seem simple.

Perhaps the most important reason for using any of these items—objects, models, mock-ups—is to *present an immediate sensation*, not one that must be translated from words or into words. True, words are often used to explain what is seen. Joan describes her moth by means of words. But anyone can get some understanding of the thing in question just by looking at it. Later on he can put the ideas into words if he wants to. Right now he is caught by the immediacy, the fresh presence of this real thing.

He can look at an object—for example, a cow—and form his own impressions of it. If he had merely read about the cow, he could have constructed the image of the cow in his mind's eye only from the meaning he got out of the words. That would, in turn, depend upon what meaning he was able to put into those words. And any further thoughts about this animal called cow would have had to be attached to the imperfect image manufactured from words. This process of thought is filled with opportunities for misunderstanding.

The words *milk, cheese, casein, Aralac, Kemtone, amino acid* all mean more when they are attached to actual things. The relationship between words and things is a complex one. We want not to weaken but

to strengthen the bonds. We must help people to see more meaning in words, to "understand" them better, to use them more accurately.

Perhaps you will start from real experiences with cows and their products and come to the generalization: "The domestication of cattle has been very important in the history of man." Or perhaps you will start with a generalization such as "The nutritive quality of any animal product depends to a great degree upon the food that the animal eats," and then a visit to a dairy in winter will show how the cow's fodder is fortified with additional carotene to replace the carotene of the summer-green grass.

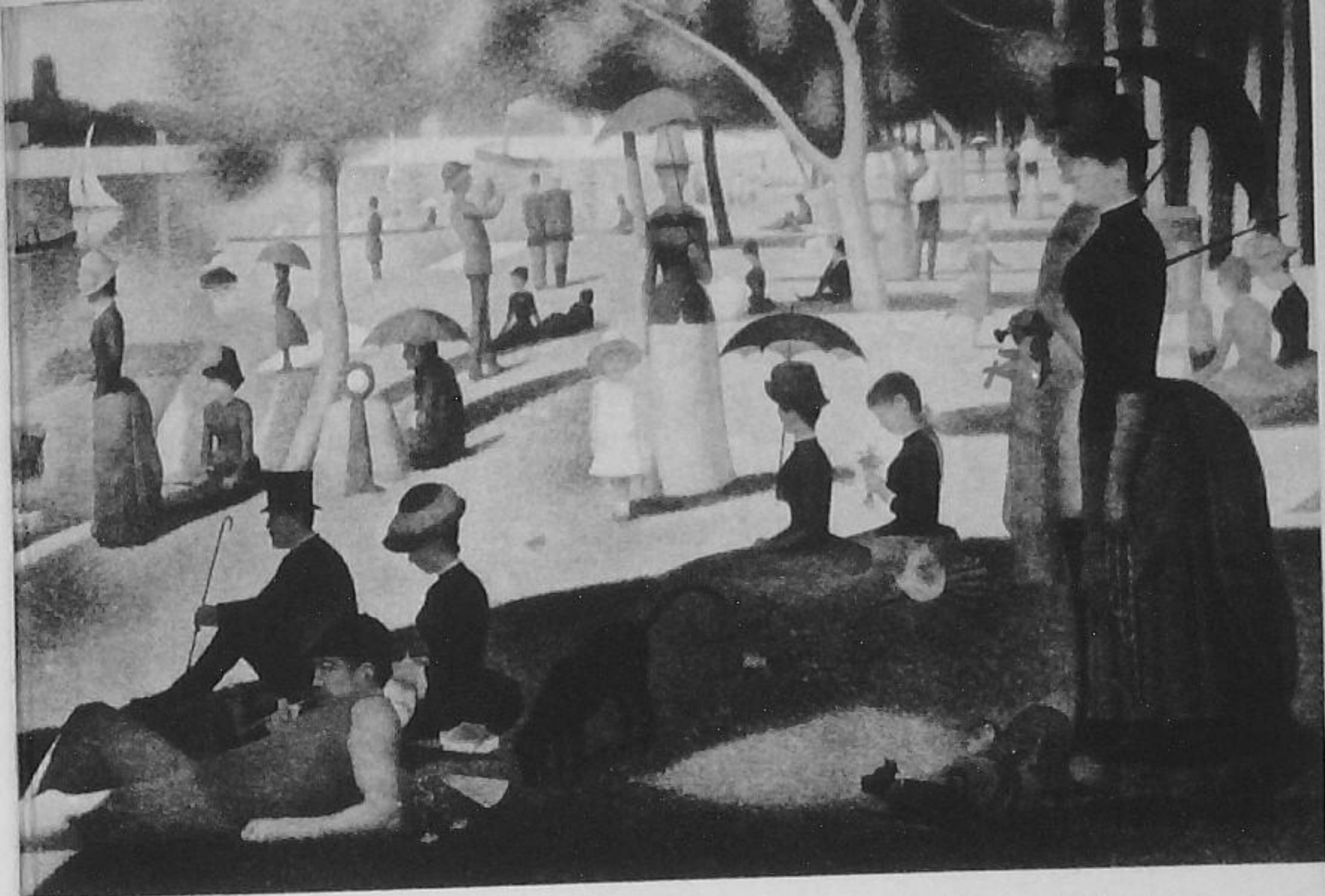
In either case, whether building up a concept or explaining one, you are trying to connect the abstraction to reality; the *conception*, to the *perception*. The broader the base of perceptual understandings, the higher can be built the structure of conceptual understandings.

4 • Pictures That Teach

What *is* a picture? The faded and yellow photograph of your Aunt Bertha that is glued in the family album? The richly colored portrait of President Lincoln that hangs in the White House? The drawing on the package of soapless detergent that shows an energetically happy young woman delighting in the gleam of her glassware? All of these are pictures, and so is the technically accurate drawing of a sloop—and the brilliantly vibrant park scene by the Impressionist painter Seurat. For that matter, so are the images of these pictures that have come into your mind's eye as you read this paragraph.

The models and mock-ups we discussed in the last chapter are substitutes for the real thing—and so are pictures. Like models, pictures are a narrowed view of reality, but narrowed in a different way. A model can be manipulated and explored, or walked around and observed, even though it differs in size or material or in some other way from the real thing. A picture lacks this three-dimensional quality. It can't be taken apart, can't be investigated in the way a model can; it must send its story to us through our eyes only. As we look at it we must be content with the view that the artist or photographer has selected.

Pictures represent reality in other ways than do models. Aunt Bertha's photograph helps us remember the twinkle of her eyes. President Lincoln becomes more than a name in a history book as we look at his thoughtful, gaunt face. A stroll along the banks of the Seine River would not induce the magic nostalgia of the Seurat painting. The painting shows us the reality that actually existed only in the artist's mind.



Seurat's "Summer Sunday on the Grande Jatte."

The pictures we shall discuss in this chapter are those we use as "flat" pictures, the ones we pin up on the bulletin board, pass around in class, paste in scrapbooks, draw on posters, or project on a screen. We shall not consider the film or the film-strip, although they are collections of individual pictures. Some of our observations may apply to them as well, but a planned sequence of pictures on film involves additional problems. We shall limit our discussion to the pictures we see every day, those that are easy to find and easy to use.

WHY DO WE USE PICTURES?

Pictures help us to see. They broaden our view, so to speak, opening up the world before our eyes. Faraway places and strange peoples, when we cannot go to them, come to us through pictures. The future can be opened up, yesterday can be recalled, and ancient Egypt can live for us through the paintings on the walls of the burial vaults.

A picture has one very important advantage over communication through words. Everyone can see it and get some kind of meaning from it. You don't have to know the language when the picture is clear; the sub-

ject is plain, and you learn through your eyes. A six-year-old can draw some meanings from the same picture that interests a graduate student. As you use pictures in your class work, everyone in your group can derive some meanings, some ideas, even though their understandings will vary.

People like to look at pictures. According to one research study, three times as many men and four times as many women look at the average one-column picture as read the average news story.* This is not a very surprising revelation but it does re-emphasize the importance of using pictures in teaching. It also underlines the importance of helping people to read pictures intelligently.

WHAT TYPES OF PICTURES CAN WE USE?

Photographs. A certain teacher of general science forbade her students to take along their cameras on a Friday afternoon hike. The children would waste time posing for pictures and would probably lose the cameras too, she thought. So on Monday, when she led a discussion about the trip, there were only the memories to help with the learning.

It could have been, "Mary, show us the picture you took of that white horse. We can compare it with the pictures of different kinds of horses here in this book." Or, "Look at this picture that Joe took of the whole group. Notice how the spot we are standing on is covered with small plants, vines, and bushes. Do you suppose that soil erosion will destroy this spot in a hundred years? What may happen to change the appearance of this piece of ground?" Or again, "This picture of a branch of a maple tree shows very clearly how the leaves grow opposite each other, and how each leaf has three large lobes and two much smaller ones down near the petiole. Ruth's hand here, holding down the branch, shows us the comparative size of the leaves and of the winged fruit, the samaras. Remember how they twirl in the air, how they float and sail in the wind?"

You can make photography a part of a regular group assignment. That is what Miss Ethel B. Smith, of Jamesburg (N. J.) High School, has done in her business classes.† She asks the students to plan and take

*Bert W. Woodburn, "Reader Interest in Newspaper Pictures," *Journalism Quarterly*, 24, pp. 197-201.

†Ethel B. Smith, "Let a Camera Help You Teach," *Business Education World*, 30, pp. 223-5.

photographs that explain such things as "the values of being on time." The finished pictures are posted on the bulletin board. For the cost of a roll of film, the students gain practice in working together, as well as in sorting over their ideas and in making an abstract principle concrete and visual.

Photographs which the student has made himself are important to him. If you use them for teaching, if you attach added meanings to them, you will help him learn. These pictures won't be professional, but for your purpose they serve better than those of an expert photographer—because they secure for you the feeling of participation on the part of the learner.

You can take pictures yourself to help with your teaching. Pictures will record such things as the Chinese dragon your pupils made for the parade—the head fashioned from paper boxes and the many "centipede" legs that were really the children stooped under a cloth "body." Pictures can help your pupils remember the various stages in the development of their beans, growing in the window box. Pictures can show pupils the finished appearance of an object which they are making. For example, a class in woodworking can see in a picture how the dovetail joint should look. Pictures can help you share your experiences with those whom you teach. The color slides of your trip through Canada will make the wide wheat lands seem like our own, will show the splendor of the mountains and the busyness of the cities.

Almost any subject can be taught better through the use of pictures, and any teacher can learn to do creditable photographic work. You may not be interested in becoming the technician—developing your own negatives and making your own prints and enlargements—but you can enjoy being the artist, selecting the views that best express the meanings you want your students to learn. There is nothing difficult about the process—just select a simple camera and start practicing. Manufacturers of photographic film publish many books that can help you when you decide to experiment with more complicated cameras, artificial lighting, and special types of film.

The photographs you use won't all be those that you or your students have taken; in fact, most of them will come from other sources. And few of them will be original prints; most will be published reproductions of

photographs. You know where to find these pictures you need—the *National Geographic Magazine* may be your best source, or *Holiday*, *Life*, *Newsweek*, *Popular Mechanics*, *Vogue*, or *Woman's Day*. For news events, your daily paper or the Sunday picture supplements will furnish pictures.

These reproductions will lack the detail of the original print, but they will nevertheless be useful. If detail is important—if, for example, your students want to see just how the new Studebaker is styled—they had better get a photograph from the local dealer instead of one reproduced in a newspaper advertisement. The magazine reproductions are fairly good, too. Although newspaper reproductions lack clarity of detail, if the picture will be used to illustrate the newsboard story of the principal's new car, the newspaper picture is quite appropriate. Look for reproductions whose technical excellence equals your need.

Drawings and paintings. A painter may or may not try to make his work look as much like a photograph as possible. He is a visual reporter, but not a photographer. Since he chooses what he will show us, some details may be blurred and others carefully drawn. He may also present in great detail some things that a camera could never register on film. Compare, for example, a photograph of the ocean liner "Queen Mary" with the painting of it in the window of your travel agency. The painting shows you the railings on the deck, the portholes in the state-rooms, the lifeboats, the bright colors, and the flying flags. It emphasizes the features of safety, luxury, and gaiety. The photograph does not emphasize these details but shows them and many others as well. You can see in the photograph no more or no less than the lens of the camera saw.

Drawings and paintings that represent reality with some accuracy are easy to understand because there are no puzzles for the eyes and the mind. Things are what they seem. We can use them in the same ways that we would use photographs.

Many artists, however, disdain this craftsmanship of producing reality with paint and pencil. They feel that their efforts should be directed toward helping people feel as well as see. Their painting shows us their own view of reality. They try to record their feelings and attitudes, and to express them in visual terms of light, color, texture, line, and shape.

When you look at such pictures, cut yourself loose, if you can, from

your expectations of photographic accuracy. The painting may show some recognizable object, but it doesn't have to. You would enjoy the taste of chocolate cake even with your eyes closed. You can enjoy perfume without knowing which chemicals went into it. You can enjoy colors and shapes and textures even if they do not represent something.

You may find it easier to enjoy the work of artists who picture real things and real people. Rockwell Kent's "Salamina" can bring the exotic charm of Greenland into your meeting room. Grant Wood's "Daughters of the American Revolution" can illuminate the terms "conservative" and "status quo." Andrew Wyeth's feelings about the coast of Maine help you to show to a Chicago boy the windswept fields, the lonely houses, the bright sunlight on the old wood of wagons. And, of course, the painters of other times and other lands can help you, too. Giotto helps you explain the strength and glory of medieval Catholicism. Hogarth helps you show that some characteristics of human nature have not changed much through the last two centuries. The unknown artist who painted his bison in the cave at Altamira helps you explain the long journey that men much like ourselves have taken through time.

Pictures such as these can help you teach. They can also help your students to accept paintings as yet another source of information about their world, as another pleasant experience to place alongside those they get from books, magazines, newspapers, motion pictures, radio, and television.

Another quite different type of drawing and painting is the quick, sometimes symbolic, representation found in sketches or cartoons. They impress us by the simplicity with which they make their point. It is usually only one point, but they make it easy to see.

We are all familiar with the comic-strip kind of cartoon. The simple drawing usually shows a stereotyped character in some interesting situation. We are interested either because we have experienced something similar or because we have dreamed ourselves into that predicament before. Years ago, the comics were really comic and humor was an essential element. Today virtually none of the comics is funny; instead they are short stories concocted from such universal ingredients as love and adventure.

Comics have become a standard technique in advertising. Simple line

drawings and "cartooned" faces beam at us from countless magazines and billboards. A few years ago, Elsie, the Borden cow, came into our lives. Today we are making friends with the wide grins of the Birdseye children, and slim young ladies with a hyperthyroid sparkle in their eyes are selling everything from sheets to detergents.

As teachers, we can also use cartoon drawings. If advertisers use them, we can be sure that they promote sales; they very well may promote learning of a more useful kind. You can cut the faces out of the newspapers or magazines and use them in your displays. In the next chapter you will learn how to draw these simple pictures so that you can produce them as you need them.

There is another type of cartoon that can be highly useful in teaching: the symbolic drawing that simplifies issues and ideas and represents them pictorially. We are familiar with these cartoons on the editorial pages of our newspapers and magazines. Usually they concern events of timely importance, and usually the people and things and events shown in the drawing stand for some general idea. They may or may not be humorous.

Because these symbolic cartoons are simple and concise, they often state succinctly the issues we may have been discussing at length. They may act as a motivation to learning, but more likely they reinforce our teaching, repeating in a different way the ideas of our lesson. The humorous cartoon often makes us laugh because it is so unexpectedly and exactly "to the point."

In order to understand this kind of cartoon, a person must be able to relate the concrete picture to the abstract idea. First, he must see that the people, things, and events are only symbols of ideas. And, secondly, he must connect these symbols with the *correct* ideas.

The first of these steps involves a degree of maturity in intelligence. According to one study,* children at any given age vary widely in their ability to see abstract ideas in cartoons. This ability increases as they grow older, and most children are able to understand abstractions by the time they are 13 years old.

*Laurance F. Shaffer, *Children's Interpretations of Cartoons: A Study of the Nature and Development of the Ability to Interpret Symbolic Drawings*, Contributions to Education, No. 429, Teachers College, Columbia University, 1930.

The second step in understanding cartoons involves the student's background. No one can understand a symbol unless he already understands the object for which the symbol stands. A cartoon may emphasize an idea, but it can hardly teach fundamental materials. We must be sure that students learn the facts; then the cartoon can help us by emphasizing the interrelationship of these facts. We can help people interpret the cartoons if we ask questions that stimulate thinking and make the person search through his own information until he can fit this new idea into the right place. If the cartoon is posted on the bulletin board, a question may be tacked up too. If it appears in a textbook, class discussion may be used to start the thinking process.

What questions would you ask in order to stimulate your audience into thinking about Bill Mauldin's cartoon? Encourage pupils to bring in cartoons for the group to share. As the pupil tells the class about the

"Fresh, spirited American troops, flushed with victory, are bringing in thousands of hungry, ragged, battle-weary prisoners . . ." (News item).



cartoon, you can often learn much about him—his attitudes and feelings, as well as his intellectual understanding of the facts involved.

Of all these kinds of pictures that we can use—the detailed photographic kind of reporting, the expression of the artist's own opinion, and the quick sketch and cartoon—few are likely to be the precious originals of the artist. Like the photographs we use, most drawings and paintings are reproduced in various ways so that the work of one artist can help many people. We must select reproductions that are as precise and as detailed as necessary. The newspaper reproduction of the editorial cartoon will not be clear in every minute detail, but it won't need to be. The reproductions of Giotto's paintings that appeared in the 1948 Christmas Issue of *Life* may be quite good enough for your purpose. You need not buy expensive reproductions.

HOW SHALL WE SELECT PICTURES?

Let us go back to our formula for successful display. Since a picture can be a display in itself, we ought to be able to use the first part of the formula—understanding the problem—to help us choose pictures.

For the people who will see them. We begin with the people who are to see the display (the pictures). Immediately we recognize that the same pictures do not appeal to children and to adults. This is natural, since pictures are records of certain experiences, and if a child has not had a similar experience, he cannot understand the picture very well.

Most children seem to prefer pictures that tell a story or that show something happening. Very young children rather enjoy playing the game of identifying pictures of certain things. When a three-year-old sees a picture of an automobile in her father's magazine, she shouts "car" and gets, of course, a pleased nod from him. However, school children do seem to like pictures into which they can "read" their own experiences.

One study of pictures used in advertising showed that women seem to be most interested in pictures of other women, of babies, and of children. Evidently the magazines for women believe these to be the preferences, since these are virtually the only pictures that appear on the covers. The

same study showed that men seem to be interested in pictures of inanimate objects.

These findings about preferences are based upon random pictures as they were seen in magazines and do not necessarily reflect the interests of adults as they look at pictures for specific purposes. We may certainly presume that a woman who intended to buy a refrigerator would be interested in pictures of various refrigerators. And we would also expect that a man who had just returned from a vacation on the Gaspé Peninsula would be interested in pictures of that pleasant land.

All the preferences we have listed—of children, men, and women—lead to the assumption that people like best those pictures that mean something to them in terms of their past experience or their hopes for the immediate future. We can assume that junior-high-school boys will be interested in pictures of bicycles and that teen-age girls will enjoy looking at pictures of their idols, the movie and television stars of the moment. Any picture that means something in a person's life will catch his interest.

Choose pictures for your purposes. In our formula for display, the second consideration was your goal. Why do you want to show a picture? You probably have some very good reason. You may want to set up a standard toward which your students should work. "This picture shows us what a lemon meringue pie ought to look like." Or you may want to bring closer to them the lives of people of other cultures. "Look at this picture of a Navaho family. See how young the mother and father look! How old do you suppose they are?" You won't show a picture only because it happens to be decorative. You will choose a picture that shows precisely what you want shown.

Not that you will completely discard your preference for attractive pictures. Those you enjoy will stay in your memory; you will see them again and again in your mind's eye. But unless you have had some reason for looking at a picture, this remembrance and re-examination will not be reinforcing any particular learning. As you turn this page and look at the next two pictures, you will find that one is easily the more beautiful. But your choice between them will depend chiefly on your purpose rather than on their intrinsic beauty.



Which of these pictures would you choose to help you explain the massive splendor of ancient Egypt's architecture? Which picture expresses most forcefully the dramatic strength and permanence of these monumental columns? Which picture would you choose to show the way the temple might have looked in 1200 B.C.? Because they show human figures



dwarfed by the immense colonnade, both pictures fill us with awe. But each picture has its own specific uses.

Pictures should encourage participation. Our third step in the formula for display is to plan for participation. We accomplish this effectively if we select pictures that are already interesting to our viewers. If pupils identify themselves with the people in the picture, we are ready to teach. Without this natural approach, we have to apply a little thought toward achieving this feeling in our viewers. We must choose pictures that can be easily tied in with their lives, even though we must do the tying. A picture of a raging forest fire or of the blackened stumps after the fire has passed can mean something to city dwellers if you explain it in terms of more floods and less water in the reservoir, the washing away and depletion of the quality of the soil that grows their vegetables, the loss of wood pulp that makes their newspapers and books, or the ruination of their summer vacation land.

Shall we use color or black and white? We have already seen that the technical excellence of the pictures we use should be suitable to the purposes for which we need them. There is an additional technical question to be settled: Shall we use colored pictures or black and white? This may seem a pointless question to you—you may say that *of course* colored pictures would be better.

However, several studies of advertisements that compare colored advertisements with black-and-white ones do not indicate that color has much superiority for impressing ideas on the memory, even though colored advertisements do attract attention somewhat more quickly. It has been suggested by psychologists* that the use of color excites the viewer emotionally and so may interfere with the intellectual process. It is thought that the colored designs in the Rorschach test arouse a greater number of emotional responses than the black and white and that the colors make it more difficult for the observer to get a visual grasp of the figure-background relationships.

Audio-visual experts have been interested in the effectiveness of color.

*Seymour B. Sarason and Elmer H. Potter, "Color in the Rorschach and Kohs Block Designs," *Journal of Consulting Psychology*, 1947, 11:202-206.

When one group is shown a colored motion picture and a similar group is shown a black-and-white version of the same film, the second group seems to do slightly better in recalling specific information from the film. Yet some research studies reinforce our general ideas about the power of color. Several educators have shown that children prefer colored pictures. It was reported in 1923 that a mail-order house found that an article pictured in color was ordered fifteen times as often as the very same article pictured in black and white elsewhere in the same catalogue.*

What are we to assume from this conflicting evidence? We may well agree that color can affect us emotionally, especially since the techniques of color reproduction make printed color seem brighter than nature. And we are safe in believing that the appearance of color where it is not expected would have more effect on us than if we saw color all the time. Because the mail-order catalog before 1923 had little color, what there was would inevitably have attracted attention. Since then, the research of advertisers has shown a progressive decrease in the power of color. During these same years, and probably not as a mere coincidence, the amount of color in advertising has been increasing.

Shall we or shall we not use colored pictures? We may conclude that pictures intended to arouse an emotional response should be colored. Pictures that are to be purely factual should be black and white except when color adds realism and makes facts easier to understand. But as more and more color pictures find their way into classrooms, children will gradually lose this possible emotional interference with their intellectual processes.

HOW SHALL WE USE PICTURES?

We are accustomed to the conventions of pictures. We "recognize" our house or our street or our friend when we see them in a picture. These conventions have been learned:

More than one ethnographer has reported the experience of showing a clear photograph of a house, a person, a familiar landscape to people living in a culture innocent of any knowledge of photography, and to have had the

*Daniel Starch, *Principles of Advertising*, A. M. Shaw, 1923.

picture held at all angles, or turned over for an inspection of its blank back, as the native tried to interpret this meaningless arrangement of varying shades of gray on a piece of paper. For even the clearest photograph is only an *interpretation* of what the camera sees. We are too accustomed to looking at pictures to be conscious of the fact that they interpret a three-dimensional world in two-dimensional terms, or that they change a setting of color into a composition in black and white.*

As people must learn to understand the conventions of pictures, so must they be helped to get the full meaning from the picture.

Help people to read pictures. Unless a person looks at a picture with a purpose in mind, his eyes are likely to merely skim across it, stopping here and there for very brief pauses. He will get a general idea of the subject and no more. The picture would be more interesting to him if he knew why he was looking at it and if he hoped to find out something. Such interest is present when a student has a question and turns to a picture to find the answer. This motivating interest is often lacking, however, and you must help students in their examination of pictures by discussing with them the things to look for. People are likely to see what they are told they will see. For example, if someone asks you whether an acquaintance of yours wears glasses, you may have to stop and think. You bring to mind an image of him wearing glasses, as was suggested to you. Then you see an image of him without glasses. These images mix with your memory image of him and then you may not be quite sure which image corresponds with reality. The suggestion of glasses has influenced you to decide in favor of them. You can use this influence of suggestion to help people read pictures. Discuss with them what they can see and they will then be more likely to see it.

Lead students "into" the picture by asking them questions. Try to carry their thinking beyond the picture by asking such questions as "Why is that man doing that?" "What had to happen to this object before it could look like this?" "What may change this in another few years?"

Try to answer these questions about Seurat's painting "A Summer

*Melville J. Herskovits, *Man and His Works: The Science of Cultural Anthropology*, Alfred A. Knopf, 1948, p. 381.

Sunday on the Grande Jatte" without turning back to it on page 55: What kind of weather are the people enjoying? Would you say it was hot or cool? From the styles of clothing, what year do you think it is? Are these rich people or poor people? What makes you think it is Sunday? What adjectives would you use to describe the people and their activities? Do you think those adjectives could be used to describe the way of life of this period in history? How would a Sunday afternoon in a park be pictured today? What would you put in such a picture if you wanted to reflect life as it is lived today?

How well can you answer the questions? Look back now and see whether you don't read the picture more intelligently than you did the first time you looked at it.

Plan suitable ways to show pictures. How many times have you worked yourself into the following predicament? You have some appropriate pictures that illustrate a point you are making. You hold them up as you talk. But then you notice that only those in the first row can really see them. You decide to pass them around the room, but then you find yourself talking into the air because the attention of the group is on the pictures, not on what you say. Or have you found that although your suggestions of what to look for in the picture are remembered by the first several people to see it and pass it on, by the time the picture gets farther on its way, you have led the thinking so far away from the picture that it gets scant attention from the last people to look at it?

These predicaments are caused by your confusing the problem. You are trying to show pictures to a *group* by using the method for showing pictures to *individuals*. Remember, your students will be looking at pictures either as individuals or as members of a group.

To groups: Why are you showing pictures to a group of people? Probably because you want to present information or to build up an attitude simultaneously for all. We teach people in groups so that the teaching of several individuals can go on at the same time. The pictures shown to a group must be seen by all *at the same time*.

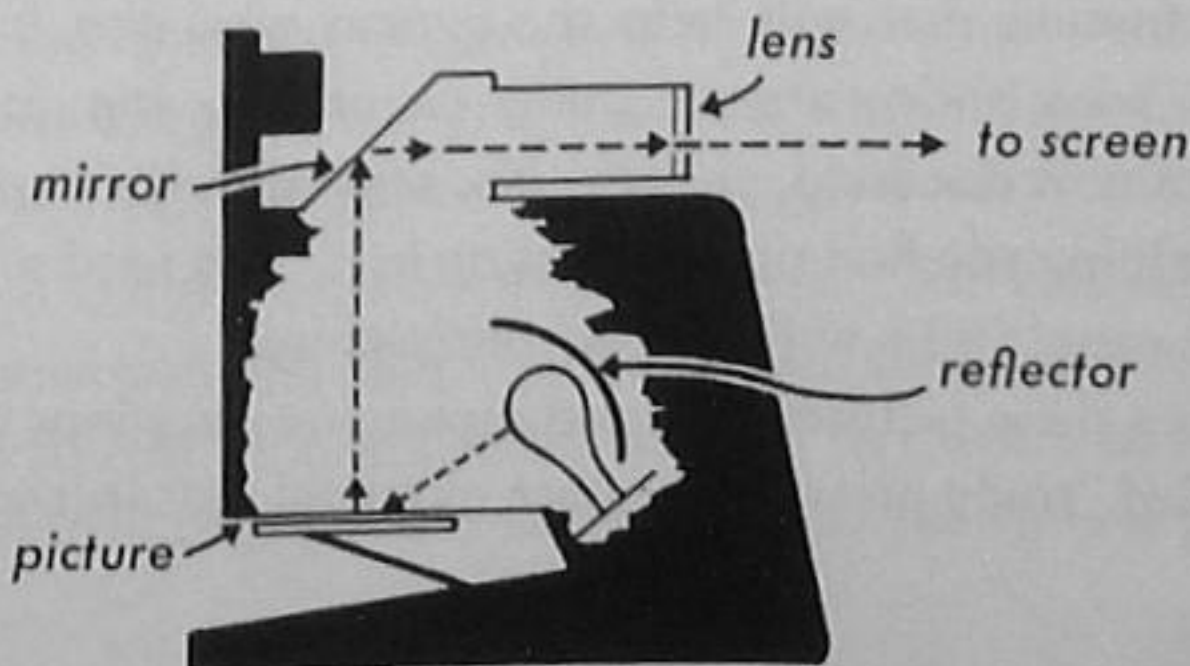
When Senator Hubert Humphrey of Minnesota was suggesting to the U. S. Senate an amendment to the displaced-persons legislation that would admit more children into this country, he had the Senate page boys carry

to the front of the room several large photographs, about four feet square, showing some of the children from Europe who had found a happy life in the United States. The pictures helped him to impress his audience with the importance of his proposal.

If we can obtain great enlargements such as these, we can do an equally effective job with our own groups. Watch the billboards for suitable pictures. Usually the advertising companies are glad to give you a duplicate set of the folded paper sheets. You can cut out the large picture and mount it as you wish. Ask your druggist, grocer, and travel agent to save for you their window-display cards and posters. From these sources you can procure large colored pictures of many things: foods (fruits, vegetables, milk, meats); vehicles (automobiles, trains, airplanes, farm machinery); people (the cavalier in his historic dress, babies glowing with health, local and national political figures, models wearing a variety of hair styles and make-up); places (Death Valley, the Grand Canyon, Hawaii, Rio de Janeiro). You may need to be cautious about brand names and other such copy on these large pictures if your school regulations forbid their use.

Such large pictures are not always available. To make any picture big enough for an entire group to see simultaneously, we need our own enlarging machine. The opaque projector, or Balopticon, is such a machine. It uses mirrors and lenses to magnify and project a picture onto a screen or wall. Illustrations in books, as well as loose photographs, drawings, and maps, can be projected.

To use this projector effectively, you must be able to darken the room completely. As the diagram shows, the light that shines on the picture must be picked up by the reflecting mirror and then projected by the lens



onto the screen. This roundabout process means that less light than the lamp gives actually reaches the screen, so the shadow picture cannot stand much competition from light in the room. The darkness of the rest of the room will dramatically focus all attention on the screen, where the details of the pictures can be pointed out on the brilliant enlargement.

There is another way of showing pictures to a group effectively—distributing a copy of the picture to each person in the room. This is, of course, standard practice with textbook illustrations. If each person has the picture to examine, the group leader can talk about it and help people to see into and past the picture. Sometimes it is possible to get a large chart for the wall and duplicates of that chart in notebook size. You can point out things on the chart and the students can see the details in their own small replicas.

These three methods for showing pictures to a group—using very large pictures, projecting pictures on a screen, distributing duplicates of the picture to each person in the group—are all effective. The very large pictures are dramatic. They concentrate attention easily and can be discussed by the group in normal light. The projected image helps you use small, one-of-a-kind pictures from many sources. If there are many copies of the picture, the advantage of individual attention to details can be added to the efficiency of group discussion and instruction.

To individuals: It seems easy to show pictures to individuals, especially if one person shows a picture to one other person. As you sit down with your friend and the picture, and you talk together about it, learning progresses with little complication. The difficulty is that you can seldom devote full attention to each individual. You must arrange ways of helping people read pictures without being present yourself.

Each picture that is to be studied should be accompanied by some written explanation that will help the person who sees it to *read* the picture. This book shows a great many pictures to you, an individual, and each picture is discussed, either in the text or in the caption, for the purpose of helping you find richer meaning in it. You need to do the same thing for the people who will look at your pictures.

Sometimes these pictures with accompanying questions and explanations are called “study prints.” They are mounted on cardboard and their

captions are either underneath the picture or on the back of the mount. A series of these pictures that you have prepared to illustrate the unit of work can be placed at a "picture study table," where the captions substitute for you and act as the leader who helps the picture make its point.

When pictures are pinned to the bulletin board, descriptive and challenging labels are important. Usually the picture is too small for the whole group to see at once and it gets attention from individuals. They need help in reading it. Label the pictures with short descriptive phrases that point out the essential details.

A file of pictures can be a useful part of a reference library. Many public libraries have picture collections from which you or your students can borrow pictures much as you would books. Pictures may be made a part of your school library, or you may accumulate your own file for your students to use as they need it. The beginnings of the collection will probably be yours, but your students will add to it. And each of them can work out the captions for the pictures he adds to the file.

Some students make notebooks as a record of what they are learning, and pictures form an important part of this record. Here, too, descriptive phrases are important. To decide what to say involves a sorting over of ideas—one step in learning. As the students read over these phrases later, they will recall some of the original ideas.

Although your questions and explanations help people read pictures, their own captions will help them learn, too. In fact, your major purpose is to get people to direct their own learning. You want them to study a picture, to try to understand the purpose behind it, to think about the circumstances leading up to it, to consider what is likely to follow it. In all these ways in which individuals study pictures, it is important that they be helped to get the full meanings from the picture. Either you must stand by to explain and question, or you must write this explanation and these questions beside the picture, or you must encourage the learner to write his own captions, expressing his own "reading" of the picture.

Encourage critical appraisal of pictures. Pictures show reality from only one angle, and that angle may not necessarily represent the truth. It is just as easy to misrepresent through pictures as through words. Check your sources carefully before you rely on the accuracy of the pic-

ture. Of course, the misrepresentation may not be malicious. An artist shows you what he believes or what happens to interest him, or both. His views may not be true for you, but that does not make them any the less true for him. Nevertheless, as we use pictures in education, we must help our students to understand the artist's biases and, if possible, their own biases, too.

Sometimes misrepresentation in pictures is not a part of the picture itself but is caused by the reproduction of the unusual rather than the typical. Compare the Chamber of Commerce publicity pictures from California with the photographs taken by Edward Weston during his Guggenheim Award trip through California. The publicity pictures show the truth, yes, but only a part of it. They show the flowers, the palms, the cultivated valleys, the watered parts of the desert that forms much of California. Weston shows the great beauty and the more typical truth of the barren hills, the craggy Sierras, the dry lake beds that bake in the noonday sun.

Sometimes teachers fail to bring out the truth that is in the pictures. This photograph of soil erosion, for example, can be easily misunderstood. Is the embankment several hundred feet or only a few inches high? There is nothing in the picture itself that tells us. A person who expected to see

The "cliff" in this picture is actually only about 4 feet high.



only towering cliffs marked by erosion might miss the beginnings of dangerous erosion in his own farm land. This picture is an excellent one—it certainly shows the details of the subject—but it cannot stand alone. It needs explanation to prevent false impressions.

HOW CAN WE PRESERVE PICTURES?

All these pictures we have been discussing are such important teaching tools that we want to keep them in good condition to be used again and again. They need to be protected from damage by mounting them on some durable material. They should be shielded from the dust of the atmosphere and the dirty grease of finger marks by covering them with some impervious yet transparent surface.

Mounting pictures. To mount pictures, you will need, first, a strong reinforcing substance. This can be inexpensive cardboard—your art-supply store has a wide variety. If your budget does not allow for such purchases, you can use cardboard cartons and cut them to size. The cardboard sheets used by laundries in folding men's shirts are quite useful, and free if you ask your students to bring them. If you are on the look-out for suitable backings for pictorial materials, you can find many possibilities.

To mount paper pictures to these heavy paper backings, you will need a strong, permanent adhesive. Glue (the gelatinous substance from animal skins and bones) makes a strong joint but is likely to discolor the paper and to make it brittle. Mucilage (the gummy substance from plants) has the same disadvantage. Cellulose tape (Scotch tape to most of us) should be used only for temporary mounts and for pictures that you do not value, because in a short time it discolors the paper and causes deterioration.

Rubber cement is a highly satisfactory adhesive. When it is spread liberally on the mounting paper and the picture is pressed and smoothed into place, there is no buckling as the cement dries. Any excess can easily be rubbed away. However, rubber cement does not give you a permanent joining; in fact, after several years, the picture may fall off. This may not be a disadvantage, though; you may not require a permanent mounting.

Pastes—mixtures of flour and water—are also very useful. They are easy to use, strong, and permanent. They, too, should be applied liberally, and the picture should be carefully smoothed in place to prevent possible buckling when dry. You may buy suitable pastes inexpensively, or, if you have a lot of mounting to do, you can make your own for even less money. Here is a formula suggested by the Library of Congress:

$\frac{1}{2}$ cup all-purpose or bread flour	3 cups boiling water
$\frac{1}{2}$ cup cold water	few drops formaldehyde
	$1\frac{1}{2}$ teaspoons glycerin

Stir the flour and cold water together until the mixture is completely smooth. Add a little of the boiling water to the paste, stir until smooth, then add the paste to the rest of the boiling water. Cook slowly, stirring constantly, until the mixture is thick and smooth. Add the formaldehyde to prevent spoiling and to discourage insects. Add glycerin to improve flexibility.

The mixture should be quite thick, but thin enough to drop from the brush. It may be thinned with water if necessary. It should be entirely free from lumps. Strain through cheesecloth if necessary.

Pictures pasted onto cardboard will probably be mounted securely enough for most of your needs. But cardboard is not everlasting. It bends and cracks; its edges become ragged and torn with time. You may wish to preserve your picture by applying a cloth backing. This method is especially suitable for very large pictures or maps that would present a storage problem unless they could be rolled up. It is possible to buy a waxed cambric that has a "built-in" adhesive. The cloth is laid on the back of the picture or map and pressed tight with a warm iron. This cloth is available by the yard or by the piece in several sizes from Seal, Inc., Shelton, Conn. To mount pictures in this way costs about 2 to 10 cents per picture, depending on the size.

You can also find several varieties of adhesive sheets to be used for joining either paper to paper or paper to cloth. One of them, Parafilm, is available from the Marathon Paper Mills, Rothschild, Wis. A sheet of this material is laid between the two surfaces to be joined, and then the warm iron seals the joining.

You may also attach your own cloth backings to pictures or maps with the ordinary paste of our recipe. The Library of Congress recommends bleached muslin or percale thoroughly washed and dried. Since

the process is very simple but rather time-consuming, you should plan to cloth-mount all your pictures at the same time.

HOW TO MOUNT PICTURES ON CLOTH

1. Spread an old table with heavy paper rubbed with paraffin.
2. Tack one edge of the cloth to the table, then the opposite edge, pulling the cloth taut. Then stretch the other two sides and tack them.
3. Sprinkle lightly with water to tighten more.
4. Lay the picture or map out on another table and wet it thoroughly on both sides with clear water and a sponge. Put face down.
5. Absorb excess water with blotters or paper towels.
6. Apply the paste with brush evenly and thoroughly, painting it on first in one direction and then in the other.
7. Place the picture paste side down on the cloth, parallel with the edge of the cloth, and carefully smooth it out so that no air bubbles remain.
8. Lay heavy manila paper on top of the picture and rub it thoroughly with a straight rounded edge such as the edge of a book or a wooden-edged ruler to force the paste into the cloth at all spots.
9. Wipe off any extra paste at the edges with a wet sponge.
10. Let dry for at least 24 hours. Trim.

To preserve your pictures you need to do more than just mount them on a solid backing. You must protect their faces, too. The liquid cellulose acetate sold under various brand names (Krylon, for example) may answer your need. It is often sold as a wallpaper protector to be sprayed near light switches or where the baby's hands will make the wallpaper dirty. It can also be sprayed on pictures to protect them. Twelve ounces cost about two dollars and cover about 45 square feet. Clear cellophane can furnish a temporary protection for pictures when it covers the image and is taped in place at the back of the mounting. Transparent plastic envelopes for your pictures may be found in stationery stores or in photographic supply houses. Two pictures can be inserted back to back in these envelopes.

There are several brands of cellulose acetate foil available (Celluseal, Clearseal, Permafilm, and others). This is a strong, thin, flexible, and transparent film that can be applied to pictures easily. It comes with its adhesive side covered with waxed paper. You peel this waxed paper off as you apply the film. No heat is needed; you merely smooth it down to

press out any air bubbles. This film comes in glossy or dull finishes. Both are transparent, and both can be wiped clean of finger marks and dust. The dull finish has the added feature of being able to take pencil marks that can later be erased cleanly and easily. A roll 12 inches by 20 yards costs about six dollars and is available from library supply houses.

A more expensive process for preserving pictures is lamination, in which the picture is permanently sealed between two heavy sheets of clear plastic. The audio-visual department of the Los Angeles City Schools has its own machinery for lamination and reports that pictures treated in this way have circulated among the schools for several years without any visible damage or deterioration. They have laminated "study prints" (pictures backed with directions for the study of the picture), large pictures for wall decoration, and even simple sheets of colored paper to make durable mats for vases of flowers. You can have your pictures laminated at an approximate cost of 1½ cents per square inch through a local manufacturer who works with plastics.

PICTURES CAN HELP YOU TEACH

Now that we have discussed the kinds of pictures that are useful to you and some of the ways in which to obtain the most learning from their use, let us conclude the chapter by reviewing some ways in which pictures may assist the process of learning.

There is no doubt that pictures *attract attention and interest*—not only because they show new views of the past, the future, and the far away but because they do this in a direct way. Like objects, models, and mock-ups, pictures eliminate the inaccuracies and ambiguities that may be involved in words and speak directly to the viewer through his eyes. He is attracted and interested because it is easy for him to get some immediate meaning from a picture. Perhaps he sees actual things, or people doing something, or a bright splash of color. Whatever he sees, he sees it quickly and easily, and he at once gets some meaning from it. If the picture itself attracts interest, you can easily help the student to take the short next step to an interest in the idea which the picture represents.

Pictures make it possible to teach with a minimum use of words, but

a skillful leader will also use them to *encourage learners to turn their thoughts into words*. Although direct experiences are important, verbalization is also important; words are essential to our lives. You can title the pictures you show, or suggest that the students make up their own captions. You can ask questions that will stir up discussion about the pictures. Children can make up stories about the pictures they like.

Not only will these practices encourage learners to express themselves verbally and so learn more about how to express themselves, but this talking and writing about pictures, this expressing, will *provide added practice in organizing thoughts, in recalling details, in making generalizations*. The actual creating of pictures—the photographing and drawing and painting—are, of course, excellent ways of expressing what has been learned. As in verbal expression, the student learns how to express himself as well as more about the facts and the concepts of the lesson itself.

Pictures can often *show the structure of an idea or the simplest expression of that idea*. Cartoons are perhaps the best example. Their symbolic style pares away the qualifications so that the bare framework of the thought is clearly apparent. Perhaps you recall the "shock of recognition" that hit you when you first saw Bill Mauldin's World War II cartoons. Willie and Joe are the Everyman of this century's wars; the places and events are symbolic, yet bitingly real. Photographs, drawings, and paintings share this capacity to show quickly and clearly the very heart of a situation.

Through pictures students can be helped to *build up conceptual understandings* as well as to *break down concepts into easily understood parts*. Take the pictures of Karnak on page 64 as an example. They may be studied as a specific example of such a generalization as "Religious architecture is characteristically massive in scale, typifying the immensity of the infinite and inspiring awe in the insignificant man." And a close study of the hieroglyphs carved on the columns may lead to the formation of a new conceptual understanding, such as "Religion seems to be a search for answers to the unknowables, a search for light in the darkness of death."

For all these reasons we have discussed—and for other reasons that you may have discovered—you will want to use pictures in teaching. They can make an important contribution to the drama of learning.

5•

Your Drawings

Can Teach

Can you draw a straight line? If you are like most people you'll say "No!" But you can now be reassured—for you are going to throw away the rulers when you draw people and things. You may think you can't draw very well—but you don't need to be an artist to help people learn.

You aren't trying to produce a work of art; you are trying to express ideas. In fact, if the drawing is perfect or very intricate, people will forget the idea while they look at the details of the picture. Furthermore, you will never expect your drawings to stand alone as drawings; they will be illustrating the things the group is talking about. And they will not need to be professional—merely recognizable.

DRAWING DEPENDS ON SEEING






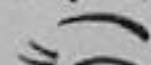

To make recognizable drawings you must first see the essential structure of the object you want to represent—not merely the outlines, but the internal structure. Get your pencil or your chalk and let's practice. Let's try to draw a human figure. What holds the whole body together? The backbone. Mark it down on your paper or chalkboard. And what's on top of the backbone? The head. Draw a circle there. A little way down the backbone come the shoulders. There are several bones there, but draw just one line to show the shoulders' horizontal structure. At the

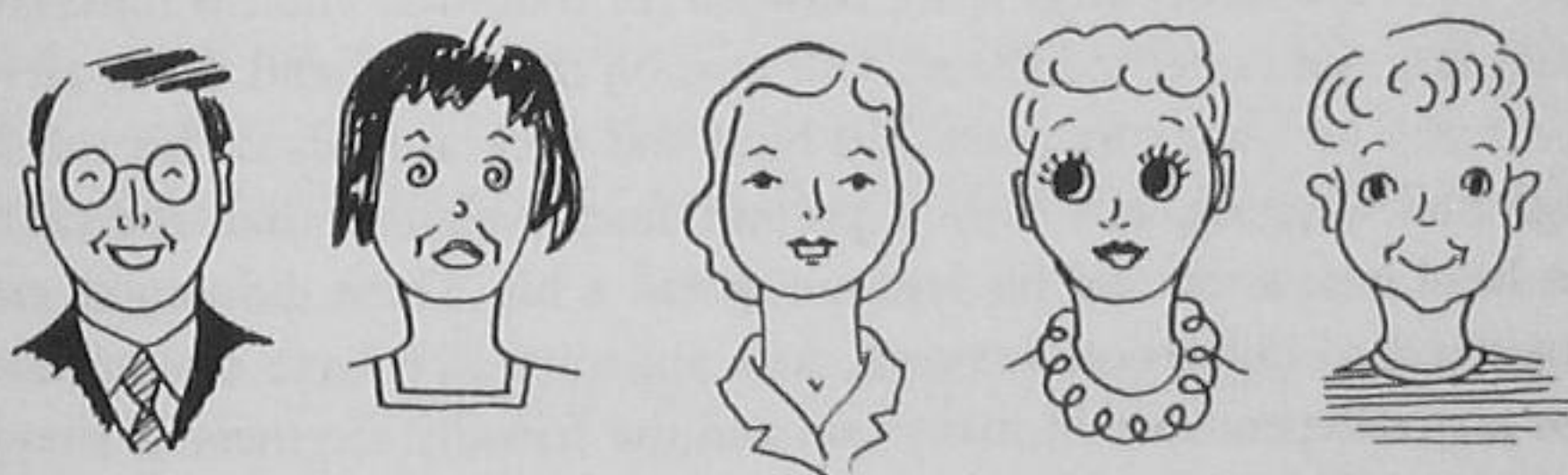
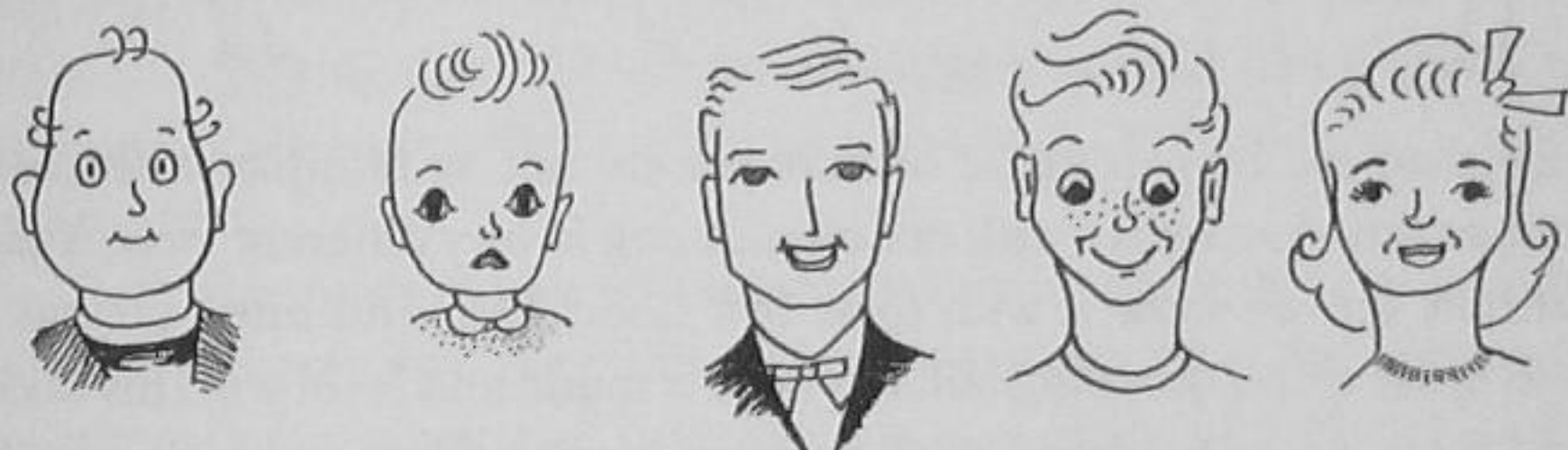
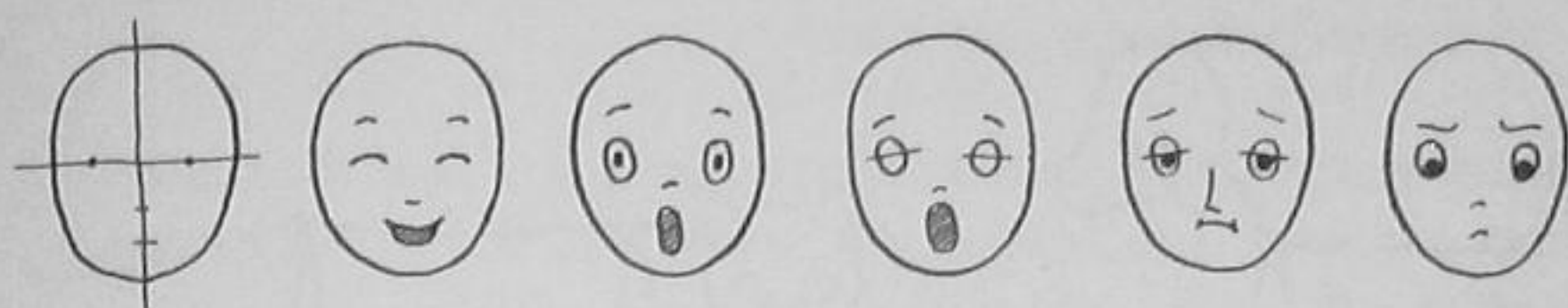



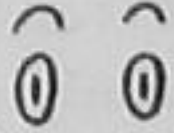


lower end of the spine are the hips, and they, too, are formed of several bony shapes. Draw another short line to show their horizontal form. There's the body! It's easy to tell where the arms go and easy to make them bend at the elbows and the wrists. And the legs hang from the hips, of course, and the feet go flat on the floor. Now what do you have? Not very much, but you do have a symbol that anyone would recognize as a human figure.

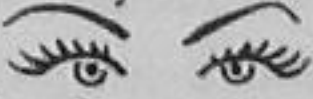
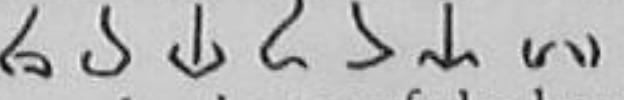
What can you do with this figure? You can put its hands on its hips. You can bend its backbone over so that it is looking at the ground. You can make it do exercises. With a few additions it can become a man or a woman. And both will make the lesson more pleasurable for all concerned.

Faces may look hard to draw, but there is an easy way to draw faces and heads. Start with the circle or oval for the head. Draw faint lines down the center and across the middle. The eyes—just heavy dots will do—go on the center crosswise line about halfway between the center and the outside edge. A little above them draw two short lines for eyebrows. The bottom of the nose goes about halfway between the eyes and the chin, and the mouth about halfway between the nose line and the chin. Mark them in as short, straight lines. There you have a face.

But it is a rather blank face, isn't it? Let's put some expression into it. That mouth can have a smile () or a happy grin (). It can look determined () or grouchy () or surprised (). The eyes can show joy ( ) or anger



() or fear () or sorrow ()
or boredom ().

Practice putting the features together on the face to see what you get. Of course, you can be much more elaborate if you wish. You can add flirtatious eyelashes to your glamour girls (). You can make lots of different noses () to go on different kinds of people. You can vary the shapes of the heads and the placement of the features to show different characteristics.

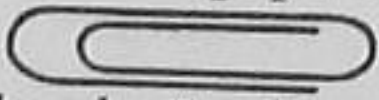
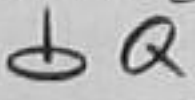
None of that was hard to draw, because you weren't trying for perfection. You were satisfied with drawing symbols of figures and faces. But in drawing these symbols, you learned to deal with three important basic characteristics: structure, proportion, and outline.

Look for the structure. We saw that the symbol for the human figures was easy to draw because we knew that the bones gave it solidity. We indicated those bones by single lines which formed the structure.

We can do the same thing when we draw animals. Their necks, spines, and tails, their legs and feet, their heads, with a few characteristic features, can represent the whole animal. Animals are somewhat more difficult to



draw than the human figure because we are not as familiar with their bone structure as we are with our own. A dog is very different from a cat, but how can we show it with these few lines? Our illustrated cat has a level spine with a drooping tail. His head is round and level with his neck. And there is a rather large space between his shoulders and his hips. He looks lazy and rather indifferent. Our dog, on the other hand, looks alert and ready for your command. His head and neck are raised; his tail is high and wagging. His body is proportionately shorter than the cat's, his head is squarer, and his legs are spread a bit. These differences are not standard differences between dogs and cats. We have emphasized the lazy independence of many cats and the friendly alertness of many dogs so that the pictures are more easily recognizable.

We couldn't draw these animals at all unless we knew their structure. And we can't know that unless we really look at them. Learning to draw consists mostly in learning to *see*. Look at that paper clip on the desk. It is easy to see, and easy to draw (). Now try something just a bit harder, a thumbtack. Look at it. Then draw it (). It's the *looking* that's the important step. And look for the structure first.

Notice the proportion. We know how important relative sizes are. We know that the addition of ten pounds to our weight may make a marked change in our "proportions." We appear shorter and broader as well as heavier. As we drew the stick figures, we used different lengths and widths to help us symbolize short, fat people and tall, thin people. And when we drew animals, we found that by differentiating the proportions we could make the cat and dog easier to recognize.

This knowledge of proportion also comes from really seeing things. You know that your foot is bigger than your hand—you've lived with that difference—but do you know which is longer, the palm of your hand or the middle finger? You can't draw your hand very well unless you see that difference.

If we really look at a baby's face, we can see that it is very small in comparison to the rest of his head. By emphasizing this short, broad, round face, we can make our drawing look like a baby. We recognize people by the difference in the proportions of their facial features. A caricature is a drawing that emphasizes or exaggerates these differences. Can you draw a caricature of your own face? You ought to be able to. You see it quite often.

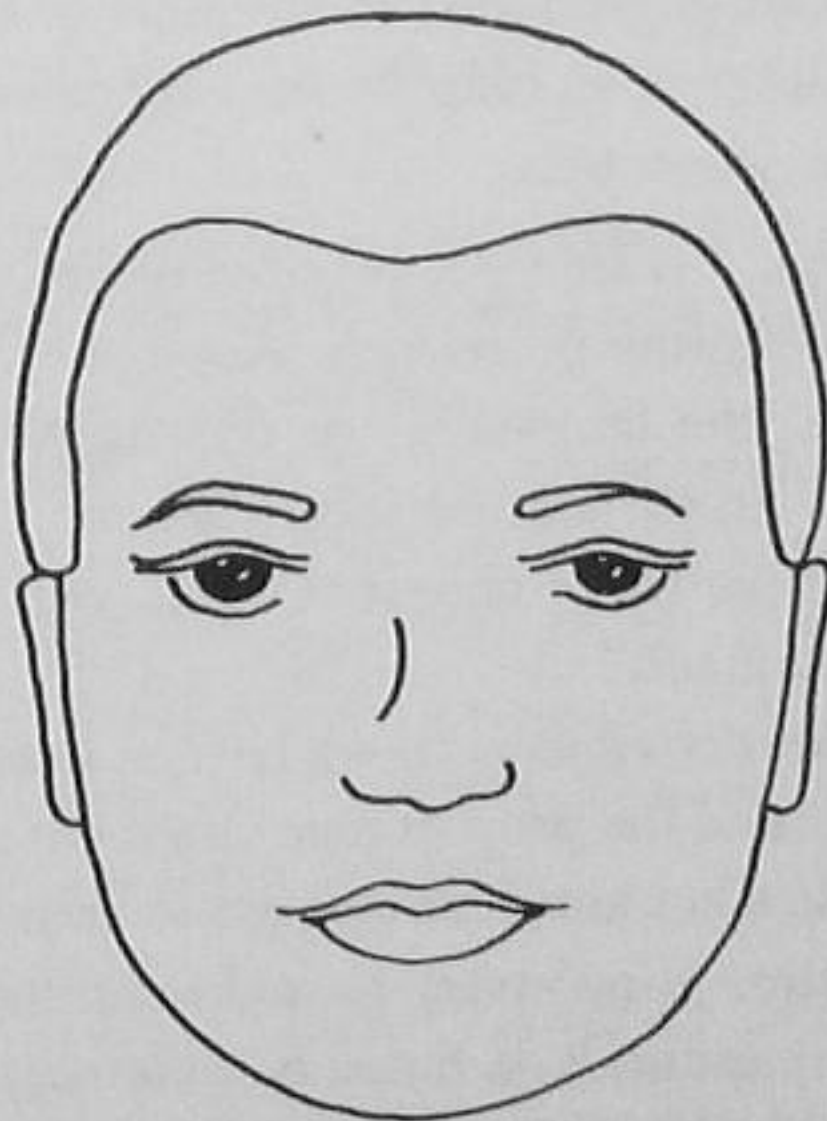
To be able to do so you would have to take a good look at its proportions and to know how they differ from the average. How does your face compare with our illustrated "average"? Is your forehead higher than the usual one third of the face length? Is your nose longer? Then your chin must be somewhat shorter than the average. A caricature would show it as being even shorter than that. Is your face broad or narrow in pro-

APPROXIMATE PROPORTIONS OF FEATURES

*Hairline to
brows— $\frac{1}{3}$
of face.*

*Brows to tip
of nose—
 $\frac{1}{3}$ of face.*

*Nose to chin—
 $\frac{1}{3}$ of face.*



*Top of head to
hairline— $\frac{1}{5}$
of head length.*

*Eyes at $\frac{1}{2}$ of
head length.*

*Ear same length
as nose.*

*Space between eyes
same as width of one eye.*

*Center of each eye
at $\frac{1}{4}$ of face width.*

Width of face— $\frac{2}{3}$ of length.



Caricatures exaggerate differences.

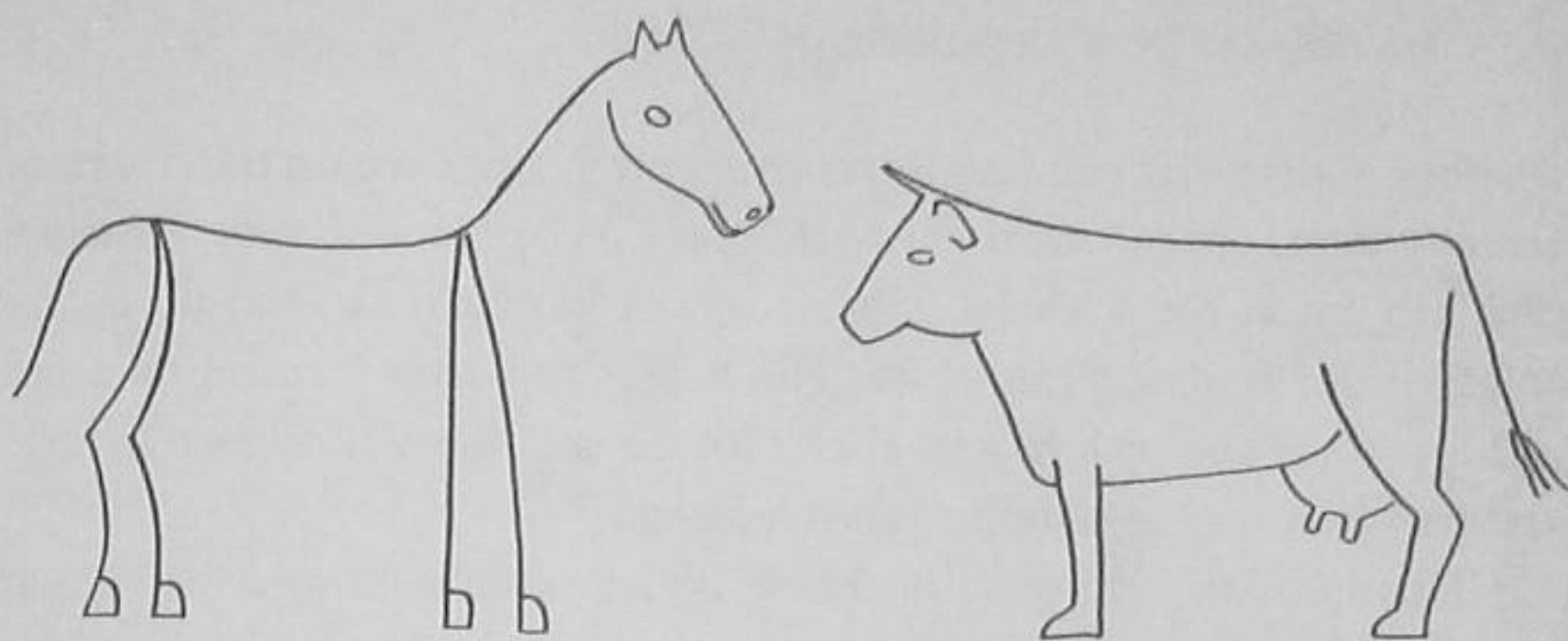
portion to its length? Are your eyes set wide apart or close together? Look hard at your face. Then you will be able to draw it.

Of course, this caricaturing is really an advanced exercise in learning how to draw. You may not be able to draw a caricature right away. But, just as we sometimes walk pigeon-toed in an effort to correct our habit of toeing out, so this practice in looking for the "abnormalities" may help you to see differences in proportion.

Observe the outline. A line is a versatile device. We have used it to show structure and to register proportion. Another of its common uses is to show the outlines, the boundaries of objects. When we look at objects, we see no lines drawn around them. We see only the edges of those things. But, when we try to represent them, we show these edges by means of lines—"out-lines."

We don't outline our drawings until we have at least sketched in the structure and have indicated the proportions. Often we need no real outlines—our structural sketches are clear enough to show what we mean. But sometimes the outline is necessary to make the drawing easier for others to recognize. For example, a horse is quite easy to recognize in stick-figure form, but a cow is not. An outline helps by showing her udder. An elephant would be hard to portray as a stick figure because it is characteristically chunky and bulky. An outline is needed here, too. And our faces used the "outline" to show eye shapes, eyebrows, nose shapes, and lip shapes as well as the outside edges of the face and the hair.

Now try to draw a fairly difficult object, your own left hand. First



look for the structure; you can feel it inside the fingers and inside the palm. Now consider the proportions. And as you sketch out the structure, keep the spacing about right. Start at the wrist and draw each finger as it spreads out to the knuckles and then to the first and second joints and finally to the fingertips. You might put a little dot at each joint as a marker. Now you are ready to draw the outline. Look at the hand carefully before you start to draw. Don't try to mark down all its details, but notice which variations of the outline are important for showing form. When your outline is complete, you may erase the structural guide lines—and there is your hand!

Keep practicing if you want to improve your skill in drawing. You wouldn't expect your students to master a new skill immediately. Neither can you. But you *can* learn to draw.

Study the Sunday comics for more help with structure, proportion, and outline. Li'l Abner, Dick Tracy, and Henry can teach you how simple line drawings can describe people and things. They can teach you a lot about drawing facial expressions that register thoughts and emotions. These drawings, of course, are cartoons. And that is what you have been learning to draw as you have practiced.

USE YOUR DRAWING TO HELP YOU TEACH

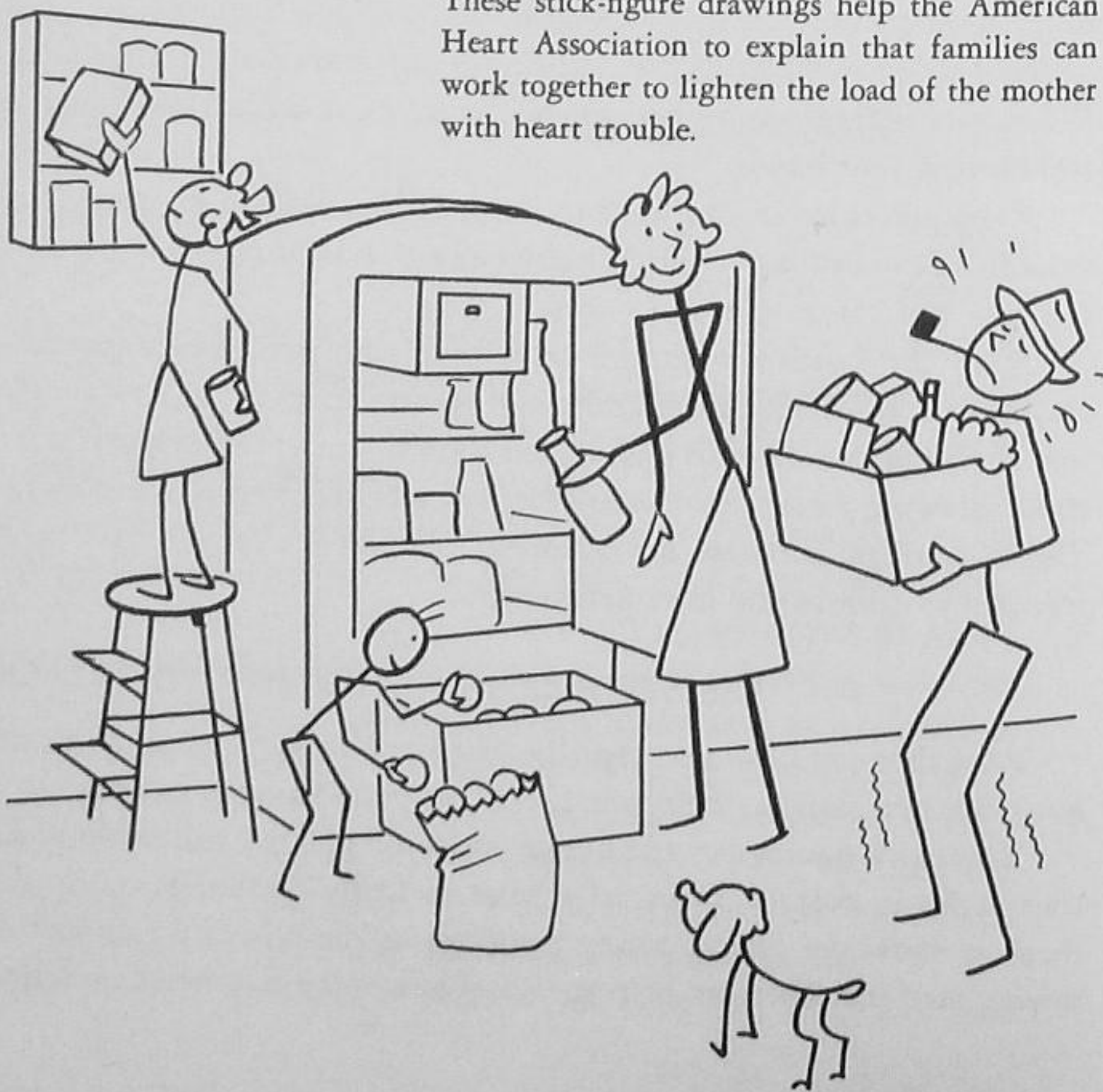
Now that you have mastered the first steps in learning to draw, see how your new skill can help you. Let us put your drawings to work.

Your stick figures can add humor to learning. They can easily illustrate styles in posture, from Sally Strut to Dolly Droop. You can use them to show the correct sitting positions at the typewriter or at the sewing machine. They can help you show how some calisthenic exercises

are done—that is, if you find it inconvenient to lie down on the floor and actually demonstrate them yourself. The simple faces of your drawings can grin out at the students. If your school has been cleaned up by the children, personifying the building in before-and-after pictures by a sad, unhappy face and by a happy, cheerful face will show this “face lifting” and will be a way of thanking the children.

This animation through line drawings has often been used to promote people's interest in nutrition on the theory that a happy, healthy-looking face on a tomato has more appeal than the normal red fruit. But some nutrition experts think that children, at least, are deterred from eating the right foods by these cartooned faces. They reason that if Bill is about to take a bite out of his apple and suddenly an imaginary face dances before his eyes, he'll think twice before he takes that bite. Still, we see

These stick-figure drawings help the American Heart Association to explain that families can work together to lighten the load of the mother with heart trouble.





This simple line drawing both focuses the attention of the children and clarifies the idea to them.

carrots with sparkling eyes, healthy-looking vegetables, milk sporting strong muscles. You will need to test the truth of these two conflicting points of view for yourself.

Did you think you couldn't draw? Well, you may never be a Michelangelo, but your drawings can help people to learn. They can increase the pull of a poster. They can add sparkle to a duplicated page. They can make a "chalk talk" out of a lecture.

And now that you have made a good start at learning this new skill, you can help others to enjoy their own creative abilities.

Graphs, Charts, and Diagrams

When we drew faces and figures and objects, we symbolized the structures and the outlines of these things through simple line drawings. Many other symbols are expressed through the same use of lines. For example, we all know the meanings behind the symbols \$, ¢, &, %, ?, and (). Other symbols, such as arrows showing direction, circles representing a magnifying glass surrounding an enlargement, and dashed lines showing weakened connections are all easy enough to understand if you have been taught what they mean.

Lines can also help us communicate with other people by symbolizing more complicated ideas. By letting lines and combinations of lines stand for these ideas, we can make the complications seem easier and the relationships clearer. These abbreviated, symbolic systems of lines we call diagrams or charts or graphs. Although dictionaries differentiate somewhat among them, the three words are often used interchangeably. They are all explanatory drawings that help to show relationship, structure, or quantity.

Explanatory drawings can help us to express our thinking in easily understandable ways. And because these drawings are so important a means of communication, we need to learn how to make them, how to read them, and how to use them. As we discuss the many types of explanatory drawings that show quantity, relationship, and structure, we shall

also be pointing out ways in which we can help other people to learn to use them.

These explanatory drawings are abstractions, of course, but they are not necessarily hard to understand. A baby soon learns that his mother's smile is a symbol, an abstraction that stands for warmth and security. As he grows up, he learns many other symbols at the same time that he learns the realities upon which those symbols are based.

Studies of children's ability to understand these explanatory drawings have shown that the conventionalized picture charts are the easiest to understand and are preferred by most children. As a matter of fact, children seem to enjoy working with many kinds of graphs and charts, perhaps because through them they can quickly see the relationships that seem hard to understand when they are expressed more abstractly through words. Children can understand the circle type of graphs, or "pie charts," too, but the bar graphs, the line graphs, the cross-section diagrams, the flow charts are more difficult. Children need special help as they try to read and use them.

Studies have shown that the I.Q. of children is not the best indication of their ability to find meaning in graphic drawings.* This ability, according to the studies, is more often associated with age or with actual training in the reading of graphs. And probably all of us could profit from instruction in the details of these symbolic drawings.

The person who makes the drawings controls their clarity. If you are drawing a graph on the chalkboard, it is up to you whether or not it will be easy to understand. If you make your drawing at the moment when it is needed to explain a point, it will probably be quite easy to follow. This casual, on-the-spot drawing will carry meaning because it helps to answer the problem immediately—it clears up the question at the moment when it is a question.

*Sister Clara Francis Bamberger, *Interpretations of Graphs at the Elementary-School Level*, The Catholic Education Press, 1942.

Ruth G. Strickland, *A Study of the Possibilities of Graphs as a Means of Instruction in the First Four Grades of the Elementary School*, Teachers College, Columbia University, 1938.

You will plan the sequence of the ideas you present to fit our habit of reading from left to right. You will plan your use of colored chalks to help make your meaning clear, differentiating between ideas by using contrasting colors. You will work through each separate idea carefully before going on to the next one. You will use one style of lettering and only a few kinds of symbols.

Often you will use drawings made by someone else or made by you ahead of time. These drawings will need more explanation than those you make on the spot. Help your audience by pointing out the symbols and their interpretations or by asking questions about the relationships between the drawing and the ideas it explains. You can use the type of drawing that is most appropriate to your purpose, and you can use it in so simple and clear a way that its meaning fairly sticks out. There are many types of drawings that can be useful to you. We classify them, according to their purposes, as drawings to compare quantities, drawings to explain relationships, and drawings to show structure.

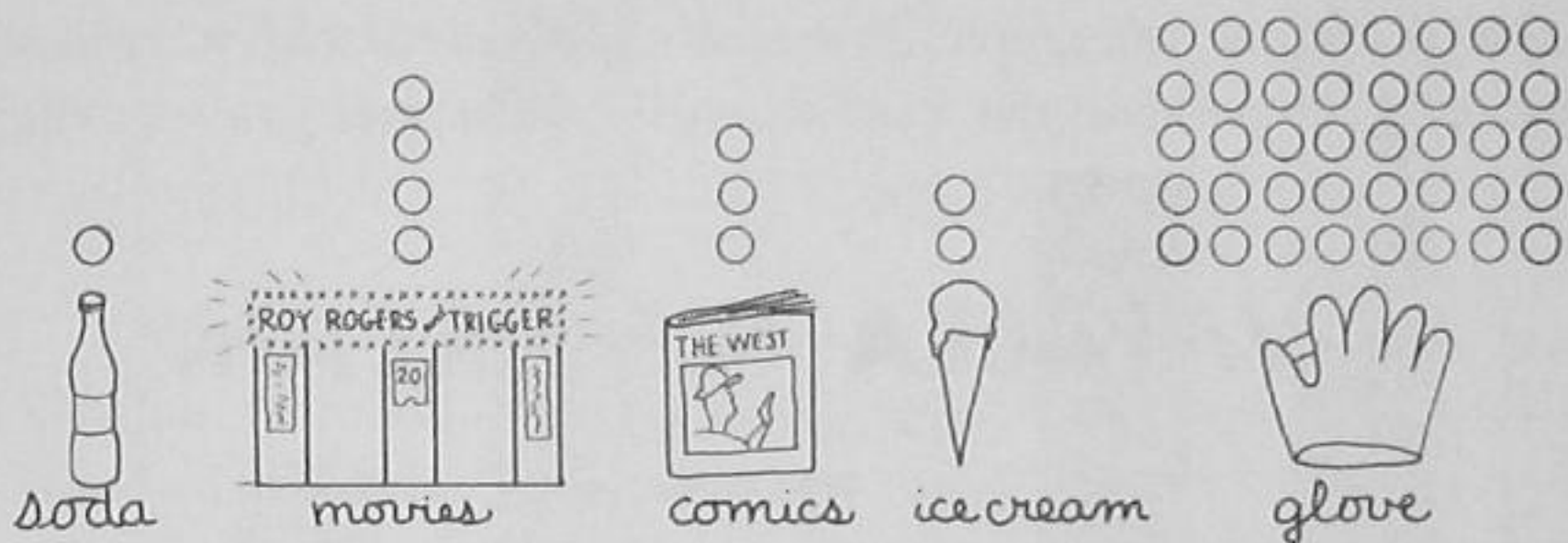
DRAWINGS CAN COMPARE QUANTITIES

If your purpose is to show quantitative relationships, you can select from several types of graphs.

Pictorial charts for simple comparisons of quantity. Perhaps fourth-grader Jimmy is concerned about his plans for spending his allowance of 25 cents a week. The five nickels have to go as far as possible. You and Jimmy can draw a pictorial chart that will help him and his friends understand some of the alternatives and can help you teach a simple but important lesson in consumer economics. Picturing the differences in the numbers of nickels makes it easier for Jimmy to understand that he will need to save some of the motion-picture, comic-book, or soda nickels in order to buy a baseball glove next month. Pictorial symbols make it easier for Jimmy to see the relative worth of the various purchases that tempt him.

Of course, it would be easier for Jimmy to understand his problem if he could actually have the nickels themselves right there to divide into piles representing those to spend and those to save. The nickel is really a

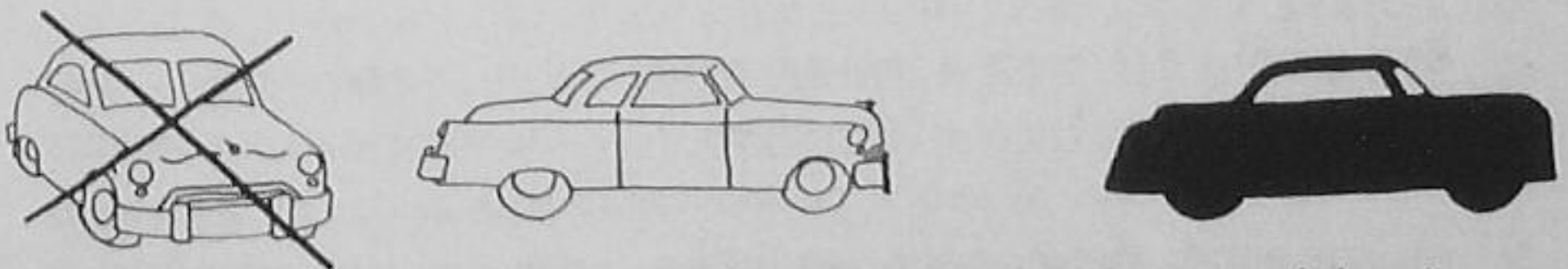
How shall Jimmy spend his allowance?



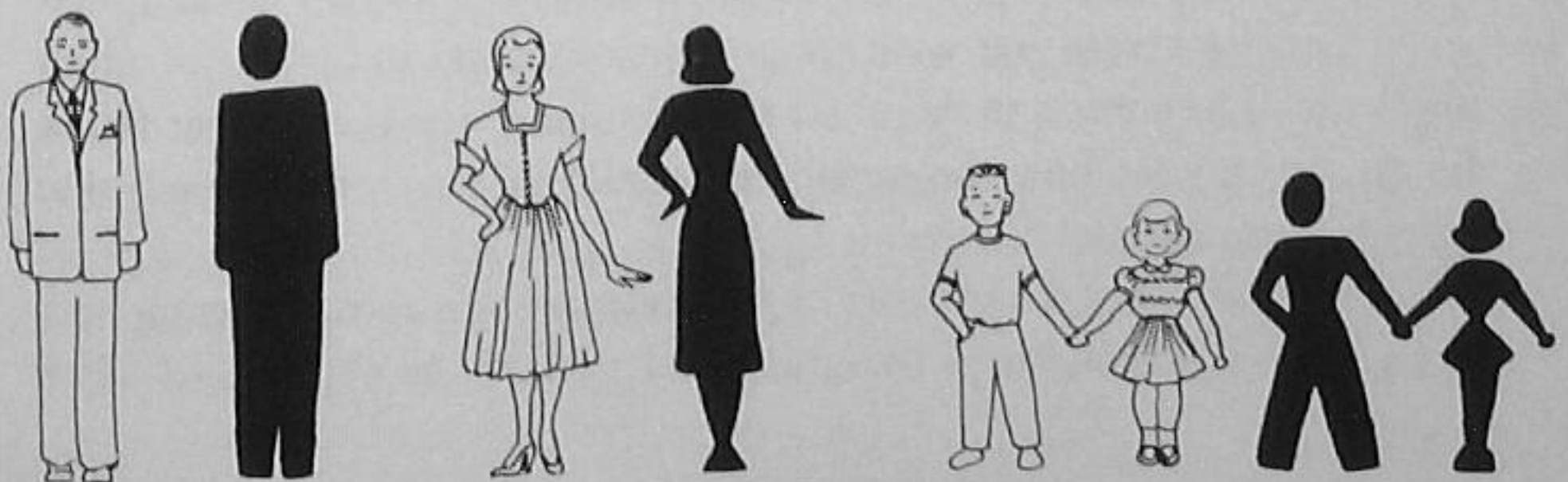
symbol in itself, a symbol of the things for which it can be exchanged. But Jimmy is going to have to learn to deal with money in a more abstract sense. As an adult, he will usually have to plan his spending and saving in an abstract way without the actual dollars piled up in front of him to be portioned out. He will have to be able to see ahead, to use his "mind's eye" in planning his life. While he is a child, he should be helped to understand abstractions.

For Jimmy, we used the symbols of nickels arranged in columns. Pictorial symbols are often used in this way, repeated in lines to show amounts of things. They are used, too, in place of words or in addition to words with other forms of graphic display. Look at pages 94, 96, and 97 to see how such graphs help make meanings clear.

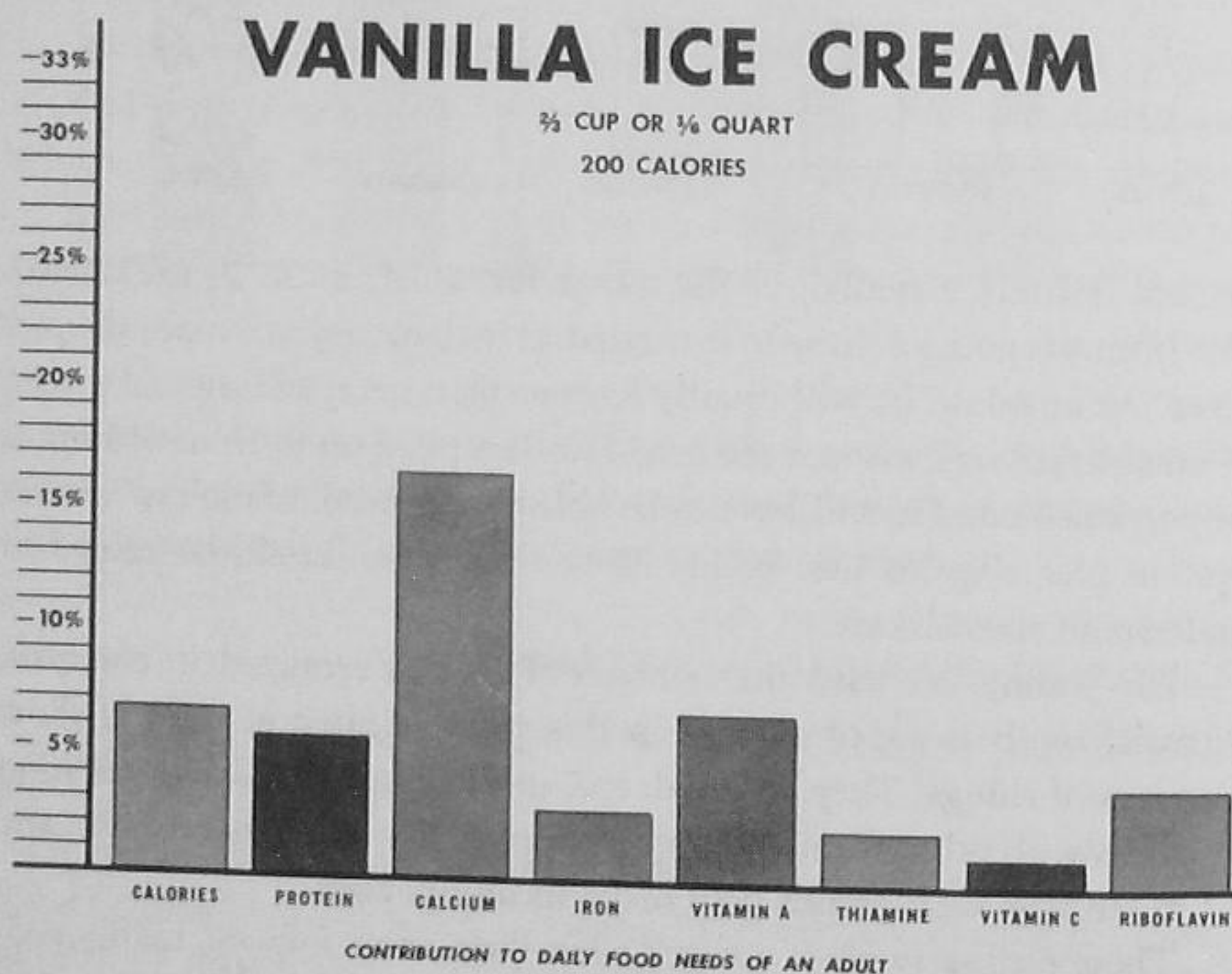
These picture symbols are just what their name implies, highly sim-



Start with easily recognized silhouettes. Simplify shapes and details.

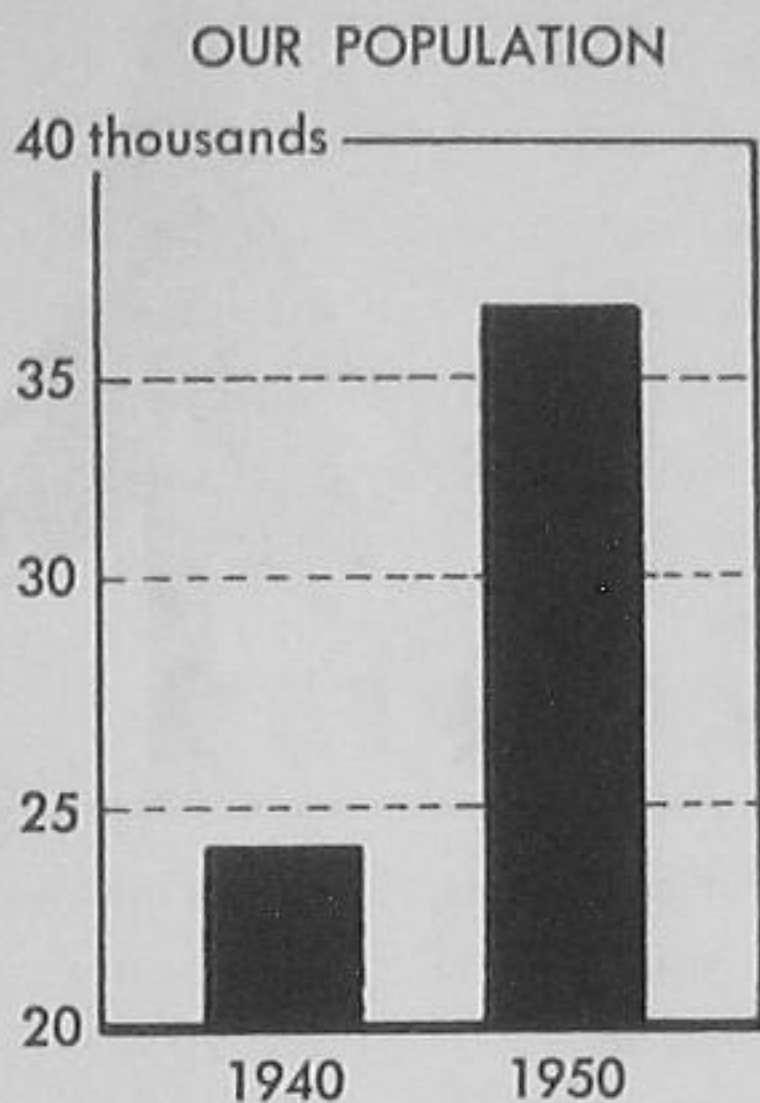


plified little pictures that suggest, rather than represent, the original. They are not difficult to work out. (Use some of the suggestions from Chapter 5.) But if your graph has to look more professional, you can buy strips of picture symbols that can be pasted on wherever you need them.

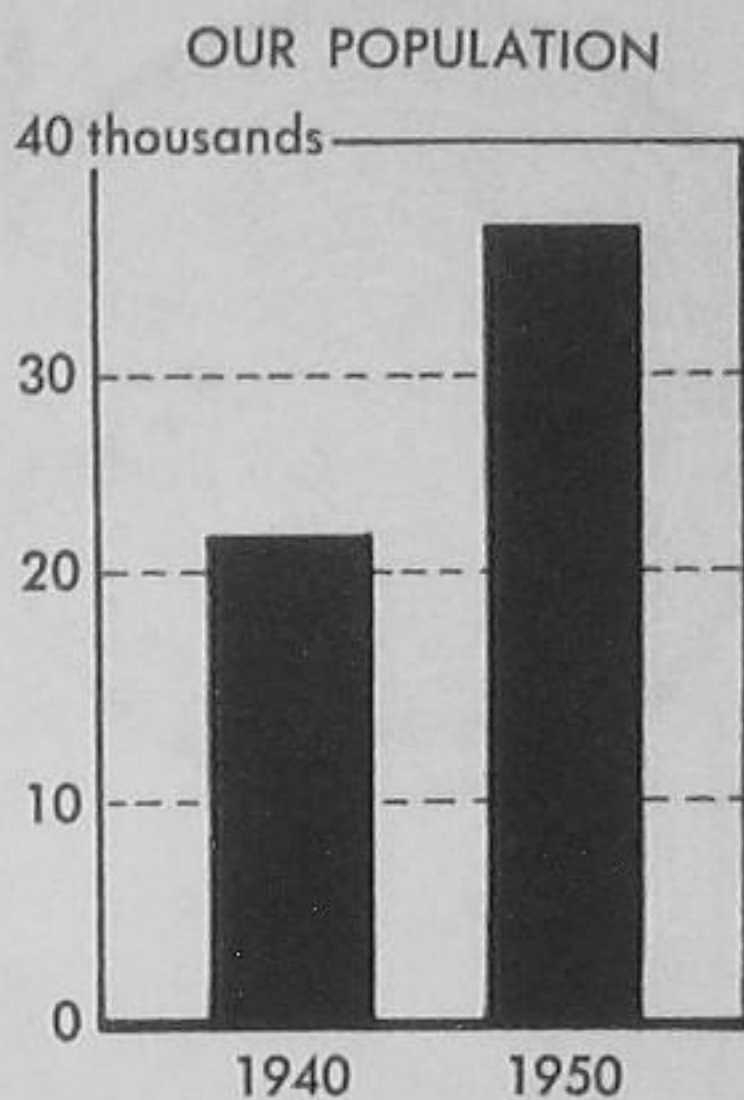


Bar graphs for more complex quantitative comparisons. Bar graphs have been used very effectively to show the comparative amounts of nutrients in foods. When a person unfamiliar with bar graphs is shown the graph above about vanilla ice cream and understands that each bar is measured by the scale on the left, he will find it easy to understand that ice cream has a larger proportion of calcium than of other nutrients. If he compares this chart with similar charts about other foods, he can quickly see how the nutritional quality of ice cream exceeds that of many other desserts.

The meaning of the bars can be made clearer by means of accompanying picture symbols, but if the graph is drawn on the chalkboard when



A

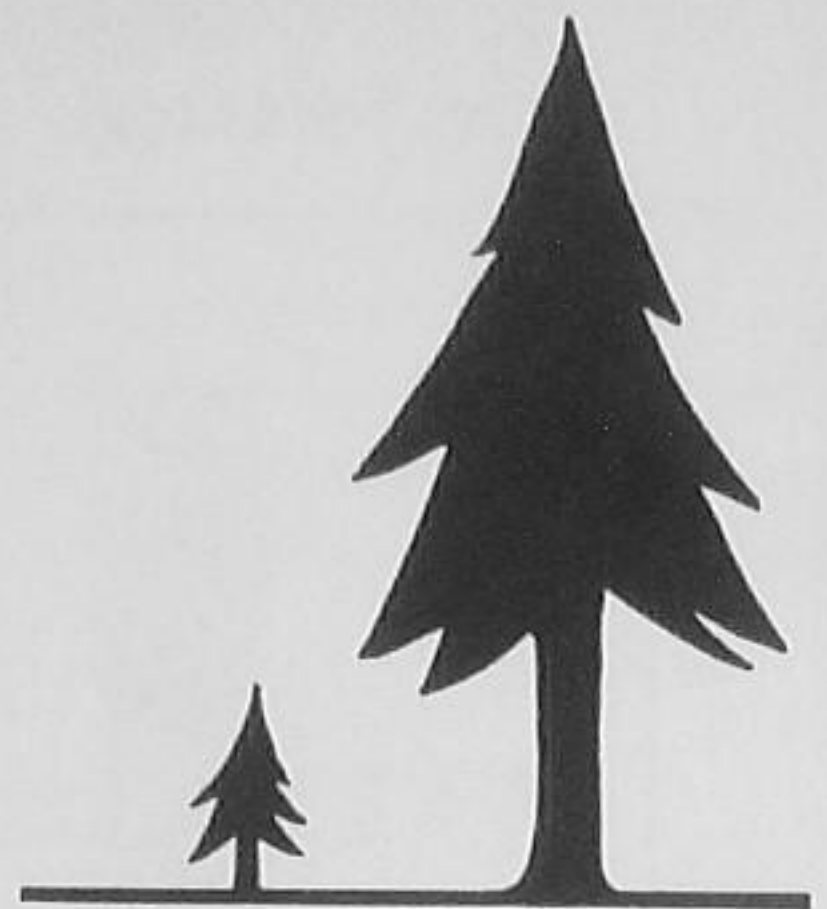


B

it is needed for clarifying a question, or if it is explained while it is being used, the bar graph should be easy to understand. To avoid confusion, mark only a few divisions on the measuring scale. In this kind of graph you are not trying to present ideas with absolute accuracy. You are trying to show general relationships. And always begin the measuring scale with zero. Note in the illustration above that the proportions of population growth are presented in a misleading way in example *A* because the measuring scale starts with 20, not 0.

Area diagrams for proportions and percentages. A divided pie or cake shows proportions quite simply. Because these foods are usually served in pieces, the size of the piece is easily related to the whole. Children might readily learn to interpret circle graphs if they had soft oatmeal cookies to cut into sections. They could learn both fractions and graphic communication in a tasty way!

We often see the circle graph used to show us the buying power of our dollar or the proportion of our dollar that goes for taxes. This divided dollar, like the divided pie, is a type of area diagram. The total area, whether it be a circle or a square or another shape, is divided to show comparative proportions. Because the divisions are usually difficult to interpret with accuracy, these area diagrams should be used to emphasize general ideas rather than to show small details. A drawing of the Capitol Dome could be shaded with two patterns of cross hatching to show the



*Fire, insects,
and disease
10%*

*Withdrawal
for use
90%*

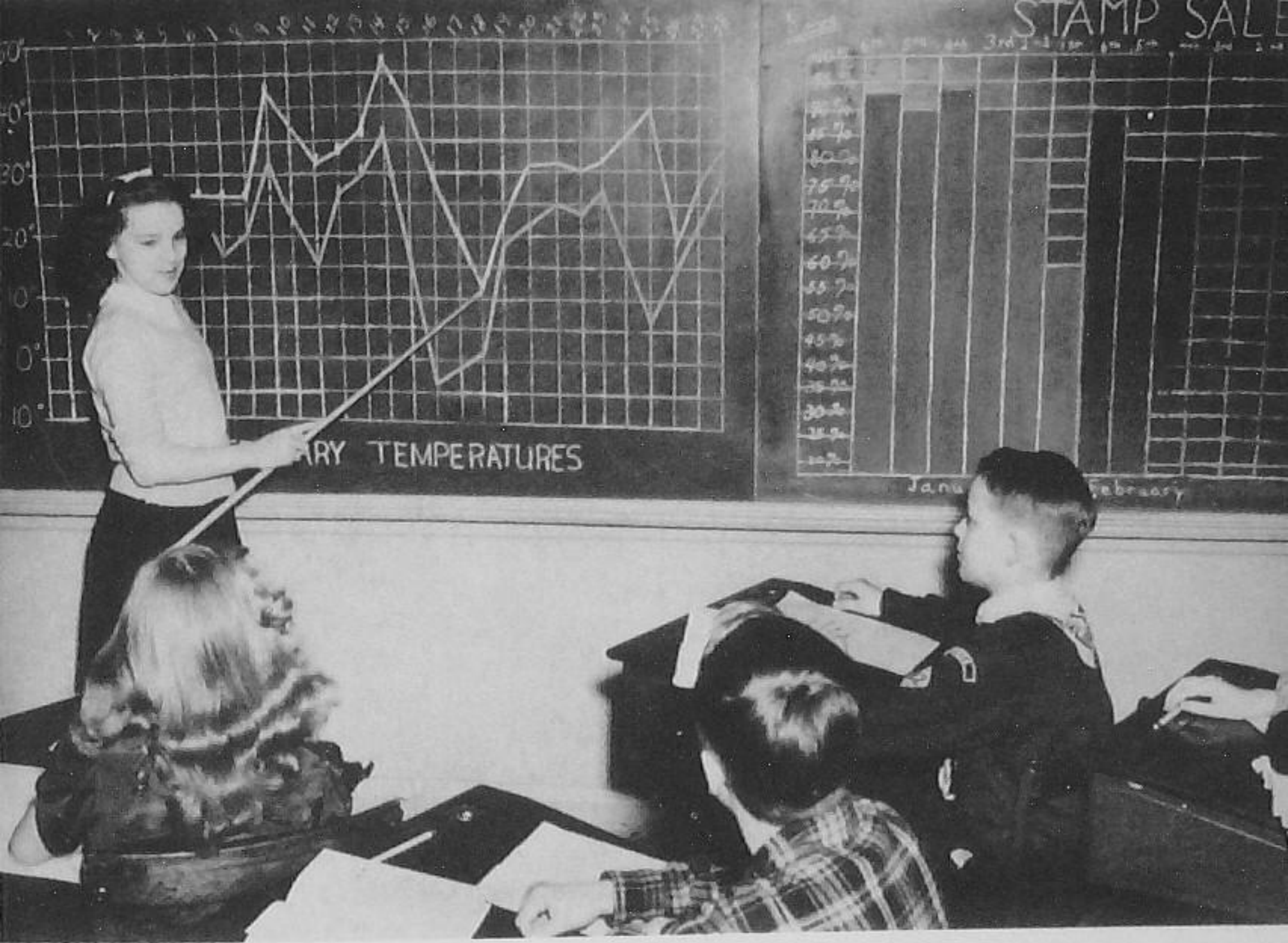
Here are two types of area diagrams, both illustrating the same thing. One type of diagram shows difference by means of a divided circle; the other, through the comparative sizes of the symbolic trees. Notice how the use of the symbolic flame and insect and the interpretation of the circle as a cross-cut log have helped to make clear the meaning of the diagram.

proportion of "yeas" and "nays" on a particularly decisive vote, but it could not show accurately the finer distinction between the numbers of Republicans and Democrats among the Congressmen.

Maps are often used as a different type of area diagram. Sections of the map are colored or patterned in different ways to represent different numerical values. Outline maps that can be filled in by students as area diagrams will help them learn the particular facts of the lesson and at the same time will teach them another communication skill.

Another type of area diagram is really a type of pictograph. This diagram shows two or more symbolic pictures that differ only in size. That difference is in proportion to the quantity difference the diagram wishes to show. However, since it is hard for us to judge accurately these differences of area, this type of graph should be used only for very rough comparison. Nevertheless, it can be very effective.

Line graphs to show changes accurately. The line graph can show with a fair degree of accuracy the directions and trends of changing conditions. It is quite a difficult graph for many people to read, however, and its use should be made clear as it is being drawn. It can be very useful



The children of this sixth-grade arithmetic class are learning to read line graphs by using them—in this case, by charting the temperature highs and lows for the month.

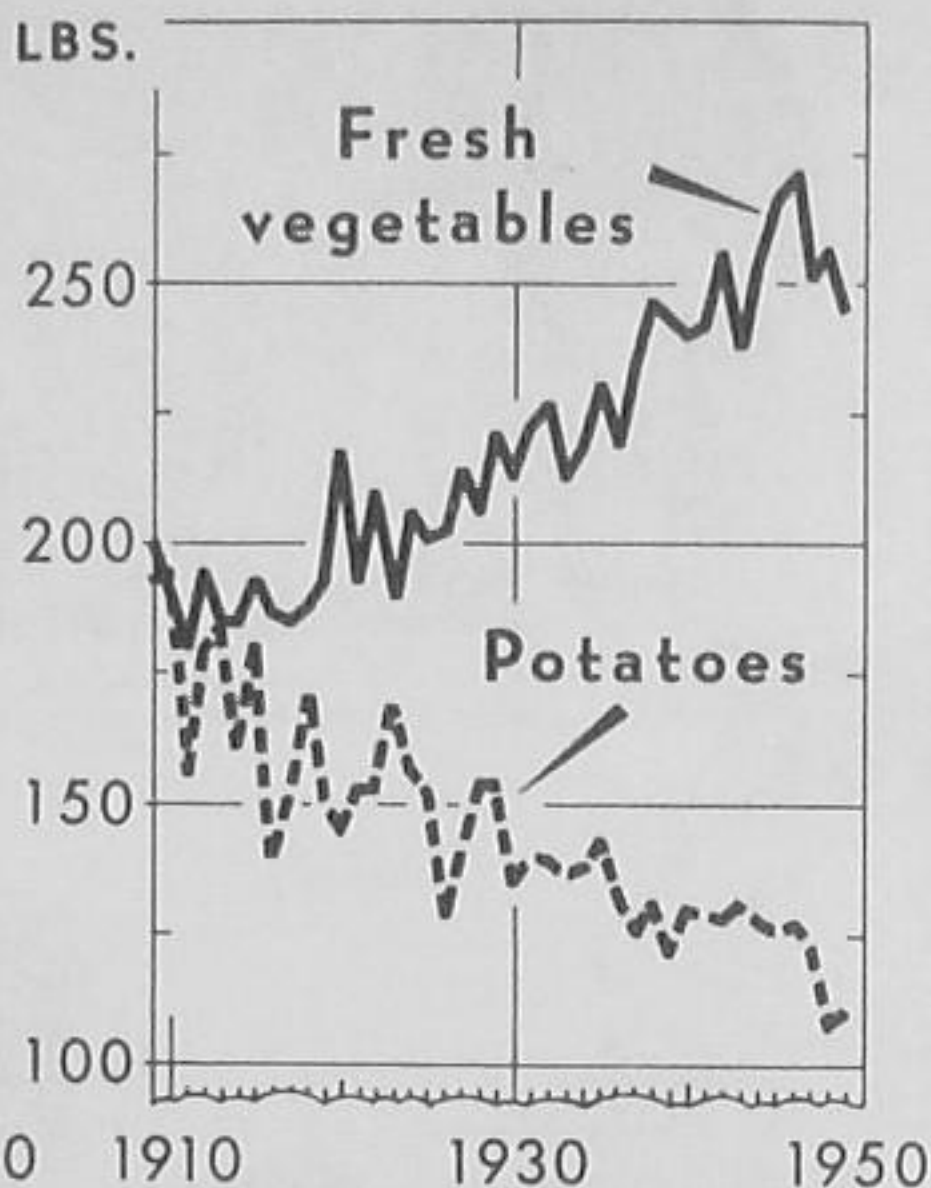
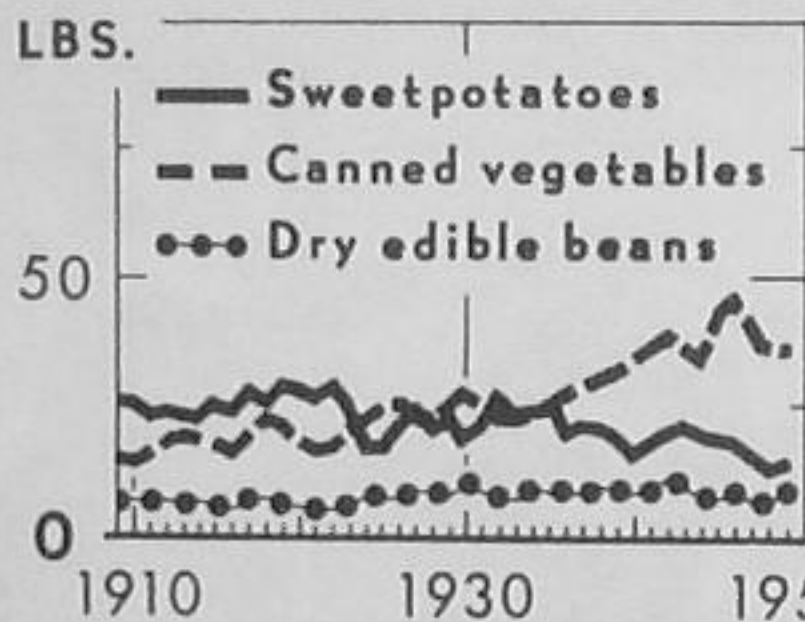
where there are many cases or many values to be shown, where the time sequences are continuous, and where accuracy is important.

If you want to show how the temperature fluctuated through the days of last week, you could have a line meandering through the week according to the levels of the average daily temperatures. Your temperature line would then wander across a checkerboard frame with points on the vertical lines representing the levels of temperature and the points on the horizontal lines representing Monday through Sunday. This is one example of the many uses for this kind of graph.

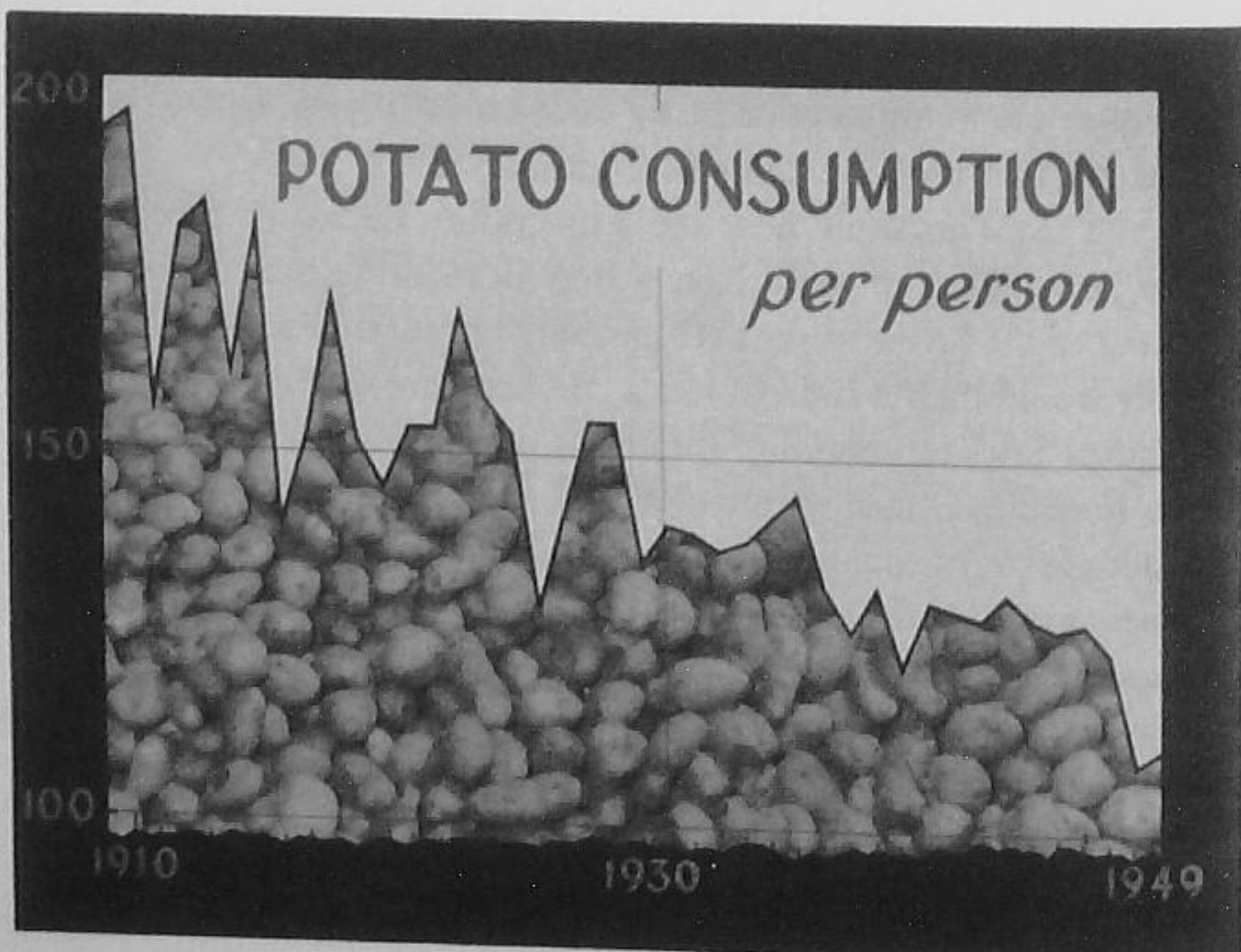
There are several variations of the line graph that help people grasp its meaning. Filling in the graph with a drawing or photograph "silhouettes" the story against the background. This silhouette graph is much more effective than the line graph in showing, for example, potato consumption.

VEGETABLES

CONSUMPTION PER PERSON



The various line graphs included in the chart above are clear enough if they are examined carefully. And together they give a picture of total vegetable consumption. But by separating one idea and dramatizing it with a photographic silhouette, a much more effective graph is achieved.





The rat-feeding experiment of these children has helped them to learn how to make and use graphs. Notice how their picture symbols make the line graph easier to understand.

Expanding the line on your graph into a solid three-dimensional shape is a helpful variation. But this solid representation is more difficult to draw and is best suited to carefully executed graphs that are prepared in advance.

All line graphs are difficult for most people to understand. Avoid using them where they must stand alone—on a poster, for example. They need explanation, oral or written.

CAN YOU COMPARE QUANTITIES?

We have been discussing explanatory drawings that can help compare quantities. Now let us see how you can use them. Here are some problems that may come up in group situations. What do you visualize as a suitable explanatory drawing in each case?

A group of young mothers meeting with you in your local social center is anxious to learn the best ways to care for their new babies. They are concerned because the babies are not all gaining the same amount each week, and one mother is worried because her baby weighs now at two weeks

no more than it weighed at birth. How can you show them the normal patterns for decrease and increase in weight?

Some of the children in your junior-high-school class complain that they can't manage to stretch their time to include all the things they want to do because there are always so many things they have to do. How can you help them to visualize the span of time between school and bed? How can you help them to apportion this time so that they can get in some of their desired activities each day?

Robert is interested in how the people around him feel about religion. He decides to find out how many people in his town belong to each of the churches and the number who belong to no church. How can he present the material in a graphic way so that he can show others what he has found out?

Look at the next page for possible ideas.

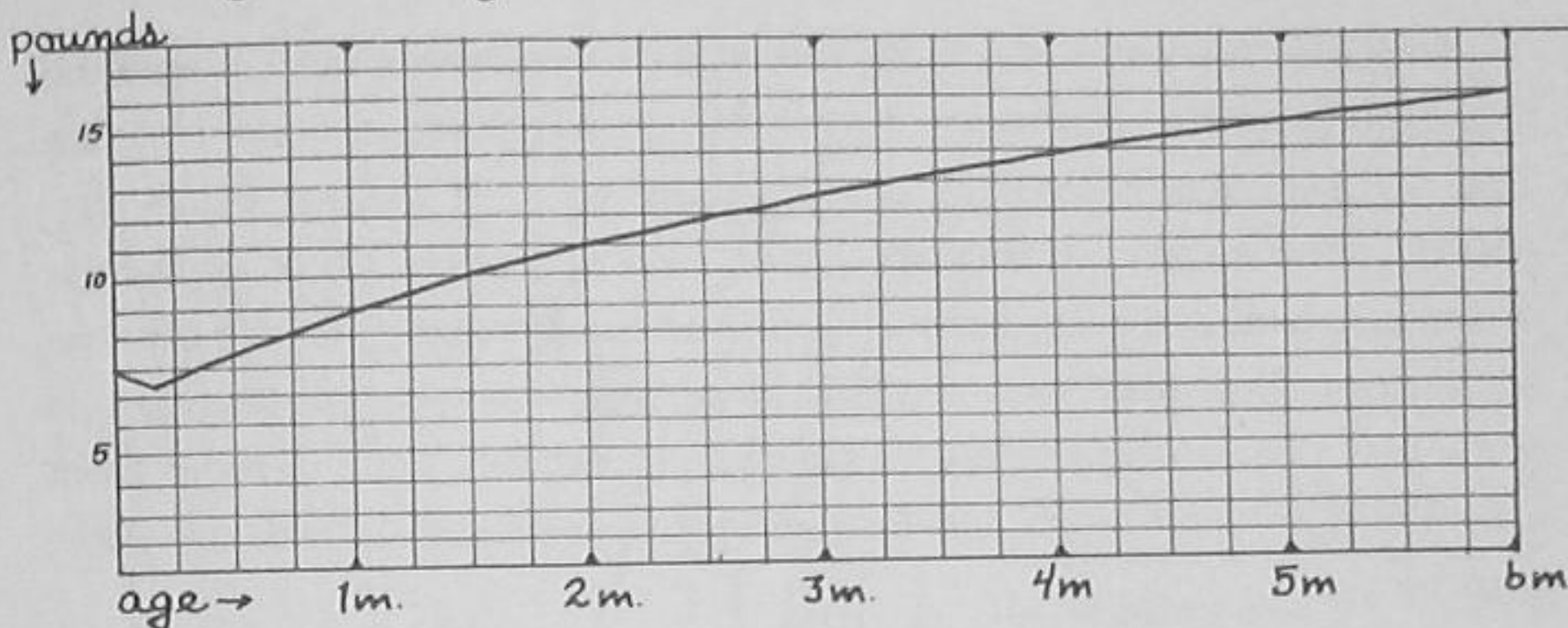
When you wish to show relationships of quantities, you may choose, according to the complexity of those facts, pictorial graphs, bar graphs, area graphs, or line graphs. And you can make any of these types more intelligible if you explain as you draw and if you ask questions and encourage questions about it after it is drawn.

DRAWINGS CAN EXPLAIN RELATIONSHIPS

Line drawings may be used to explain relationships other than those of quantity. Diagrams, consisting of lines, words, and other symbols, may show comparisons and contrasts, development and change, organization, and interaction. These diagrams may be somewhat difficult to understand by themselves but, since you will use them to help clear up immediate questions, they will be providing another kind of explanation for the learner. Often this translation into visual terms will help him.

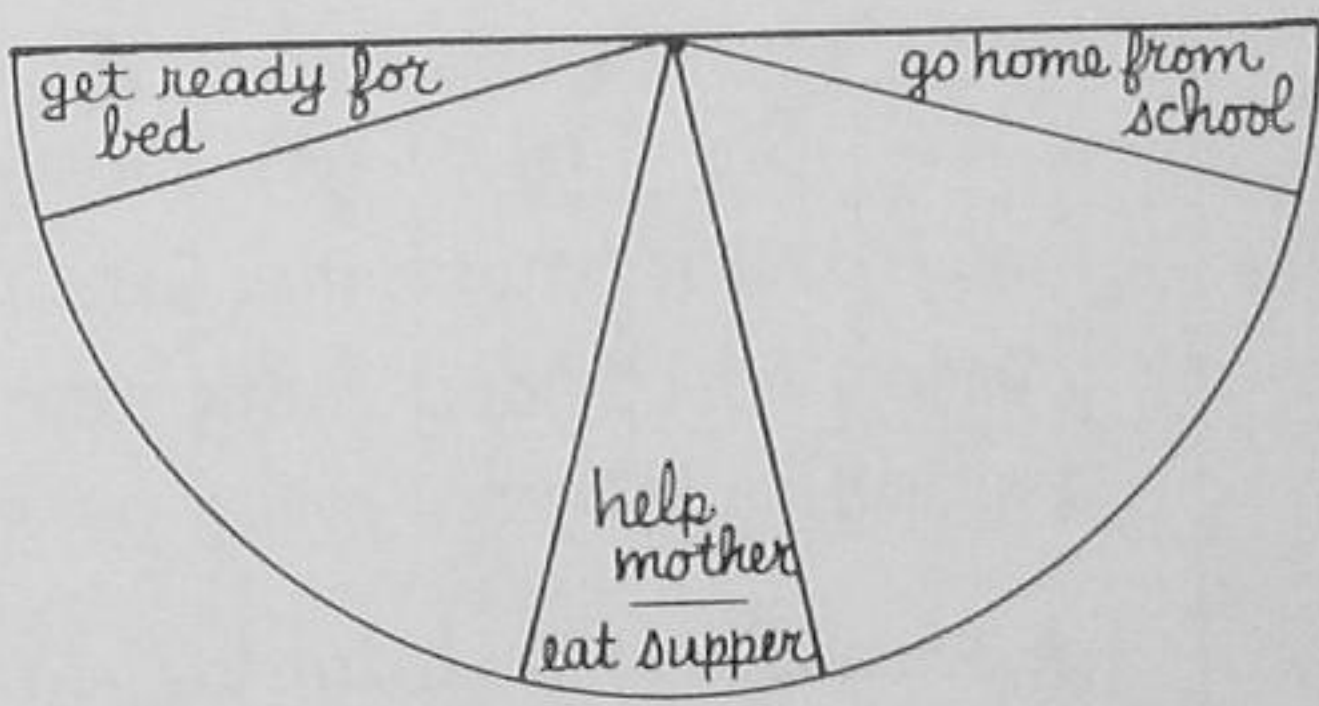
Columns and tables for comparison. It is easy to compare things by setting them up beside each other and then just noticing the differences. That is what you can do by using columns or tables to organize the specific ideas you wish to compare.

Average Weight Record From Birth to 6 Months

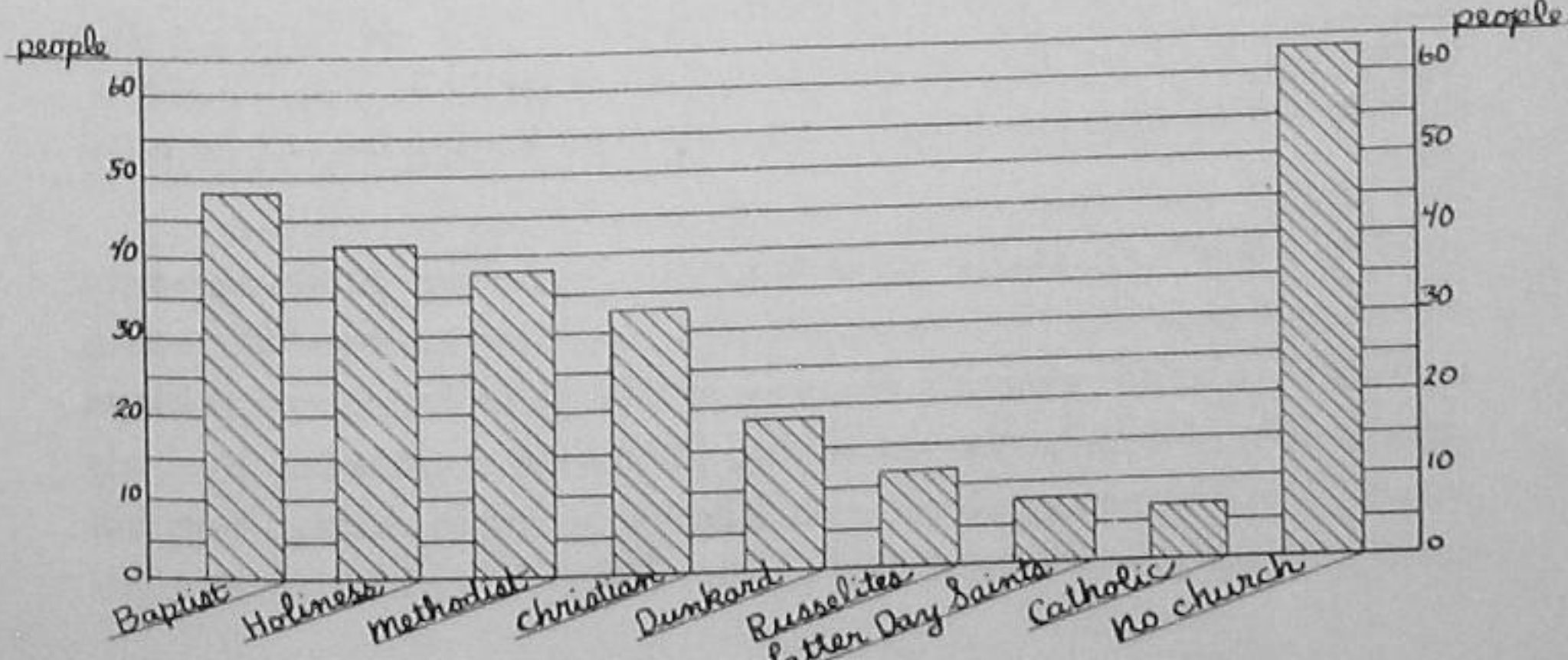


Fit the things you want to do into the time you have.

You have from
3 to 9



CHURCH MEMBERSHIP IN PLAINVILLE, U.S.A.*



* Adapted from James West, Plainville, U.S.A.

Suppose, for example, that you wish to show a class in general language how the European languages seem related to one another. You make a column for each language and write in various words suggested by the students as they are said in each language. Through the use of symbols you can record the opinions of the group about the obvious similarities. You may then explain how some apparent similarities do show real relationships of words that have probably been derived from a common ancestor word and how other apparent similarities are mere coincidence.

Are European Languages Related?

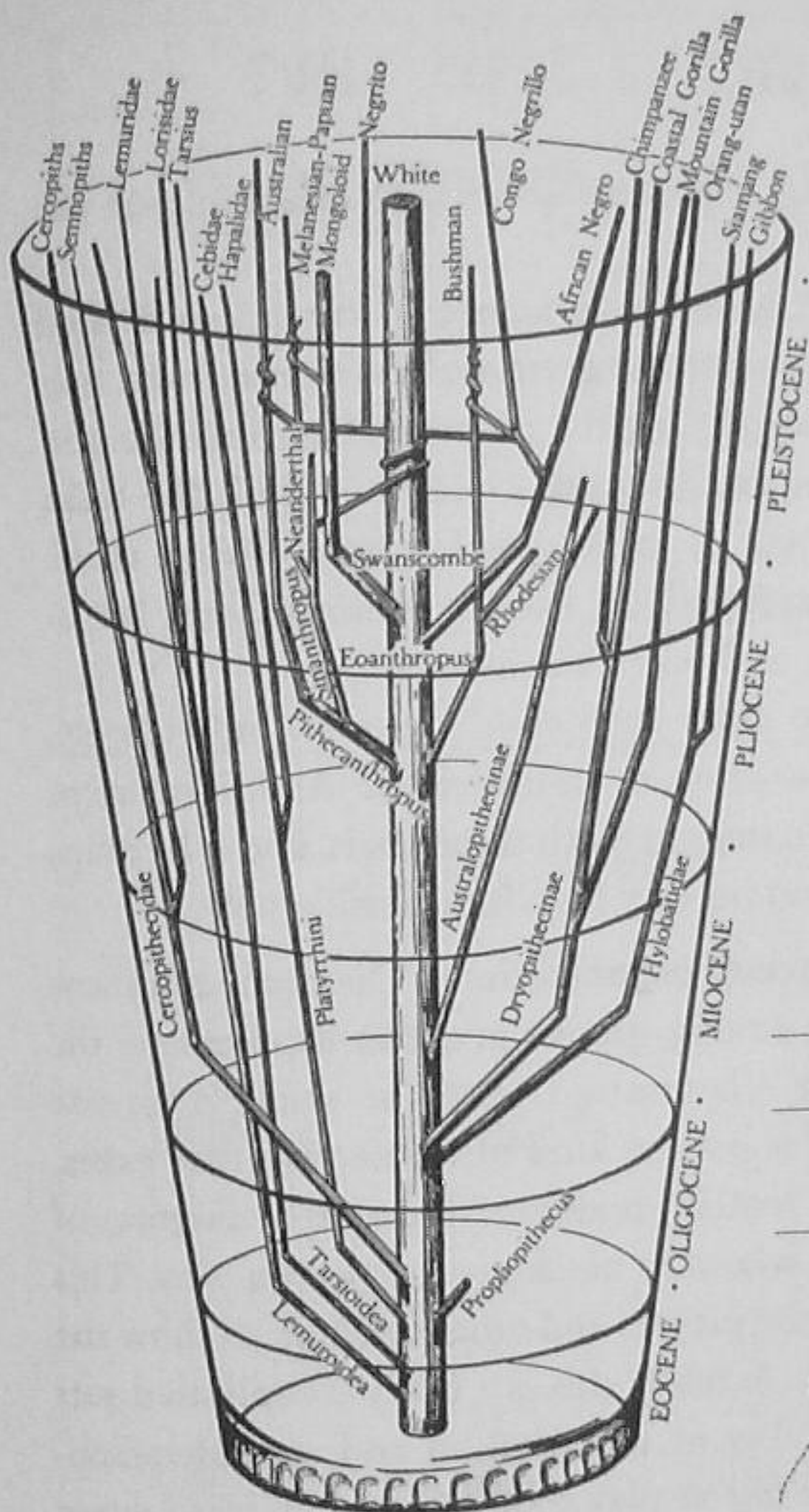
DUTCH	GERMAN	SWEDISH	ENGLISH	FRENCH	SPANISH	ITALIAN
▲ U	Sie	ni	you	▲ vous	Usted	voi
mij	mich	mig	me	● me	● me	▲ mi
▲ vader	▲ Vater	▲ fader	father	père	padre	padre
● moeder	● Mutter	● moder	mother	mère	madre	madre

▲ sounds seem related to English

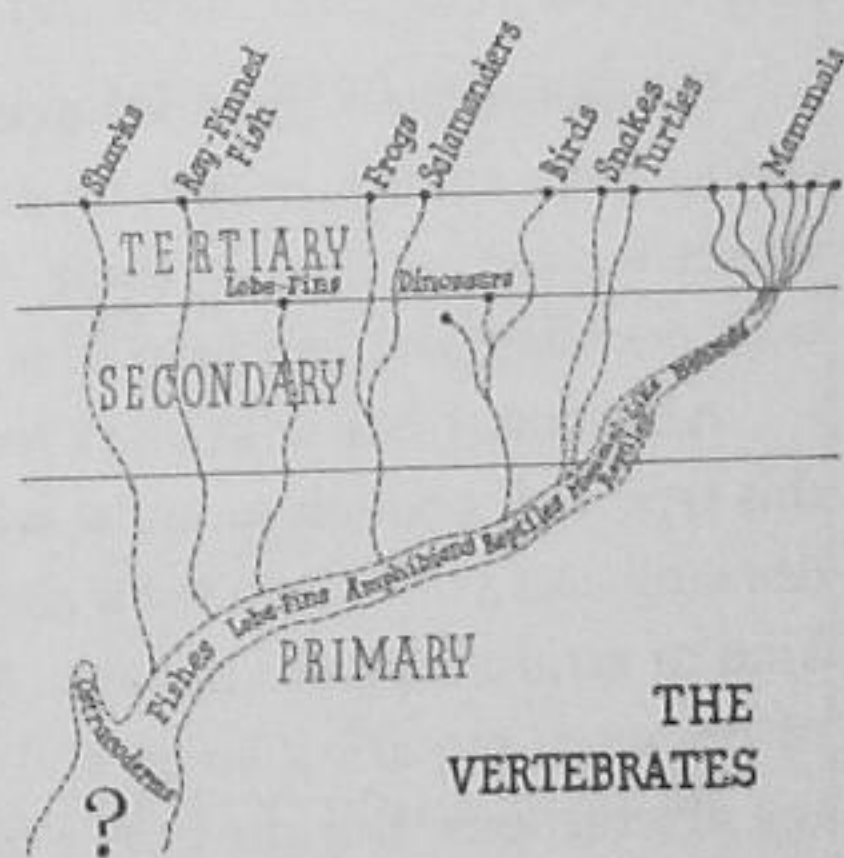
● spelling seems related to English

This tabular chart can be used effectively to show time relationships too. If Nancy wonders about the meaning of the word "generation," you might help her chart the life span of her great-grandmother, her grandmother, her mother, and herself on a table representing the last hundred years.

The "flow" chart for development. Processes of development and change can often be shown more clearly in diagrammatic form than in words. Take, for example, the way in which the heart pumps blood into the lungs for oxygenation and then pumps it out again into the body tissues. This circulatory process could be explained in words alone, but a diagram can give meaning to those words.



The diagram to the left, by E. A. Hooton, and the one below, by William Howells, are both variations of the flow chart.



One of the most commonly used diagrams for showing development and change is the "flow" chart, in which the processes of change are likened to a river with its various tributaries. This same type of diagram is sometimes called the tree chart, in which case the "tributaries" are thought of as branches from the main trunk of the tree.

Above are two examples of this kind of diagram. Each is explaining the same process; yet each uses a different variation of the flow chart. Hooton's diagram is in the form of a tree growing in a tumbler of water that represents time. Howells' diagram seems to show the primates burrowing upward through the bulk of time with the various tunnels leaving the main shaft at different depths and all coming to the surface—that is, the present. Hooton's diagram is the more detailed in showing living

species and their backgrounds, whereas Howells' locates some of the fossil finds on his chart.

Student progress can be charted as evidence of development and change. Most of the charts of student progress, however, have been prepared as though they were primarily for the purpose of comparison and contrast. They have shown the names of all children and all the tasks to be done and have kept account of the accomplishment of each child. This technique may develop competition between the students, but it will also develop envy, worry, and other insecurities.

A better plan might be to chart each child's growth individually, for that is how we expect him to grow, as an individual. And, if he helps set up his own goals and his own steps to reach those goals, and if he helps keep his own chart, the visualization may help him considerably.

The interaction chart for group organization. Diagrams can show connections among people or among groups and can supplement the words we use to explain these relationships. And the symbols we use with our diagrams can help to show the kind of connection that exists.

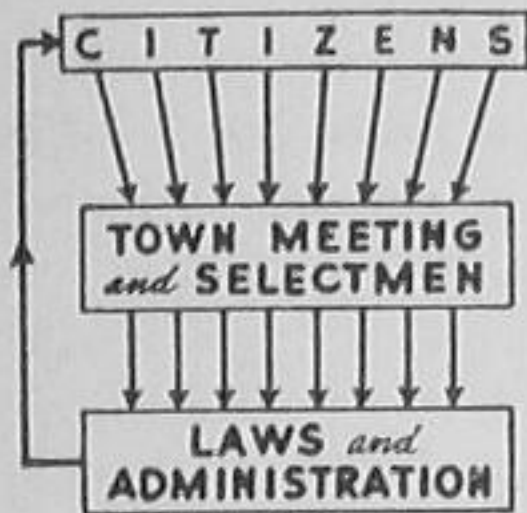
Almost any boy who plays football understands a simple diagram of this type well enough to know whom to block out on a given play. This drawing uses symbols to show the players and other symbols to show the kind of action expected of each. Actually this is a fairly complicated sort of drawing, requiring some ability at visualization and at understanding abstractions. But the boys *want* to play football, so they learn every detail in "skull practice."

Motivation for learning about government may not be strong, but the chart on page 103, showing organization and responsibility, is not difficult to understand. The three types of government are set side by side for ease of comparison, and the positions of the citizens, as well as the arrows showing the lines of authority, show some of the differences between democracy and autocracy.

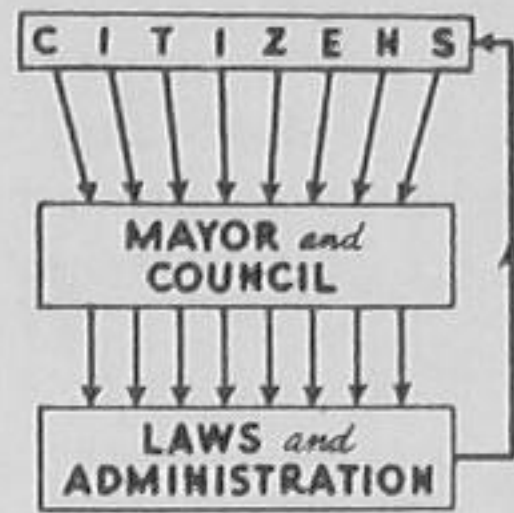
Teen-agers and their parents can understand various patterns of family organization more easily if the discussion is illustrated as it progresses. They all know of families in which the "old man" is the boss and the mother is the only one who ever dares to cross him. And they all

SOME TYPES OF CITY GOVERNMENT

1 NEW ENGLAND TOWN MEETING



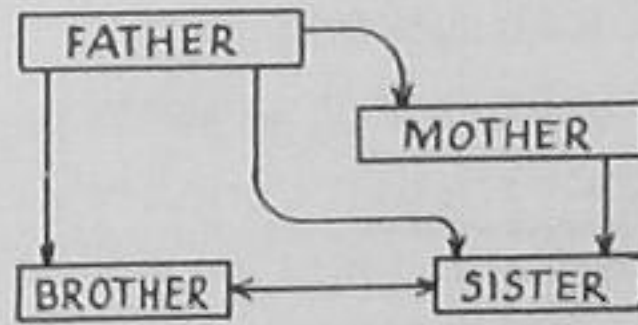
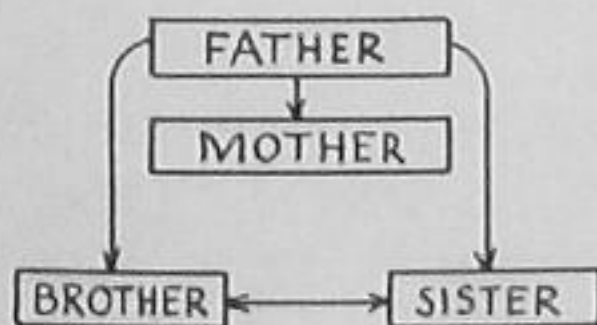
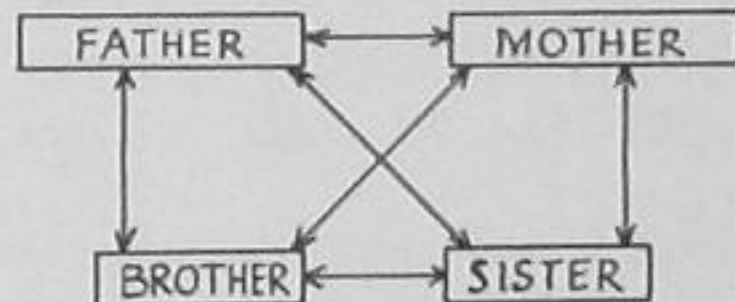
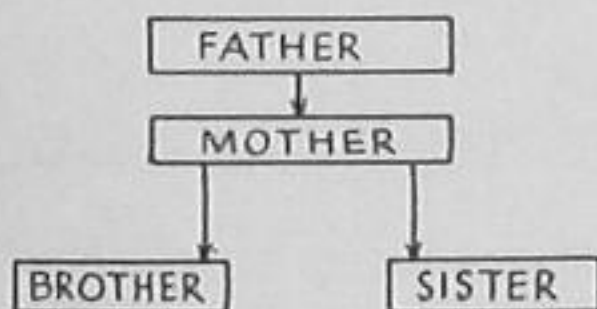
2 INDIANA CITY GOVERNMENT



3 NAZI-OCCUPIED CITIES



SOME KINDS OF FAMILIES



know of the "Dagwood and Blondie" family, in which the father is the one to be laughed at. Discussion can bring out other, more pleasant kinds of family patterns, and diagrams can show the interaction of authority and decision.

CAN YOU SHOW RELATIONSHIPS?

Would you like to practice again? Try your hand, your drawing hand, of course, on these problems.

A group of Girl Scouts is planning a banquet for their mothers, and they want to learn how to be waitresses. How can you show them in a

diagram form which things they should do from the left of the person being served and which things from the right?

A group of young people is studying social organization in the community, and they decide to develop a chart that shows how an individual begins life as a member of only one of these organizations, the family, and how he joins others at different periods of his life. What might their chart look like?

Look at the next page for some ideas.

When you want to draw a diagram to help you explain relationships among ideas or things or people, you can use columns and tables to show comparisons and contrasts, a flow chart to show processes of development and change, or a type of organization chart to show the interacting of responsibility, authority, friendship, and isolation.

DRAWINGS TO SHOW STRUCTURE

There is still another way of using line drawings to express ideas, perhaps the most common way of all. These are the drawings that show structure. They may delineate or they may symbolize, but they are always connected with concrete things.

It is important that we understand the comparative structure of things and the space relationships between things. Of course, much learning of this kind goes on almost automatically. When we climb a flight of stairs, we don't need to watch carefully and reinstruct our muscles each time we take a step. We remember the height of the step, and we retain the right muscle set. Have you ever been surprised as you sat down in a chair and found it to be several inches lower than you had expected? Then you know what we mean by an automatic memory of space relationships. Sometimes it seems as if these automatic muscle learnings are more efficient than the conscious brain learnings we try so hard to form. It is hard to forget how to swim, once we have learned. It is not so hard to forget the proof of a theorem in geometry. But an understanding of structural relationships is important at the mental as well as at the muscular level. In our mechanical culture, we need to understand something of the technicalities of the gasoline engine and how to read the symbols on the highway signs that warn of approaching curves and crossings.

WHEN A WAITRESS SERVES

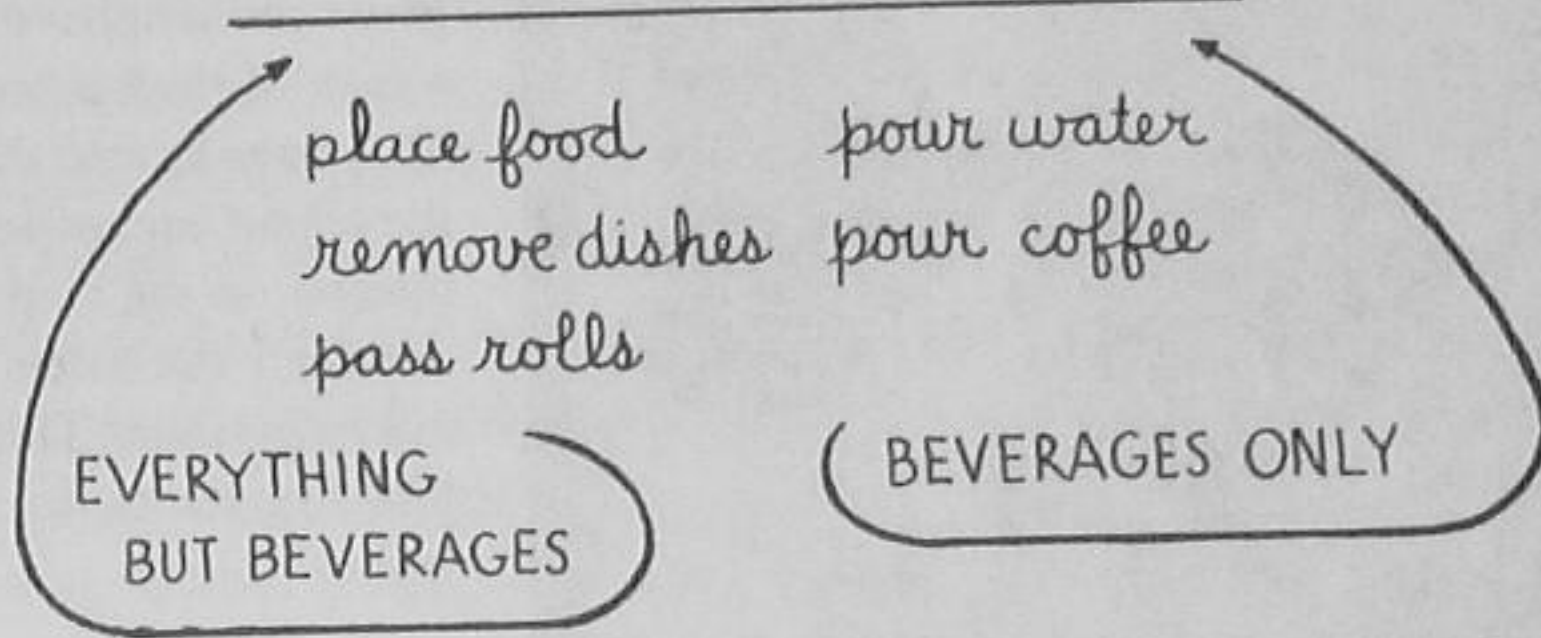
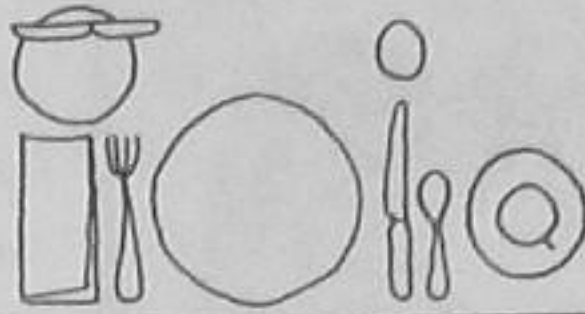
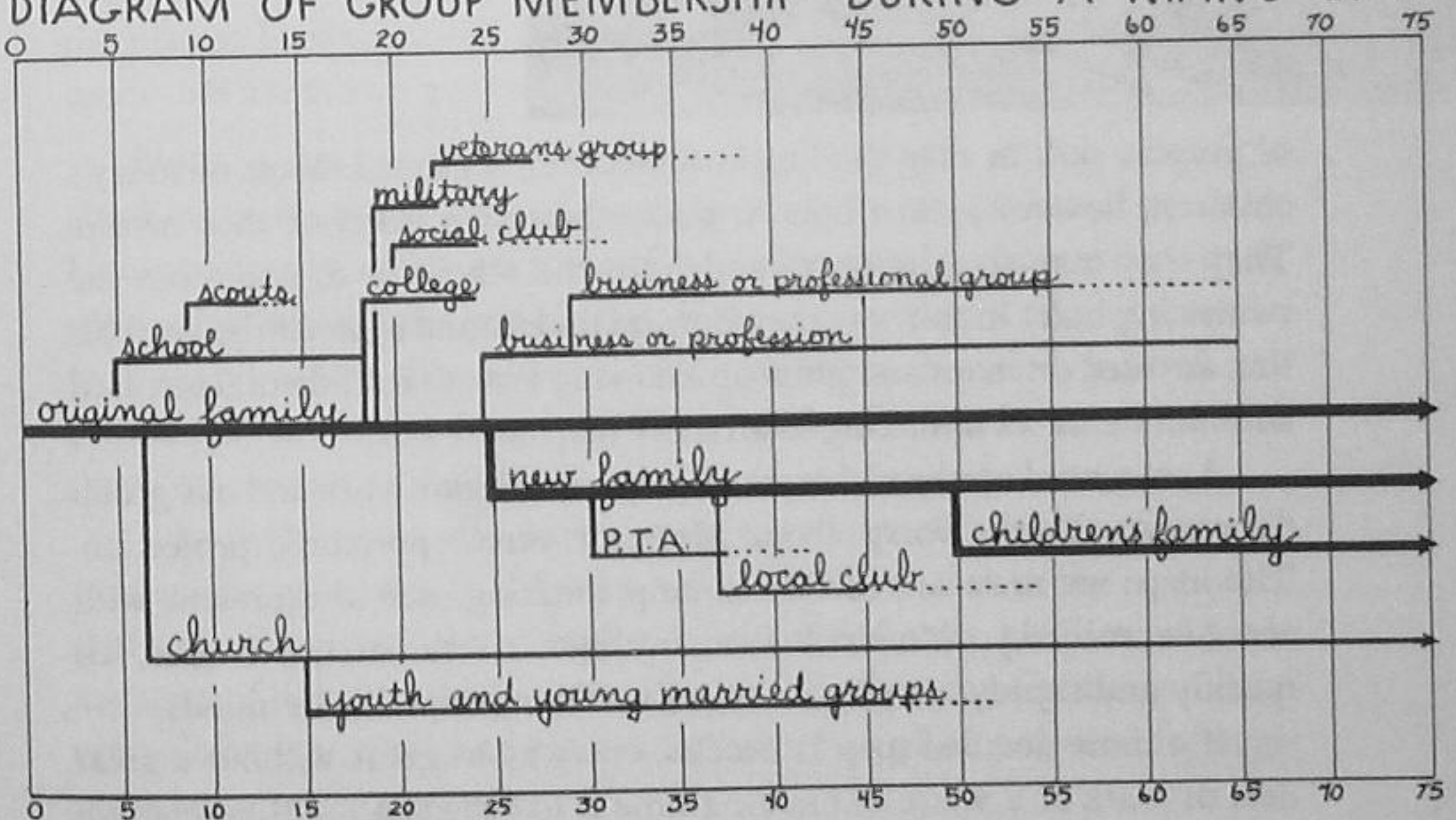


DIAGRAM OF GROUP MEMBERSHIP DURING A MAN'S LIFE



Once we can understand, use, and make drawings that show structure, we shall be able to help others to understand and use them. Three common types of these structural drawings are maps, plans, and patterns.

Maps. All of us recognize maps when we see them, but we are not all particularly efficient in understanding them. Understanding maps is really only another form of reading but, like the reading of pictures and



As a result of their study of safety principles, these third-grade children have developed a map of their school district. They have located their homes, the school, and other places of interest on the map, and have discussed the safest routes to and from school. This was their first experience in map-making.

of graphs, skill in map reading is sometimes neglected. Most of today's children, however, learn how to make their own maps of their world. They may map their route to and from the school or to and from the swimming hole. In this way they learn to understand some of the symbols that are used on maps and grow up knowing how to read them. Increased automobile travel is making us all more map-conscious.

A map need not be elaborate to help us with our work and our group discussions. Don't worry about Mercator versus polyconic projection. The maps we draw are merely to help thinking, not to represent with absolute accuracy. We draw land outlines, rivers, streets, houses, all quickly and simply, merely to help fix relationships in our minds.

If a more detailed map is needed, one way to get it without a great deal of work or a waste of drawing time is to project an outline map on the chalkboard. A map in a book can be placed in an opaque projector. Or you may have a detailed map already on a slide. Either way the map outlines can be projected. This shadow map can then be traced in chalk and further elaborated after the projector is turned off. For example, a class in government may draw in symbols to show the number of con-

gressional representatives from each state. If the map is needed only during a lecture or as part of an oral report, the projector can be left on, and the audience's attention would focus upon the spotlighted action as the map was filled in with details.

If you plan to make a detailed map, you can get help in working out the symbols, colors, cross hatching, and so on. Send to the Superintendent of Documents, Washington 25, D. C., for the booklet *Suggested Symbols for Plans, Maps and Charts*, prepared by the Natural Resources Committee. If your pupils use these standard symbols, they will be better able to read other maps and plans.

A map drawn from a projected outline onto a large piece of paper may form the basis for several display ideas. Colored pins may mark the location of events reported by newspaper clippings as a group studies problems of labor and management. Strings may lead from regions on the map to books that tell of the peoples of that region or to samples of foods that are grown in that region.

Plans. Just as a map is like an airplane view, so is a plan. It is another conventional way of drawing what we would see if we were looking directly down on something. Maps usually show large areas; plans show small areas and objects. If we are drawing a plan of a house, we pretend to saw that house in two, just above the window level, and lift off the roof and the top half. Then we draw what we see as we look down on the rest of the house.

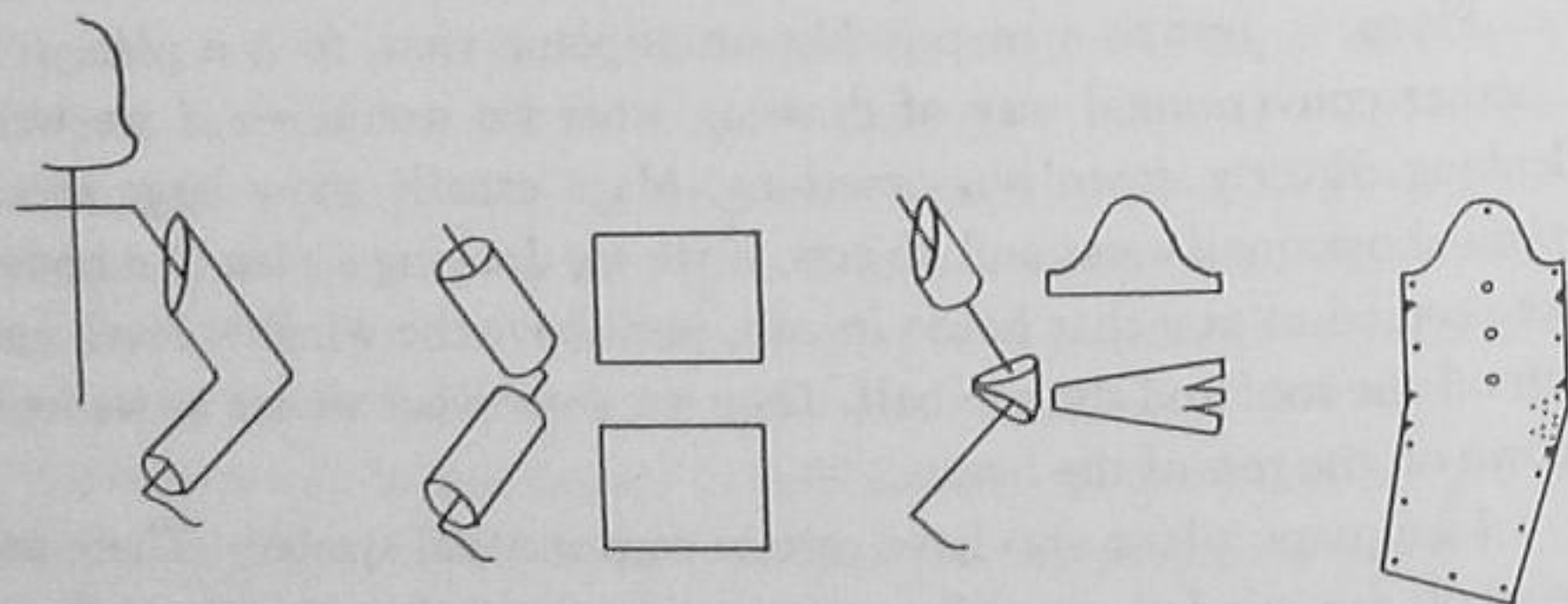
Like maps, plans also have certain conventional symbols. There are symbols for windows of different types, for doors that swing and doors that slide, for electrical outlets, for many other details. Mechanical plans use lines of different thickness and pattern to show certain things. These symbols become more and more complicated on plans prepared for engineers or for other specialists.

Children can learn the meaning of plans by making their own. They can draw plans of their dresser drawers, of their closets, of their playrooms. They will be learning where things belong and perhaps will be encouraged to put their own things away properly. If a child must move to a new house, he can be made to feel more secure in this strange place

if he helps to "plan" out where his own belongings are to be kept. He will be taking a step toward understanding the space relationships of this new house and so toward feeling that it *is* his home.

Often plans are accompanied by "elevations." These, too, are structural drawings, but some of them look more like a picture of the real thing, because we are more accustomed to viewing things from the side than from above. The elevation is a plan of this side view. There is no perspective, no attempt to make the picture look "like" reality. An elevation shows the object drawn to scale exactly as the lines of structure would appear if there were no third dimension, if the object were really "flat as a flounder" (standing on its tail).

Patterns. Another type of line drawing that represents structure is the pattern. By "pattern" we usually mean a guide for making some article. The pattern often consists of a drawing or an outline that can be followed in cutting or tracing.



Some skill at visual imagination is required if one is to see easily the relationship of the pattern to the finished article, and we need to help pupils develop this ability. A chalkboard drawing can help to show the relationship between a dress pattern and the hoped-for garment. Colored chalks can help to differentiate among the lines with different meanings and to relate the drawing to reality.

Still more effective would be a display of the finished article alongside the pattern pieces. This is sometimes possible in wood- or metal-working. The pattern for a gate-leg table is much easier to understand if it can be related to a finished table.

SUGGESTIONS FOR USE OF THESE DRAWINGS

There are a few important suggestions to remember in order to make the best use of all these kinds of symbolic drawings.

Make sure that the drawings grow out of the problems facing the group. Perhaps the drawing will explain some technical point, such as the rhythm of an iambic pentameter line —' —' —' —' —'. Or perhaps the group is keeping a record of its progress in a waste-paper collection drive by making a chart. If a class in hygiene has been working to cut down the frequency of colds among the school population, a large bulletin board in a corridor may carry a graphic record of the number of people with colds each day. In any situation, the drawing will teach best if the people who look at it are ready to learn.

Keep the drawings simple. Use only one type of symbol or one kind of lettering. Don't try to show more than one idea at a time. If you plan to compare several different ideas and wish to show several drawings at once, follow one thought to the finish and be sure it is clearly understood before preparing the next related drawing.

Choose the kind of drawing that suits the problem and the medium being used. You remember that the several types of explanatory drawings have specific purposes. You can use a divided circle to show proportions but not to show deviations from an average. Similarly, you should choose a type to suit the medium you will use. Knowing that a line graph is probably the hardest type to understand, you will not use it on a poster, which receives only passing attention. You will use it when it is needed to clear up a problem and where it can be carefully explained as it is used. The simpler kinds of symbolic drawings are more suited to display that must carry its message quickly.

Practice thinking visually. Whenever you come up against an idea that seems a little difficult, try visualizing it in a diagram form. Imagine the succession of the kings of England in terms of a tree, a family tree. Think of a chemical reaction as though it were a series of ponds that join in a river and then redivide into different ponds. Watch the books and magazines for charts, graphs, and diagrams. You might keep a file of ideas for impromptu drawings. But keep using your brain to help you visualize. If you can see, you can help others to learn to see.

DRAWINGS CAN HELP YOU EXPLAIN

Let us conclude this chapter by reviewing some of the ways in which symbolic drawings help people learn.

One of the reasons for using these drawings should be easily evident at this point in your reading. Didn't you first give your attention to the drawings on each page of this chapter before you read the words? The drawings *attract attention and interest*. Like so many other visual methods, they present a variation on verbal communication and their novelty is attractive to a word-jaded brain. Then, too, they appear to be something of a puzzle, a challenge to ingenuity.

These drawings *aid people in digesting the meaning of generalized concepts*, both through the accumulation and the knitting together of details into a new generalization and through the reverse process, the explanation of a generalization by spreading out and examining its parts. As an example of the former method of teaching conceptual understandings, remember the tabular chart showing words in English, German, French, and Spanish? The concept "Most modern European languages are related to one another" is easy to develop from this evidence. The spreading out and explaining of a concept was accomplished by Hooton when he diagramed the family tree of the primates and his 1946 opinions on human evolution.

The person who makes the diagram probably learns more about the problem than anyone else does by studying the diagram. He has to collect the data, decide which interpretations to accept, pick out the significant details to show. If you encourage students to present their own facts and opinions through symbolic drawings, the drawings help them to *learn through expression*.

But the most obvious reason for using these explanatory drawings is that they *condense ideas into a skeleton presentation* and help the learner to see the structure, the framework of the idea. Once this framework is evident, it is easier to fit in the pieces and parts that make up the whole. Remember the drawing of a clock to help children visualize the amount of time between school and bed each day? When Jane gets a clear picture of this time space in her mind, perhaps she'll see that if she wants to get to

her Spanish assignment, she'll have to cut down on her lengthy after-dinner telephone conversations with her friends. Or, for example, if the youth group of the community church sees on a chart what organized social groups a person may belong to during his lifetime, the young people will have a better appreciation of what church membership might mean to a five-year-old boy, a twenty-five-year-old woman, a forty-year-old man, and a seventy-year-old woman. Each of the drawings we have recalled to your mind in this paragraph has shown the framework of an idea and has made it easier for the viewer to sort over and classify his facts, hypotheses, and opinions.

If you sketch out your own explanatory drawings, if you use those that have been prepared by someone else, or if you encourage your pupils to work out their own—in any of these three situations, the drawings will help people to learn.

7. The Copy: Composing and Lettering It

This book would certainly be more difficult for you to follow if it were not divided into chapters and sections, each with its own title. The words that form these titles point out the sequence of ideas and topics and help you find your way more easily. A display needs such words even more than a book does, for unless you quickly see the idea—the logic behind the display—you will probably turn your attention elsewhere. Occasionally the materials may tell their own story, but a well-selected word or phrase can add meaning to any display.

Perhaps your group has been studying advertisements. They want to find information that will help them to buy more wisely, and they want to learn to see through the tricks that may be used to trap the unwary buyer. Newspaper and magazine advertisements have been collected as examples and have been pinned to the board. But the advertisements alone don't tell very much even though the group has selected them carefully. So you make the display more effective by placing at the top of the display the words "READ THE ADS CAREFULLY" and at the bottom, "'USE THEM WISELY!" To make the labels tie in even better with the logic of the display, the letters at the top might be in red and red circles could outline those parts of the advertisements which should be considered critically. The lower letters could be blue, corresponding to blue circles outlining those portions of the advertisements that help the buyer make wise purchases. In the language of advertisers, words and phrases

READ THE ADS CAREFULLY



USE THEM WISELY

are called "copy." Titles for displays, labels for materials, explanatory or descriptive statements—in short, any words included in a display for the purpose of helping people understand it—we shall call the "copy."

WORD THE COPY CAREFULLY

A title for a nonfiction book usually consists of a few words chosen because they describe the subject of the book accurately. Descriptive titles for a display of advertisements might be "Advertisements from our Magazines," or "Pros and Cons about the Ads." These titles express the literal content of the display, but they lack the action implicit in "Read the Ads

Carefully. Use Them Wisely." These last phrases use directive language: they *direct* the reader to *act* in a certain way. And one of the purposes of these displays is to get our audience to act and so to learn.

Directive language. There are several kinds of short phrases that use directive language, and many of them are good for use with displays. The proverb is an example—"Look before you leap," "Don't put all your eggs in one basket." These phrases are a simple way of transmitting the common sense of our culture. They recognize no exceptions. They simply tell us what to do.

Another type of directive language is the motto. *E pluribus unum* tells us that our strength lies in unity. The motto is not so obviously directive as the proverbs we used as examples, nor are all proverbs so obviously directive. But the direction is understood, even when it is not explicit.

Slogans are another form of directive language. The word *slogan* is derived from an old Gaelic phrase, *slaugh-ghairm*, which means, literally, "army cry." A slogan has come to mean a battle cry or a rallying cry, such as "Remember Pearl Harbor," or "Don't give up the ship!" Each of these slogans grew out of a dramatic incident and was effective because it called forth an emotional response. Of course, slogans are not always associated with wars or emotion. "Ask the man who owns one," for example, hardly calls for an emotional response but, like other slogans, it is associated with a specific object or group of people.

How can we use these directive phrases in education? Because they do not appeal to reason as much as to authority or to emotion, we must select and use them with caution. Our efforts are pointed in just the opposite direction—toward logic and the thoughtful weighing of evidence as a basis for action. These directive statements are likely to oversimplify an idea and leave out the "maybe" and the "perhaps." They lead people into "tabloid thinking"—accepting at face value the sensational headline.

One of the characteristics of a mature and educated person is his ability to withhold judgment until he has examined all possible evidence, and then to consider his judgment as tentative. It is the immature person who is unduly influenced by slogans, who takes the old proverbs literally, who buys solely because the radio announcer proclaims a bargain. True,

the desired maturity more often results from a healthy emotional state than from added years in school, but surely one of the important aims of education should be to foster habits of reflective thought. We do not expect children to be mature thinkers, but we can help them learn to discriminate between fact and fable.

So we shall use the power of the directive statement. But we shall be cautious. By explaining the slogans, mottoes, and proverbs, and by helping children to make up their own directive copy, we shall help them see through some of the magic spells of words.

Group identification. Such highly charged phrases as "Everyone says so" often appeal to the individual as a member of a group. The mere fact that "everyone does it" does not make the thing logical for any one individual. "Daddy, all the other girls at college have fur coats," wheedles Jane. If Daddy is wise, he will discuss the family pocketbook with Jane and help her decide whether or not the coat would be an intelligent purchase *now* for *her*, regardless of "all the other girls."

The use of collective pronouns such as "we," "us," and "they" does give the effect of friendliness and togetherness. Identification with one's group is an important part of growing up, but so is the realization of selfhood, of uniqueness. We don't want a world composed entirely of "we" and "they" with no "you" and "me" and "he." We need individuals as well as group members.

Sometimes the pull toward group identity is more subtle. Proverbs and other types of directive language are usually general enough so that each person who reads or hears them can think that they are aimed at him. "Birds of a feather flock together" could apply to any one of us. In this way we absorb the "group" spirit imperceptibly.

Still, if we are careful in our use of group pressure, it can become a valuable psychological tool. Such commonly accepted conventions as cleanliness or good manners can be urged because "we all do it that way." The pressure of group opinion can be used safely to encourage such scientifically approved practices as regular dental care or such sensible safety measures as obedience to traffic laws. It may be safe to assume that everyone likes puppies and that everyone enjoys a good meal. But we must proceed with caution when we use group pressure in our copy.

During the annual Red Cross drive for funds, the individuals in your group will be asked to contribute. In many schools and other organizations a quota is set up, and groups are pitted against one another in competition to see which gives the most. Your group has to decide what to do in this situation. Should they capitalize on social pressure? Should they create a bulletin-board display using the copy "Be a good neighbor" or "We all profit. We all give"? Should they urge contributing individuals to wear the Red Cross button showing that *they* belong?

Or will your group instead use the drive as an occasion for a study of the Red Cross—how it functions in the local community, how it may have helped each person in the group? Will they prepare a display that shows specific examples of Red Cross services, such as photographs of the local swimming and life-saving classes and samples of bandages and other aids for sick people developed by the home-nursing classes? Will their copy read "Does the Red Cross help you?"

Language devices. Proverbs, mottoes, and slogans often use language "tricks" or figures of speech to catch our attention and to remain in our memory. A rhythm, a pattern of accents, will do it. In "Early to bed and early to rise, makes a man healthy, wealthy, and wise," the beat goes ' _ _ ' _ _ ' _ _ , ' _ _ ' _ _ '. The rhyme of "healthy" with "wealthy," and of "rise" with "wise," helps, too, in making us remember the proverb. Alliteration is another memory-catching device. For example, the two *w*'s add their bit to the effectiveness of the old proverb. All these three devices—rhythm, rhyme, and alliteration—are forms of repetition.

Similes and metaphors are other devices that catch our interest, puzzles that solve themselves on second glance. "His strength was as the strength of ten because his heart was pure." "All the world's a stage, and all the men and women in it merely players."

Our display copy can use these devices, too. "A good lunch packs a punch" was used during World War II with great success on posters and exhibits. It has rhythm, rhyme, alliteration. It also uses the metaphor for its "double-take" effect.

Emotional appeals. "Don't sell the steak—sell the sizzle," writes one advertising man. And he's right. We don't buy the piece of meat for

itself. We buy the delicious taste. Copy that appeals to our senses and our emotions will convince us.

Our emotions are affected by our senses. We tend to feel happy on a warm, sunny, spring day. We feel irritated by the jarring noises of the compressed-air drill that is tearing up the pavement. And, unless several hundred perfume manufacturers and many thousands of women are wrong, a man's romantic feelings are aroused by his sense of smell.

Copy can capitalize on the power of these sense impressions. Merely pointing them out will help. If we suggest that the aroma of coffee is in the air, you can almost smell it. If we talk about the harshness and scratchiness of burlap or the smooth richness of velvet, can't you *feel* the difference? It's there, on your mind's fingers, we might say. Sounds and tastes can be suggested, and sights can be brought before the mind's eye.

These appeals to the senses are usually directed toward the desire for comfort or pleasure of the individual who is to read the copy and see the display. They capitalize on the needs and wishes for which every man seeks gratification—the desire for delicious foods, for warmth and security, for smooth textures, and for health and vitality, for love and affection, for amusement and diversion. Copy can be written with these needs of the individual as a focus.

The individual also has an interest in the self as it is related to other people. Here are our needs for prestige, for honor, for dignity. Copy can appeal to the pride that all of us wish to feel about some part of our lives.

Our emotions are not all concerned with our immediate self, of course. Many of our feelings are concerned with others directly. We love our mothers and fathers. We feel tender concern for our pets. We feel sympathy for strangers who are in trouble. We love our children. And there is much love, tenderness, and sympathy, along with admiration and respect, in friendship.

These emotions we have listed are all positive. That is the only kind of emotional appeal we can safely make in display for education. It would be hardly defensible to use fear or envy or hate as a basis for our copy, since in our culture we deplore the manifestation of these emotions. True, we could try to develop a fear of, say, jaywalking, but most learning can be based on a positive approach. It need not be a purely intellectual

approach, as we have seen, for the emotions usually act as the trigger that sets off the intellectual effort.

This emotional trigger is of basic importance to learning. We may accept an idea intellectually but we don't always *act* unless we see the answer to "What does this have to do with me?" Perhaps one of the reasons why the educational practices based on learning for the sake of learning alone are not always successful at first is that in the minds of the students no emotional reward has been substituted for the negative but sometimes effective fear of poor grades. Teachers must help students find successes and rewards that are satisfying and more positively stimulating than the old competition for grades.

Can you write copy? Let us summarize the suggestions we have made for writing good copy—copy that people will want to read and will remember long enough for it to affect their actions.

1. Use directive statements (with discretion).
2. Use group identification—general statements that people can read themselves into, collective pronouns.
3. Use language devices—rhythm, rhyme, alliteration, repetition, similes, metaphors.
4. Appeal to the senses and the emotions.

Now, using these suggestions, let us try to compose copy for a specific display. Suppose that you and your group are working out a Memorial Day exhibit about the United Nations. The group has permission to set up its three-dimensional poster in the big show window of the local drug store. All kinds of people will see the display—mothers and fathers, children, young men, high-school students. The copy may appeal to all, or it may be written with only one group in mind. But first you will think about the specific people you wish to reach.

As you consider this problem, you will also be thinking about your specific purposes. Do you want to tell about the U. N.? Do you want to describe its work? Or do you want to stir up an emotional response? Do you want to get people to do something? The purpose will largely determine the copy.

Next you will put your general idea into words. It might be

United Nations means people from different nations working together. It is our best hope for peace. If we support it, it can help each of us achieve a more secure life. We need it, and it needs us. If we learn about it and tell others about it, we can help its power grow in the hearts of men.

Briefly stated, this is the idea your group wants to put across. Now you will begin thinking of the specific words you might use, and then you will start arranging the words, remembering the thoughts you wish to express and also remembering the rules for "readable and memorable" copy. You may come up with copy like this:

Fear your neighbor, and he becomes an enemy.
Know your neighbor, and he becomes a friend.
LEARN ABOUT YOUR NEIGHBORS THROUGH
THE U.N.

(Repetition.
Direction.
Rhythm.
Emotion.)

Learn about the United Nations.
Believe in the United Nations.
Then TELL THE WORLD YOU DO!

(Direction.
Repetition.
Familiar Phrase.)

The United Nations believes in peace.
YOU believe in the United Nations.

(Direction.
Repetition.)

WAR! FOR YOU, AGAIN? SUPPORT THE U.N.

(Appeals to Fear.
Direction. Rhyme.)

What ideas do you have for copy? Can you think up other phrases and come up with better ideas?

HANDWRITING

Your copy writing may be sensational, but unless it is presented in a bold and striking manner, it will not accomplish its purpose. It must belong to the rest of the display; yet it must stand out enough to catch attention. And, above all, it must be easy to read. The ideas it presents must be easily understood, and, equally important, the handwriting or the lettering must be easily legible.

Probably the simplest way to title or label your displays is through

handwriting. You use it on the chalkboard all the time, and you can easily transfer your chalk techniques to crayons or to paint brushes and use your handwriting on bulletin boards and in exhibits. Normal pen-and-ink writing is suitable for hand-made slides.

How legible is your handwriting? Get a pencil and paper or step to the chalkboard and test yourself by writing the word *penmanship*.

Now examine the letters. Is it easy to tell the difference between the *e* and the *i*? Between the *e* and the *a*? Could a reader tell whether the word is spelled *p-e-n-m* or *p-e-m-n*? Or do the *m* and *n* look more like a series of *i*'s or *u*'s? Does the *p* extend below the line enough to differentiate it easily from the other letters? Does it extend so far below the line and with so large a loop that it would interfere with the line of writing below?

Legibility is achieved by making each letter distinctly different from every other letter. These differences among the letters are expressed partly through the different lines made by your pencil but mostly through the differences between the shapes and sizes of the spaces enclosed by the lines you make. The dot does less to set off the *i* from the *e* than does the enclosed oval of the *e*. The *e* is legibly different from the *l* only if the enclosed ovals are of distinctly different lengths. A *d* is different from *cl* mostly because of the differences in spacing between the strokes.

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

The letters in these illustrated alphabets are easy to read. And with a little practice and perseverance, they are easy to write. Not that we want everyone's handwriting to look exactly alike. The individuality, the personality, that shows in your handwriting makes it attractive as long as that individuality does not also make it hard to read. If you are

a teacher, you have probably become quite expert at reading other people's writing. But your students have not had your experience, and your handwriting must not act as an obstacle to their learning.

This is my penmanship
 This is my penmanship
 This is my penmanship
 This is my Penmanship
 This is my penmanship
 This is my penmanship
 This is my penmanship

Here are several examples of handwriting showing wide variations in legibility. Some examples are close to the flowing Zaner method of penmanship that you may have learned in the second grade. Others seem crabbed and hurried, perhaps representing years of lecture note-taking. Some are in cursive style with one letter smoothly attached to the next; some are in manuscript style with separate letters formed almost like typewriter print. These distinct styles help establish the individuality of each example.

But the style does little to ensure legibility. The formation of each of the letters and its differentiation from similar letters is more important. Compare some of these letter forms with those in the sample alphabets. Several other factors are involved in the legibility of these samples, too. The degree of slant makes a difference: those closest to the vertical are the easiest to read. The spacing between the letters and the words

is important; either too much or too little space interferes with easy reading. Exaggerated capitals and flourishing loops below and above the line of writing are obvious obstacles.

Size of the letters is another important factor in legibility. The only way you can test your writing for size is to see it as the viewer will see it. Walk to the back of the room and look at your chalkboard writing or walk past your exhibit and test the readability of the writing there. Then, realizing that you will be better able to understand your own writing than will your audience, make your letters just a bit larger than seems necessary.

LETTERING

In handwriting, we found that differences in contour among the letters were of great importance for legibility. Also very important for rapid and easy reading was the spacing of the letters and words, and the size of the letters. When you make printed titles and labels, the same rules apply.

Upper- and lower-case letters. When writing, few of us confuse capitals and small letters. We may wonder when to capitalize a word, but we know a capital when we see it. But some of us are not familiar enough with the printed alphabet to differentiate between upper- and lower-case letters. It does look silly to see a word spelled like this: CApItAls. Notice the difference between the lower-case and the upper-case letters in this comparative alphabet.

When will you use capitals and when small letters in your display copy? Generally speaking, capitals look more important and more forceful than small letters, and they attract attention more quickly. But COMPARE THIS LINE WITH THE NEXT FOR EASE OF READING: capitals, also called upper-case letters, are more difficult to read than small letters, also called lower-case letters. The variations in the heights of lower-case letters help the eye to catch the differences quickly and so speed up the reading. All capitals are the same height, and the differences between the letters are consequently harder to see. It is wise to use the capitals for short words or for simple phrases only. The small

letters will be more useful for longer words and sentences. They also tend to give a feeling of informality and friendliness.

Formation of letters. The shape and style of the letters is also an important factor in legibility. You will find that heavy, even-stroke letters

such as this **A** are easier to read than light-stroke letters such as

this, **A**, or than thick-and-thin letters that look like this, **A**

This is especially true when you must read from a distance, as you do when looking at a poster or a bulletin board. Research studies to find the most readable kind of letters for use on the instrument panels of aircraft have found that the width of the stroke should be about 1/6 the height of the letter. That is just about the proportion of our first *A*.

And, if you want your letters to be easy to understand, avoid very unusual forms. **A** may look Chinese, but it is not easy to read.

And **A** may show grace and delicacy, but it too is not easy to read. Any adventures with originality should be confined to single letters or brief words. Your main purpose in using words is to communicate thoughts. Using their shapes to set a mood should be a secondary consideration.

An easy way to shape letters is to think of them as combinations of circles and straight lines. The simple straight-line letters are not so difficult to form as those that combine straight lines with circles. Think of a *B* as an *E* with curves.

$$E + 3 = B \quad F + 2 = R$$

and so on. Most of the crossbars can come in the center; those in the *B*, *E*, *F*, *H*, *K*, *P*, *R*, *X* can all be centered. The *A* and the *G* may have their crossbars a little below center.

The three letters *M*, *N*, and *W* are easier to read if their diagonal lines are long—

not **M**, **N**, **W** but **M**, **N**, **W**.

Notice that the *W* is not just an *M* turned upside down, for the *M* is usually made with parallel sides, whereas the *W* usually has slanted sides. Another difficult letter to form is the *S*. The quickly changing snake

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

vwx yz

curve, S, is hard for some people to make. It is easier to think of the S as three straight lines connected by two curves:

$\equiv + \text{C} = \text{S}$ or this: $\text{C} + \text{V} = \text{S}$.

Letter spacing. To ensure legibility, letters must have enough space between them to keep their own individuality, yet be close enough to one another so that the word hangs together as a unit. One of the most common difficulties in lettering involves the relative spacing between the letters. The A, C, J, L, and T are examples of "open" letters; they create their own spacing by their very formation. These letters can be placed close to one another. The H, I, M, and N are examples of straight-line letters; they need more space between them for easy reading. Take the word SWIMMING as an example. Notice that the IMMIN is a succession of straight strokes. They seem very crowded when they are hand-lettered with equal spaces between the letters.

SWIMMING SWIMMING YOUTH

To avoid this, we have to vary the spaces between the letters according to the shape of those letters. There is no rule that will help you do

this; you have to train your eye to adjust the spacing correctly. For example, the word VAT can be printed with very little if any space allowed between the spaces to be occupied by the letters. The top of the *V* and the *T* naturally fill in the space not occupied by the top of the *A*. In SWIMMING you will separate the straight-line letters by a much wider space than you will use between the *S* and the *W*. Try to arrange the letters so that the *total area* of white space between each two letters is about the same.

If you look closely at our sample word, SWIMMING, you will notice another variation in spacing: the letters themselves are not the same width. In typewriter print, SWIMMING, each letter is shaped to fit in the same space because there is no way to vary the mechanical operation of the machine. Note that the *I* occupies the same space as the *W*. But in lettering by hand, we can improve the legibility of our words by varying the space occupied by each letter. The *I* would not require the same amount of space as the *W*, since it is only a single stroke of the pen, whereas the *W* uses three vertical strokes.

These two letters represent the two extremes of the alphabet in terms of space occupied. All the other letters take more space than the *I* and less than the *W*. Again, there is no rule to follow other than that of your own eye, but generally the round letters, *C*, *G*, *O*, and *Q*, take somewhat more space than the straight-line and combination letters, and the *M* takes considerably more space than the others though not as much as the *W*.

A spacing device which helps capital letters to "line up" more evenly is to make the points of an *A* or a *V* or an *M* extend a little above or below the space allowed for the other straight-line letters. The top and bottom curves of the round letters can extend somewhat higher or lower than the straight-line letters to give the illusion that they are the same size.

Look back to the sample alphabet and study the differences in spacing, or pick up your newspaper and study the printing in Milton Caniff's comic strip, "Steve Canyon."

Letter and background contrast. Many research studies have shown that the greater the contrast between the lettering and its back-

ground, the more easily and quickly the letters can be read. This contrast can be achieved by using dark letters on a light background, as in the pages of books, or by using light letters on a dark background, as on a blackboard.

Another way to achieve contrast is to combine colors of high intensity with those of low intensity. Bright values of yellow, red, orange, blue, and green stand out well against dull, grayed colors.

Avoid the use of two colors of the same degree of intensity. Yellow letters do not show up well on a white ground because both colors are light. Bright green and bright red should not be used together for lettering because neither color will stand out sharply. In fact, bright colors that are directly opposite, such as red and blue-green, or blue and orange, seem to flicker and jump when they are used together.

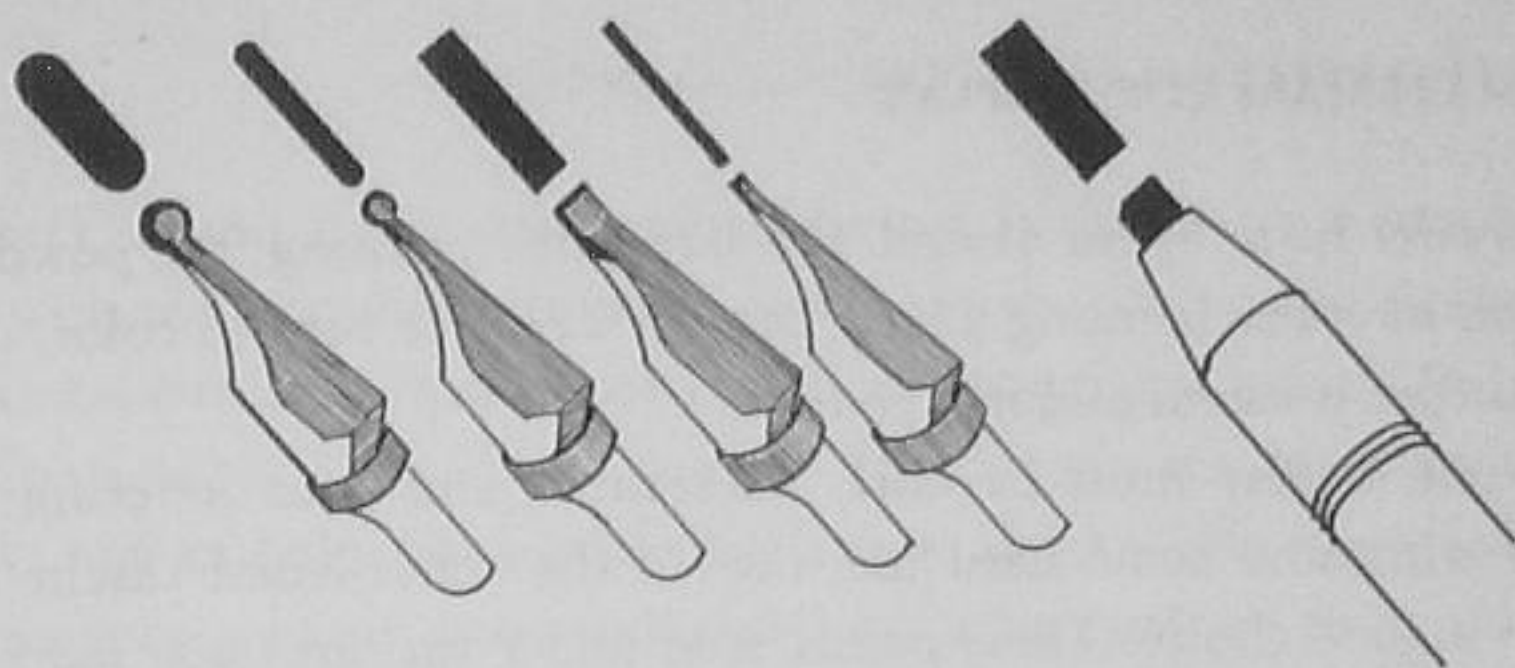
Sometimes advertisers purposely adopt this technique of using opposite colors in lettering and background to attract attention. But they usually dull one color a bit or use a darker shade so that the combination does not quite irritate the eyes. We may use the same technique if we have no other way to get audience attention, but we must take care to keep our copy easy to read.

MATERIALS FOR DISPLAY COPY

Some kinds of advertising displays use merely the printer's type. In the layout the artist suggests specific type faces and spacing. But most commercial display relies on the creative ability of the artist. He actually paints or draws the letters, of the headline at least, and his skilled hand is probably responsible for many other details.

In our display work the skilled hands are ours. Yours are not so skilled, you say? Don't despair. The right tools and materials, the desire to produce respectable displays, and *practice* will produce effective results.

Ink. Ink is perhaps the most versatile of the materials to use for lettering. It can be used in a fountain pen for copy to be read at close range, or it can be painted in wide brush strokes for large, bold headlines that carry their message from a distance. Ordinary fountain-pen ink is satisfactory for fine-line writing—it does not clog the pen; it dries



quickly; and it is inexpensive. However, because it is thin in consistency, it is somewhat transparent. And if you try to use it in wide strokes, the bottom of the stroke, where your brush or pen last touched the paper, will usually be darker because of the little puddle of ink that is left there.

To overcome this difficulty we use the so-called India inks for wide strokes or where uniform colors and value are important. This drawing ink is thicker, more viscous, and opaque. As it dries, it leaves on the paper a solid precipitate that is relatively permanent. (India ink clogs pens with a gummy crust unless the pen point is wiped clean occasionally while it is being used.) These drawing inks come in many colors, but you can be sure of complete opacity only with the black.

For close-to-the viewer copy, your fountain pen and your most legible penmanship will probably serve very well. For copy that must be seen from a greater distance, you may wish to use the drawing inks and special lettering pens. These pens, which are manufactured with points of various widths and designs, can help you vary the style of your letters.

For rapid lettering on a large scale, you might try a felt-pointed fountain pen that acts as a brush, spreading ink quickly as you write. The width of your line is governed by the thickness of the felt point. This pen is not for delicate work—it doesn't substitute for the precisely pointed lettering pens. On absorbent paper or cloth the edges are likely to fuzz. But for the big, flashy, fast work, this pen is excellent.

Paint. Water-thinned paints are the most practical for display work. The watercolors of our childhood paintboxes, however, are likely to be too transparent for our purposes. Better use poster paints or tempera colors, which, like drawing inks, are opaque. One brush stroke blends in with another, and one color will cover another after the first one is dry. These water paints are available ready to use in small or large quantity,

or in powder form by the pound. For large-area painting, the powder is the better buy. For painting a large area in a pale or neutral color, calamine powder is useful and inexpensive.

If your display must be fairly substantial and your lettering will have to withstand some hard use, one of the water-based casein wall paints is a good choice. These paints, sold under various trade names in both powder and liquid form, make durable signs and posters.

If your display is to be set up outdoors, you had better use an oil-base paint. Rain or a heavy fog can play havoc with water paint, dissolving it and causing it to drip down from the letters like icicles. Ordinary outside house paint, thinned with oil or turpentine, is a good choice if you are apprehensive about the state of the weather.

Now for the brushes. They are a tool of the artist and as such are designed for specific purposes and can be quite expensive. If your lettering is to compete with professional work, visit the brush department of an art-supply store. But if your letters are to be used for your group's displays, or if you are helping children to produce their own displays, your brush needs will be much more simple. Ten-cent stores carry an assortment of half-inch- and inch-wide brushes, and the watercolor brush from a child's paintbox can be trimmed to a square stump that will make straight lines. For delicate lines try the tiny brush sold as a lipstick applicator in the ten-cent store.

Crayons. Children can use wax crayons without creating the mess that might accompany ink or paint lettering. Indeed, many of us enjoy using crayons because of their color variety and their effectiveness on paper, cloth, etched glass, and other materials. Simple line lettering can be done quickly with crayon; the several strokes necessary for making block letters will take longer. But where professional appearance is not important, and where ease and simplicity are desired, crayon lettering is ideal.

Paper. The copy you present must appear on some substance that is part of the display. Usually it will be printed on cards or paper and then placed in planned relationship to the other components of the display.

The classified advertisements of the Sunday newspapers are effective

as a background for inked or painted letters. Bright, clear colors contrast well with the gray of the closely printed type. The perpendicular lines between the columns and the orderly lines of type that tell of "Personals" or "Apartments Wanted" act as guide lines to help you form your letters evenly and to help you cut straight strips. If you wish to capitalize on the newspaper motif, you might use such a background to head a news board labeled "HAVE YOU HEARD THE LATEST?"

Another useful material for lettered headlines or labels is the white paper tape that comes in rolls for adding machines or cash registers or the paper that protects ribbon on spools. This paper can be cut in any desired length, and the lettered strip is easy to roll up and keep for future use. If you save it, be sure to write on the outside of the roll just what the title says so that you won't have to unroll it to find out.

There are many kinds of paper available to the display artist—textured surfaces, such as corrugated cardboard, sandpaper, or old wallpaper; colored papers, such as candy wrappers, aluminum foil, or bright scraps of printed magazine pages. For large-surface needs there is butcher's wrapping paper, blank newsprint, sides of cardboard boxes. None of these suggestions requires much money. Of course, if you wish, any art store will supply you with many expensive and elegant papers upon which to present your copy.

[illegible]

LETTERS MAY BE:

cord

cutout script

CUT OUT

CUT OUT

PLASTER

WOODEN

NEWSPAPER

CELLULOSE TAPE

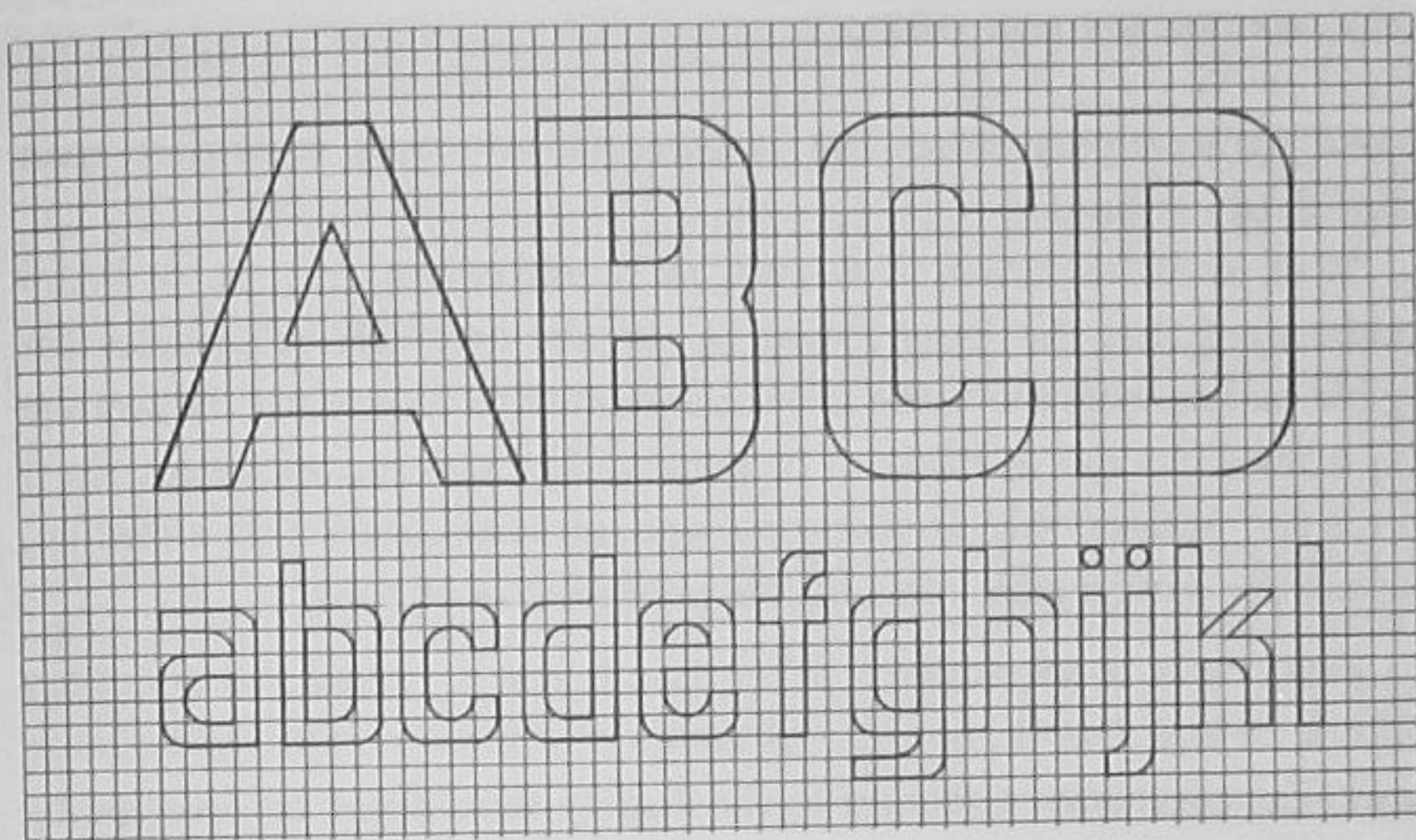
Copy can be written on any substance that is handy. It can be written directly on a chalkboard, either to stand alone or to back up a display of other articles. It can go directly on the glass or cellophane slide. For poster making, it will form part of the arrangement on the large paper or poster board. It can be painted on cloth.

Paint can be applied to transparent sheets of plastic or cellophane and used with startling effect superimposed on pictures or hanging in midair as part of an arrangement.

Alphabet sets. Individual letters cut out of paper are versatile. They can be pinned or tacked in place to form words. You can cut out the appropriate letters each time you set up a display, but it is easier to have a whole set of standard-sized letters that you can use again and again. For this set you would need several copies of each letter in the alphabet and six or seven copies of the commonly used vowels. The letters ought to be cut from fairly substantial paper that will keep its shape for many usings. Blotting paper might be good, or heavy cardboard. Or perhaps you can get some exposed X-ray film.

Patterns for these letters can be made on graph paper, then traced on the heavy material and cut out with scissors or a razor. The lines and squares of the graph paper will help you form the curves of the letters as well as the straight strokes.

It is possible to buy in stationery and art-supply stores alphabet sets made of heavy cardboard or plastic. You can find gum-backed letters



that can be pasted on paper, cards, and posters. Toy departments may have wooden letter sets that you can use. Plaster letter sets complete with push pins (Mittens Display Letters, Redlands, Calif.) are very effective for use on bulletin boards and as part of exhibits, but these sets are expensive. If professional finish is important to your purposes, consider buying one of them. Otherwise you and your group will do very well with your own hand-made alphabet.

By reversing the process we have just described for making up an alphabet, you can make up stencils, patterns that can be used over and over. By carefully cutting the letters of the alphabet out of heavy cardboard and keeping the original sheet of cardboard, you will have a stencil to use for drawing letter outlines on materials as you wish. These stencils are available in the stores in heavy waxed cardboard and in heavy plastic. Again, your purposes and your pocketbook will have to decide whether you buy or make your materials.

Cord letters. Have you ever written with rope? String, wool yarn, light cotton rope, or cord can form unusual headlines for display. The cord can be shaped into letters and pinned in place. The three-dimensional effect attracts attention, and the texture of the cord adds interest. In order to save the cord and use it again, write the words cursively instead of cutting the letters apart.

Heavy string can be tied loosely in hanks and dyed a bright color. Colored cotton cording, sometimes called cotton roving, may be pur-

chased in art-supply stores but is considerably more expensive than home-dyed cording.

With these materials, it is even more important than in ordinary handwriting that the letter forms be defined carefully. The rules for legible penmanship should be followed in order to counteract the strange and fuzzy effect that is likely to be present. Use this technique for short words and phrases only. It takes time and, although it attracts attention, it is not the most legible form for the presentation of copy.

Pins, tacks, and staples. The thumbtack is considered necessary to bulletin-board work, but its uses are quite limited because of its large head. The spectators' attention to the display should not be diverted by a sprinkling of shiny round spots. This is especially important in attaching letters to the board. Cut-out or cord-written letters are much less legible if they are put up with thumbtacks.

Pins are much more useful than tacks. They are just as strong as thumbtacks because they can be pushed even deeper into a surface. Their small heads are quite inconspicuous. And they can be used to fasten materials together. However, before you set out to prepare a display using pins, get a thimble to fit your pushing finger.

Staples are also very useful. For heavy-duty work, such as window dressing, large exhibits, and professional display work, there is a staple "gun" that drives staples at the touch of a trigger. Many desk-size stapling machines will open up so that the staples may be driven into the flat surface of a cork or composition board. These staples are easy to remove with a fingernail or a thin instrument such as a nail file or a hairpin. They are inexpensive, inconspicuous, and easy to use.

MECHANICAL PRINTING

Professional-looking lettering can also be achieved with no fuss or bother by mechanical means. Of course, the results lack the color, the texture, the "personality" of hand-lettered copy, but at times they are very useful.

You don't have to be reminded that the typewriter can be used to present copy that will be read at close range. But are you acquainted with

STANDARD PICA - 10 characters to the horizontal inch. Compare this with the large styles.

AMPLI TYPE - 6 characters
to the horizontal inch

LARGE MODERN PICA - 6 characters
to the horizontal inch

LARGE VOGUE 6 spaces to the
horizontal inch

BULLETIN TYPE - 6 CHARACTERS TO THE HORIZONTAL INCH

These actual-size type styles are available on Royal typewriters. Other companies have similar type styles.

typewriter print that can be seen easily from a distance? Special machines with "jumbo" type faces are often used to prepare reading cards for primary schools. And the large, simple print is well suited for other kinds of display work. Above are samples of these larger sized prints.

And you probably don't have to be reminded of the rubber-stamp sets that can be purchased. Colored ink pads and the rubber stamps can make useful signs and headlines. Of course, displays using copy produced in this way will lack individuality, but perhaps that lack will be unimportant to your purpose.

These simple mechanical methods may save you time and trouble when you are preparing displays. When your group is doing its own displays, it may be important that the children learn how to paint or

draw their own lettered copy. But more likely the important part of the lesson will be the expression of an idea rather than the techniques involved in that expression, and mechanical lettering will be useful to them.

THE COPY CAN HELP YOU TEACH

The preceding chapters have described materials that can be combined in some way with other materials to make up display, or that can form a kind of simple display by themselves. When used individually, the objects, models, pictures, and illustrative and explanatory drawings all can stand alone. But when a variety of materials are arranged as a display, the copy is vital for teaching purposes. Rarely can it be omitted, unless the words are spoken instead of written. Words form labels, captions, and titles. Words focus attention where you want it, as well as direct the kind of attention that is given.

Through the wording of the copy, and also by the shape and color and placement of the letters, *attention* and *interest* may be secured. Remember "Read the Ads Carefully. Use Them Wisely"? If you plan your copy especially for the purpose of pointing up the central ideas of the display, it can help greatly in *outlining the major theme* of the display.

But the major educational value in the use of copy for displays is to help the learner *translate his perceptions into words*. Although this book emphasizes the importance of visual as well as other sensory impressions in learning, this learning must be stored up for future use in words. We further the learning process when we label and title our displays with the key words which we hope will be remembered. And we promote this transfer of perception into words even more efficiently when we succeed in getting the learners to do the titling and labeling for themselves.

Although we rely on visual impressions of actual things to give first-hand perceptual experience, we also depend upon words as the most efficient means for remembering and communicating experiences.

Clippings from the News

If you are like the average person, when you sit down to relax in the evening, you pick up a newspaper or a magazine. You want to be entertained and amused, and yet you don't want to waste the time completely, and so you look for new ideas, reinforcements of old ideas, suggestions of things to do. You read the review of the film you saw last night to find out whether you agree with the opinion of the reviewer. You read Drew Pearson's column to see what he considers the "inside dope" of the day. You scan the headlines in the newspaper, the titles in the magazines, and you dip further into those articles that interest you.

THE PRESS HAS POWER

Newspapers have been called the brain of democracy. What they say, what they suggest, and what they do not say or suggest have a powerful influence on our thinking. And it is our thinking that ultimately controls our democracy. Magazines, too, influence us. They share with the newspaper the responsibility of reporting and interpreting the news, of helping us find answers to our everyday problems, of entertaining us.

The very different policies of our newspapers and magazines color much of what we read. The facts in a certain story may be the same, but the interpretation of the story will differ from one newspaper to another. The headlines will differ. The length and position of the story in the paper will differ. The editorial comments will differ.

Such differences in the press are healthy. If we could encourage more of them, our democracy would probably be healthier. The trouble is that few of us read any variety of views. And too few of us are able to sift the color from the facts.

VIEW THE NEWS AND USE THE NEWS

Schools must help if we want to improve the way in which our democracy operates. Young people must know that there are widely different views about our world and the people in it. They must see how these ideas are expressed both in the editorial columns and in the news stories.

To most of our population, the newspaper and magazine serve as general basic textbooks. After they leave school these are probably their only texts. It is obviously important that these people learn to read them intelligently. They need to know what can be found in the press, how to glean facts from opinions, how to sift through the words to find the underlying principles and policies of the materials they read. They need to set up their own standards for integrity and to judge their "texts" by these standards.

Newspapers and magazines must be studied in the schoolroom for another good reason. Here we find reports on life as it is being lived. Schools work with their communities, and children learn many of their important lessons through participation. News of the local and wider community is taking its place beside the words of the textbooks.

Today's schools are not teaching children only. Many schools operate in two sessions—the day session for the children and the evening session for their parents. Adult groups, too, use the press as an additional textbook. Children and adults use clippings to study many different things.

In English classes. The newspaper is studied probably most often in our English classes, particularly in those that study journalism. Here, where people are learning to appreciate and use their language, is a logical place for studying how words are put to work for various purposes. The bulletin board might be labeled "PICTURE-MAKING WORDS" and clippings could be pinned up from the local newspaper, from the big

city papers, from *Time*, the *New Republic*, the *Reader's Digest*, and other magazines. Another week the board could be labeled "EMOTIONAL WORDS"; another week, "PLATITUDES AND CLICHÉS."

As people learn to express their thoughts in words, they can use the written words of others to help them see the difference between reporting and editorializing. They should know when they are stating a fact, when they are stating a widely accepted theory, and when they are declaring a personal conviction. And they should carefully study the press to evaluate the stories for news, interpretation, and editorializing.

There are many other ways to use these materials in English classes. For in the press are good and bad examples of short stories, of essays, of the factual articles that in school would go by the name of "term papers." Here are copious quantities of paragraphs, punctuation marks, "grammar."

Students at the Greenwich (Conn.) High School practice their rules about the use of commas by finding examples in the newspaper. As their teacher, Hardy R. Finch, says:* "This serves a dual purpose: (1) It proves that the student knows his comma use well enough to find it in printed material, and (2) it demonstrates to the students that punctuation is used in other places besides the classroom." If your community is not in the circulation area of a good city newspaper, this practice may not be useful to you. Perhaps you might better suggest that your students check the newspaper for errors as well as for correct usage.

It is important to each of us that our students learn to express themselves clearly and learn to understand other people. Since we all are teachers of English, we should exploit such uses of the press.

In the social studies. No teacher of history, geography, government, economics, or sociology needs to be reminded of the importance of periodicals. In these subjects they are essential textual materials. All of us can learn much by studying some of the ways in which they are used in this field.

*Hardy R. Finch, "Use Newspapers and Magazines to Teach Punctuation and Spelling," *English Journal*, 38, p. 44.

For various opinions on the economic and social problems of our time, there is no better source than the "public press." The only problem is to *find* the several sides of each issue actually in print. Schools need to have access to a wide variety of materials, representing as many points of view as possible.

A group studying current opinions on compulsory health insurance should be able to read such publications as *Time*, *Fortune*, the *Chicago Tribune*, the *Daily Worker*, the *New York Times*, the *Boston American*, *Harper's*, the *Nation*, the *Reader's Digest*, the *San Francisco Chronicle*, and, of course, their local paper. After setting up their own criteria for judging, the group might try to arrange articles from these sources on the bulletin board on a "left" to "right" scale. The difficulties met in doing this will point out the need for careful, critical reading.

A study such as this would afford an excellent opportunity for seeing how the same news story is treated differently. After checking several papers for headlines, length of the story, and position in the paper, the students can decide what they would do about the story if they were the editor of a newspaper.

Methods for influencing public opinion might be evaluated as people study the headline, the news article, the syndicated column, the editorial, the pictures, the cartoon, all from the same paper on the same topic. The consistency of the paper could be judged by such a study.

An issue such as compulsory health insurance could be followed in the press for several months. The letters to the editor could show how the articulate public reacts to the ideas presented in the news. Magazine articles on this or other related subjects could show how opinions about this problem reflect the general policy of the magazine.

A study of magazines of wide circulation will show how they exert a unifying influence on our culture patterns. When fashion experts proclaim a new style in women's clothes, the magazines do their part in bringing the news to women in Rockland, Me., in Prairie Home, Mo., and in Coquille, Ore. The so-called "ranch house" has spread from the western ranches to every city and town in the nation—and the "home" magazines are largely responsible. Careful reading will show other, more subtle, influences toward uniformity.

In the social-studies courses taught by Wendall Haner at Ravinia School, Highland Park, Ill., current events were discussed regularly.*

As students enter the social-studies classroom, they are greeted by the colorful "Wall of the World." In the center of the wall is a large red-white-and-blue design showing a great compass superimposed upon a circular map of one hemisphere. Around this circle, at the four points of the compass, are the usual letters indicating the direction, but the *E* for East and the *W* for West are repeated in a vertical column between the *N* and the *S* so that the column spells out N-E-W-S and suggests the origin of news at the "four corners" of the world.

The space . . . is filled with posters and news material. . . . Pages from *Time*, *Life*, *Newsweek*, and similar publications are sandwiched between colorful maps, newspaper headlines, news items, feature stories, and illustrations.

Sprinkled all through these materials, as a special seasoning, are news cartoons. Cartoon interpretation soon becomes one of the speediest and most effective methods through which pupils learn current information. Cartoons combine the challenge of a puzzle with the joy of a joke, and students work especially hard to be up-to-the-minute so that they can explain the hidden meanings and humor points in them. Students also begin drawing cartoons of their own to be put on display and they carry these new projects over into their art classes.

The space on the right of the compass . . . is reserved for the students' own contributions and it is replete with materials which outdo the teacher's in every way. (Try to keep up with youngsters when they combine their scouting efforts!) They bring the world into the classroom and hang it on the wall, and after that it becomes increasingly their world.

In consumer education. As we change from a people who produced most of their own necessities to a people who produce cooperatively, consumer education is becoming increasingly important. The most intelligent consumers are those who know the merchandise they need. If we could help people to set up clear standards for every article they plan to buy, for every service they plan to use, their spending would be wise. But with the multiplicity of materials and services available today

*Wendall Haner, "The Wall of the World," *Clearing House*, 23, Oct. 1948, pp. 92-93.

this is, of course, impossible. We can try to set up standards for the staple things only.

A more promising plan for consumer education is to help people to find information about the things they need and to help them evaluate that information. They need to know about such publications as *Consumer Reports* and *Consumer's Research*. And they need to study and to evaluate advertising methods.

The display of advertisements which we talked about in Chapter 7, "Read them carefully, use them wisely," is a step in this direction. The advertisements do contain much valuable information for the consumer. Specifications of materials can be compared through them, and we can find out where to buy things. Our attention is called to articles we may need. Unfortunately, the advertisements often contain "high pressure" salesmanship as well as important information.

Displays of advertisements that quote authorities can help people see that an expert baseball player does not automatically become an authority on cigarette tobacco. A bit of thought will show the fallacy in the argument that a supposed social leader can intelligently advise us what face cream to use. Phrases such as "A famous New York doctor has found . . ." or "Leading authorities believe . . ." can be examined. Advertisements can be marked for unrelated details, such as long scientific words that are included merely to dazzle the reader and do nothing to explain the quality of the product.

In mathematics. Children can make up their own "financial dictionary" by clipping phrases and sentences from magazines and newspapers. Words such as *security*, *mortgage*, *interest*, *endowment*, and *tax* should become part of their vocabulary.

The newspapers can furnish many arithmetic problems to be solved in class—the same kinds of problems that face the rest of us. Grocery advertisements posted on the bulletin board can be compared on the basis of price per ounce. Problems of percentage will not be dull if the children follow the sports news through the spring and calculate the batting average of their favorite hitter.

In the sciences. In our times, when science and technology have wrought so many great changes in our lives, the press is full of news about

recent discoveries, hypotheses that are being tested, theories that are being attacked. We expect even greater things in the future. We expect a cure for cancer, a preventive for the common cold, color television in every home, new synthetic fibers for our clothes, atomic energy to power our automobiles, and an alphabet of vitamins that will produce perfect babies, increase mental capacity, prevent gray hair, and almost ensure immortality. And we watch the press for news of progress toward our hopes.

Groups that are studying the sciences should maintain a news board for at least two reasons. First, it will give them a realistic appreciation of the importance of the subject matter. If they see how chemistry works to increase their personal welfare, they will be more interested in "valence" and "molecule." If they see examples of chemistry principles operating in everyday events, they will be more excited about their own "experiments."

A second reason for clipping the news is to find examples of the scientific method, both technical and logical, in use. The technical methods of the specific science subject being studied are sometimes referred to in the press and will seem less strange to the uninitiated if he finds them mentioned here in nontechnical terms. Many teachers of science believe that one of the most important objectives of instruction in the sciences is to give students an acquaintance with and experience in the use of the logical methods of science. The news furnishes examples of the use (and misuse) of such methods as observation and experiment, inference, comparison and analogy, and classification. And news of such controversial problems as race relations and the use of atomic weapons can stimulate the application of inductive methods of reasoning.

In home economics. When family living is the topic of major concern, newspapers and magazines are again "textbooks." We often turn to the news to keep up with the "latest" in mechanical, scientific, and political influences on the home. We read about concentrated milk, Vitamin B₁₂, and color television. We can foresee food shortages and can adjust our buying habits accordingly when we read of rail strikes, bad weather in Iowa, and bumper crops of potatoes. We can watch the political actions in our state capital as well as in the national capital so

that we may express our opinions to our representatives on such issues as rent control, health insurance, and increased aid to schools.

People can not only learn about what *is*; they can also find new ideas about what *ought to be*. Family problems that have been brought to the attention of the public in the newspapers can set off group discussion. Often, through a consideration of the problems of others, each member of the group gets a clearer understanding of his personal values for himself and his family. Often he will come to see that values are not the same for all families and that diversity is an important corollary to freedom.

In safety and driver education. The newspaper is an extremely effective source of information about safety hazards of all kinds. Not only can students collect stories describing fires, drownings, and home accidents but they can soon begin to form generalized conclusions of their own. They will find out by themselves that alcohol and gasoline don't mix, that cleaning fluids can be dangerous, and that taking a dare can be fatal.

Posting all the accident news in your local paper over a period of months may help the group to see in your community certain hazards that could be eliminated. It may be possible to give evidence to the city council that a traffic light is needed at a certain corner, or that a life-guard is needed at the swimming hole.

Clippings might be pinned up telling of a campaign on the part of the state police officials against hitchhikers. The clippings could stimulate questions such as these: When you drive, should you or should you not pick up a hitchhiker? Would you pick up a high-school friend? a well-dressed young man carrying a suitcase with a college sticker on it? a shabbily dressed man and woman? an old man carrying a pack? a uniformed serviceman? *Why* would you or wouldn't you? Are your answers comparatively logical? Why do people hitchhike? When there are laws that prevent them from hitchhiking, what do they do then? Who loses when people hitchhike? Why do you always read of the bad things that happen when people pick up hitchhikers and never of the good things?

In many other ways. These are just a few of the ways in which newspapers and magazines can help you teach. You will have thought of many other ideas as you read these pages, ways of making your class work alive with news of the real world, and ways of helping your students understand and evaluate the power of the word.

WHET INTEREST THROUGH CAREFUL DISPLAY

These clippings we have been talking about are probably one-of-a-kind, single clippings brought in by a student or teacher or cut from a school periodical. They will not be suited for group use because they can be read by only one person at a time. But each individual in the group should have a chance to read them so that group discussion can progress intelligently.

Like pictures for individual use, clippings may be either pinned to a bulletin board or mounted on cardboard like a study print—a “study clip,” we might say. Either way, the displaying of them must accomplish two things: it must draw attention to the clipping and to that portion of it that is of particular interest, and it must make the clipping easy for people to read.

Newspaper clippings or magazine articles do not always successfully draw attention to themselves. The person who brought them to class and pinned them up or mounted them knows about them, but perhaps no one else notices them at all. What can be done about it?

Keep up to date. News is something that has happened recently or is going to happen soon. Last week's news may mean a great deal to your group, and so may last month's news—but not if it has been on display for all that time. Clippings on display should be changed often, so that people will expect to see new and interesting things.

Headline always. When we were discussing pictures, we saw that people were much more likely to see what they were told they would see. Use that device again here by labeling the news carefully. A bulletin board might be headed: “SHALL THE FEDERAL GOVERNMENT HELP PAY FOR OUR EDUCATION? THESE PEOPLE SAY NO. THESE PEOPLE

SAY YES." The viewers could read the clippings representing these two sides of the question. They could compare views and see how each argument was met by the other side.

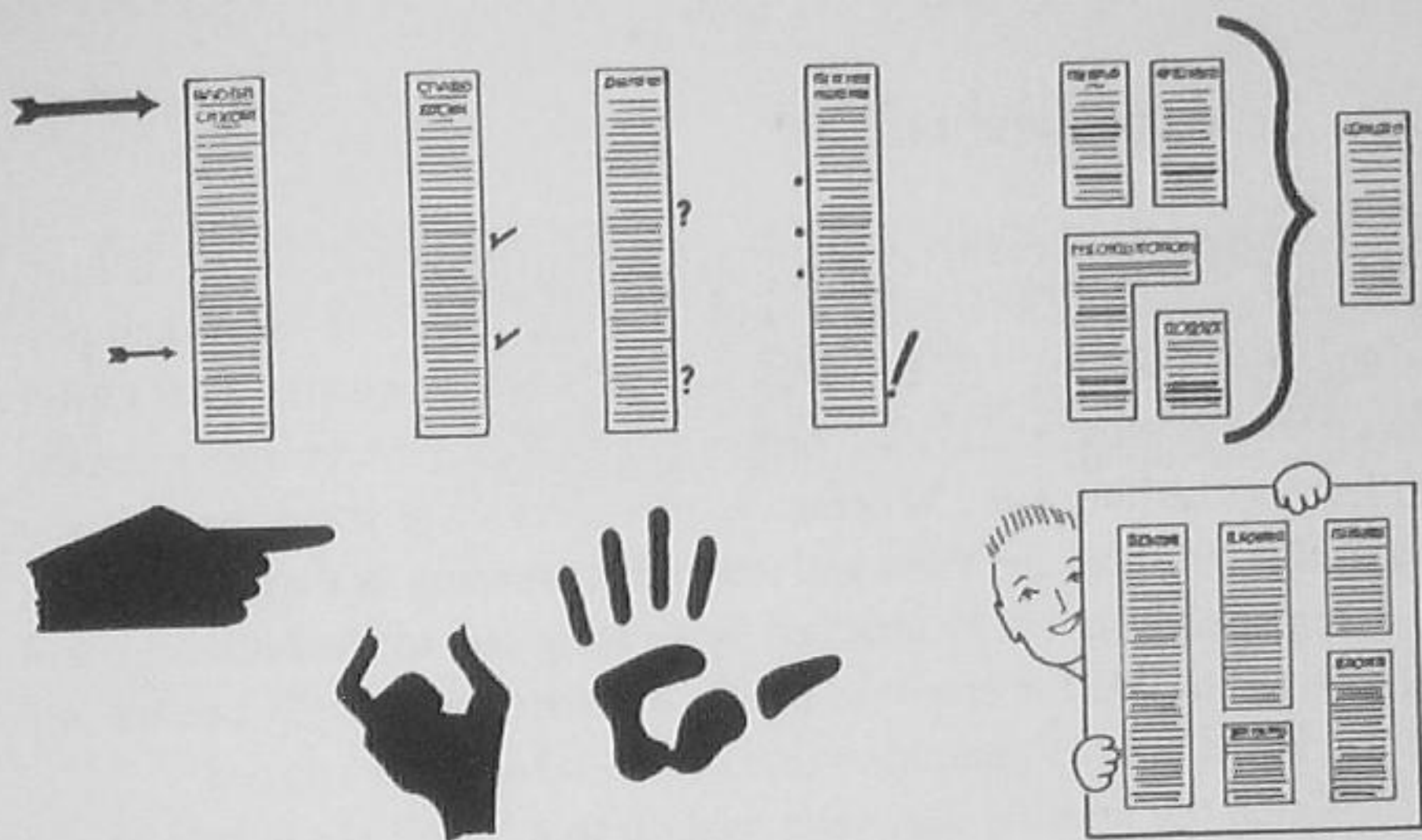
If your clippings do not fit together under a single explanatory label, put a small heading with each item and label the group with something that will attract attention in general. "HAVE YOU HEARD THE LATEST?" "WE'VE GOT NEWS FOR YOU!"

The reason for these labels is the same as that for newspaper headlines. They are there to catch the reader's interest and to give him a brief idea of what is to follow. So you will want to headline each of the clippings you use with words chosen to interest the people whom you want to read it.

Use symbols. Arrows or pointing hands or stars can draw attention to individual items of interest. Or the same symbol repeated in the display can call attention to similar points or to questions and answers. Make these symbols in bright colors and cut them from heavy paper so that you can use them repeatedly. And if one item is of great importance at a particular time, clear the board for it. One item surrounded by space and pointed out by an arrow can't be missed.



The headline on this bulletin board draws attention to the clippings and ties them together as a unit.



If your news board is labeled "HAVE YOU A NOSE FOR NEWS?" you might make up a little paper-sculpture face with a long "Pinocchio" nose to symbolize all curious people.

Make use of two and three dimensions. In comparing fair headlines with unfair ones, why not pin some up "on the level" and others on the slant? To show how a news event is treated, why not paste the news story alone on a cardboard or plastic prop and connect it by colored cords to the related headline, editorial, cartoon, and letter-to-the-editor that are pinned to the board behind? In comparing two similar stories, why not paste them side by side on cardboard so that they could be read and compared at the same time?

Try textures. If you have one clipping of interest, you might leave it in the newspaper page and paint on arrows or other suitable symbols. You might cut out silhouettes of these symbols from the newsprint page and put colored paper behind the cut-outs.

A piece of gingham might back up news of cotton. Clippings could be posted that told about new styles in clothing or new uses for cotton-seed oil, or new processing treatments for cotton threads. Yarn or rope, chicken wire, window screening, all these and many other interesting textures can be used to highlight your news—provided you don't overdo the background interest and take away attention from the news.

Help the reader to read. If you follow some of the suggestions above, you will help the reader get interested in the clippings. Now make it easy for him to continue to read. If the clippings are posted on

the bulletin board, pin them at his eye level. If a posted article is long, it might be a good idea to pin it at the lower edge of the board and provide a chair near by. The invitation "HERE'S NEWS ABOUT THE FIGHT AGAINST CANCER. SIT DOWN AND READ IT." may encourage someone to learn something new. Whether your readers sit or stand, be sure you have allowed room for them and made their reading as easy as possible.

A pamphlet might be attached by a spring clip to the bulletin board and be removable for easy reading. Or a plastic shelf might be attached to the board to hold pamphlets that can be taken away to read.

Watch the lighting near your reading spot. The light is best on the wall opposite the windows. Don't strain your reader's eyes as well as his attention by pinning the clippings to a window wall.

Any guideposts you can offer a person as he looks at an article will make it easier for him to read and to understand what he reads. Underlining words and phrases in red will help; so will bracketing important ideas with colored pencil. With your pencil you can virtually "outline" the material and guide the reader from point to point.

LET THE PRESS HELP YOU TEACH

Democracy's brain, democracy's textbook, the press is your valued servant. It helps you teach today's as well as tomorrow's citizens. If you teach them well, they will continue to learn from it after they leave you. To get the most help from the press, you must use it critically and wisely. To really help the citizens, you must teach them to question it, criticize it, and learn from it.

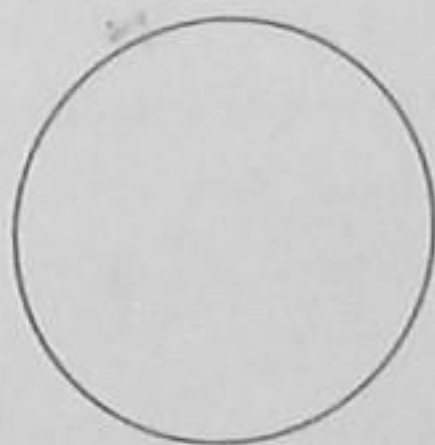
In Part One of this book we defined the term "display" as we would use it and we presented certain assumptions about the learning process and ways in which display might influence its operation. There we also suggested a formula for display, a series of steps that would help you to prepare successful displays. Part Two has discussed the materials for display, how to select them, and how to use them. Part Three will examine the various tools of design (such as color and line), and some of the rules for design (such as balance and contrast) that will help our displays to achieve their purposes. Part Four will describe some of the mediums for display through which the materials may be presented and will make suggestions for the appropriate use of these mediums.

PART 3

DESIGN *for Display*

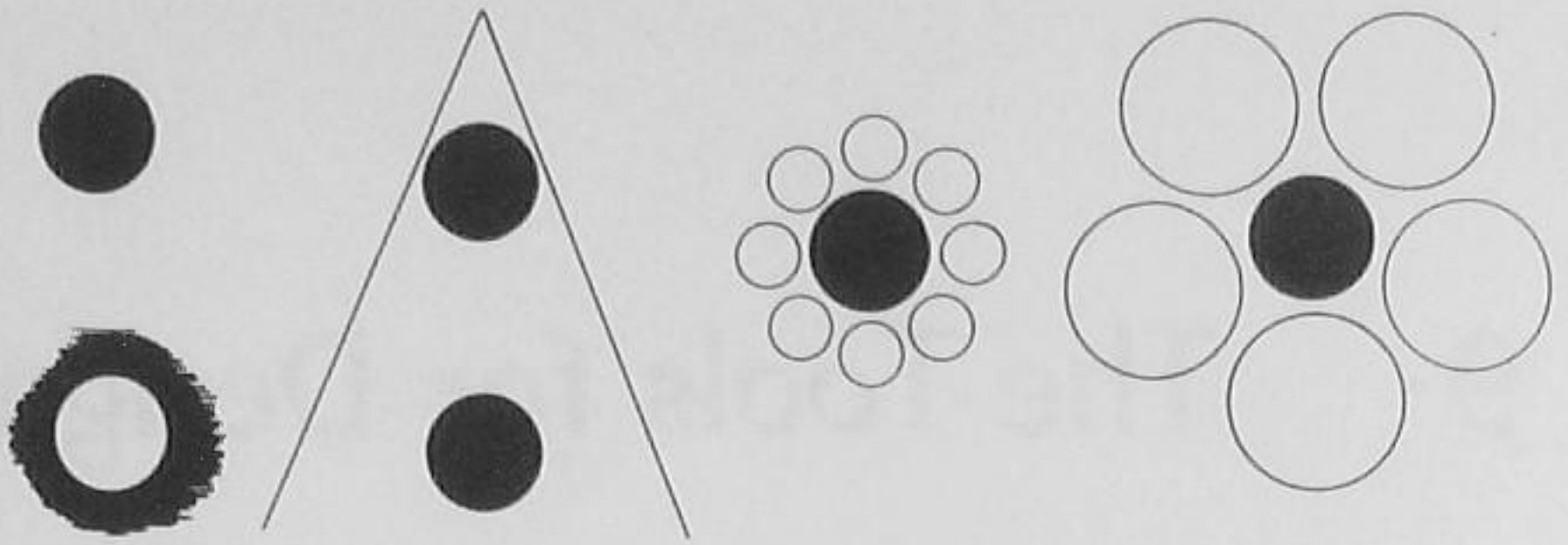
9. The Tools for Design

Look at this circle. What do you see? Just a round white spot? Or do you see a moon? Or a dinner plate? Your answer will depend on the way in which you are using your mind.



You can see a thing in two different ways. One way is to see it merely as it appears. In this case, the object seems to be a white circle. The other way is to recognize it, to see it as something you have seen before. When you call this white circle a moon, you are remembering the last time you saw a shape like this and you are calling this shape by the name that was appropriate at that time.

This second way of looking at an object is very much influenced by the context in which it is presented to us. If the round white spot has a fork on one side of it and a knife and a spoon on the other, we would call it a dinner plate. If it is one of a long line of round white spots, we might call it a pearl in a necklace. If it is part of a pattern of spots on a table next to an open milk bottle, we'd call it spilt milk.



The background against which the circle is presented to us also has quite a lot to do with our seeing it as a plain, abstract circle. Compare these drawings and see how the same-sized circle looks different when it is compared to smaller or larger circles, when it is near to or far from contrasting lines, when it is lighter or darker, brighter or duller than its background.

As you looked at these "optical illusions," you were influenced by the relationship between the circle and its surroundings. You were not influenced in the same way as when you saw the circle as a dinner plate or as a pearl in a necklace. This time your eyes and your mind were seeing differences in the actual shape and size of the circle.

These examples have shown the truth of the statement "Things are not always what they seem." The reverse of this statement is true, too, and is very important to you: things can be made to appear what they are not.

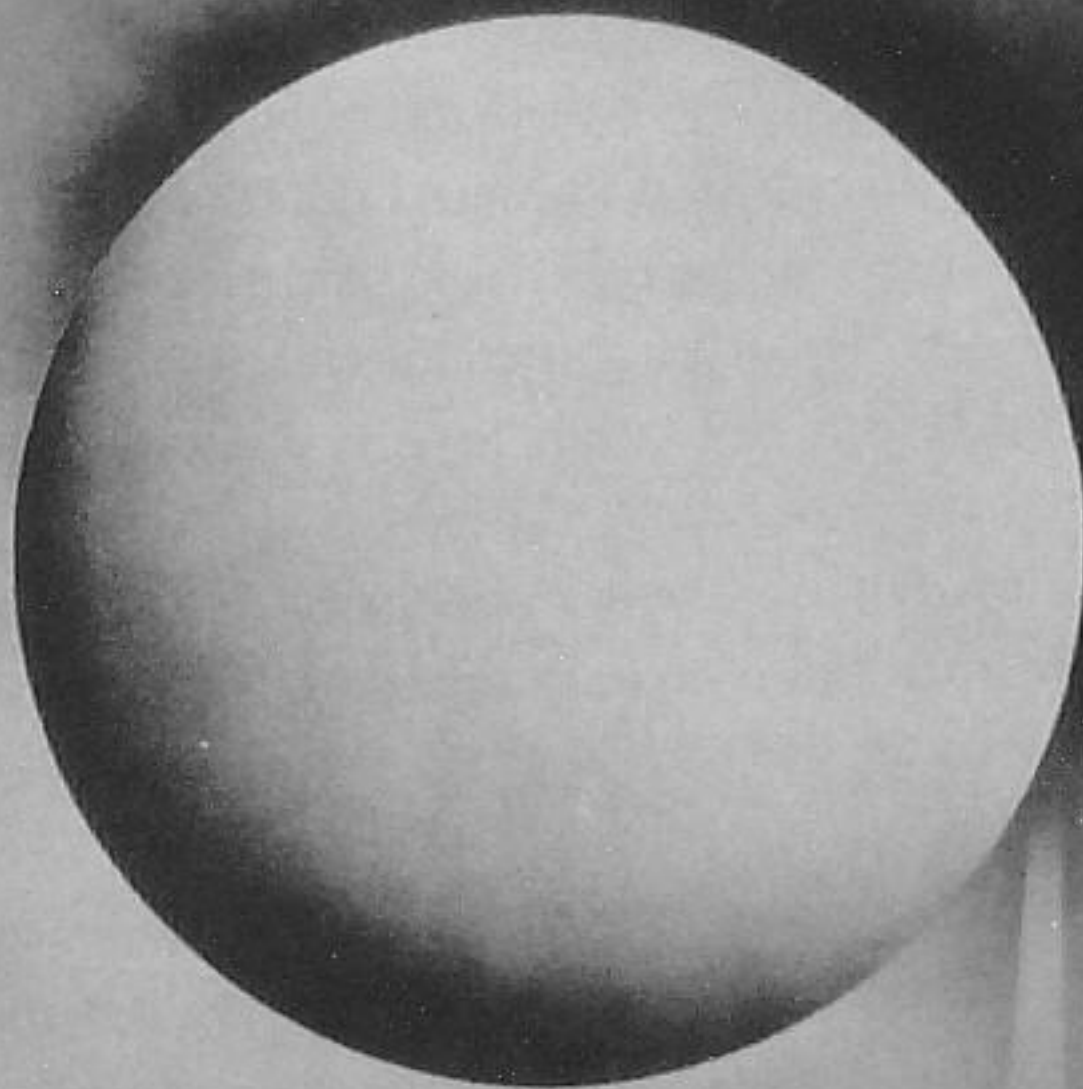
Herein lies the great power of design. By planning carefully, you can influence people to look at your displays. And as they look, you can guide their eyes and persuade their minds to believe what they see.

A design is a plan for doing something. As we use the term here, we mean a plan for arranging the various parts of your display so that you can reach your audience more easily. Let's look at the outstanding example of design for display on the following page and try to see how the artist's design plan works.

The purpose of the poster is obviously to get people to attend the tennis matches. The artist must have thought about these people and decided that those most likely to come either played tennis themselves or wished they could play. So he aimed his poster directly at the tennis player. And aim is the word, isn't it? Your backhand will have to meet that ball or it'll hit you in the eye.

S.F. FEDERATION FRANCAISE DE LAWN-TENNIS R.C.F.

A. M. CASSANDRE



DU 21 MAI AU 5 JUIN

**GRANDE QUINZAINÉ
INTERNATIONALE
DE LAWN-TENNIS**

STADE ROLAND GARROS — PORTE D'AUTEUIL

A poster by A. M. Cassandre.

That's the first thing you notice in the poster, the ball. This poster is really a flat piece of paper, but the artist has, through his clever use of space, made you feel as though you were a real part of the scene. By making the player much smaller than the ball, he has presented you with a little puzzle. You *know* that a man is much larger than a tennis ball. It takes only a second, though, to understand that the artist is saying that the man is way over there on the other side of the net and that the ball is very close to your eyes. By striking the ball right out of his poster at you, the artist has made you feel compelled to do something. You *feel* like hitting the ball back. But since the poster is conventionalized and the picture doesn't really look like a tennis game but only suggests one, you are not fooled mentally but only emotionally. Still, you *feel* like doing something. So you may decide to go to the tennis matches. At least, so the artist hopes.

The artist has made sure that you see the ball immediately by making its shape contrast with the other parts of the poster. All the structural lines are straight. The horizontals of the lettering and of the tennis net and the vertical line of the court marking emphasize the roundness of the ball. Its huge circular form is repeated in the small circular letters of the most important part of the copy.

Just as the shape and size of the ball are emphasized through contrast and repetition, so is the figure of the man brought to our attention. The small, sharp diagonals of his body contrast with the staid horizontal and vertical lines and are repeated only in the diagonals of the letters at the bottom.

But if the ball and the player were the only things you saw in this poster, you would have no directions about what to do with your feeling for action. The artist has planned a certain path for your eyes that will make sure you see the important details. He makes you see the ball; then you see the man and realize that he is behind the tennis net. Then you recognize the force and the direction of the ball and your attention automatically shifts to the foreground. To help you shift, the artist has provided a shaft of light that takes your eyes from the ball, the man, and the net, right down to the letters that briefly present the message.

One path which the observer's eye may follow in looking at Cassandre's poster. From the ball, which first attracts the observer, the eye proceeds, via the black line, to the message which the poster carries.



If you have one moment to look, you'll get the idea. If you have several moments, your eyes will go back around and into the poster and you'll see who is sponsoring the event, the dates, and the place. The photograph above shows the planned path that the eyes will most likely take.

As we have interpreted this artist's design, we have noticed that certain things helped him to guide our attention. He worked with *space* as he drove the ball at us, with *size and shape* as he directed our eyes to see the ball and the player. He used *line* to contrast the shape of the ball with the rest of the poster and to lead our eyes through the design. He used *texture* to compare the smoothness of the ball with the pattern of the net. He used *color* to reinforce the vitality of his message.

These five elements of design are used as tools to accomplish certain purposes. And, as with any tools, an understanding of them is necessary if you are to use them properly.

SPACE

Space is not very important unless there is something in it. Space is not very important to *you* unless it has some relation to you, unless you are in it or near it. For a simple example of this "relativity," look around the room you are in right now. You can probably estimate about how many square feet of space are there. Now look up at the ceiling. Lean back and speculate on that empty, unused space up there. It's a duplicate of the floor space, but doesn't it look different without the furniture? Your feelings about space depend on how you look at it.

An object has little reality for you unless it is in some relation to you and the space which holds you both. As you walk through the meadow, a flower is either to your right or your left, near you or far from you. A flower which you pick and put in your buttonhole means something quite different to you from one on the bush with ten or fifteen other flowers.

The space you use in display is more like that of a room than that of the meadow. In the meadow, the earth and the sky are the limits; the space is your whole world. A display space, like a room, has definite limits, actual boundaries that are right there. These boundaries set up a new, smaller world. It is within this small world that you work with display. You find out what the limits will be and then you use that space to the best advantage.

Display in two dimensions. The duplicated page, the hand-made slide, the chalkboard, and usually the bulletin board and the poster are restricted to two-dimensional work. Within certain limits, you have the space from left to right and from top to bottom.

One small dot anywhere in this space will immediately become the focus of attention. Both the dot and the space are involved in a sort of partnership. Without the dot, the space would get no attention. But without the space around it—if, for example, the dot were surrounded by eighty similar dots—the dot would get no attention either. Here is one of the basic rules for the wise use of space. Remember the partnership between space and objects. They help each other.

Research studies have compared the attention value of newspaper advertisements that had plenty of white space in them with those which were crammed full of printing or pictures. And, as we would expect, it was found that the advertisements with more white space emphasized the material by contrasting it with the empty space, that the extra white space created and promoted a feeling of individuality by separating the material from other, competing advertisements. Check the results of these studies for yourself when you look through your newspaper.

Use all the space you have. Don't *fill* it all, but see that it works for you. Give as much attention to the shape and size of the space that you do not fill as to the things you want to display.

Your being confined to two dimensions does not mean that you must be satisfied with flat effects. Our tennis-ball poster is an example of what can be done to suggest other dimensions. You get a feeling not only of depth but also of time. That ball left the player's racket only a second ago and you must respond right now.

How did the artist manage to bring in these other two dimensions? He used perspective. He made the line representing the court marking grow smaller as it went up the poster, and we accept this convention to mean that the line is going away from us. He made the size of the man and the ball out of their normal proportions. He overlapped the ball onto the lines that stand for the net. He darkened one edge of the circle to show that it is to be seen as a sphere, and he made a dark "shadow" just behind the ball. These are conventions, too, that we accept. By representing what we would actually see if the scene were really in three dimensions, the artist brings vitality to his design.

To add a third-dimensional look to your flat displays, use these same tricks. Use converging lines; use out-of-the-ordinary proportions; overlap things; make "shadows."

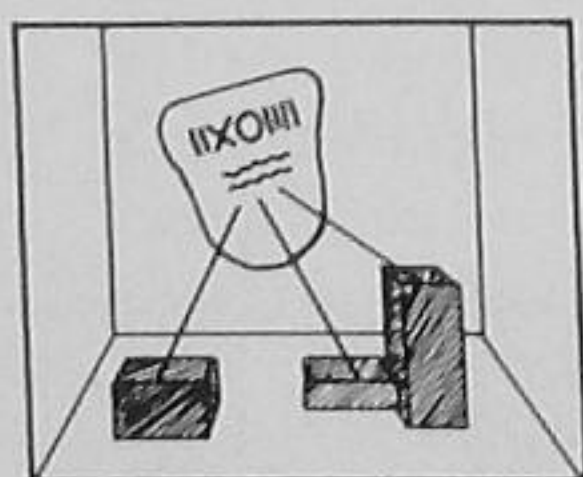
Three dimensions in display. If you have space with three dimensions, by all means use all three. And suggest through their use another dimension—time. What you are after is display that almost comes alive.

What can you do with "in and out" that you could not do with only

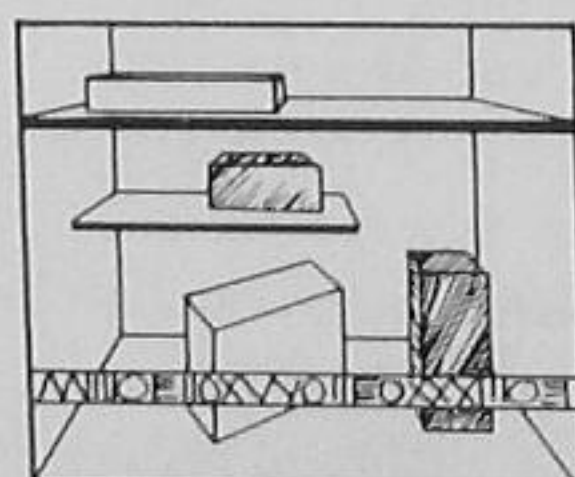
"up and down" and "left and right"? This time your space is like an empty box instead of an empty page. What can you put into this empty box?

Remember that the space you do not fill up is going to be just as important as the space you do. You are not trying to cram the box full: you are using it as though it were the world of space; you are using it to set off the ideas you want to present. Remember the partnership.

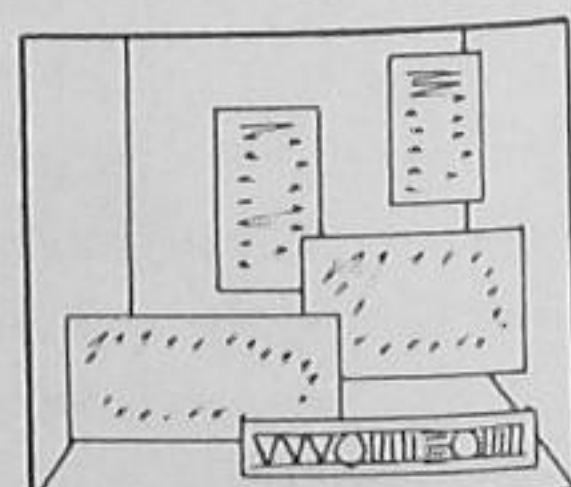
As you think about this empty box, you will see that it really has six sides: the top, the bottom, the right, the left, the front, and the back. Some people concentrate their thinking here, on these sides, with the result that their display really becomes just several two-dimensional displays placed together. But if you are thinking in terms of three-dimensional space, you will put both two- and three-dimensional objects into the space, and you will arrange them so that they take advantage of the "in and out" as well as the "up and down" and "left and right." You may put shelves in your space—wood, glass, or plastic. You may stack things up. You may suspend things from the top surface with wires or strings. You may paint or paste the copy on clear cellophane and suspend it so that it appears to float. You may stretch things on the diagonal—



Open space
NOT



Up and down
NOT

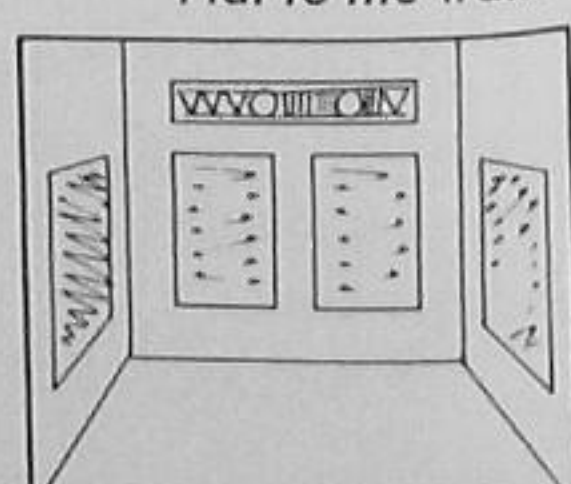
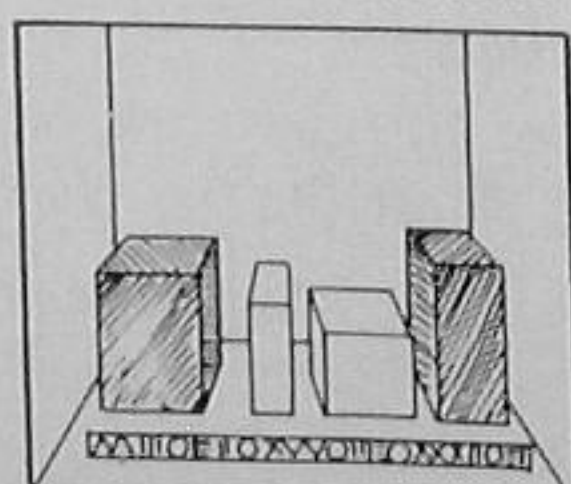
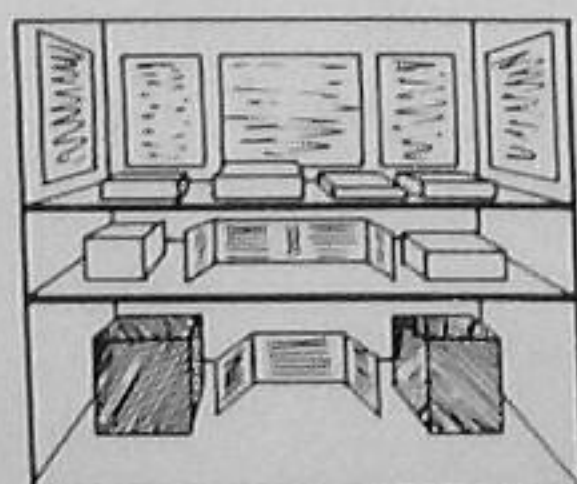


In and out
NOT

Cluttered

All on one level

Flat to the walls



not just from the top left to the bottom right, but also from the top back to the bottom front, and in other ways that use all the space. Perhaps you'll paint or paste copy or pictures right on the glass that is nearest the viewer.

As you use three-dimensional space, you will be automatically toying with time. Whether or not we understand Einstein's theories of relativity, we do understand that space involves time because we know that to go from here to there always takes some time. Whenever three dimensions are used, the viewer gets the feeling that here is reality. That thing is there, this thing is here.

Whenever there is a feeling of movement, there is a sense of time passing. An absolutely inert display can give a feeling of movement if it has used space well. Remember the poster with the flying tennis ball? The techniques that were used in it can be used here, too. But it is even easier to get movement in three-dimensional space.

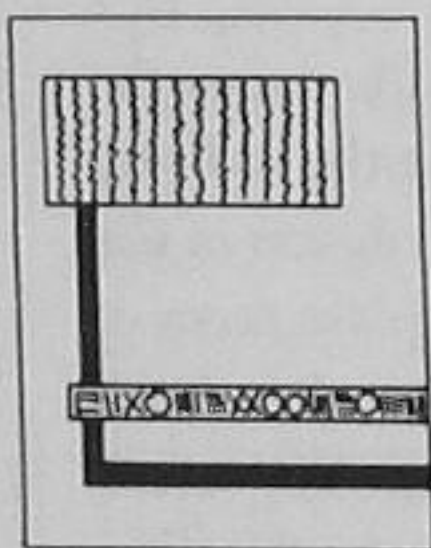
Let's go window shopping for a moment. As we walk down the street, we look in the windows at the displays. We are doing the walking and the moving, but as we pass by the windows, we see the objects in the window change in their relationship to each other. The displays seem to be moving as we see them from one side, then from the front, then from the other side. Here is a feeling of movement, even though the actual display stands still. Movement suggests time, time suggests vitality. Your display lives.

SIZE AND SHAPE

Size and shape, two other tools to help you plan your design, can both be used to guide people's attention and so to govern what they see and, to some extent, what they think. The tennis ball was the largest thing in that poster, and you saw it first. Unusually large and unusually small objects command attention because they are out of the ordinary. You want to look through a telescope or a magnifying glass because you are interested in seeing things larger than life size. You are also fascinated by miniatures—tiny furniture, ship models, and so on. Jonathan Swift used this same interest of ours in the unnaturally large and small to help us see through Gulliver's eyes some of the stupidities in our "civilization."

You can help people read your design correctly by emphasizing through size the most important things. You don't have to stick to reality. When sizes are out of the ordinary, they interest and amuse. Everything in your display can be enlarged or reduced. Or if you want to draw attention to one object, you can make it very large or small compared to other things that are present. That word *compared* is the important one, for a thing is large only as it is compared with other things. If you weigh 150 pounds but everyone else in your family weighs less than 120 pounds, you are large. But if you marry into a family where no one weighs less than 180 pounds, then you become much smaller. And yet you weigh the same. Lemon tastes more sour than usual after you eat a piece of candy. Milk tastes sweeter after you eat grapefruit.

Comparison is also the basis for our use of "shape" as a tool of design. Most of our display work is done within a square or rectangular boundary.



Shapes that repeat = stability, permanence.



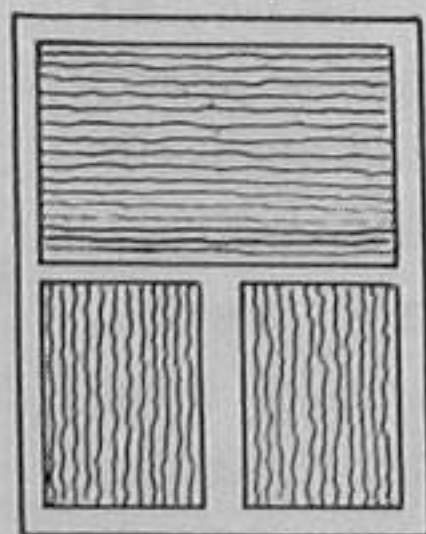
Shapes that contrast = vitality, excitement.



Conventionalize for quick understanding.



Conventionalize for simple strength.



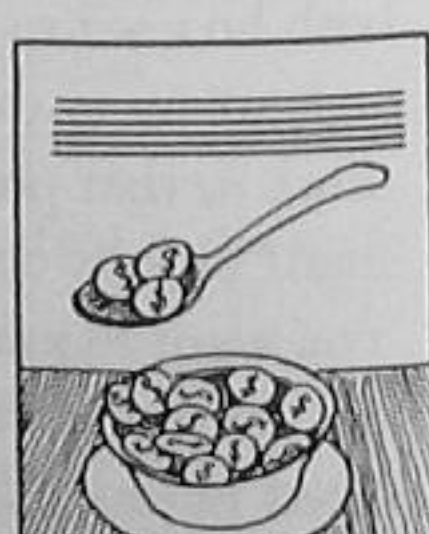
Easy mathematical divisions = monotony.



Simple contrasting shapes = drama.



Distortion of shape adds emphasis.



Fantasy can add emphasis, humor.

The shapes we use are always compared in one way or another with these horizontal and vertical lines. If they repeat these structural lines the shapes will fit in, belong, seem a part of the design. If they contrast, they will stand out, draw attention to themselves. What do you want your shapes to do—get attention or form part of the quiet background? Pick the right shape for the specific job you want done.

Here, as with sizes, you don't need to stick to reality. For the sake of rapid and clear communication, you will simplify many of the shapes you use. You will omit details, keeping only enough of them to characterize the object. When we drew cartoons, we chose to draw only the necessary lines. We can simplify shapes in the same way. This technique of simplifying is sometimes called "conventionalizing."

Distortion is another technique that can work for you. Overemphasis, caricaturing of shapes, can help them attract attention. See how we immediately know that the boy at the bottom of page 158 is listening. Both simplification and distortion help pack power into a design.

LINE

We have talked before about the use of line. When we were learning how to draw, we used it to "de-lineate," to show the edges of things. When we learned how to symbolize ideas in visual form, we used line to make our various graphs and diagrams. As we examined Cassandre's tennis poster, we speculated on the route which he planned for our eyes to follow and we considered his use of line in this plan.

Can planned lines lead the eye? In this last description of line and how it can be used, we were really basing our ideas on a hypothesis: that the path the eye takes can be directed by the way in which line is used. On the basis of this hypothesis, we went on to say that ideas presented in the order and sequence of this directed view of the design could influence a person in certain planned ways.

Designers have assumed more or less without question that they can predetermine the path that the eye takes when looking at a page in a book, a picture, or a display arrangement. Artists of other centuries as well as artists of today have planned most carefully so that the lines in their work would lead the eyes of the spectator in a planned pattern.

In 1935, G. T. Buswell carried out an experiment to test this previously accepted hypothesis.* By carefully recording the points in pictures on which the eye rested for a moment and by keeping track of the sequence of the eye movements, he found that most people looked at pictures by fixing their eyes successively on several points but that they followed no particular pattern at all. If the person were asked to keep looking at the picture for a longer time, the pattern of the eye fixations might follow somewhat the designed lines of the picture, but not necessarily in any determined sequence.

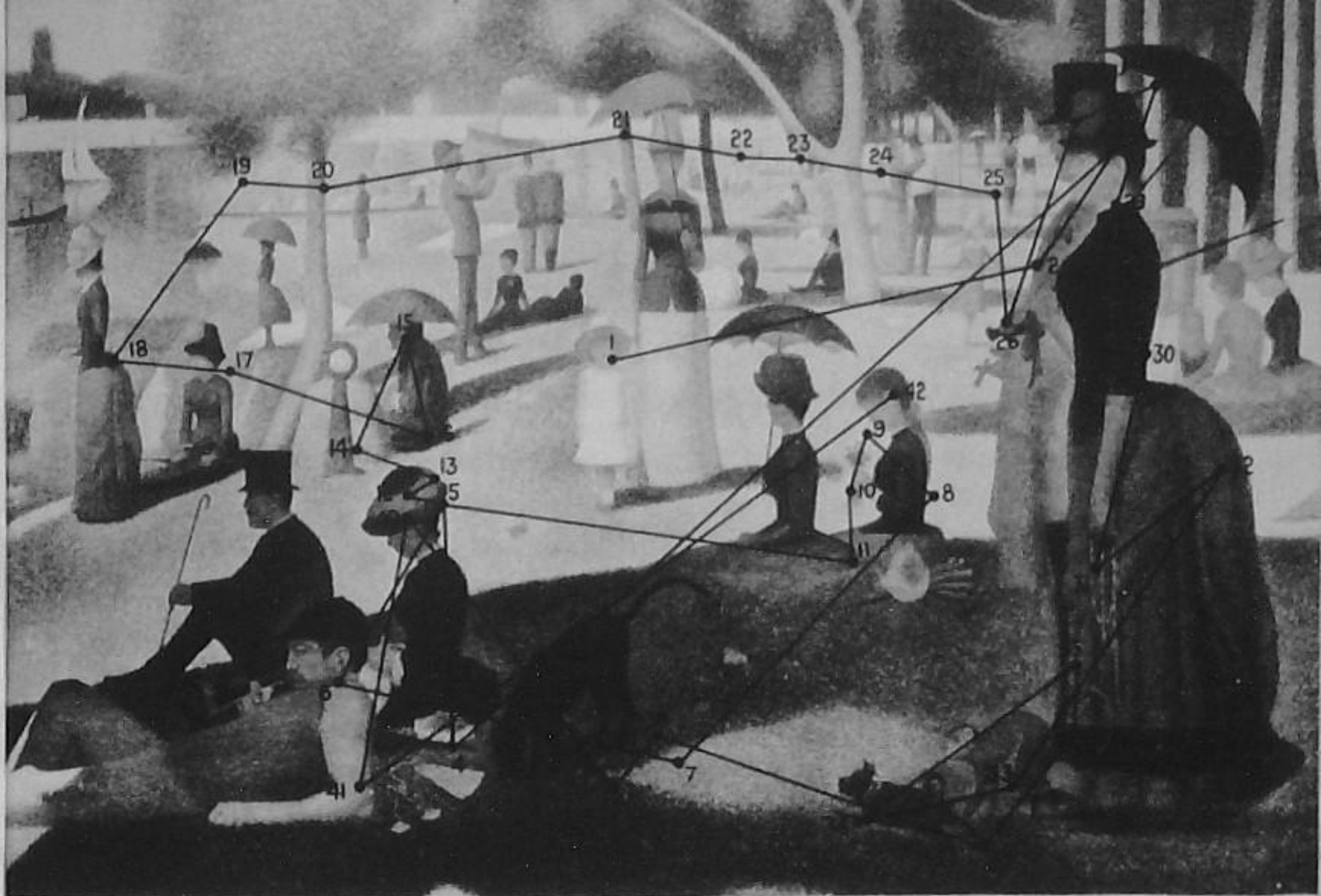
This study certainly seems to negate the validity of our hypothesis. But Buswell's study was concerned with the points on the picture at which the eyes stopped for a moment. He could not know what was going on in the minds of the viewers. Perhaps the eyes need concentrate for only a moment on a point on a line in order for the person to grasp the direction of that line and its meaning and relationship to the design. If Buswell's findings are true for the movements of the eyes, that does not mean that the person comprehends only the exact points at which the eyes look.

In 1947, Hoyt L. Sherman published the results of his experimental study of a new way of teaching drawing.† He provided each student with drawing board, paper, and charcoal pencil. He then turned out all the lights and, after the students were accustomed to the complete darkness, a quick flash of light illuminated an abstract shape on a screen. Again in the complete darkness, the students were asked to draw what they had seen. Surprisingly, they could. Without light, drawing completely from the memory they had of that quick vision, they could reproduce that abstract shape with some degree of accuracy. The same method was used for drawing progressively more detailed shapes and forms, and eventually the students were drawing faces and figures in the dark, too.

Sherman called his method "drawing by seeing." The darkness sup-

*G. T. Buswell, *How People Look at Pictures*, University of Chicago Press, 1935, p. 198.

†Hoyt L. Sherman, *Drawing by Seeing: A New Development in the Teaching of the Visual Arts through the Training of Perception*, Hinds, Hayden and Eldredge, Inc., 1947, p. 77.



One person looked at Seurat's "Summer Sunday on the Grande Jatte" in this way: First he looked almost in the center of the picture, then moved his attention to the head of the woman in the right foreground. By following the numbers, you can trace the pattern of perception during a 40-second examination. Each person who looks at the picture will have a different pattern of perception, some following the artist's design pattern fairly closely, and others not at all.

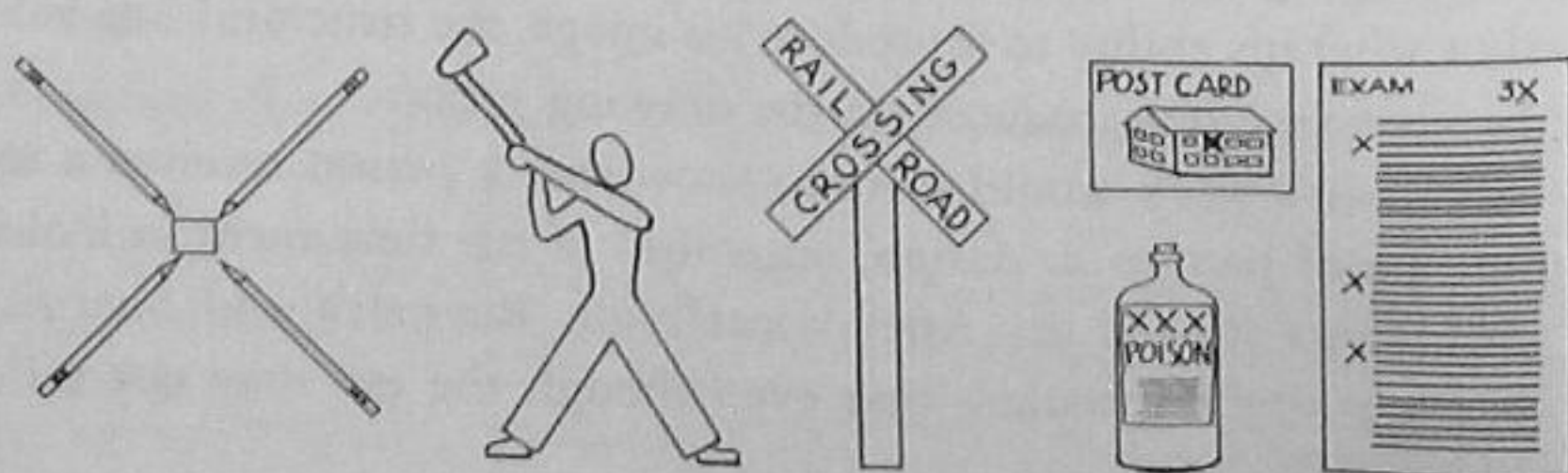
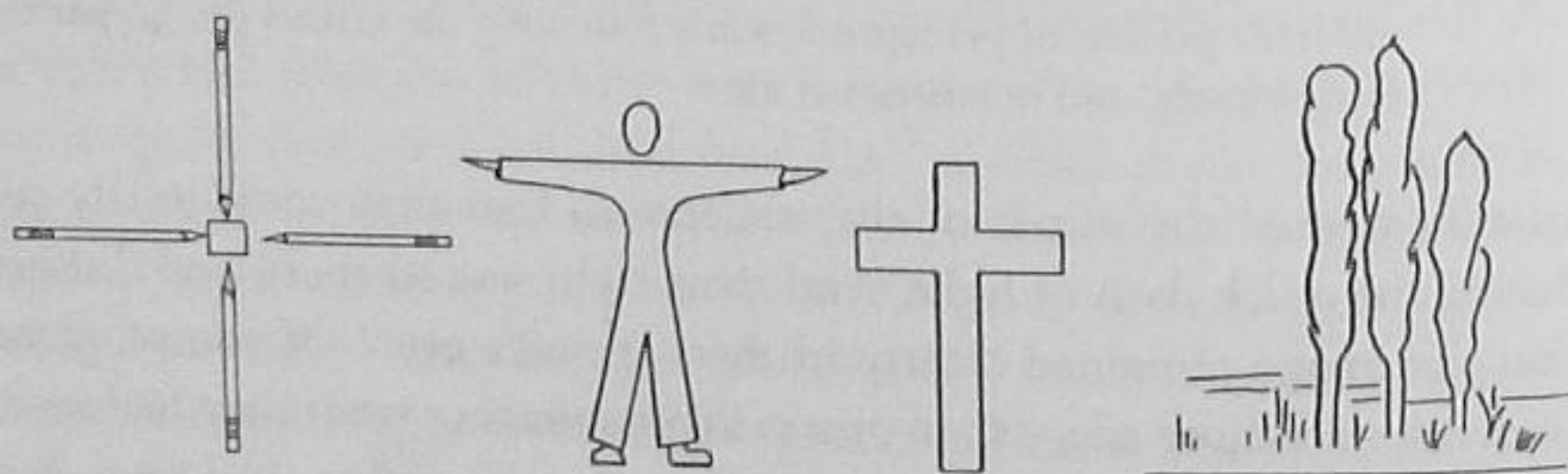
posedly cleared the minds of the students so that they could really see during the quick flash of light. And their sight was so sharp and distinct that the image remained clearly in their "mind's eye." Of course, some students were more adept than others in reproducing what they had seen, and some students did not seem to see exactly what others had seen. But the structure of the object seen in the flash of light was always reproduced in recognizable fashion. No matter what details the student noticed or what his ability to reproduce his image, the structural line values of the vision were reproduced on the drawing paper.

Sherman's work would seem to show that a person receives a total impression of pattern or design, regardless of the time spent in looking or the points looked at. After considering Buswell's and Sherman's studies, we might speculate that even though the eye may not follow

exactly along the lines of the design, these lines are nevertheless effective and they do help to determine the impression that is made by the design. If we accept this hypothesis and agree with most artists, we can say that designed display can show relationships and differences and can help the viewers to understand the display.

How can we use line? Let us see now what we can do with line. Pretend that your desk blotter is the two-dimensional display area, and use pencils to form lines. If you take four pencils and try to arrange them so that they point out an eraser, you probably will arrange them in a cross, all pointing at the eraser in the center. Is your cross placed parallel to the sides, top, and bottom of the desk blotter? Or is it placed diagonally? Both arrangements are shown below. Which cross shows more solidity and dignity? Which shows more action?

The **+** cross we use as a symbol of the crucifixion. Almost every culture uses it in one way or another, perhaps because it symbolizes man with outstretched arms, trees with outstretched branches. It represents the vertical height of growing things and the horizontal line of rest and of the earth itself, from which comes all life. Whether or not they form a cross, these horizontal and vertical lines are symbols of dignity, formality, order, permanence. When you use them in a design,



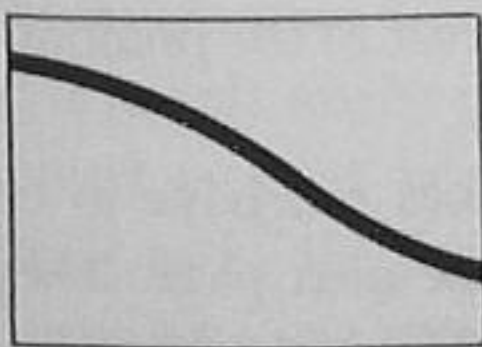
you are also repeating the structural lines of the display boundaries and giving strength to your display.

The diagonally placed cross, on the other hand, we use in quite a different way. It may symbolize something crossed out, not to be used, a wrong answer. Or it may be used to draw attention to a certain place for some reason. "X marks the spot," we say. The stop-look-and-listen sign at the railroad crossing uses the diagonal cross in this way. Each time, the diagonal cross has been used to show some kind of action. "X, don't pay any attention to this." "X, don't use this." "X, you did this wrong." "X, stop and think." "X, look here, this is the place."

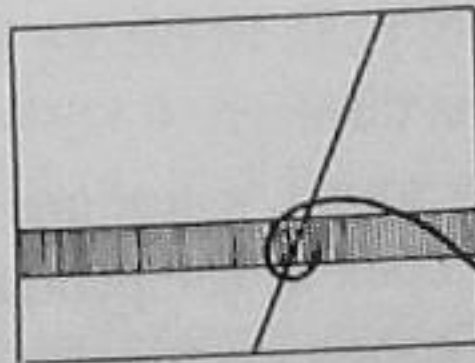
Perhaps we first perceived this symbol for action by watching a man's legs as he ran or as he took a firm stand for wielding an ax or drawing back his bow string. At any rate, in our minds these diagonal lines have come to stand for action. They contrast with the structural lines of nature, and of the display boundaries, and so call attention to themselves. If you wanted to show the flight of a comet, the line of the trailing fire would be diagonal to show speed, action. The diagonal line would show how the comet contrasted with the stability of ordinary life.

One other kind of line helps us explain our ideas—the curved line. It also expresses a sort of movement—not the sharp action of the diagonal, but rather the grace of rippling water, the curves of the human figure, the rhythm of the waltz, or perhaps the tortuous complications of tangled vines.

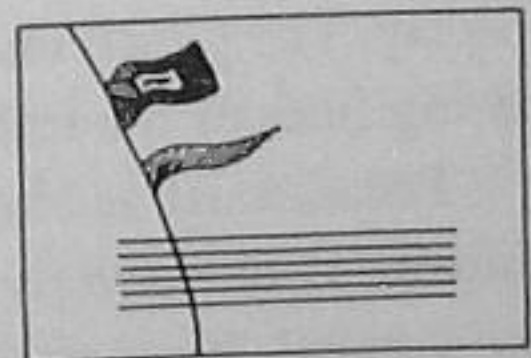
How can we use these different kinds of lines in making designs? If they are to have meaning, they have to go together. It is easy to see that if a vertical line adds strength to our design, then two parallel vertical lines will seem even stronger. Similar lines tend to reinforce one another.



Here your eye follows the line and you are led to **this point.**

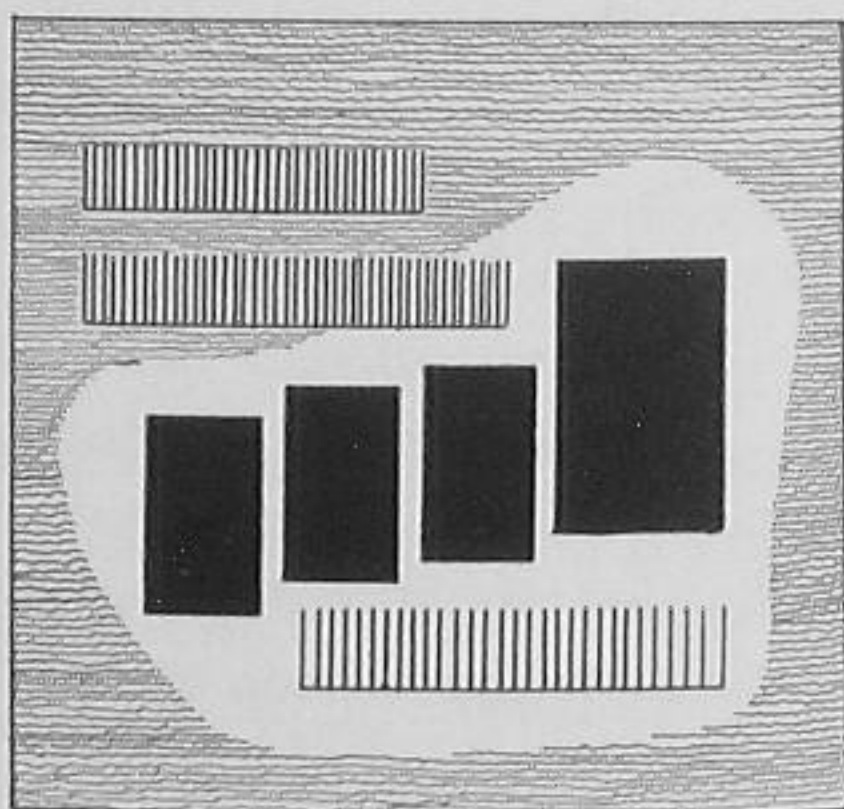
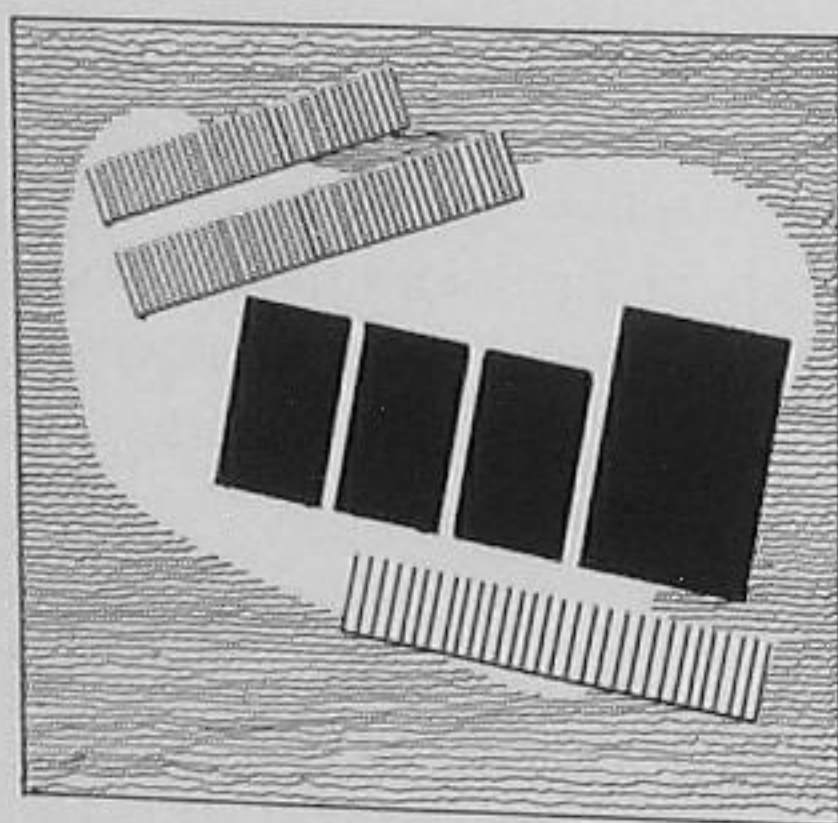


Here your eye spends most of its time examining **this area.**



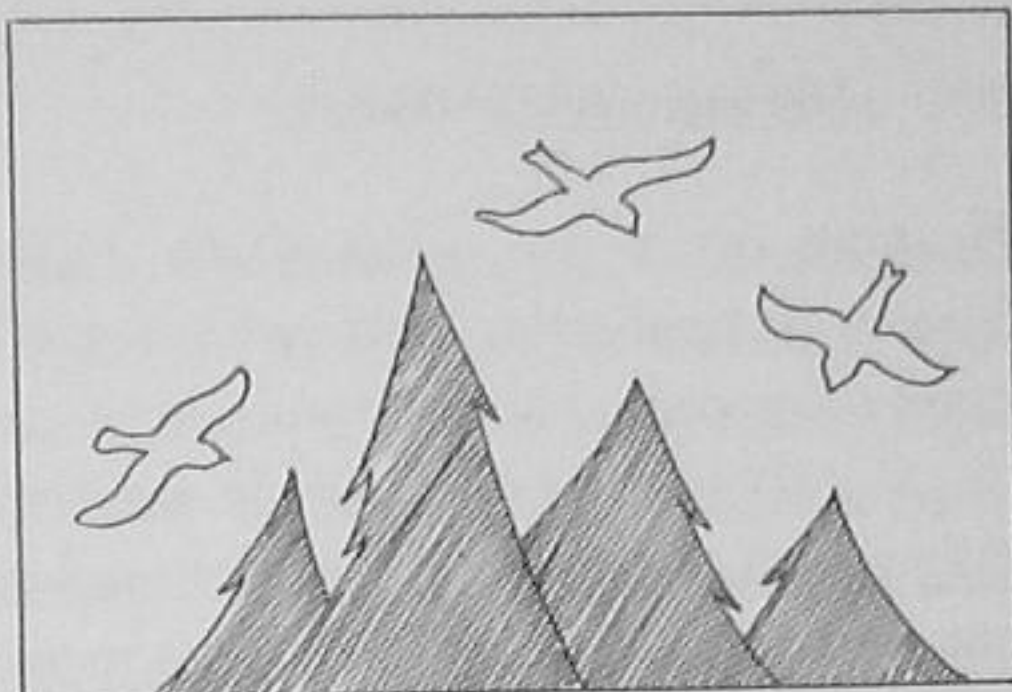
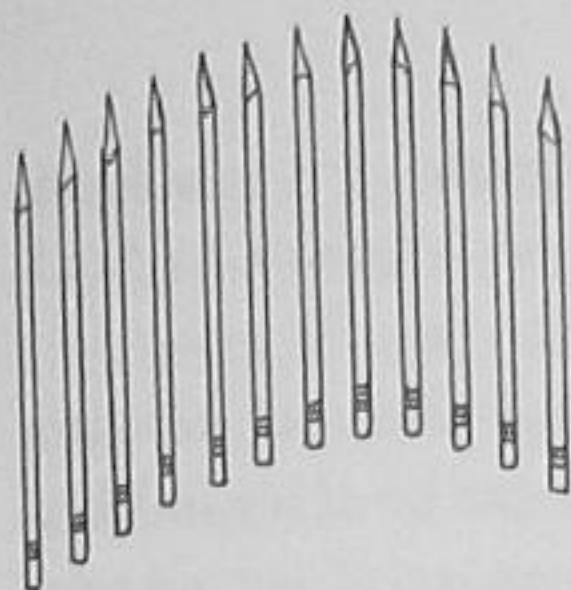
Your eye is attracted by the unusual shapes, but the line leads it into the copy.

It is also easy to see that contrasting lines will attract more attention and stimulate a greater feeling of action. Since that is precisely what we are seeking in display work, we shall try to use plenty of diagonal lines and curves. However, too many contrasting lines are confusing, and we want to avoid a chaotic effect. Our display has an important point to make. So we shall use diagonals and curves to attract attention and to lead the eye, but we shall still use the horizontals and verticals to show structure and stability.



Your eye is likely to grasp the direction of a line even if it does not follow it exactly. Lines which are planned to direct the way we see, we call "leading lines." But when there is a point of interest along a leading line, of course we stop being "led" and look at the point. When two leading lines cross, there is a visual center of interest. If these points are likely to get the most attention, these are the places to put the things to which we want to draw attention. The picture that is to stand out can be placed at the one change in line direction in an otherwise unified display. The punch line of copy can be placed in contrast to the predominating lines of the rest of the display.

Paradoxical as this may sound, a leading line does not have to be present to be strongly felt. Look at the pencils on the next page. They are vertical, yet they give a strong diagonal feeling. There is an "understood" diagonal line there. Look at the fluttering birds. Because they are very much alike, we tend to look from one to the other and our eye describes an irregular curve.



And in planning for the path you want eyes to take through your display, don't forget that we habitually read from left to right and the eye already is being led for you when you put copy in the display. Use the copy not only to say what you want to say but to help guide people through your design. Put the copy on a curve, on a slant, on the horizontal. Don't interfere with its readability, but use the copy to guide the eye.

COLOR

Color has great power to attract the attention and interest of most people. It is especially valuable for this purpose when it contrasts with black and white. When the first full-page color advertisement appeared in the *Saturday Evening Post* in 1899, it was truly remarkable in attention-getting power. But lately tests show that color in advertising does not seem to have as much power, perhaps because there is so much more color in the advertisements these days. Still, these tests do show that color seems to attract initial attention better than black and white, and that people seem to remember a thing better if it has been pictured in color. The particular power of color seems to lie in its ability to represent objects, scenes, and people with fidelity and in its ability to suggest such abstract ideas as warmth, cheer, coolness, and loyalty.

Likes and dislikes in color. What is your favorite color? Psychologists have studied the problems of color preferences, on the theory that people might find it easier to remember things that had been represented in their favorite colors, and they found that blue and red are likely to be the first choices of most people. Orange and green are preferred by some people, but yellow is rather far down on the list of color favorites for almost all the people tested.

These studies have shown that children seem to notice colors more quickly than adults and are likely to prefer the brighter colors and com-

binations of intense colors. Older children and adults are less spontaneous in their color reactions and are likely to prefer more sophisticated color combinations.

Since we know that people are very likely to remember pleasant rather than unpleasant sensations, and unpleasant rather than indifferent sensations, we may well be able to affect the memory of our viewers by the use of certain colors and combinations of colors. Bright blue letters may proclaim your story. Red and blue against a white background is a popular combination for cereal packages and it is easy to see why. Yet, if yellow is rather a disliked color, it might be a good idea to use some of it, too. We are aiming not to please but to teach. A slight visual shock of yellow may help.

Combinations of colors. When we plan the colors for our clothes, we think about flattering our skin and eyes and hair. But in display work, we want to attract attention and hold it. Our colors must not be quiet, nor can our combinations be too quiet. They have to shout, or, rather, sing.

Singing combinations are likely to come from opposite sides of the color wheel: bright red and blue-green, blue-purple and yellow, purple and lime green. You don't want this singing to be too raucous, so you subordinate one of these colors, either by dulling it a bit or by using a smaller area of it. But you let it be just a bit irritating. See how these directly opposite colors seem to flicker as you look at them? A bit of flicker is good for your display; it will attract attention.

Colors direct the eye. A color repeated in different parts of a display tends to show a relationship among those parts. A brilliant cerise used only twice in one design will make those two points seem related to each other and the eye will tend to go back and forth between them. A bright green that is next to a slightly grayed green that, in turn, is next to a grayer tone of green gives a feeling of relationship among the colors that carries the eye along. Such a color plan might also show a relationship between the ideas that are presented in the three similar colors.

TEXTURE

Texture is another of the tools that you can use to make your displays more interesting. Texture is usually thought of as a difference that is

noticed through the sensitive touch of your fingers. Or perhaps you refer to the differences between the smooth feel of ice cream and the crunchy freshness of celery as a difference in texture. Your eyes are also conscious of textures. You can see the softness of wool flannel trousers and the firm stiffness of blue jeans. The surface markings of a frieze broadloom rug do much to show its difference from a Wilton rug. The surface peculiarities of things help to make it easy for the eye to grasp essential differences and similarities and so act as a tool for us to use in working out our display designs.

This is one of the ways in which we can use texture—to help the eye of the spectator find its way around the design. Repeating a certain texture within the design can show that the two ideas are similar and are to be compared. And, like a repetition of shape or color or line, use of the same textures here and there in the design tends to lead the eye from one spot to another.

How can you use textures to “underline” your ideas? Probably the most important reason for using textures in your display is to get a feeling of three dimensions, of reality. Unusual or unexpected textures keep the eyes busy. And you want to get people entangled in your display—just enough entangled so they want to look longer and learn more.

These differently textured materials can be used in many ways:

For surfaces

corrugated cardboard
newsprint
oatmeal paper
candy wrappers
aluminum foil
doilies
waxed paper
sandpaper
tissue paper
parchment
cellophane
quilted padding
cloth, many kinds
wire screening
onion sacking

For lines

yarns
ribbons
tape measure
rubber bands
copper wire
baling wire
electric wire
conduit
chains
thread
pipe cleaners

Other materials

steel wool
sand
leaves
sea shells
moss
fur
sawdust
seeds
pine needles
mirrors
absorbent cotton

Even without using actual materials with their own characteristic textures, you can give the feeling of texture by means of ordinary paper and paint. An old toothbrush and a bit of wire screening can spatter around a design or fill in stencil patterns. The air brush does the same kind of thing, making tiny little dots that form smooth tonal gradations and show contours. Patterned background gives a feeling of texture. (Remember the tennis net of Cassandre's poster?) Checkered or dotted or striped backgrounds might set off plain, smooth shapes.

The pictures you include in your display can introduce a very real feeling of texture. You may not be able to have real water, but you can have it in a photograph of the splashing, foaming surge of flood tide. A photograph of a day's catch of rainbow trout can show the silvery scales that glimmer over the colored skin. A reproduction of a Degas painting can show the fluffy delicacy of dancers' skirts.

PUT THE TOOLS TO WORK

The power of planned design is very subtle. It influences the spectator without announcing itself. Have you painted the top and bottom steps of your cellar stairs white, as the National Safety Council suggests? This device helps to prevent dangerous falls, not because you stop each time you start down the stairs and say, "Oh yes, the white step means watch out." You don't consciously see the white step at all. But "subconsciously" you do. It helps you even though you don't use top-level concentration on it.

Of course, each person who sees your display will come to it with a different set of interests and problems, and each one will read into it something different. And you can't be sure just how each person will look at the display. But you can plan your subtle approach, your design, so that the simplicity of the plan is apparent, so that it is easy to follow along from point to point and to come to the conclusions that you have planned.

You can use the tools of space, size and shape, line, color, and texture to make your designs as effective as possible.

The first time you ever ate an olive you appraised it by comparing it with other things you already knew. It was the same shape and size as a large grape. But it was a shiny black, not green or blue-violet. As you bit into it, you found that it had a large center seed, not at all like a grape, more like a peach. The texture of the flesh was firmer and tougher than the peach, though, and its color was brown, not golden orange. And it certainly didn't taste like a peach—or a grape, either. By noticing its similarities to and differences from other fruits that you already knew, you learned about an olive. Size, shape, color, and texture all helped describe it. When you plan the designs for display, you use these same elements as tools to help you make the ideas clear to the spectators.

Size, shape, color, and texture can serve two functions: (1) The viewer can be helped to see a similarity between one thing and another so that he may more easily follow through the pattern of the display and grasp the meanings of the ideas presented in their logical order. (2) The viewer can be helped to see differences among the elements used so that he will be able more easily to separate and remember the ideas. He needs to see how things are related and alike, and also how they are separate and different.

Artists who work with these visual tools all the time have developed a language to explain their use. And sometimes we laymen get confused

between "balance" and "symmetry" and "dominance" and "rhythm," to mention only a few of the artists' terms. If we can define the principles we use according to the ways in which we use them, we may be able to understand their meanings and to make these principles a basis for future work with design.

Let us go back to our purpose of pointing out differences and similarities in order to help people to understand the ideas we are trying to show in our displays. Get your pencil or chalk again and we shall see, first, how we can use that versatile tool, line, to help us show how things are alike.

SHOW SIMILARITIES THROUGH REPETITION

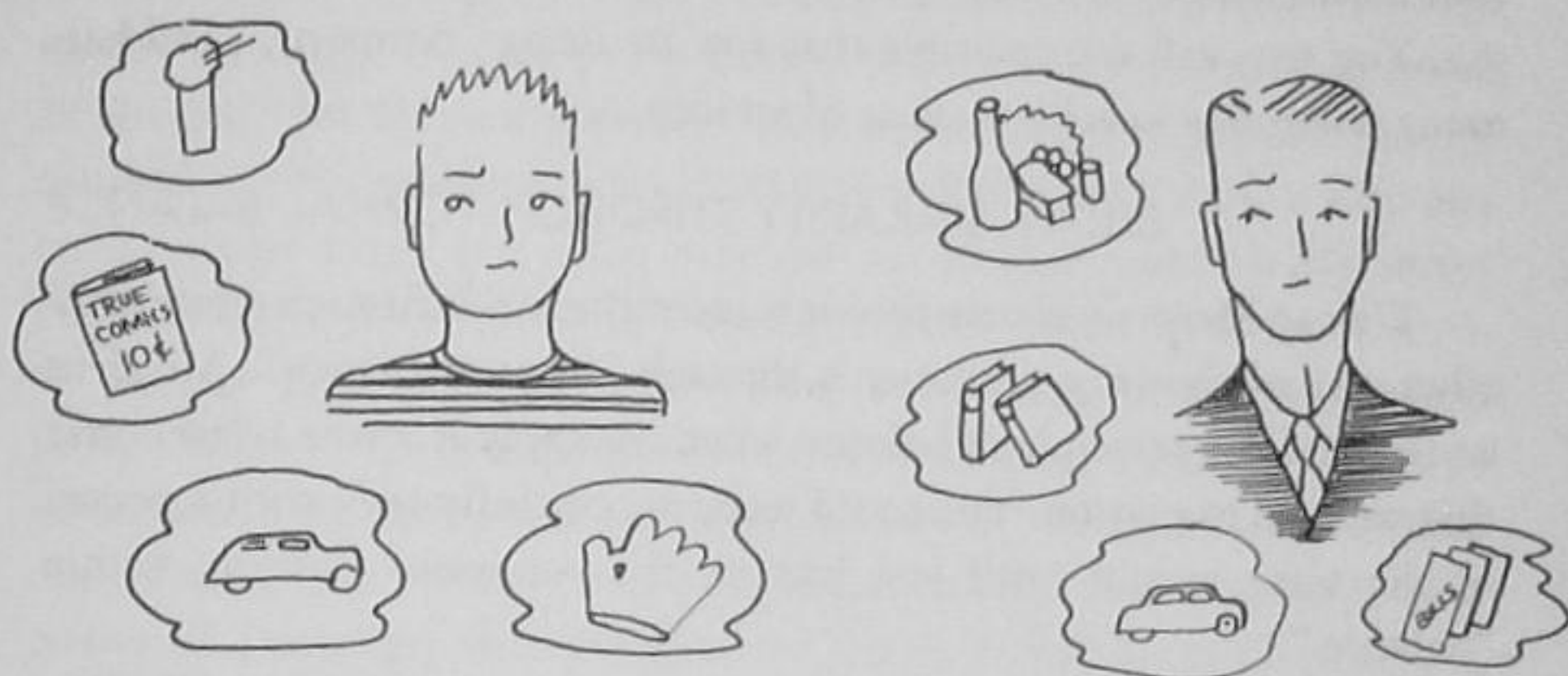
If you draw a square on a piece of paper and you want to show how it is like another square, the easiest way will be to draw another square just like it. When one is exactly like another, their similarities are easy to see. This is the principle of "repetition." It operates in many ways in our lives.

Uniformed men seem to be all alike because of the repetition of the color and line of the uniforms. As we think about it, we know that any one soldier in a parade is not like any other, but their uniforms are apt to make us see them as all alike. The repetition of the sounds of the drum and the sight of the lines of marching men, all in step, reinforce this feeling of sameness.

Regularity, rhythm, repetition, all can produce this effect. If you draw six small circles on your paper, they will seem to be all alike, even though you know that you have not made six true circles. Repetition tends to minimize the differences and to emphasize the similarities.

If you want to show how a problem of children's finance is comparable to a more difficult problem of adult finance, you will repeat some elements that you have used for the description of the two cases. The illustration could be a chalkboard drawing. Or by cutting the dream pictures from magazines and combining them with the lettering and the cartoons, the idea could be used on the bulletin board. In either case, the repetition of the faces with the same expressions and in the same posi-

HOW SHALL I SPEND MY INCOME ?



A PROBLEM EVERYONE SHARES —

tions in the display and the repeated wishes of each person help to show that the problems are very much alike.

SHOW SIMILARITY THROUGH UNITY

Another principle that artists talk about is "unity"—that is, the state of being consistent or alike or together.

The display idea of the boy and the man, each with the same problem of spending his income, shows unity in that the ideas presented easily group themselves together. The use of the same kinds of lines and the same grouping of shapes has also helped to unify the drawing.

Materials, too, can show unity. If the head of the boy had been cut from a newspaper picture and the head of the man were cartooned as it is here, if the dream idea of the ice cream soda were drawn in simple lines, the toy auto were intricately and precisely pictured, the real car were shown by a photograph, and the comic book were a real one actually hung on the wall, you can see that the unity would be lost. The idea behind the display would be the same, yet its clarity would be jeopardized because the materials lacked unity.

You work with the same principle of unity every time you choose the clothes you will wear together. You don't plan to wear sneakers with

your business suit. You don't plan to wear a satin blouse with a corduroy suit. You may call the principle that you are using "harmony," and harmony is one way to achieve unity of an idea.

SHOW SIMILARITY THROUGH FORMAL BALANCE

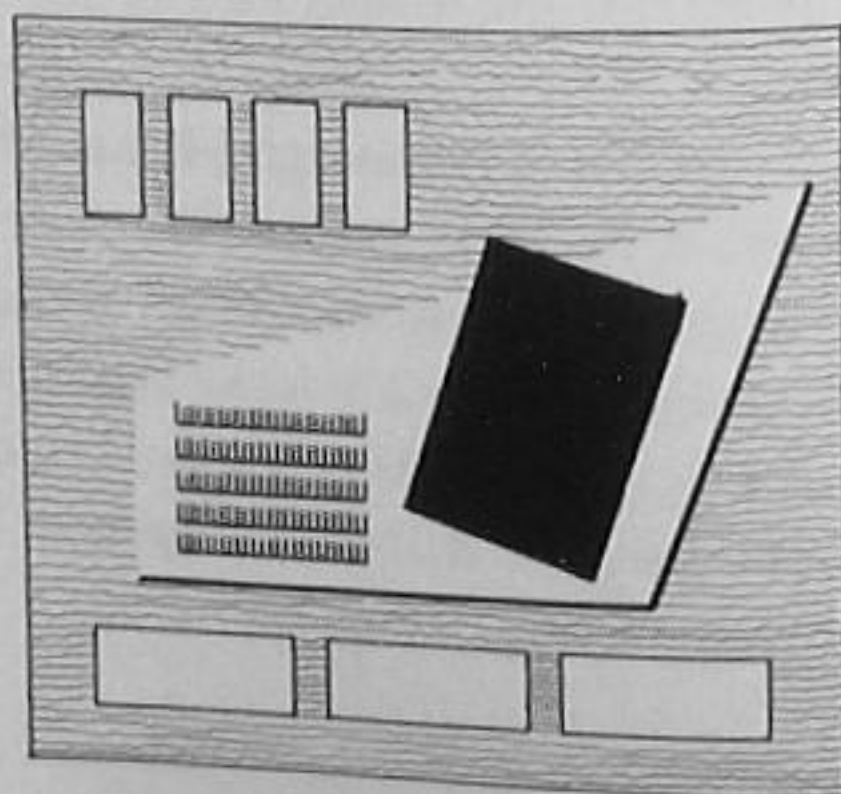
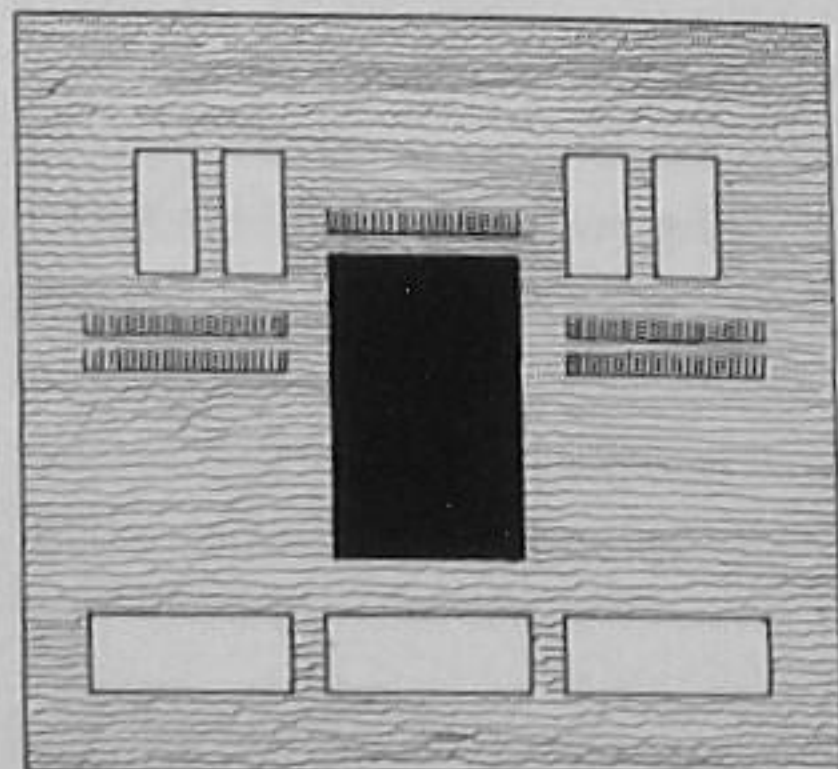
We can show similarity through repetition and through unity. Another way of showing similarity is through "formal balance." All of us understand the principle of balance when we apply it to the teeter-totter that we used to play on. You could teeter successfully only with a person of the same weight until you learned the variations possible within "balance."

Our displays use the same principle. Formal balance is achieved when two sides of an arrangement are similar. A perfect square is an example of perfect balance; it is symmetrical on all sides. This perfect balance and symmetry is easy to understand. It makes things look alike. Our eyes can see it quickly and easily; formal balance seems orderly and strong.

SHOW DIFFERENCES THROUGH INFORMAL BALANCE

Some artists have defined esthetic satisfaction as the feeling of pleasure we get from exploring and questioning as we see a design, adjusting the parts and pieces in our minds until at last we have the answer to the puzzle—the order and unity and simplicity that is there waiting for us to find it. The more complicated this puzzle, the greater the esthetic pleasure we feel when we have at last mastered it.

Formal and informal balance in use.



That is why many artists use informal balance. Formal balance sometimes seems dull. It gives us too simple and obvious an answer. It offers us but little intellectual pleasure, because the puzzle is already worked out and there is nothing more to consider. Artists may show a tiny girl on the teeter-totter, but often they tell her to play with her big sister, and they move the bigger girl toward the center until the sisters balance.

All the tools of design can be used to work out the principle of informal balance. Large expanses of empty space carry a certain weight of their own in attracting our attention and so can "balance" with smaller objects. One large, rather simple shape can balance the attention-getting power of a smaller, more complicated shape. Bright spots of color can be quite small and still balance with larger spots of duller, paler colors because the brightness will weigh more heavily in its power to attract the eye. Very rough textures, or unusual surface treatments, can call attention more effectively than smoother, more common surfaces, and this power can be used to help balance the arrangement.

You can give your audience a pleasant esthetic exercise by using informal, off-center balance. Still, your primary purpose is not to provide esthetic pleasure but to help people to learn. You use off-center balance because you know that it attracts more attention and interest than the static dullness of formal balance.

Informal balance works, however, only with simple ideas and simple designs. If a display is already complicated and somewhat difficult to understand, the further exercise of finding the answer to the puzzle of informal balance will bewilder your audience. Keeping the ideas and the presentation simple is always the best practice, but if a complicated presentation is unavoidable, you ought to help your audience by using formal balance.

SHOW DIFFERENCES THROUGH CONTRAST

The olive with which we became acquainted by careful examination was different from a peach because it differed in color, size, and texture. It illustrated another of the principles of art—"contrast." Sometimes artists refer to "emphasis" or "dominance," but each of these depends on contrast for its effect.



KEEP

WELL INFORMED

the news intelligently

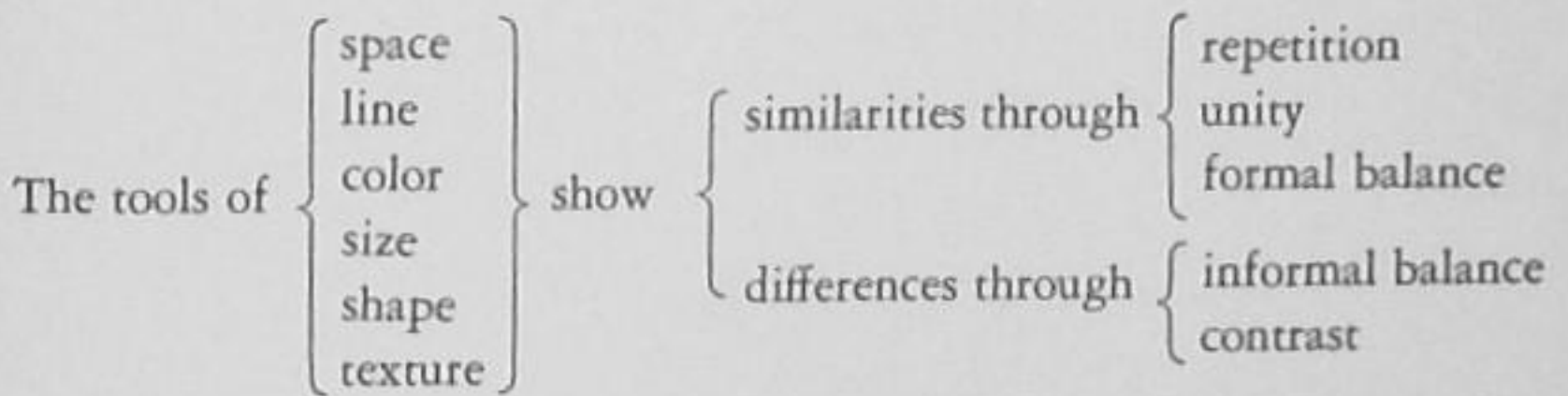
learn to read

READ
KEEPING UP WITH THE NEWS
BY PER G. STENSLAND
AND LARRY DENNIS



Spaces and forms that are alike seem to belong together, and their similarities make the eye view them as a group. Twelve children, all eight years old, sitting in a classroom, may seem to be all alike because they are about the same size and wear about the same kinds of clothes. But if one of them suddenly throws a wad of paper at you that hits you with some force, he is no longer, in your eyes, a member of the group. He has achieved individuality.

You can do the same kind of thing when you plan a display. The idea that you want to emphasize must be different from the rest of the display. It must contrast in order to emphasize itself. Space, shape, size, color, texture, all these can help in creating emphasis. A bright glass of orange juice will contrast with a dark blue napkin on a breakfast tray. The irregular shape of an ink blot will contrast with the straight edges of a piece of paper. The tiny hand of a baby will contrast with the hand of its father in both size and texture.



Here is a diagrammatic representation of what we have been saying about the tools and rules of design. You can use them to help people to learn from display. Look at this example. Can you see how each of these tools has been used?

PART 4

MEDIUMS *for Display*

11 • Duplicating Processes

In Part Two of this book we considered some of the individual items that make up displays. And in Part Three we discussed ways of arranging these various materials so that they could be most effective. Now we shall deal with some of the ways of bringing together these isolated items to form complete displays.

Just as the stage, the motion picture, and the radio are different mediums for drama, so there are several mediums for display. Each has certain innate characteristics which fit it for specific uses and which also limit the variety of materials it can present to the viewer. The duplicated page is such a medium. It is restricted to the display of words and drawings. But it can do an effective job of showing these to many people at the same time.

When you need to reach many people at the same time, there are several possibilities open to you. If you can distribute a set of textbooks, your problem may be solved. Perhaps you have a printing press at your disposal or can afford the cost of such publication. If you need only four or five copies, carbon paper can help you. With a small group you may be able to use a large chart or picture, or you may be able to draw on the chalkboard for all to see. But many times none of these suggestions can help you. You need to make a number of copies of something quickly and inexpensively.

Within your classroom, you can, by means of the mimeograph and

the hectograph, place in each person's hands such study materials as outline maps, summaries of reports, study guides, and samples of standard work. Questionnaires, attitude scales, problems for discussion, examination questions, and other evaluation devices can be duplicated to help you and your students.

When you want to reach people outside your own group, duplication processes are equally helpful. Notices, invitations, requests for assistance, interpretations of school policies, and other such messages to parents and the public can be prepared easily by duplication. Greeting cards that you make yourself with a silk screen can carry a personal message to your friends.

Many schools, churches, and other organizations publish newspapers, magazines, and yearbooks by means of these simple duplicating processes. It is possible for the members not only to take charge of the editorial work but actually to prepare the pages and the covers and to assemble each publication right through to the final staple.

When a group is sponsoring some event of interest to the community, duplication can be used to prepare posters and similar advertising materials. Tickets to special events, as well as the programs for the school play, the church social, the carnival, or the talent show can be prepared through these simple, inexpensive processes.

Often you need to reproduce a supply of material for repeated use. Forms for the office, for attendance, for your film-evaluation records, rifle targets, patterned pages for sewing-machine practice are examples. The school motto or symbol can be reproduced by silk screen on felt pennants or on T shirts or arm bands.

TYPES OF DUPLICATING PROCESSES

To be useful to you, a duplicating process must require no very expensive equipment. It must be simple, and it must produce acceptable results. There are four processes that fulfill these requirements: the gelatin-hectograph method, the fluid-hectograph method, the mimeograph method, and the silk-screen stencil method. Each has certain characteristics that can help you choose which to use for your purpose. The following table lists some of these characteristics.

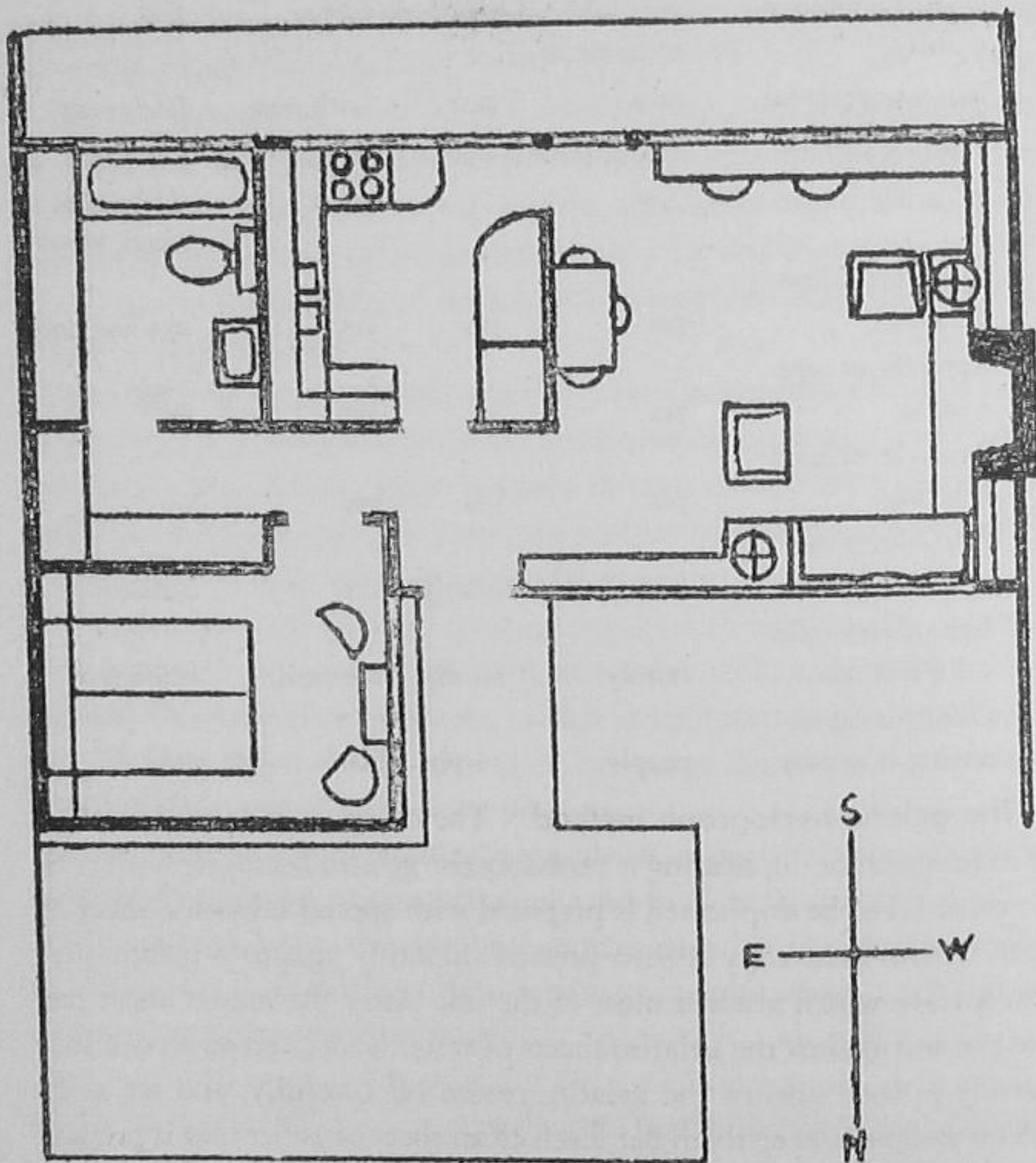
	<i>Gelatin</i>	<i>Fluid</i>	<i>Mimeograph</i>	<i>Silk Screen</i>
Maximum number of copies (approximate)	50	250	5000	500
Cost of equipment	very low to medium	medium	higher	low
Ease of operation	easy	easy	fairly easy	fairly easy
Printing surface	firm-surfaced paper		soft-surfaced paper	any paper, cloth, glass, metal, wood
Reproduces line drawings	yes	yes	yes	not fine lines
Reproduces type-writing	yes	yes	yes	no
Reproduces hand lettering	yes	yes	yes	yes
Reproduces two or more colors	faintly	faintly	yes	brilliantly
Reproduces solid-color sections	faintly	faintly	not easily	brilliantly
Color for reproducing is usually	purple	purple	black	any

The gelatin-hectograph method. The cheapest and simplest of all the techniques for duplicating is probably the gelatin-hectograph process. The material to be duplicated is prepared with special inks on a sheet of paper. This master copy is then pressed smoothly against a gelatin-glycerin surface which absorbs most of the ink. After the master sheet has been pressed against the gelatin, sheets of smooth-surfaced paper are successively pressed against the gelatin, peeled off carefully, and set aside under a weight to keep them flat. Each clean sheet of paper that is pressed against the gelatin surface will absorb some of the ink from the gelatin.

The simplicity of this process is reinforced by the fact that you can buy the hectograph compound from national mail-order houses and use it in an ordinary baking pan or cooky sheet. A pound of the compound costs about a dollar and can be used for several years. It is melted over hot water and then poured into the clean pan and allowed to harden overnight before it is used.

FOR: a working couple
an average city lot

CONSTRUCTION: concrete slab with asphalt tile
slab extended to form carport and terrace



exterior walls of concrete blocks
almost flat roof covering whole slab

SIZE: 660 sq. ft. enclosed space
1155 sq. ft. slab and roof

Both typewriting and hand lettering can be duplicated on the hectograph.

There are several ways of applying the special ink to the master copy. Special pencils and inks of several colors can be used to draw lines, pictures, lettering, and so forth directly on the master sheet. Or, with a special ribbon on the typewriter, you can type your material on the master copy. If you prefer, you may use a special carbon paper, drawing and typing with it in the same position as for any carbon copy. For good clear lines, firm pressure of a pencil is important, and typing without a ribbon (as for a stencil) is necessary in order to produce sharply defined letters. Black, blue, green, red, and purple carbon papers are available, but the purple seems to produce the clearest copies.

Erasures on the master copy may be made if you are careful to remove as much ink as possible and then correct the mistake with a new clear inking. If extensive corrections or deletions are necessary, you can even cut out with a razor the incorrect portion of the master copy and splice in a new piece with paste or cellulose tape and then redraw your copy. As you work with this process, you will discover for yourself many helpful tricks.

To remove the master impression from the gelatin, hold the pan under lukewarm running water and rub the gelatin surface gently with a soft cloth. Do not use hot water, for it will melt off too much of the surface gelatin. This home-made hectograph is very simple to prepare and use, and its low cost makes it an important device to know about.

Many organizations have a hectograph machine that is even simpler to operate. (One of the trade names is Ditto.) Here the gelatin surface may be a cloth-backed gelatin pad or a gelatin-covered roll that picks up the special ink of the master copy. Although it involves a greater initial expense than a home-made hectograph, this machine is easier to feed paper into, and it produces uniform, properly aligned copies more consistently.

There are drawbacks to the gelatin-hectograph method. Only a few copies can be made from each master copy—on the home-made hectograph, perhaps not more than 25; on the hectograph machines, probably not more than 50. The copies eventually fade, so that if you want the material to last for years, you had better investigate the mimeograph process. Another handicap is that the purple ink stains the hands and

clothing and is generally messy unless you are very careful to be neat. Since the ink is soluble in alcohol, however, stains need not be permanent. There are excellent soaps and cleansing creams sold by the manufacturers of the carbon paper to remove the ink from the hands.

The fluid-hectograph process. As in the gelatin process, the fluid-hectograph method of duplication employs special carbon paper. In this method, however, a reverse copy is prepared, a mirror image of the message desired, by using the carbon paper face up so that the copy appears on the back of the paper on which you write, draw, or type. Be sure to maintain firm, uniform pressure with your pencil or typewriter, and do not type through the ribbon. Distinct lines of carbon ink are important for clear copies.

The master copy is fastened on a machine equipped with a tank of special fluid, mostly alcohol. The fluid moistens a cloth "wick" which extends across the machine and dampens each piece of paper that is fed into the machine. As the damp paper comes in contact with the master copy, it picks up some dye from the master copy.

A special machine is needed for this method of duplication but, after this initial expense, supplies are not costly. The fluid-hectograph process is easy to use and produces somewhat clearer results than the gelatin method. More copies can be made from one master, and the master may be saved for reuse if desired. But the disadvantages of fading copies and staining ink which prevail in the gelatin process are still present.

The mimeograph method. Until recently, the word *mimeograph* was the brand name owned by one company which sells the machinery and supplies for this duplicating process. There are several sources of these materials, and now the name *mimeograph* may correctly be used to designate the process, no matter who produces the materials. The term *wax-stencil method* has been used for the process, too, since the stencil is a key piece of equipment. The stencil in this process is not really made of wax; it is a very thin tissue webbing impregnated with a wax-gelatin substance. When a mark is made on the stencil either by drawing or by typing, the wax at that spot is pushed aside, allowing ink to seep through the thin basic tissue when the stencil is placed against an inked

cloth pad. The stencil is then pressed against the paper which is to receive the copy. This "pressing" is regulated by the duplicating machinery.

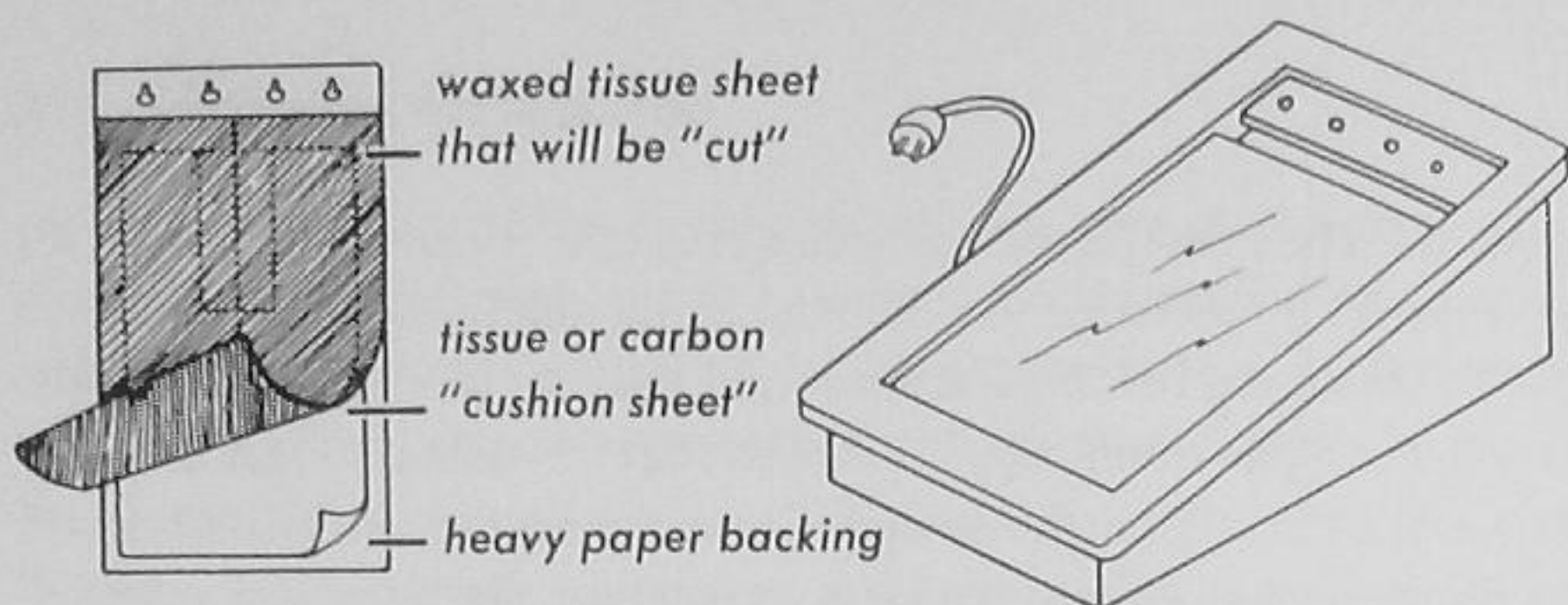
To obtain the best results, great care must be taken in preparing the stencil. For typewritten copy, be sure to shift the ribbon so that the letter keys strike directly on the stencil. Clean the keys carefully with a stiff brush before you begin to type and, as you type, clean the keys occasionally, giving especial attention to such closely detailed letters as the *a*, *e*, *m*, *w*, *s*, and *g*. Strike the keys slowly with an even pressure, applying a slightly heavier touch on letters that have a large printing surface, such as the *m* and *w*, and less pressure on the *o*, *d*, *e*, and other letters where too much pressure might completely puncture the stencil and cause the "hole of the doughnut" to fall out.

Punctuation marks, too, should be typed lightly so that your finished copies are not sprinkled with big black spots. Before inserting the stencil in the typewriter, place a special tissue or carbon "cushion sheet" between the stencil and the heavy paper backing. This will help you get clear impressions.

To correct mistakes, you must close up the perforations in the wax of the stencil sheet. To do this, rub gently over the area to be corrected with a smooth, hard object, such as the end of a glass rod or a blunt pencil lead. This will close up some of the tiny holes caused in typing. Then slip the glass rod or pencil between the cushion sheet and the stencil, above or below the mistake, to keep them from sticking to each other. Next, brush on a thin layer of "correction fluid," which consists of the same kind of wax mixture that coats the stencil, dissolved in a quickly evaporating liquid. After a few moments, when the replaced wax is dry but not hard, you may type again on the patched spot, using normal pressure.

Because stencils are rather expensive—about 10 cents each—you will wish to plan carefully before you start to cut one. Plan the spacing of your material—where drawings and hand lettering will go as well as the position of the typed material. You will probably decide to make up a "dummy," a model showing what the finished pages will look like.

When you draw figures, graphs, designs, or letters on the stencil,



A glass-topped illuminated apparatus for drawing on stencils. The "buttonholes" in the top of the stencil hook on the screws, the heavy paper backing slips down through the slot, and the waxed stencil sheet is smoothed down over the glass. This apparatus is easily constructed from three-ply, screws, frosted window glass, and an extension cord with a light bulb.

you may trace them from your "dummy." This tracing work is easy if you have a tilted glass in a frame with an electric light underneath. These frames may be bought from companies which sell stencil supplies, or you may make your own. In either case, the material to be traced is placed against the glass and the stencil is anchored firmly to the frame with the waxed stencil sheet smoothed in place on top of the page to be traced. The electric light makes it easier to see the lines to trace. If the lines you want to trace are still hard to see, take out your dummy and lay it on a sheet of carbon paper, carbon side up, and draw over the lines. The carbon deposit underneath will make the lines more opaque when the electric light shines through.

When working on the glass plate, there is one important precaution. The heat from the electric light may cause the wax of the stencil to become quite soft. This will make it easier to draw the designs, but you will need to regulate your pressure on the stylus accordingly. Also, the heat from your hand where it rests against the stencil may soften the wax, so that extra care must be taken.

If you are unable to buy or improvise one of these tilted glass frames, it is possible to trace things onto the stencil by holding the original and the stencil against a window pane. But it is difficult to keep the two surfaces from slipping, and your arm will tire if you have much drawing to do.

The tools for tracing and drawing are called *styli*. They are available

with various points for producing several effects, but all of them are smoothly finished so that they do not tear the stencil. Practice with different points before you go to work on a stencil. Lettering guides are also available for many styles of letters and numbers if you prefer mechanical precision to the informality of your own lettering or handwriting.

Also available are "screen plates" of several patterns. These are small metal or plastic squares with the surface grooved in a special way—perhaps dotted, perhaps cross-hatched, perhaps with a pattern imitating the grain of wood. If one of these plates is placed under the stencil and the stencil is rubbed with a smooth blunt instrument, the pattern of the screen plate will be transferred to the stencil. In this way, block letters, portions of drawings, and so on may be figured and patterned. Sometimes it is even possible to transfer an engraving to a stencil by rubbing the design into the stencil. Line drawings on zinc engravings come out best.

It is quite simple to produce interesting copy by combining type-writing, hand lettering, drawings, and screen patterns. There are other techniques, too, that will make the copy more interesting. All the designs we have been describing are made up of lines or small perforations. With a bit of silk like that used in the silk-screen stenciling process described later in this chapter, it is possible to produce solid-color inked spaces. Cut out a piece from the stencil with a razor blade and substitute a piece of silk, patching it to the stencil with correction fluid or a special cement. When making this patch, be sure to leave a good $\frac{1}{4}$ - to $\frac{1}{2}$ -inch overlap and cement these edges thoroughly. This silk "screen" will admit enough ink at this spot to make a solid mark, but not enough to cause a messy blot. Mimeograph supply houses have many drawings already prepared on small stencil squares that you may patch into your stencils. They will also transform your own drawing into such inserts so you can use the same design on many stencils without having to redraw it for each use.

After your stencil is ready to use, it is attached to the duplicating machine on top of a cotton flannel pad that is soaked with printer's ink. The ink is usually black, but red, blue, green, or other colors are also usable.

It is even possible to print several colors on the same sheet of paper.

If the areas where you want the different colors are spaced some distance apart, take a clean cotton pad and liberally daub the different colored inks where they are needed. This method will not work where the colors must be close together because they will run together and dilute one another. But, by running the sheets of paper through the machine once for each color desired, changing the stencil and the cotton pads for each color, you may have different colors next to and even overlapping one another.

Usually, the ink is soaked into the pad from the inside of the large perforated cylinder to which the pad and stencil are attached. Because it would involve much trouble to clean out the whole cylinder and substitute colored ink, usually the fresh pad for colored inks is attached over a shielding layer of paper right on top of the black ink pad, and the colored inks are daubed on before the stencil is applied. Only twenty-five to fifty copies may be made, however, before the stencil must be removed and the pad re-inked with the color.

Of course, you do not have to go into all these complicated details of stencil patching and multicolor printing to be proud of your stencil duplication. Yet you can see that careful workmanship is necessary. Your work is repaid by the advantages of the process. Thousands of copies may be made from each stencil. If it is blotted to remove excess ink, a stencil may be saved for future use. If handled carefully—not creased or torn—it can be used repeatedly. The copies are cleanly printed and easy to read, and they do not fade with time.

One disadvantage of this method is that the ink that prints through the stencil onto the copies does not dry instantly and occasionally marks the backs of the pages above. To prevent this, "slip sheets" may be used, pieces of scrap paper that are inserted between the pages as they come out of the machine. Another important disadvantage of this method is the cost. The duplicating machinery is expensive, as are the stencils and other pieces of small equipment. But for organizations that can afford it, the stencil process provides probably the most versatile method for duplication on paper.

The silk-screen stencil method. The "silk screen" duplication process is so called because the basis for the stencils used is a piece of

LAKE BURIEN STAR

LAKE BURIEN SCHOOL

14660 - 18TH AVE., S.W.

SEATTLE, WASHINGTON

Volume 1

January

Number 9



BASKETBALL

Yes, it's basketball time at Lake Burien. Boys are practicing daily on the outside court. Since the gymnasium cannot be used because the cafeteria tables and chairs are on the floor, the outside court is used.

Games are being played with other schools. Lake Burien must use other gymnasiums. Mr. Anderson has made all arrangements for basketball with other teams. More basketball information will be included in the February 8th issue of this school newspaper.

MARCH OF DIMES

The National Foundation for Infantile Paralysis campaign is underway at the present time in the United States. This is a worthy cause, and money contributed to this fund helps some less fortunate children.

If you get the opportunity to contribute a dime or so, you may be assured that this will help someone in medical need.

CAFETERIA

Many boys and girls at Lake Burien eat a daily lunch in the cafeteria. This lunch program is for your benefit, since you can obtain a tasty hot lunch for only 20¢ a day.

Buy a ticket from Mr. Mercer. This Ticket costs \$1.00 and may be used for five lunches. It will cost 25¢ if you wish to purchase one lunch. You save a quarter by buying your ticket for the week.

DEADLINE

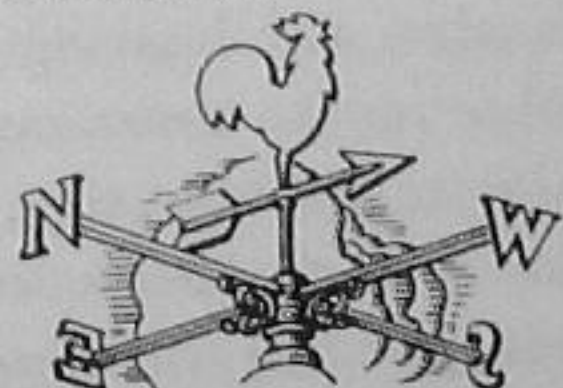
Deadline for news and classified ads for the February 8th issue may be sent to Room 5 until 3:30 p.m. February 2nd.

The February 8th issue will honor one of our greatest American presidents -- Abraham Lincoln. Read several interesting stories about Lincoln in this issue. Some boys and girls have already written stories for this issue.

FLICKER FROLICS

Friday is the BIG day at the Lake Burien School! The Lake Burien P.T.A. is putting on FLICKER FROLICS in the Lake Burien gymnasium. This will be held the day after Thanksgiving.

Twenty-five cents admission will give you FINE ENTERTAINMENT on Friday. The net proceeds from these motion pictures will be used to buy a public address system for the stage in the gym. COME TO THE BIG ENTERTAINMENT on Friday of this week. You will enjoy yourself and will help the school at the same time. Tickets for adults will be 50¢. Tell your mother and father about this BIG EVENT.



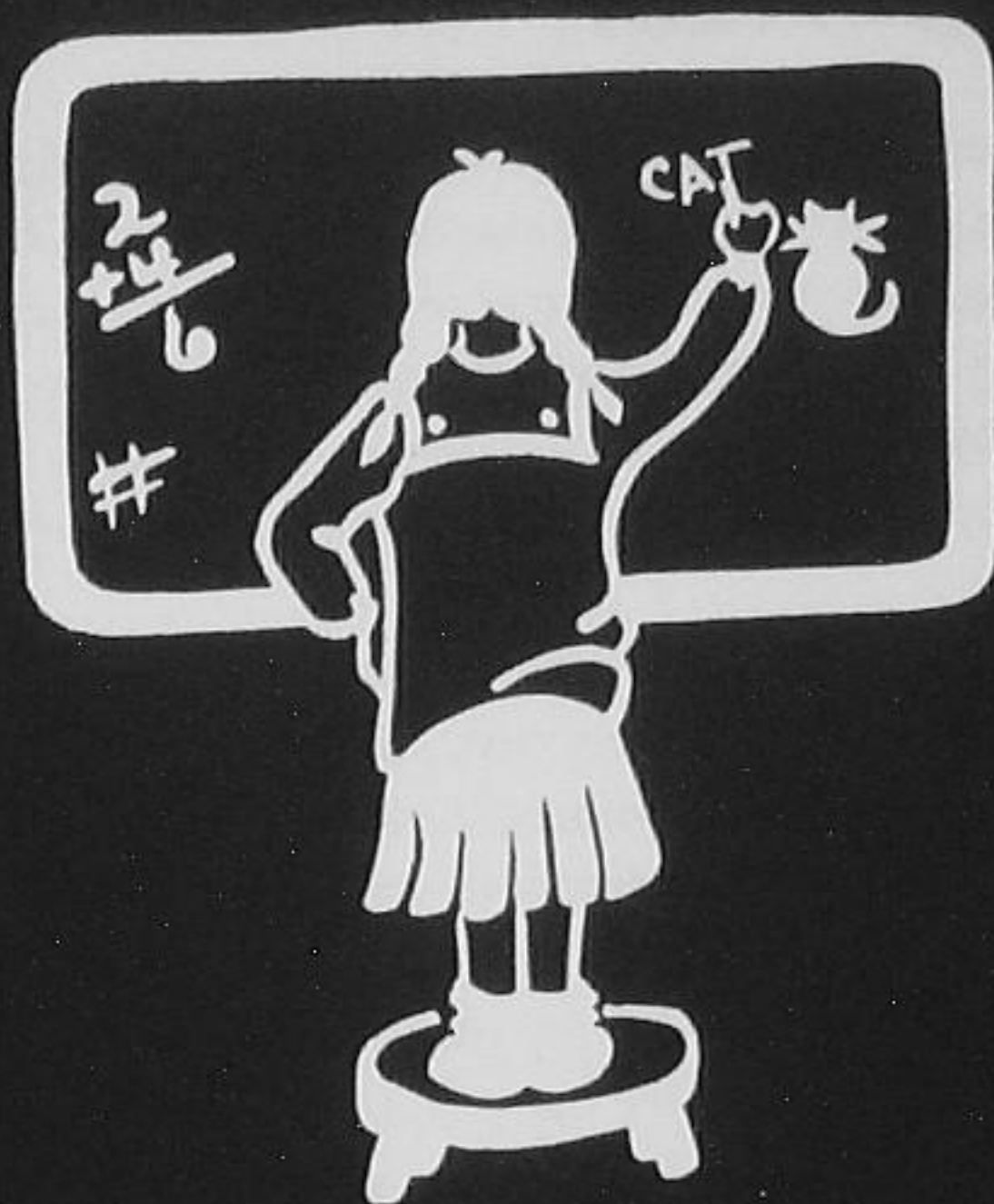
thin, almost transparent, silk. Wherever you do not want color to appear on your copies, you attach a piece of stencil material to the silk screen to block the passage of the ink. In every area not covered by the stencil material, paint can be squeegeed through the silk. The mesh of the silk is so fine that its pattern does not show on the finished copy and a solid-color space appears.

This silk-screen process is used by commercial advertising companies and sign painters for much of their poster advertising. Look around at the car cards the next time you are on a local bus or street car. Many of them are made by the silk-screen method. You don't want to go into this work to such a degree or invest in so much equipment, but you would get a lot of good ideas by visiting a commercial plant.

The best screen is made of special imported silk, but any sheer, plain-weave material, such as organdy or nylon net, can be used. Experiment with inexpensive materials first; then, if you wish, buy regular silk screen from an art-supply company.

The cloth screen is stretched tightly across a wooden frame and tacked firmly in place on all four sides. The dimensions of the frame will depend on the size of the material you wish to duplicate. The frame is hinged to an old drawing board or other flat surface larger than the frame, so that the silk-covered side of the frame is against the flat surface. Use hinges that have removable pins so that you can lift off your frame when necessary.

Now you are ready to make your stencil. The simplest way is to cut the design from plain paper. Remember that you are making a reverse of what you want to appear on your copies; the stencil pieces will prevent the paint from coming through the screen where they are attached. Arrange the stencil piece or pieces on the screen so that they will lie between the screen and the copy as it is printed and fasten them around the edges with masking tape. Lay a practice piece of paper on the board and lower the screen into place. With a spatula or knife, put a gob of paint in the lower edge of the frame and spread it across the bottom. Now, with a rubber squeegee, spread the paint up to the top of the frame. This spreading will cause the stencil to stick to the silk screen for most short "runs" of twenty to thirty copies.



Classes

Silk screen is a versatile medium.

If you are going through this process in your mind as it is described, you can imagine what your copy will look like as you turn the frame back on its hinges. There on your practice paper will be colored ink in every spot where there was no stencil blocking the way. On careful examination, you may find ink where you don't want it. Block out those spots with masking tape or more paper. Now remove your practice sheet and place your good paper in position, lower the frame, use the squeegee, lift the frame, and remove the copy, repeating this procedure as many times as you wish.

Of course, this simple paper stencil will not give you the sharp, clean edges required in more delicate work. Regular stencil paper is available

for this process, paper that can be cut with a razor-edged stencil knife and stuck to the screen with a special liquid adhesive. Or you may block out parts of the screen by painting glue or shellac onto the screen according to your design plan. There are also many special stenciling techniques known to those artists who do silk-screen work. This versatile process can be used by the amateur or by the most exacting of artists, pleasing each of them.

When you are through with one stencil pattern, the paint can be washed off and the stencil removed. The silk is still there, ready for another stencil. One piece of silk will make thousands of copies.

Special paints for silk-screen work may be purchased, some designed for use on paper, some for use on cloth. As you work with your silk screen, you can experiment with paints to find those which are the cheapest and most suitable for the kind of work you are doing. Try out ordinary poster paint, regular oil-base wall paint, and casein-base wall paint. Remember to buy a suitable solvent, too, so that you can clean the screen when you are through.

You may have noticed on car cards or on your local billboards the new phosphorescent "Day-Glo" paint, specially designed for silk-screen work. Although this paint is more expensive than ordinary silk-screen inks—about \$6 a quart—its brilliant, attention-getting qualities may justify the expense for some important uses. The paint is available in several colors from silk-screen supply shops.

Here is an interesting idea, an original way to use the silk screen for poster work. Merald K. Orth,* of the Newburgh (N. Y.) Free Academy, has printed his posters directly on the chalkboards in school rooms. For school functions, this publicity method is hard to equal. Because the chalkboards are washed with water and the paint must wash off easily, Mr. Orth did not use regular silk-screen paint but mixed his own, using poster paint and powdered soap. He suggests that finely granulated soap be mixed with water, a little at a time, until the soap is the consistency of a thick mush. Stir the poster color thoroughly and mix the paint with

*"Intramural Advertising and the Printing Instructor," *Industrial Arts and Vocational Education*, June 1946, pp. 265-66.

the soap in the proportion of one part soap mush to three parts paint. Stir thoroughly and thicken with granulated soap or thin with water as needed.

Mr. Orth suggests that three students work together to put up the posters—one to hold the screen, one to work the squeegee, and one to supply the paint.

Have the pupil place the screen against the blackboard in the desired place and position, and hold it firmly. The second pupil then places the squeegee in position at the bottom of the screen and the third pupil covers the entire length of the blade of the squeegee with a generous supply of paint. The squeegee is then run to the top of the screen exactly as though printing on paper or poster board. Care should be taken when removing the squeegee from the screen to get all excess paint on the blade. This can then be emptied into the container held by the third pupil. The screen is then removed from the board, lifting the right edge toward the left as though it were hinged to the board. The job in this room is now complete. Once the knack is acquired, thirty rooms can be done in less than one hour.

If the paint dries on the screen as the pupils go from room to room putting the poster on the boards, the screen can be washed off with water, then dried thoroughly. The paint can be thinned a bit and the work can go on.

Bright colors must be used because of the dark background of the chalkboard. Two- and three-color posters can be worked out, but these will call for more precise application. The same stencil can be used to make regular posters on black paper or cardboard.

As you think through this silk-screen method and look at the examples of the work, you can quickly see that it duplicates bright, clear colors and simple designs. It is especially suited to the duplication of posters, greeting cards, or magazine covers, where bold simple patterns are important. We amateurs cannot use it for delicate line drawings or fine shadings or for small, thin letters.

One disadvantage of the silk-screen method is that most of the paints used are slow drying and the finished copies must be spread out around the room or placed in special drying racks. Its unique advantages, however, far outweigh its drawbacks. For duplication of bright colors and bold designs it cannot be equaled in amateur work. It is quite inexpensive,

too. A complete kit of silk-screen equipment can be assembled for a small cost and can be used over and over. The only cost recurring with each new use is that of the stencil paper and the paints.

DUPLICATING PROCESSES AT WORK

As summarized by the table on page 181, each of these four duplicating methods has certain clear advantages and is especially suitable for certain kinds of work. The simple home-made gelatin pad is cheap and easy to use. The machine hectographs and the fluid duplicators are less expensive than the mimeograph machinery and produce acceptable results. The mimeograph method turns out the most professional job of duplicating typescript and line drawings. The silk-screen technique is unexcelled for simple duplication of bright, bold designs. Whichever method you use, the materials you can turn out are limited only by your imagination and skill with typewriter, pencil, ink, and, in the case of the silk screen, your skill with the cutting knife.

The simple illustrative drawings of Chapters 5 and 6 can be drawn with hectograph carbon or pencil or can be cut in a wax stencil. The pictorial symbols, the bar charts, the pie charts, and other quantity explanations are readily reproduced. Structural drawings such as plans and maps and diagrams are easy to do. Many of these explanatory drawings can be adapted for use in poster designs produced by the silk-screen process. You will remember, too, to use the suggestions about the tools of design as you work out your ideas. You will want to make your materials as powerful and useful as possible.

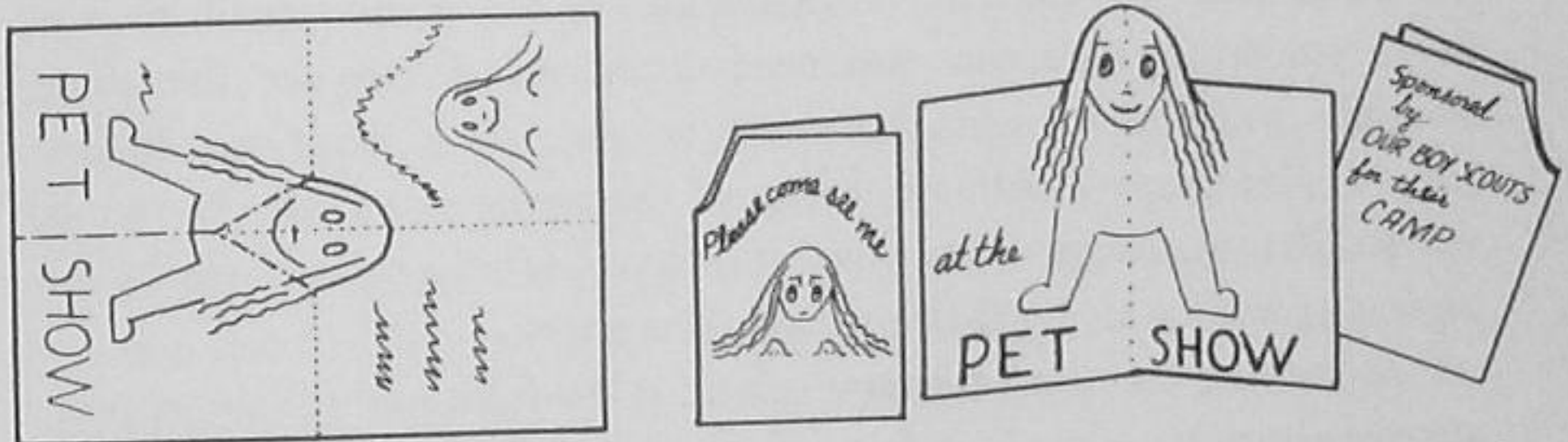
For all important work you will be wise to prepare a "dummy" so that you can check beforehand on spacing and the general appearance of the display material. Start by determining the size of the paper or other material you plan to use. For each process, the maximum size is limited by your equipment. But don't think that you have to use that maximum size. Postcards can be run through duplicating machines. Half-sized sheets can be used easily if that is all you need. Unusual sizes and shapes can sometimes make your messages more emphatic.

If you do decide to run your material on a half sheet or on a small piece of paper, don't cut the paper to the correct size before duplicating,

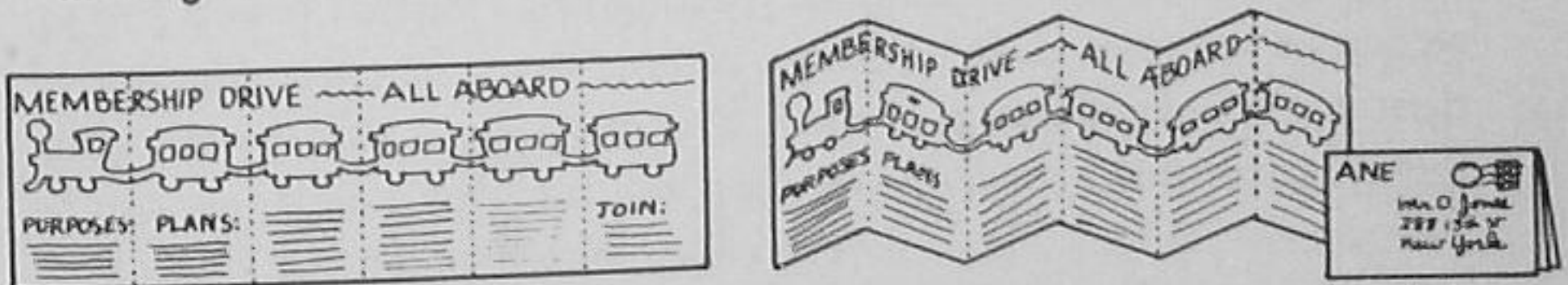
PLAN FOR THREE-DIMENSION FOLDS



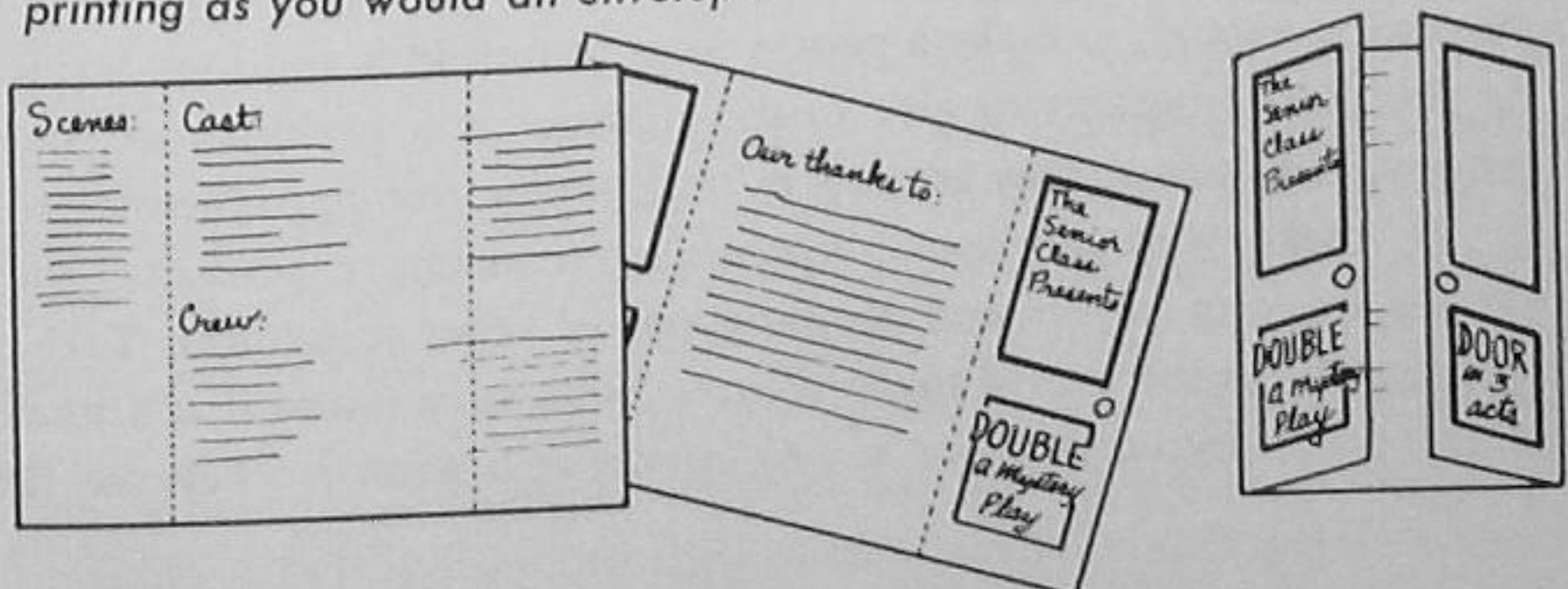
Print on one side of the paper, with the copy facing in both directions. Fold twice to get the small pamphlet.



Print on one side of the paper. Fold down the center. Cut around the top of the dog's head. Fold away on, forward on



To save labor and paper, make two printings exactly alike on legal-size paper; then split the paper. Fold, staple at the top, stamp and address each printing as you would an envelope.



Print on both sides of the paper. Fold toward center.

because you will have difficulty in getting the printing on straight. Instead, repeat your message several times on one stencil or carboned master, run the stencil on one standard-sized piece of paper, and then cut it into the smaller sizes desired. Or if you plan to print a half sheet on both sides, prepare the stencil or carboned master with the copy for the front at the top and the copy for the back at the bottom. Run the sheets through; then turn them over and end for end and run them through again. In this way one stencil does double duty and both paper and running time are saved as well.

Plan to take full advantage of the working area of each stencil. If the material to be duplicated does not occupy all of the stencil, plan to fit on something else that you need duplicated. Forms for the office, statements of problems for discussion, or other short items may fit into this remaining space. After running off the copies, cut apart the two or three different things. This time- and stencil-saving process works out especially well with legal-size stencils and paper.

In making up your "dummy," plan for the folds and for the appearance of the copy when it is finished. A turned-down corner or a folded flap can add a three-dimensional touch to attract attention. Remember how surprising and interesting the greeting cards are that have a pop-up section as you open them? You can achieve the same effect. Get one of these cards and see how it is done. You can plan so that, by changing the direction of the copy, one running will turn out a page that can be folded twice to look like a little booklet, with copy on the front, both sides of the inside, and the back, too.

If your material will be mailed in an envelope, think about the impression it will make as it is removed from that envelope. Does it look interesting enough to make a person want to unfold it and look inside? As you plan programs to give to the audience at a performance, how can you fold them so they are easy to read, yet interesting in themselves?

To make your duplicated materials interesting, experiment with various kinds of papers and combinations of other substances. Take a tip from the greeting-card manufacturers, who have found that a touch of ribbon or feather trim or a real button sells a card. They use the

scratchy "oatmeal" papers for the "homespun" messages. You can, too, on the mimeograph. And don't use white paper for everything. The introduction of another color makes a thing seem more important. Remember that the silk-screen process works equally well on cloth and glass and wood. How about a burlap greeting card? How about a denim poster? Why not try silk-screening a poster onto the window glass of the downtown stores?

Of course, not all of these ideas are easy to put into effect. Almost any skill is improved by practice. Even if you read this book from cover to cover, you will not be anything of an expert at *doing* the things it suggests until you try out the suggestions and practice them again and again. The suggestions of this chapter may encourage you to try these duplicating processes. But, before you start using any of the equipment we have talked about, study the instruction booklets, too.

Remember that these suggestions and instructions are not only for you but also for the people you work with. Children and young people enjoy operating these duplicating machines and can turn out very creditable results. Many high schools train some students in these processes, but many more students could enjoy learning. Look back over the examples shown in this chapter. Notice how many of them were prepared by students.

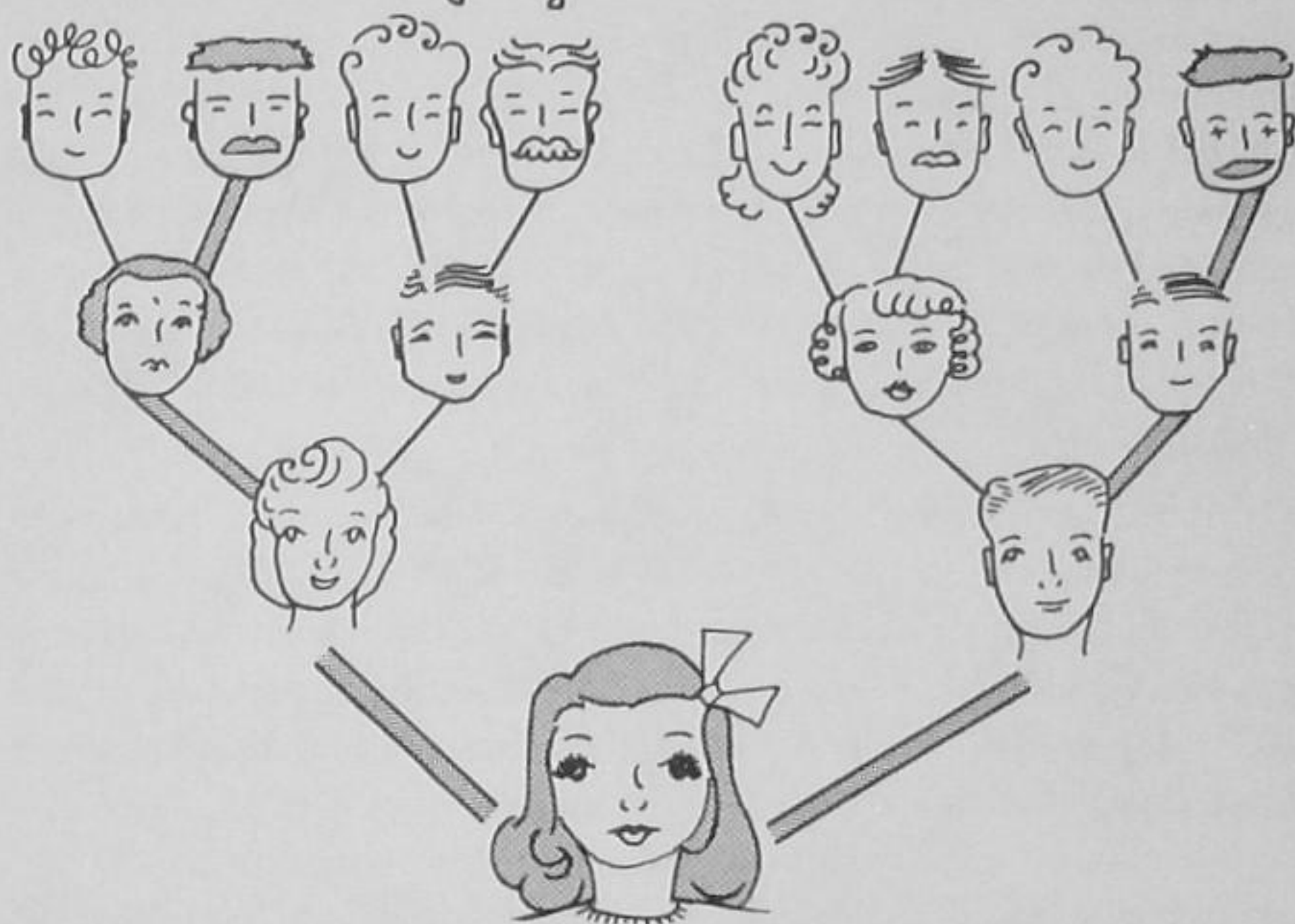
Every time you go to the board and pick up the chalk, you have a purpose. What is it? You are hoping for something to happen in the minds of the people who watch you and the board. There are many ways in which you can use the chalkboard to help people think. Here are some of the results you can hope for.

WHY DO WE USE THE CHALKBOARD?

Visualization of ideas. Mary Jones may be wondering why it is that she has red hair whereas both her mother and father have brown hair. Her biology class has been talking about inheritance, and she thinks she must be some kind of freak. The chalkboard can help her to see how the red hair of her mother's mother and the red hair of her great-grandfather Jones might have skipped over the generations and blossomed out on her. Through the charting of the generations and the family characteristics, she will be able to see herself as one link in the fascinating chain of heredity. She will have visualized a new idea.

When Mary goes to her physical-education class, she may have doubts about her teacher's advice to wear high heels on special occasions only. But when, at the teacher's suggestion, Mary takes off a shoe and draws around the sole and heel with chalk and another girl with the same shoe size draws around her low-heeled shoe, Mary can compare the drawings. She can see the difference in the amount of support her foot gets.

How Mary got her red hair:



Mary's size 6 shoe

Ruby's size 6 shoe

Organization of thinking. Lists are often written on the board. The ideas which the group volunteers will be more easily remembered, more easily grasped as a whole, if they are written down as they are expressed. Usually, however, the list itself is not the goal. The important thing is

the process of organization and limitation and combination. Relationships must become apparent. In mathematics, colored chalk can help students to keep their thinking straight. The operation signs can be colored to differentiate them, in a child's mind, from the numbers. In geometry, theorems can be stated with the facts of the hypothesis in one color and the ideas to be proved in another color. These two colors could be used throughout the proof, for the diagrams as well as the argument. The chalkboard can help people to clear up hazy ideas and to organize their thinking.

Better understanding of vocabulary. Perhaps you have been talking with children about breakfasts and Billy says "What a funny word!" Billy can write the word *breakfast* on the board and everyone can look at it. You can help him divide it into syllables and think about the meanings of each syllable. As soon as relationships with other words are understood, the word has acquired a new reality.

More complicated words, such as *microorganism* and *convalescence*, can be studied by advanced students. Such words as *common*, *community*, *communication*, *communicable*, *communion*, can be thought about in relation to the word *communism* in an attempt to study the meaning of words and the emotional overtones which gather around them as they are used.

Trouble spots in spelling can be pointed out by writing the words and using colored chalk for the syllable or letter that is important.

Understanding of details. You use the chalkboard for giving directions. You write specific, clear instructions for outside assignments. You announce changes in plans. You write your suggestions for class work. Whenever there is detailed information to absorb, you know that some pupils will take longer than others to digest it. You can make allowances for this difference in time by writing the material on the board as you say it. Some can understand as you speak and go on to other things. Others need both written and oral instructions, and time to let it all sink in.

Concentration of attention. As a leader, you have learned to recognize that glazed expression that comes sometimes into people's eyes when



The chalkboard is helping these children to organize the words they have learned about China.

you are talking. It's a sure indication that you and they are not "communicating." That is the time you think hurriedly about changing your method. You have probably been so interested in what you have been saying that you have let your enthusiasm carry you off ahead of the group. This is a good time to turn to the board so that your listeners' indifference will change to interest. Here's a bit of suspense. They wonder what you are going to do next. And as they watch the chalkboard, they are paying attention with their eyes as well as with their ears. A lecture gains in interest when it becomes an illustrated talk.

For example, if you are busily and happily talking about the ways in which emotions may block our logical thinking and you are trying to explain the values of reflective, deductive thought, the whole idea may be too abstract for your audience. You are warned by that look in their

eyes, and you turn to the board and draw a woman befogged by gloom. It becomes obvious that she can't see what's really happening around her; her vision is distorted by the gloomy emotions. You have oversimplified your point, and the woman on the board does not explain what you want to say, but she does help you regain the attention of the group.

Perhaps you are trying to explain what maps are. Most of the group is with you, but Billy, over in the corner, has that faraway look as he gazes out the window. You can bring him back to the present, politely, if you say, "Billy, we have been talking about maps. I wonder if you could draw for us, here on the board, a baseball diamond. Show us where the bases are. Where do the players usually stand? Thank you, Billy. Billy has drawn a map, a map of a baseball field." Then you and the class and Billy can go on together, talking about other new words, such as *symbol* and *legend*.

Even one word, a key word, written out clear and bold can bring people back to the point. And the word there behind you can reinforce the rest of your words.

Development of better group relationships. Ruth is the noisy cut-up who is never so happy as when people are looking at her. She can be the one who writes on the board for the class, and in this way she gets the limelight she needs to bolster her feeling of belonging to the group. At the same time she is contributing something positive to the class activity.

Paul is the shy boy who stays aloof and wanders on the edge of most group activities. But he, the isolate, has just as vital a need to feel accepted by his classmates as has Ruth. He may be too timid to speak before the group, but he may glow with pleasure at the chance to write a few words on the chalkboard or to add a line to a picture. In this way he gets used to the feeling of being looked at by all his classmates.

USE THE CHALKBOARD IN MANY WAYS

Use the chalkboard to help people to visualize their thoughts and, as a result, to think more clearly, to understand relationships, to develop concepts, to learn new words, to understand directions, and to laugh to-

gether. The individuals who use it can grow as members of their group. The chalkboard can help each person to think and to grow, if you study its unique characteristics and make use of them.

Don't overwork the chalkboard. The unique value of the chalkboard is that it can be used to give an immediate explanation, an impromptu example. Don't use it as a substitute for duplicated material.

Test questions that must be read carefully ought to be duplicated for each individual. Don't penalize the person in the back of the room, who cannot read the board as well as those in front. Don't write things on the board and then expect the students to copy them. Arithmetic problems, recipes, outlines of subject matter, all can be duplicated easily and given to the students. Why waste classroom time in copying and clutter up your precious board with unnecessary materials?

But perhaps you don't think of the chalkboard as being precious because it stretches along three walls of your room and there's more than enough space for everything you could think of writing on the board. Make use of these boards for other things. Fasten wallboard to them for bulletin-board space. Or, if your administration approves and if you are sure you will not need the board space, wallpaper them just as though they were bare walls. Or paint pictures, posters, or abstract designs on them with water paints; then wash off the colors when you want a change.

Use the chalkboard for the things it does best; don't try to make it do everything.

WHAT KINDS OF CHALKBOARDS CAN WE USE?

Materials and colors. Most of the chalkboards installed in schoolrooms are either slate or composition. The composition boards can be quite satisfactory, especially if they are made of firm, tough materials that are not affected by dampness or easily marred. These boards are lighter in weight than slate and are available in portable easels. Slate is more durable, but it is also more expensive.

One defect of these boards has been troubling teachers and students for a long time: they are black, and therefore they absorb light and do

not reflect enough of it for easy reading. And they make the eyes work harder because walls, books, and papers are all light colored and the eyes are strained when they must constantly adjust themselves from light to dark. The black wallboards make the classroom gloomy, too.

Educators and engineers have been experimenting with other colors for chalkboards. One test in England showed that when words were written on a yellow-cream board in dark-blue ink, children and adults could read from it more than 10 percent faster than they could from a black board with white chalk.* And the pale-yellow board would add to, not detract from, the appearance of the room. These pale-colored boards cannot be used widely, however, until a dustless dark chalk is produced. White chalk dust is a nuisance, but dark-blue chalk dust would be quite troublesome. Other experimenters have worked with a soft green as a color for the board and find that white chalk provides contrast sufficient for fairly good legibility. Many people have found that yellow chalk used on a black board has a higher contrast value than white on black.

The ideal surface for the chalkboard feels smooth to the touch, but there are enough tiny ridges and bumps so that the chalk can catch on them and leave a mark. Slate seems to have an excellent surface, but it is always black. Composition boards can be made in other colors, but they are not very durable. So experimenters have been looking for other materials, too.

One of the most promising of the new ideas is a glass board with a finely ground writing surface. Colored glass can be used, or colorless glass can be installed against surfaces that are painted the same color as the rest of the room. This color showing through the glass would keep the writing surface from being so prominent in the room. And if the walls were some pale, soft color, chalks could be selected that would contrast both in luminosity and hue. One difficulty with the ground-glass surface is that the roughness wears away with constant erasing and washing, and the glass has to be reground. A solution being tried is to

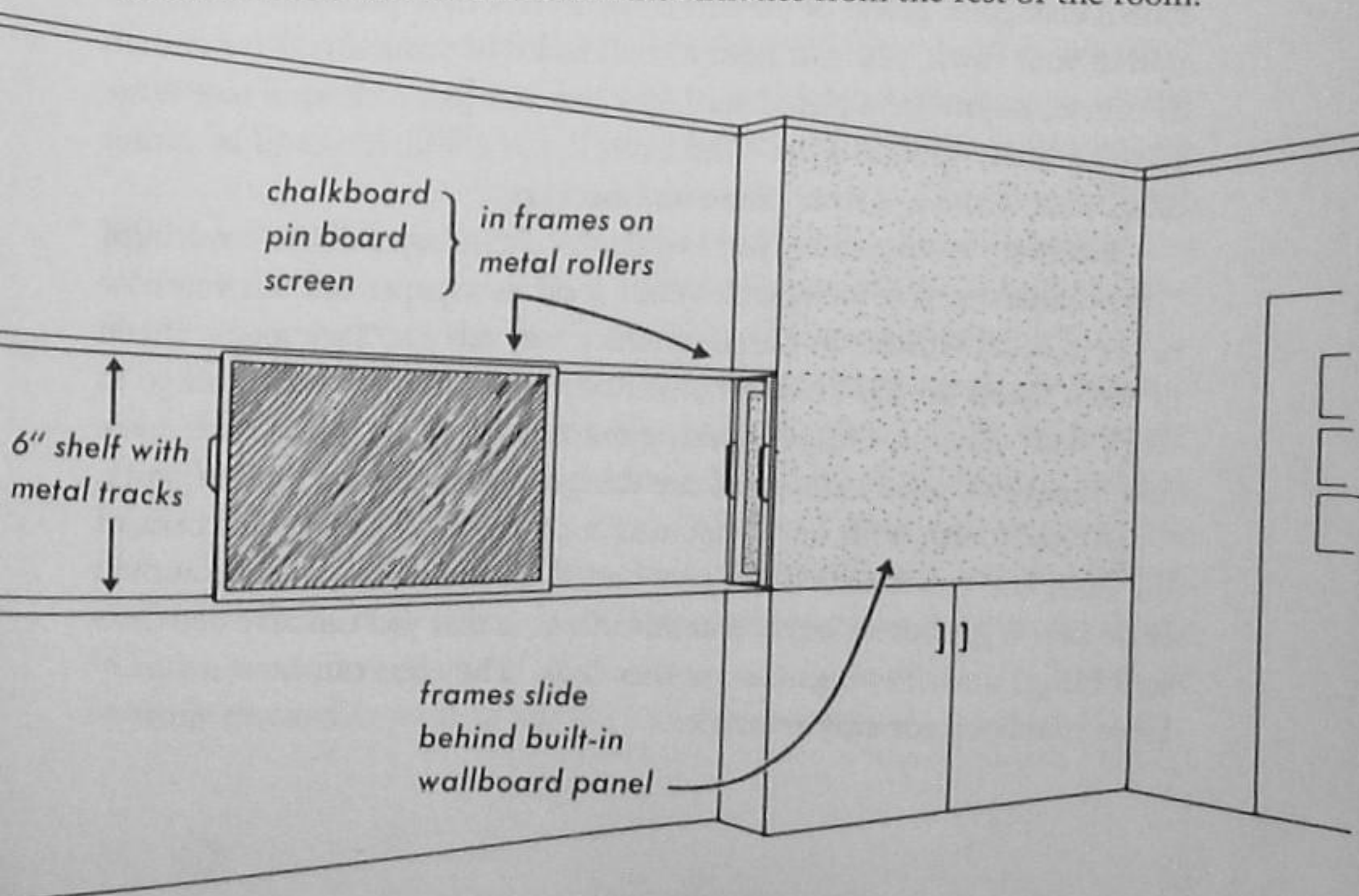
*W. D. Seymour, "Experiment Showing the Superiority of a Light-colored Blackboard," *British Journal of Educational Psychology*, 7, pp. 259-268.

mix a finely powdered abrasive with the molten glass so that the surface texture of the finished glass will always have a roughness, regardless of wear.

Position and construction. There are some new ideas about installation of the chalkboards, too. The sliding board that goes up and down like a window gives much more writing space for the same area. At Emmanuel College, in Boston, the science building has these sliding boards with a ground-glass screen in place behind them, ready for film or slide projection.

An interesting new plan is to have small tracks set into the wall across the front or side walls, and to have the chalkboard, the bulletin board, the screen, and perhaps a clear glass panel for framing charts or pictures all set into these tracks. Any one of these can easily slide to front and center when needed.

A class at Temple University uses a swinging chalkboard with one end hinged to the front wall near the entrance door and the other end supported by a leg that rolls around on a wheel. One side has the chalkboard, the other side the bulletin board. When necessary, the swinging board can act as a screen to set off the entrance from the rest of the room.





These children are getting ready for a field trip, and their teacher has improvised a substitute for a chalkboard to record their plans. Now they will have a permanent record of these plans.

Improvising a chalkboard. All these visions of the future are promising, but what are you going to do if you have no chalkboard at all? If you are surrounded by any group, be it a Scout troop, a Sunday-school class, or a group of parents come to talk over problems of recreation in your town, you will need a chalkboard of some sort. You cannot, of course, improvise a slate board, nor can you just pick up a nice large piece of finely ground glass. And even if you could, it would be rather dangerous without a firm frame and backing.

But there is something you can do. You can buy a dollar's worth of large blank sheets of newsprint. Your local newspaper can tell you how to get it, or an art store in the community may carry it. Tack ten or fifteen of these sheets on any kind of homemade easel or on the wall, and go to work with crayons. Heavy marking crayons or grease pencils are made in a variety of good colors and are designed for just this kind of work.

As you finish with one sheet, tear it off or flip it over to the back of the easel and you have a clean new one. A disadvantage is that you can't erase as you go, but an important advantage is that you can save one day's scribblings and drawings for another look. The class can have a sort of large notebook for easy reference.

HOW CAN CHALKBOARD WRITING BE IMPROVED?

As you practice your writing on the chalkboard, you will be surprised to find how much easier it is to form your letters well with the chalk than with a pencil on paper. When you hold the chalk firmly in your hand and write with the true "arm movement" that your second-grade teacher may have urged, the letters and the words are quite easy to make.

Make it easy. Although the vertical surface makes the letters easier to form, it creates several other problems. One of the first of these is the difficulty of keeping the lines of writing straight. Do your lines slowly rise at the ends? Or do they suddenly drop? Or do they wave across the board? There is an easy way of eliminating these irregularities. Walk as you write. Unless you hold your arm fairly close to your body, your writing will wiggle and slant. Stand at an angle of about 45° to the board so that you can see what you are writing, and walk along slowly to keep your writing hand at about the same distance from your body all the time. Your lines will be quite straight. It's as simple as that.

Does your arm get tired when you write? It will if you fill the board with writing. Most of your need for the chalk and board will be answered by short, impromptu efforts, but now and then you or someone in your group will want to write for several minutes at a time. One way to help the busy arm is to keep the writing within easy reach. Don't try to stretch to the very top of the board, and don't cramp yourself into a knot trying to reach the lowest corners. Your efforts will result only in badly formed letters. Better stick to the center section and save your strength.

Break the piece of chalk in two. You can get firmer pressure this way, and the broken end will make wider, smoother lines. Keep turning the chalk in your fingers as you write to keep the width of the strokes even. A soft chalk will require less pressure and will save your strength, but press hard enough to make a firm, smooth line. Keep a soft damp cloth handy if chalk dust annoys you. To avoid squeaking, draw the chalk toward you when possible, and keep it angled close to the board, or change to another piece of chalk.

Keep it legible. Remember our discussion of legibility in penmanship? We found that careful attention to letter shapes was important. We saw that the spacing of the letters and the words was important, as was the spacing between the lines of writing. Too much slant, either to the right or to the left, made letters difficult to recognize. If you need more than this brief review, turn back to pages 119-122 and analyze your own penmanship for legibility.

Here are some additional suggestions that will help your readers understand what you write on the chalkboard: Try to keep all the chalk lines about the same width. Use the plan of rotating the chalk in your fingers as you write so that all the strokes in a word, and in a sentence, are of about the same width. Notice how much easier it is to read the second example than the first.

chalk width uneven - down strokes curved
 chalk width even - down strokes straight

If you have to crowd your writing in order to get a great deal on the board, pay strict attention to your "down" strokes. Make them straight. You can see in the examples how these straight strokes add to legibility.

Probably the most important suggestion of all is to practice. You must write legibly, but you must also write quickly. You use the chalkboard to help people think, not to slow them up. Your writing usually must keep up with the group, and only practice will make your writing flow along smoothly and quickly.

With practice, your chalkboard writing should be satisfactory. It will be easy for you to write and easy for your readers to understand. And if you help other people to improve their chalkboard writing, they as well as you will be able to help your group with its problems of the moment.

PUT YOUR CHALKBOARD TO WORK

The chalkboard is a very useful piece of equipment. Alone, it can never do anything. In order to make it work, you have to work. The chalkboard is almost a living assistant, or so it must seem to you and your pupils, for it reflects your thoughts of the moment; it keeps up with you. The pictures grow before your eyes, emphasizing important ideas. The drawings develop, clearing up relationships and processes. Words can be reproduced almost as fast as they are thought; in fact, the chalkboard has been called a "visible voice." This ability to seem alive is probably its chief educational asset, for interest is focused on the ideas that are being represented, and understandings can expand and grow with the chalk lines.

Because its chief value is to illustrate and clear up ideas, the chalkboard should be used for immediate problems. It should not be choked with material that is to be displayed for days and weeks. Keep it free so that it can fulfill its one major function, clearing up problems of immediate importance.

When you wish to show a picture or a diagram to your entire group at once, using a slide to present the material is often an ideal plan. The enlargement on the screen can show the small details of these pictures and diagrams to everyone at the same time. And because the slides are compact, a large amount of teaching material can be carried from place to place and stored for repeated use.

Although slide projection does not require the absolute darkness necessary for the opaque projector, which we discussed on page 69, heavy shades or curtains will be needed to darken the room. And since whenever you shut out the light from your room you are probably shutting off the ventilation at the same time, some special provision will have to be made for adequate circulation of air. But these difficulties are more than offset by the advantage of having only one bright spot of light in the room to attract the students' attention. Your audience is almost forced to concentrate on the slide.

When you use slides as the medium for display, you are, of course, limited to two-dimensional materials. But photographs and drawings and graphs and copy can all be shown by means of a slide. The only requirement is that the materials be a combination of transparent and opaque lines or shapes that will permit the projection lamp to cast recognizable shadows upon the screen. Slides with completely opaque and completely clear areas will produce a black-and-white image on the screen. Colors are projected on the screen through transparent colored areas on the slides.

TYPES OF SLIDES

The slides you yourself make may be "hand-made" slides—line drawings, crayoned and inked pictures, and typed cellophane slides—or they may be photographic.

Hand-made slides. The standard size for hand-made slides is $3\frac{1}{4}$ " x 4". They can be made on glass, on plastic, or on cellophane, and none of them is difficult to make. The processes involved in making them are described in an excellent film produced by Indiana University entitled "How To Make Hand-made Lantern Slides." See it if you can; it will help you with your slide-making. If your students are making slides, they should see it, too.

Glass slides. Lantern-slide glass is thinner and clearer than window glass and can be obtained from school-supply companies at small cost, usually for three or four cents per slide. This clear glass must be prepared for use by careful cleaning with scouring powder or alcohol. When it is dry, you can write or draw directly on the slide with a "china marking" pencil. The pencil leaves a heavy mark which smears easily, but it can be used for temporary drawings. If you wish to preserve the drawings for future use, you can cover the slide with another piece of glass and bind the two together.

The clean, clear glass may easily be treated so that it will take India ink or water colors. Soak $\frac{1}{4}$ teaspoon of dry gelatin in $\frac{1}{4}$ cup of cold water for a few minutes, then dissolve this mixture in $\frac{3}{4}$ cup of hot water. Pour a teaspoonful of the gelatin mixture in the center of the slide and tip the slide from side to side so that the gelatin covers the entire surface. When the gelatin is dry, the slide will take paint or ink very well.

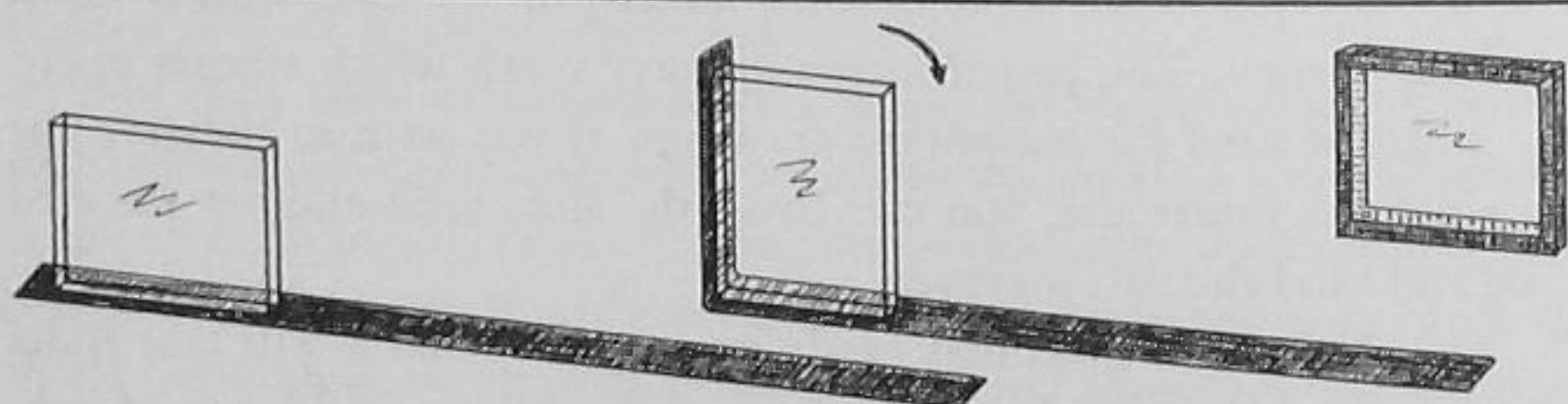
There is an even simpler method of making a slide. Merely paste a cut-out silhouette on the glass slide or place the cut-out between two pieces of glass and bind them together with tape. Or place some other opaque object, such as a leaf, between the glasses.

If the glass is frosted—that is, if it has a slightly rough surface—it will take marks made with an ordinary pencil. You may trace directly on the slide and protect your work with a cover glass. Frosted slides are

slightly more expensive than plain-glass lantern slides—about 10 cents each. You can frost your own slides by putting a bit of valve-grinding compound on the glass with a few drops of water, covering the slide with another glass, and rubbing the two glasses together for a few minutes. Wash off the compound and the glass will be frosted.

If you wish, you may save both the frosted and the clear glass for re-use by washing the slides clean with soap and water or scouring powder after you are through with them.

Glass slides are breakable. To reinforce the edges, and to avoid cutting your fingers, you will want to bind the edges. Binding tape is inexpensive and easy to apply. Cut a piece long enough to go around the edges of the slide, lay it down on the table sticky side up, carefully place one edge of the slide in the center of the strip at one end, and then turn the slide from edge to edge along the tape. Press down the free edges of the tape, and there is your binding.

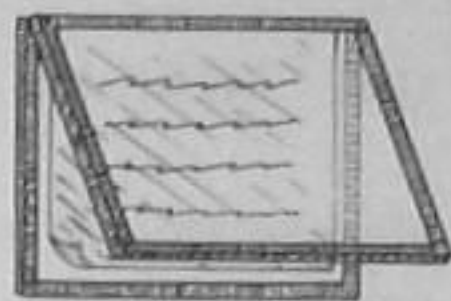
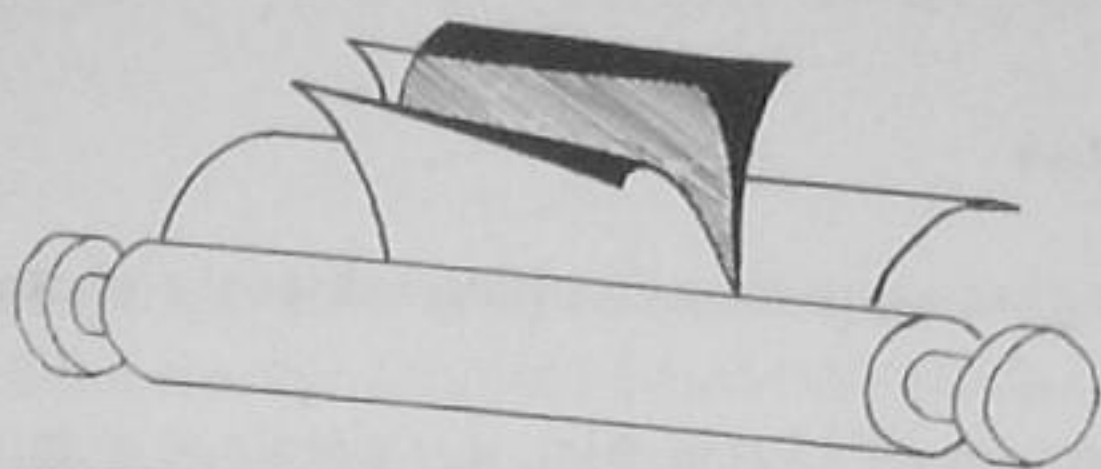


Plastic slides. Plastic slides are a substitute for the frosted-glass slides and are superior to the glass in many ways. They are unbreakable and are less likely to cut your fingers. They weigh little, and they are thin. These are important points to consider when you have a large collection to keep filed. They are, however, somewhat more expensive than the glass.

Plastic slides are used in exactly the same ways as the frosted-glass slides. They will take black and colored pencils, inks, and paints.

Cellophane slides. Ready-cut cellophane slides can be purchased, but you can make your own, too. Simply cut ordinary cellophane to a $3\frac{1}{4}$ " x 4" size and go to work on it. It will take ink if you work carefully, but cellophane is particularly suited to typewritten material.

To make a typewritten slide, you must deposit on the cellophane an



opaque coating of carbon for each letter. This is best accomplished by folding a piece of fresh carbon paper with the carboned sides together, inserting the piece of cellophane between the carboned sides, and then typing, without using the ribbon, through all three thicknesses. When you take out the cellophane, carbon will have been deposited on both sides, giving you a distinct, opaque series of letters. If you cut the carbon paper so that it is just twice as large as the cellophane before it is folded, you will be able to space your copy more accurately.

For projection, cellophane slides can be bound between two glass slides or they can be placed between two glass slides that are hinged together at the top with binding tape. In this way, the same glasses can be used for many slides, and the cellophane pieces can be filed away for future use in envelopes more compactly than if they were permanently bound in glass. Cellophane slides cannot be washed off and re-used as can glass slides, but they are much less expensive. The cellophane comes in a variety of pleasing colors, too.

Photographic slides. A photograph that is to be projected on a screen must be transparent so that light may shine through it and transfer its shadows onto the screen. You are probably thinking of the film negatives that are returned to you with your developed prints. Yes, these would make excellent slides except for one important detail: they are negatives and so would project light where the area should be dark and vice versa. In order to project photographs, the dark and light patterns on the transparent substance must be "positive"—that is, in normal relationship.

Positive prints may be made on film, just as though the film were a photographic paper, or they may be made directly on glass that has been coated with a light-sensitive surface. Either of these things can be done for you by commercial developers or, if you want to set up your own darkroom and equipment, you can do it yourself. After the positive film or glass is prepared, it will need to be protected. Bind the film between

glass slides, and bind a clear glass against the emulsion side of the photographic slide.

If you take your photographs on 35-mm. film, it is simple to obtain 2" x 2" slides. If you use color film, send it to be developed and it will come back to you as positive film, already framed in cardboard ready for projection. If your film is black and white, ask the developer to print it as a positive on film. You may then select the best prints and mount them yourself in 2" x 2" cardboard "ready-mounts," that you can buy at a photographic-supply store. These 2" x 2" slides may also be protected by binding them between glass.

Whether you are making the regulation 3¼" x 4" glass slides or the 2" x 2" cardboard slides, photographic slides are not very difficult to prepare for projection. The problem is to get really good pictures. On pages 56-58 we discussed how to take good photographs, and those suggestions are important if you want good slides, for any slight imperfections in the photograph will be magnified many times when it is projected. Your focus must be perfect. All unnecessary details must be omitted. The contrast of color and of dark-light values must be distinct.

It is important to have a good camera with a good lens. But much more important is the painstaking care you give to such details as proper exposure, proper focus, and intelligent selection of subject matter. Use an exposure meter to help you judge shutter speed and lens opening. Use a range-finder or a tape measure to check on distances. Use a tripod for all exposures longer than 1/25 second. Investigate flash bulbs and "photo-flood" lights for your indoor work. Don't be casual about these details; professionals are not, and they have considerably more experience than you. And have a notebook with you so that you may keep a record of these details of exposure. Then you can at least profit by any mistakes you make.

Equally important for good photographic slides is intelligent selection and arrangement of subject matter. Let us say that you are photographing a group of children. Does the background interfere with important details of the picture or does it help set them off clearly? Is light from the sun beating full in the faces of the children, causing them to

squint? Is it shining down so strongly that each face shows just a forehead, a triangle for a nose, and two dark holes for eyes? Or is the light coming from the side, so that the characteristic form and roundness of each child's face can be seen clearly? Is the range of the picture close enough so that you can really see what is happening? Is the picture distorted in any way by strange angles? It is not difficult to pick out flaws and good points *after* the picture is developed and printed. The problem is to see them *before* you take the picture. Think carefully before you snap that shutter. Think about the technical details of focus and exposure. Think about the artistic details of light and composition.

All these suggestions for improving your pictures can well be passed on to your students, especially to the children with whom you work. Most of them will be taking snapshots for the rest of their lives; they may just as well learn how to do a better job of it.

WHO WILL MAKE THE SLIDES?

As you have read these pages and looked at the pictures, you have probably thought of several situations in which a slide could help you teach. But who will make these slides?

Should children make slides? If a student is planning to make a slide, he will have a concrete purpose for studying, gathering ideas, and organizing those ideas in order to decide what to put on the slide. You may suggest that students make slides because you know that facts learned for a purpose are more likely to be retained. Then, too, children like to make things, just for the fun of producing something. And that creative urge is not limited to children. Many adults also will enjoy making slides.

But before you decide that slides are a perfect project for your group, think a little more. How many in your group have projectors at home? Few of them, probably. The slide will not be very valuable to them, then, except as it is used in class. Of course, some families have cameras and projectors suitable for 2" x 2" photographic slides. But most of the slides which he makes himself have little permanent value to the child, and because they usually are not of such quality that they will be saved from

year to year for your use, you will hesitate to encourage their preparation. Probably the slides that children make should be quite simple ones, purely for the immediate purposes of the lesson: to provide some concrete activity to reinforce learnings.

Should you make slides? Slides which you, as the teacher, make are an entirely different matter. Slides can really help you teach, and you can build up a permanent collection over the years. Remember, however, that there are commercially prepared slides available that are much better than any you can make in their respective areas. Reproductions of famous paintings are an example. You can seldom improve upon photographs of animals, plants, geological specimens, and other scientific materials made by professionals. Even if you were a world traveler, you could not match professional photographic slides of far-away places.

But there are many ways in which your own slides are better than any you could buy. You know your own needs and you can decide best how to meet them. Here are some examples of ways in which you can use the slides you make:

By *line drawings* you can:

- compare good and bad design in furniture;
- show suitable hair styles for various face shapes;
- show common mistakes in mechanical drawing;
- show geometric figures;
- illustrate typical posture problems;
- show a graphic representation of the "drop-out" rate in your school;
- make an outline map to project on the chalkboard for filling in;
- make a cross hatching to project on the chalkboard to use as a basis for a line graph.

By *typing and writing* you can:

- project on the screen the words to songs;
- show common mistakes as well as good penmanship;
- play word-recognition games;
- show proofreaders' markings;
- present detailed information for the students to copy.

By *photographs* you can:

- compare good and bad examples of local architecture;
- show the sequence of steps in painting a car;
- bring home the sights you have seen on your trips;
- record events of your group for their pleasure and for use in public relations;
- keep a record of excellent work done by students;
- keep a record of your own successful displays.

How to Make Posters and Charts

In this chapter, we shall make a poster and a chart. The poster and the chart and their audience will be hypothetical, but if we use them as an actual example as we theorize, you will understand better why you use these two mediums for display, how to make posters and charts, and how to judge those you obtain ready made.

Let's set up our make-believe situation. Suppose that you are a policeman in the traffic-control department, and that your specific job is to work with various groups, such as school classes, Scouts, and neighborhood groups, in their efforts to promote safety on the city streets and on the highways.

As you plan your campaign, you know that these groups of people will consider you an authority on your subject and that they will expect you to be full of information—and of inspiration, too. You know, also, that safety on the streets and highways will not result from your mere talking about it, no matter how informative and inspiring you are. You plan your work so that you get the talking, thinking, and acting done by your audience—not by you.

Already you know that audio-visual materials will help you reach your audience. You have a collection of candid snapshots you have taken of drivers and pedestrians doing foolish things. You have tape recordings of their guilty voices as they explain why they were jay-walking or exceeding the speed limit or forgetting to signal for a turn or playing ball

in the streets. You have some newspaper photographs of serious wrecks. You have a notebook of clippings from your local newspaper, organized according to type of accident. You have films sponsored by the National Safety Council for groups to borrow. You have suggestions for radio programs that groups could work out. And, as you plan, you decide that you should also have some posters and charts to help you.

WHY DO YOU NEED POSTERS?

These audio-visual materials will stimulate plenty of talking, thinking and doing—at least so you hope. But most of them will need to be part of an organized meeting. You'd like to have something that will impress an audience with an idea quickly, no matter where or how they see it.

When you talk with groups or when you stimulate them to talk, the generalized understandings that come out of the talk will be important. They will come from the thinking and talking, but you'd like to have something that would repeat these basic ideas, underscore them visually, so to speak.

You realize that your invitation to work with the group will come more often from the leader than from the group members. Still, all the people are interested in saving their own necks. You want something that will shock them a bit, wake them up to the fact that they may be next if they don't watch their step. You want something to send along ahead of your visit, to serve as advance publicity, to stimulate interest in working for safety.

This "something" can be a poster. It can quickly put over one simple idea. It can represent a general concept in "seeing" terms. It can emotionalize an idea, bringing surprise and shock. It can stimulate interest, advertise for you. It is portable and can be used as often as needed. It needs no help to do its best work. It can stand alone.

WHY DO YOU NEED CHARTS?

When you talk to people, you are the visiting authority, the walking encyclopedia of information about traffic problems and safety sugges-

tions. You will be expected to answer all kinds of questions. And you want these answers to mean something to your audience. Again visual symbols can help you. Charts can explain ideas in terms of shapes, colors, lines, pictures. They can be carefully worked out ahead of time to help you explain your more complicated answers. They can dramatize figures and facts that might seem dull if they are merely recited verbally.

The poster helps you by convincing people. The chart helps you by explaining something to people.

UNDERSTAND THE PROBLEM

You are a policeman, remember; you are not a professional artist. You can have the poster and chart made, if you wish. But you are the authority who knows the subject best, and you will have to gather the ideas whether or not you do the actual production. How will you go about it?

Remember the formula for successful display that was outlined in Part One of this book? Let us see how it works here.

Who are the people who will see the poster and chart? As you ask yourself this question, you begin to gather images in your mind, small mental pictures of groups of people listening to you, someone standing up to ask a question, someone waving his hand to be called on, someone with an intense, interested look on his face. You see a group of Girl Scouts in their green uniforms, young and serious. You see the members of the local Rotary Club, leaning back in their chairs after lunch, listening to you. You see a woman asking a question from the floor of the Women's Club.

You also see the people you worry about every day. There's Ralph Williams, who zips around town on his bicycle, ignoring the traffic rules. There's Mrs. Smith, who regularly double-parks her car in the center of the block and, looking neither to the left nor to the right, walks across the street to the grocery store. You see four-year-old Janie, who lives next door to you and who is always playing with her mud pies in the driveway. Her mother should somehow be awakened to the fact that accidents don't always happen to someone else.

As you think about these people, you begin jotting down your ideas. You put down the names of organized groups with which you might be able to work. You list safety violations that are common with the people of that group. Your jottings look like this:

GROUP	SAFETY VIOLATIONS
<i>Young people groups:</i>	
Scouts, Boy and Girl	Playing in streets
Schools, regular classes and special programs	Not watching when crossing street
Sunday schools	Jay-walking
Neighborhood House	Riding bicycles recklessly
The Youth Canteen	Driving recklessly
	Driving without a license
	Driving unsafe cars
<i>Young adult groups:</i>	
Church	Crossing streets without watching
Neighborhood House	Jay-walking
Dancing club	Driving recklessly
Y.M.C.A. and Y.W.C.A.	Driving after drinking
	Driving unsafe cars
<i>Adult groups:</i>	
Women's Club	Crossing streets without watching
League of Women Voters	Jay-walking
Business and Professional Women's Club	Driving recklessly
A.A.U.W.	Driving unsafe cars
Lions Club	Parking unsafely
Rotary Club	Ignoring laws
Kiwanis Club	Driving when overtired
Knights of Columbus	Driving when no longer physically alert
Masons	Not watching young children
Elks	Not providing safe places for children to play
Churches	Not insisting on the expenditure of tax money for added safety precautions
P.T.A.	Not supporting law-enforcement groups
Child-study group	
Country club	
American Legion and other veterans' organizations	

These probably are not all the ideas, but here are plenty to help you think. One thing becomes clear: some safety problems are the same for everyone, and some of them are restricted to certain age groups. You'll need different kinds of posters and charts for different groups.

What is your purpose in using the poster and the chart? You have already thought about the valuable things that posters and charts can do for you, but now you have to narrow down your efforts to a specific purpose. You could use ten posters and ten charts, but you will start with one of each.

What should that one be? What are the problems that appear in every part of the list? There are four: crossing the street without looking, jay-walking, driving recklessly, and driving unsafe cars. These may not be the most important violations, but a poster and a chart to help with one of these could be used immediately with all groups. The two related problems of crossing the streets without looking and jay-walking are important to all, whether or not they drive, so you decide to start with them.

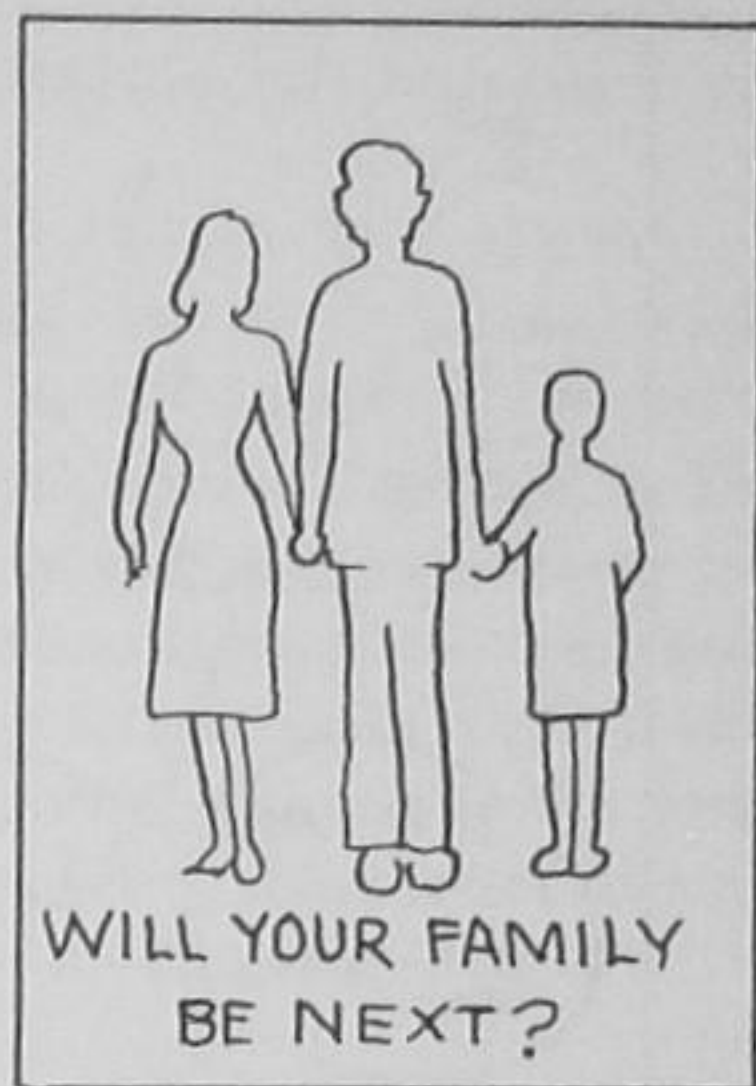
Now, what do you want to accomplish? You want all these people to know about the dangers of crossing streets heedlessly. But beyond mere knowledge, you want them to be so impressed that they will change their habits, so convinced that they will always take care. You want them to *think* about the dangers, intellectually, and decide that they will be careful. And you want them to *feel* afraid of the dangers, emotionally, and actually change their habits. Both are possible. The chart will explain things calmly and appeal to reason. And the simple, direct, emotional appeal of the poster may help to change habits.

How will you plan for "participation"? In order to do this thinking and acting, people have to be genuinely concerned with what is on this poster and chart. As you know, they have to "participate" in some way, either with the idea shown or through some more obvious device of color, design, or copy.

When people are aroused emotionally, they are more likely to feel "caught up" in what is going on. You can work on their emotions through fear—you might show a woman waving good-by to a friend

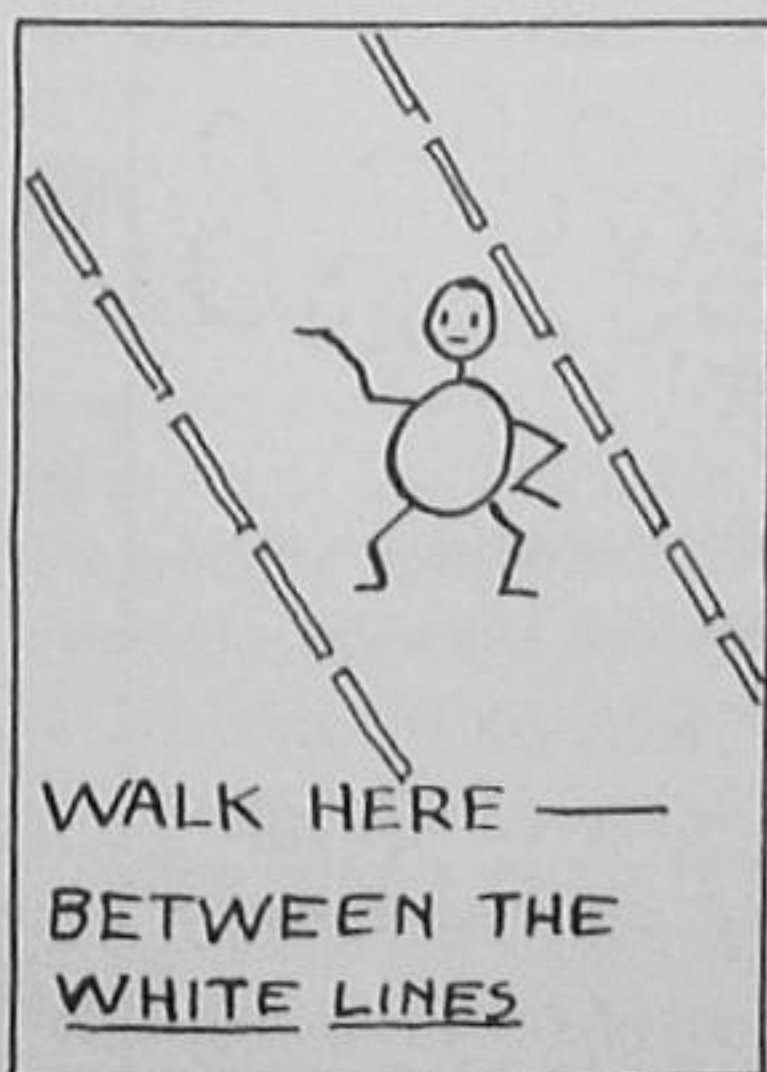


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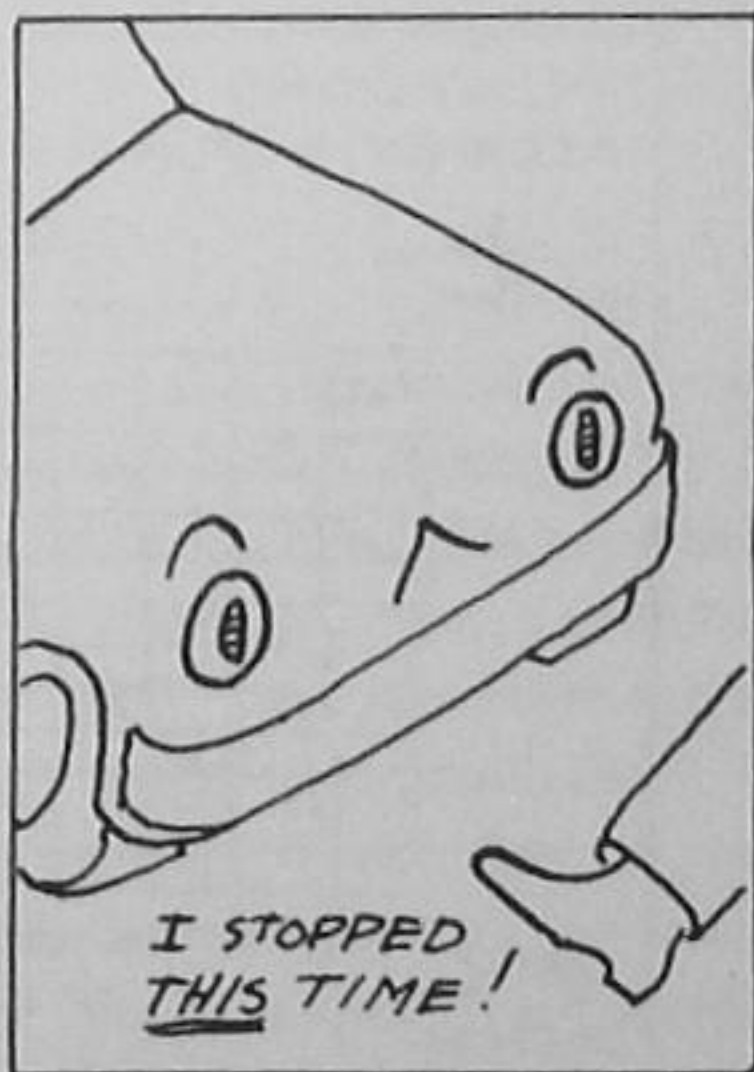


2

as she steps out into the street and entitle the poster "YOU MAY BE WAVING GOOD-BY TO YOUR LIFE." That would certainly get attention. Or you might appeal to their love of their family and their fear for its safety by showing a family disrupted by an accident and asking, "WILL YOUR FAMILY BE NEXT?" Perhaps you ought to emphasize the positive rather than the negative. You could use humor—a gremlin who points out the right thing to do. Or you could use an animated car that teaches good ideas. Or you might overemphasize the danger in some humorous



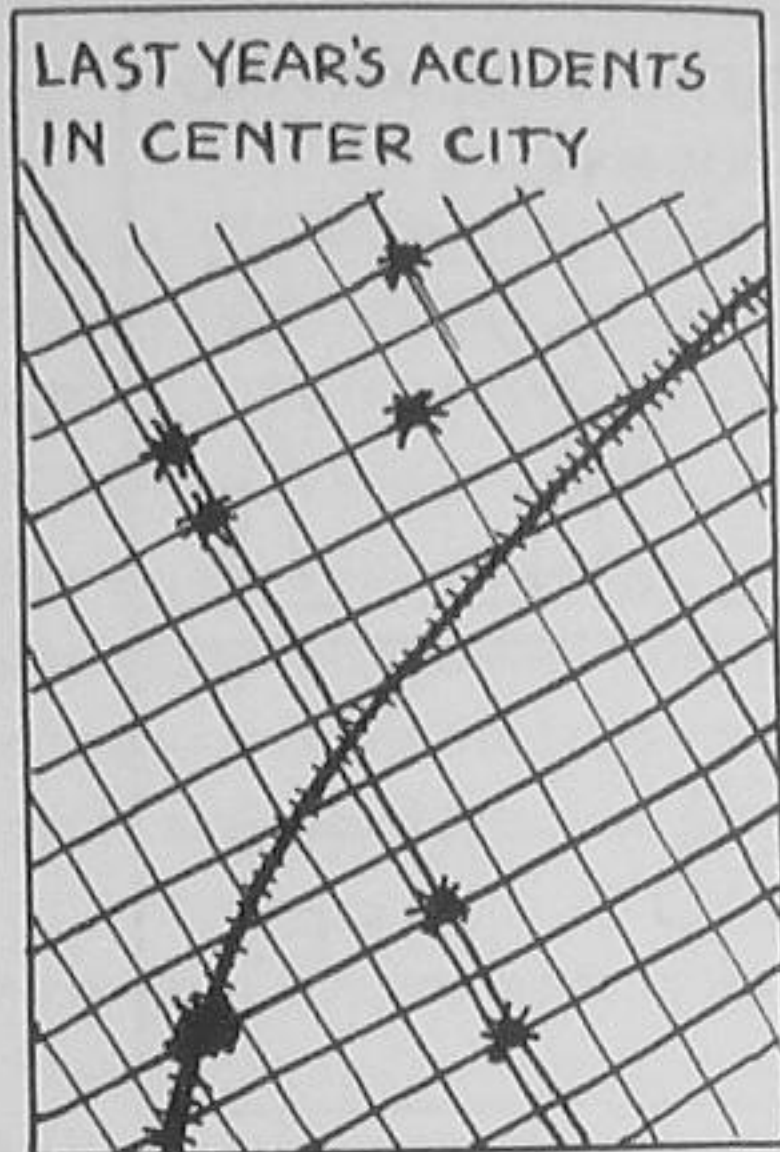
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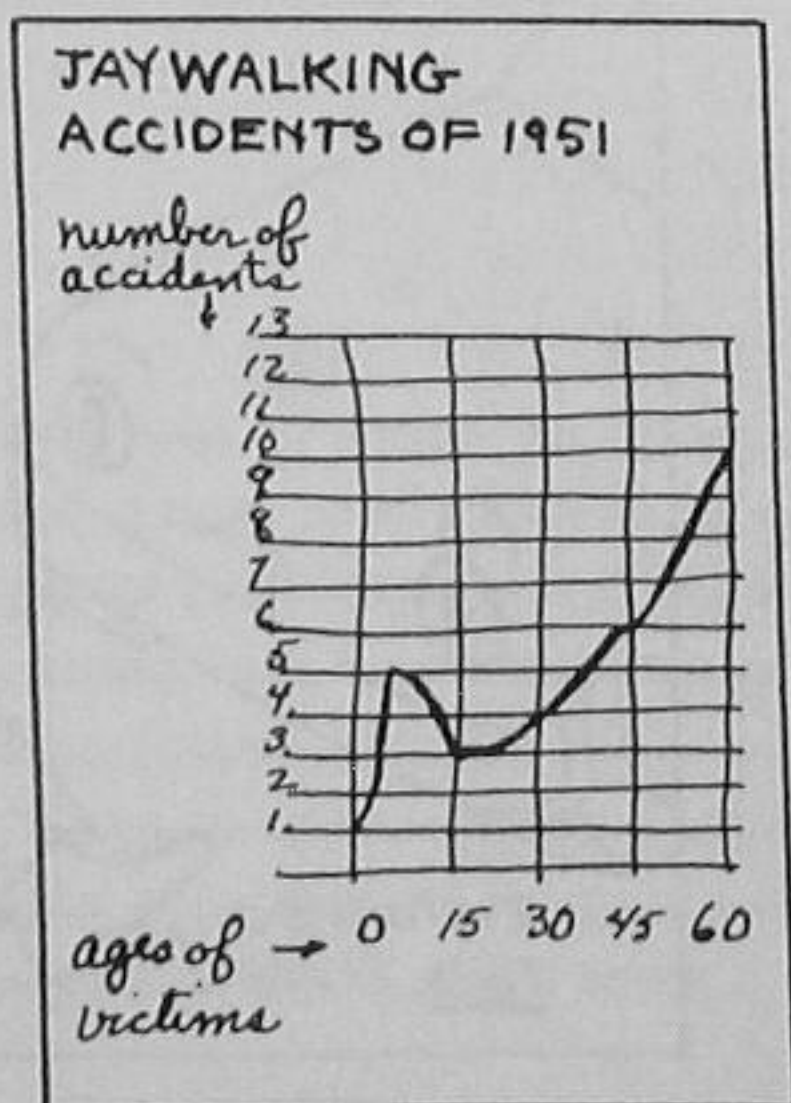
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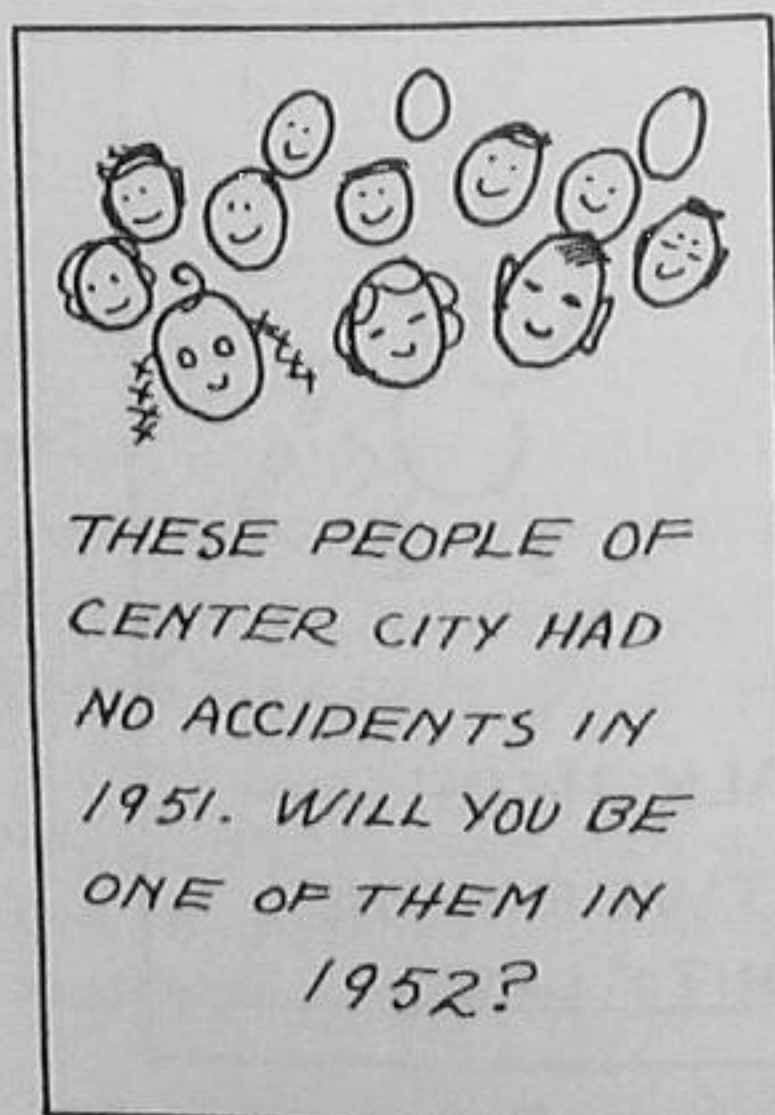
6

way, like having the jay-walker flying through the air in pieces, saying, "Next time I'll look *both* ways."

People are likely to become interested in some problem that touches them directly. Perhaps you ought to make a map of the community and show just where accidents have happened during the last year. Then each person would realize that he crosses the street in those same places. Or perhaps you ought to make a graph that shows the ages of the people who have been involved in pedestrian accidents this year. Each person



7



8

could find himself on the graph. You could emphasize the positive, again, by showing some people's faces and saying, "700 people in our city will have traffic accidents this year. Will you be one of them?"

You will continue to think about your ideas, not deciding on any one of them for a while. You will look at booklets about safety and at other safety posters, trying to see what devices they use to catch people's vital interest. In fact, as you become more accustomed to working with display, you will find yourself analyzing everything you see for these participation factors. And you probably won't be able to resist clipping and sketching ideas and filing them away for future use.

TRANSLATE INTO VISUAL SYMBOLS

These ideas of yours have been rather vague. Now is the time to sketch them out on paper. As you try them out, you'll begin to think less of some of them. That idea of the dismembered jay-walker flying through the air is too gruesome for the average taste. That one goes into the wastebasket. The idea of the gremlin has been overdone; forget that one. But the others have some possibilities, even in these preliminary sketches. So you keep these in mind as you take the next steps.

What materials will you use? Now you go over each sketch, thinking of it in terms of its parts. You think about paper and paint and paste. Idea number one will require careful drawing. Or perhaps a photograph of this situation, enlarged to poster size, with letters painted on it, would emphasize the realism of the event. Perhaps you could find pictures of a car and of a woman waving good-by to a friend and paste them on a drawn-in background. But getting the right sizes and positions would be difficult. No, you'd better check with a photographer to see whether an enlargement that size would be feasible. That copy isn't just right. Instead of announcing the fact, it would be better to question, to say "Are you waving good-by to your life?" That gets more action into it, more reader participation. This idea looks quite workable.

Idea number two is certainly simple enough. It hits right at you. But how will you make that family look as though it has lost someone? Will you put a grave in the background? No. A hospital bed? Maybe.

Or should the father be carrying a limp child? But none of these ideas points out the danger of traffic accidents; the family could have been bereaved by anything. Maybe there should be a broken body under a car. That's rather macabre. You put idea number two away. You'll think about it, though, and perhaps some day you'll find the solution and use it.

The idea of a gremlin pointing out the white lines you discarded as being overdone. But the positive approach is good; none of the other sketches shows what to do, only what *not* to do. It is good to show the white lines, too, as symbols of safety. So you store away that thought for future germination.

Idea number four, the animated auto, looks good. It is simple, forceful, and yet carries a bit of humor as well as warning. But that car will have to be carefully drawn in order to personify it and make it look as though it's sliding to a stop, as though it's very much relieved but at the same time worried about the next time. This will require a master cartoonist, which you are not. Where can you find similar cartoons to give you ideas? If you were in New York, you could go to the Public Library picture collection. You think. Who in your town would be likely to have such cartoons? The auto dealers might. You decide to look around.

You have already discarded sketch number five, the jay-walker flying through the air in pieces. Number six, the map of the community, looks good for a chart; it explains factual information more clearly than you could with words. Will you draw the map? Or should this be an airplane view of the city? No. Although that would be interesting, it would be more difficult to understand because of such realistic and unnecessary details as trees and buildings. No, this should be some simple, familiar diagram of the city so that people can quickly find themselves on it and see the main point—the accident spots.


A map of the city is the thing to use. They are sold in the stationery store in just about the right size. You can just paste one on cardboard and paint on the stars. But are those stars right? They show *where*, but not *how many*. And you want to show that most accidents happen where the highway runs through town. Numbers would be better, bright-colored numbers.

Sketch number seven, showing the ages at which accidents happen,

may not be so good since line graphs are not always simple to understand. Still, the thought is important. What would be an easier graph to use for this chart? Picture graphs? You might draw small silhouette symbols to stand for the people and arrange them in rows.

While you think about graphic ways to show amounts, you suddenly get another idea. Why not use the bar graph to show how long it takes a car to stop when traveling at different speeds? You quickly sketch out

Distance needed to stop a car

going 20 mph 

30 mph 

40 mph 

50 mph 

that idea. The bar could represent the tire marks on the pavement behind a symbolic car; all could be starting to stop at a certain point and the distance it takes each could be marked along the side of the chart. Although it might take a bit of explaining to make everyone understand, the chart would show visually what you try to say in words. Here's another good idea. It becomes number nine.

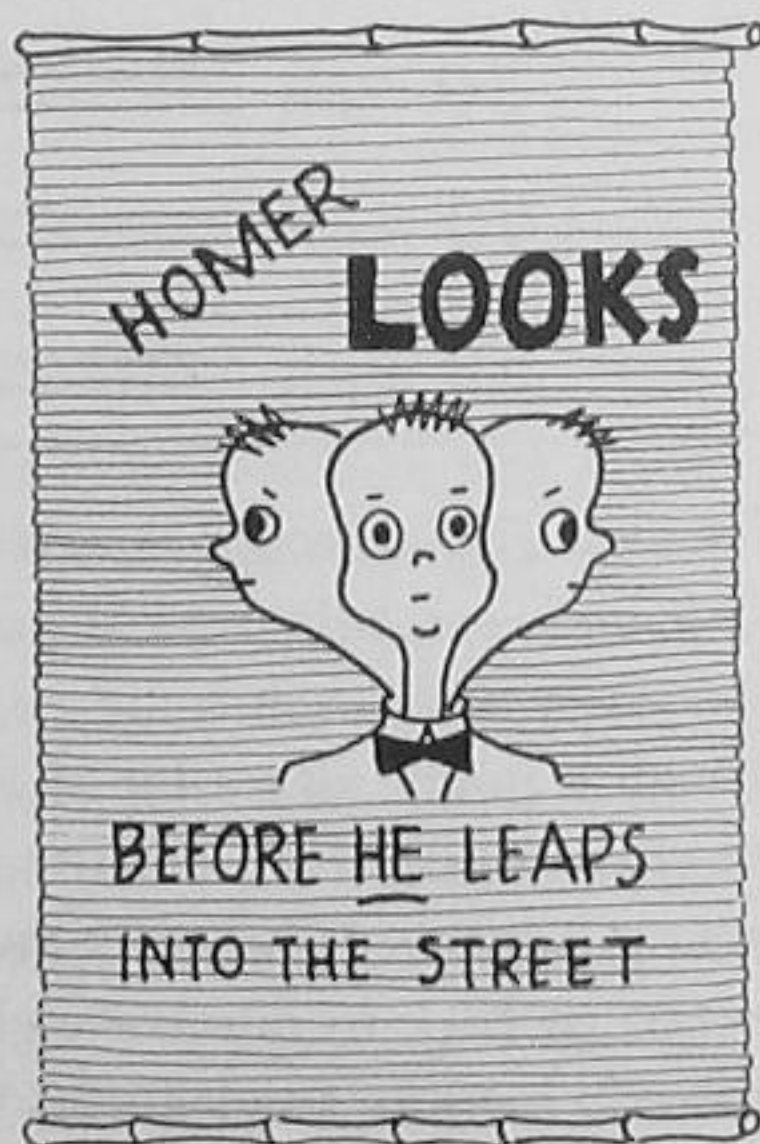
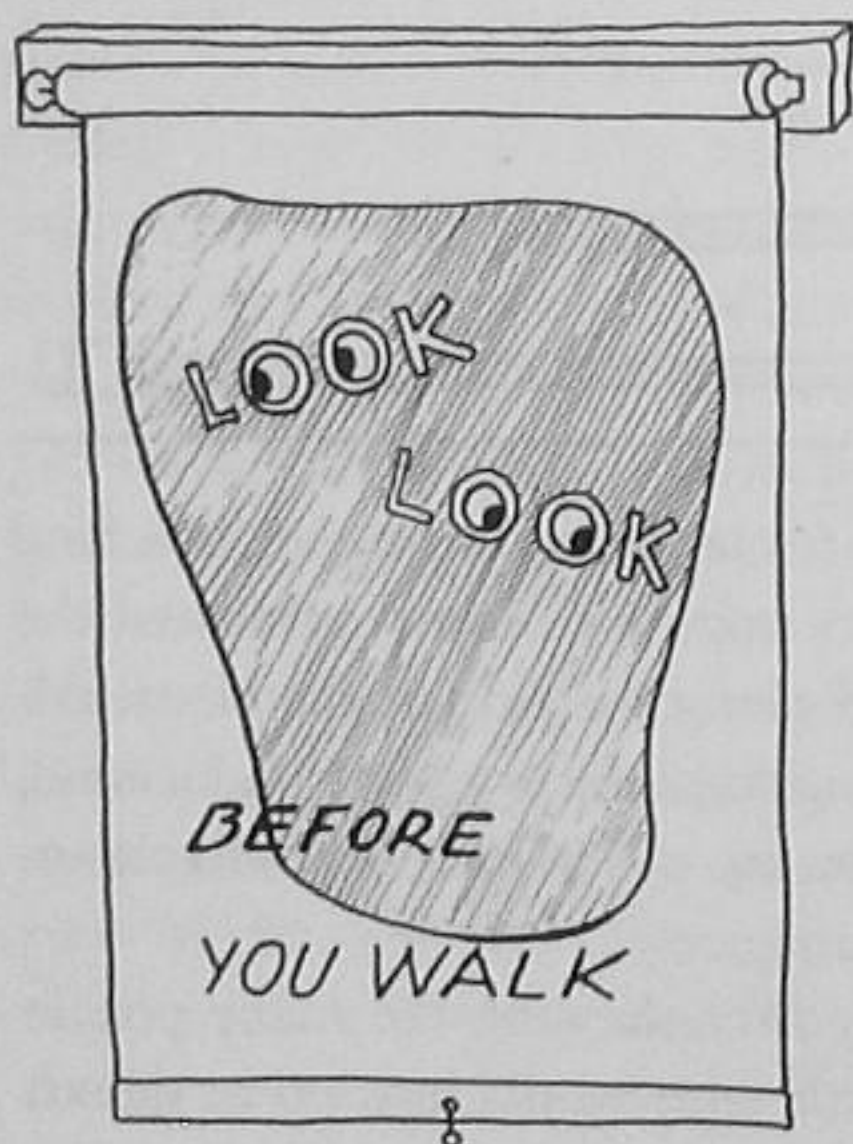
To go back to number eight, the poster showing the many people who will have an accident this year, those faces would have to be drawn in. Or they could be cut out from various sources and pasted on the poster. But in order to get the idea across, you will need a great deal of copy. You decide that this is not a good idea for a poster, because it would be almost as effective in words as in pictures.

What do you have left? The woman waving good-by, the animated auto, the map of your community, the chart of ages and accidents, and the bar graph of speeding cars; these are the ideas that have come through the culling process. The first two are poster ideas and the other three are chart ideas.

Sizes and shapes. The poster and chart should be as large as possible but they must be easy to carry, too. If they are to be mailed to the group before your visit, perhaps they will need to be folded. If they are to be carried in your car, you will make them to fit behind the seat or in the trunk.

If you are going to carry the poster or chart, make it no wider than the distance from your armpit to your wrist, so that it can be carried under your arm.

For the sake of portability, you might paint your poster or chart on a white cloth window shade. Or you might paint on a split bamboo blind with a paint that will not crack or peel.



How can design help your sketches? Now you look at the sketches for design characteristics. First you review the qualities you want. For the poster, you want attention, simplicity, surprise, shock, action. For the chart, you want clear separation of ideas, logical presentation, understandable details. Next you review, and perhaps jot down on paper, the tools of design that can help you and the ways in which they can help. Then you take another critical look at each of your selected sketches.

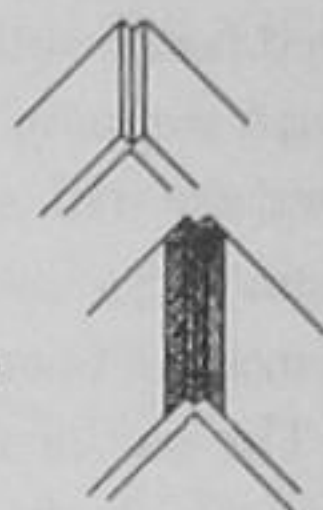
TO FOLD FOR STORAGE OR CARRYING

To fold poster, cut with razor blade on back of poster along line to be folded. Do not cut through all thicknesses.

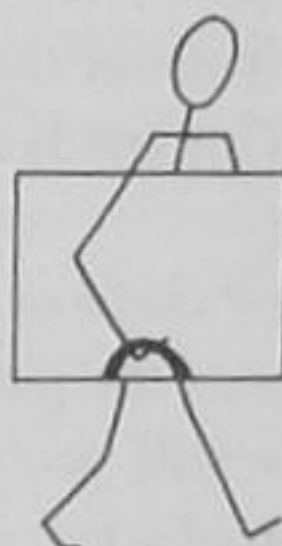


Bend open the slit. Paste on tape, pushing it into the slit.

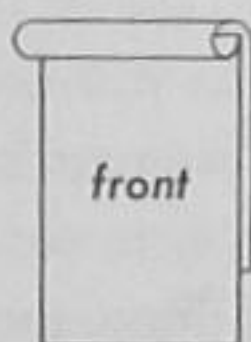
For added reinforcement, paste a strip of white tape on the front at the fold line.



For easy carrying, attach a hand grip that will help keep the poster closed during transportation.



FOR PROTECTION



Thin paper to protect the face of the poster. Flip it to the back for display.

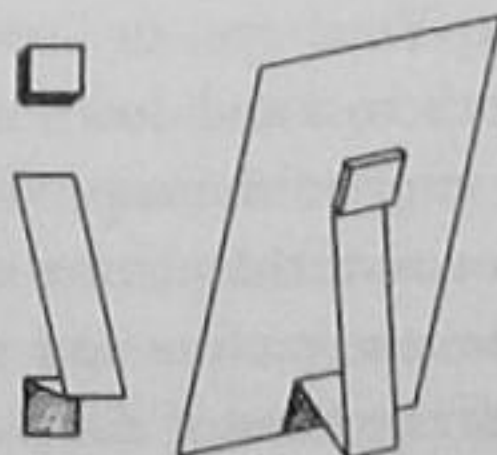


Gummed cloth tape to protect the edges and corners.

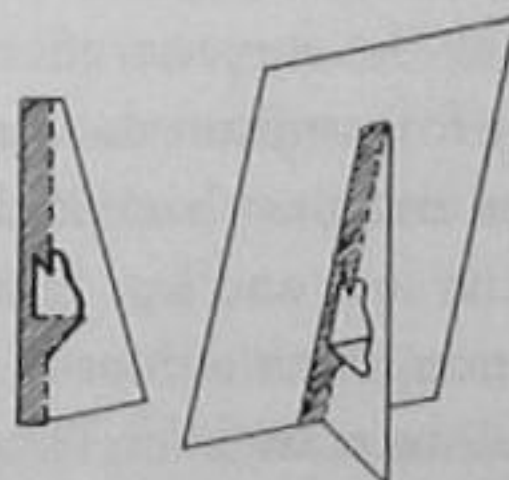


Push in tacks at sides, above, and below—but not into the poster.

FOR SUPPORT



Two squares of cardboard pasted together and a cardboard strip folded and pasted to the back of the poster.



Cut standard out of heavy cardboard. Cut with razor on heavy solid line. Fold on dotted lines. Paste to poster on shaded area. Apparatus folds flat against poster for storage.

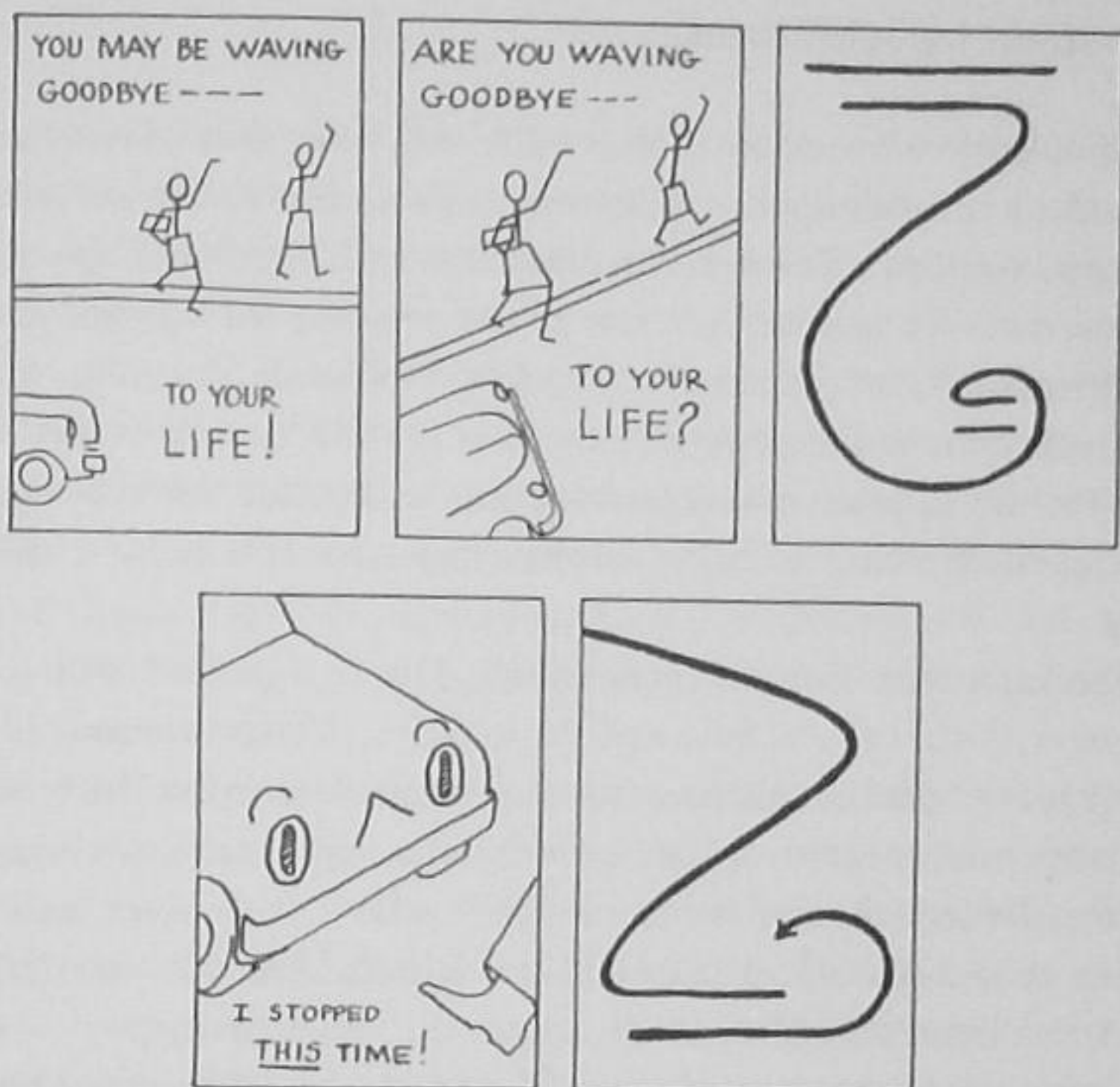
The posters. Comparing the two poster ideas, you see that the *space* is used fairly well in both (see p. 231). There is empty space around the woman stepping off the curb, so that it is easy to see her. On the other poster, the trick of filling up most of the poster space with the car makes it seem very close, too close for comfort. In fact, the car looks as though it is moving toward you. That's good.

The size of this car helps to make it the most important thing on the poster. Is that good? Do you want the viewer to think mostly about himself—or mostly about the car, and other cars that might be coming down the street? This last is not a bad plan. Concentrate on the dangerous cars.

What about the *shape* of the car? Its irregularity contrasts well with the structural lines of the poster. Will you make it as realistically accurate as possible or will you simplify it? Well, if you are making it a personified cartoon of a car, it can't very well be realistic, so it might as well be pruned of all nonessentials.

How about that woman stepping off the curb? Should she be realistic or a conventionalized symbol of a woman? In this case you are after shock, too, and perhaps it will come more quickly if the woman is realistic enough so that a viewer could identify himself with her; yet not so realistic as to be recognizable as a distinct personality. A photograph can do this if careful attention is given to clothing and if the face is turned away from the camera.

How do the *lines* of the posters help? On the car poster, the diagonals of the front of the car contrast with the poster's vertical and horizontal edges, as does the leg of the man walking into the picture. Contrast is important to the surprise effect you want. Your eye, in "reading" the poster, may follow from the top left corner across and down the page to the bumper and then back and down the page to the copy. From there it goes to the foot and leg. It could go on out of the picture along with your attention, but the foot is walking into the picture and your eye is likely to follow it back in. That's good. All the lines of the picture seem to lead your eye to the spot where the accident might have taken place, a crucial spot that is further emphasized by copy there. Yes, this looks like a good poster.



The poster with the woman is rather static. It doesn't move. Why? No diagonals. That's easy to fix: draw the curbstone on the slant and let the car drive up and into the scene. Much better. Now something is happening. The woman is stepping off toward danger. Your eyes start at the left top corner with the copy and they read across, then notice the woman and her friend, then follow down the curbstone line to the car, then come back up and into the scene with the imagined movement of the car to the vital spot where the accident and the copy coincide. It's a more complicated path than in the car poster, but it works.

In both posters the shapes and lines are arranged in *informal balance*. That is probably one of the things that was wrong with the first poster before: it was too formally balanced to show action and emotion. Now both posters are dynamic and stimulating.

The apparent *texture* contrasts between the dull smoothness of the street in each poster and the shiny glitter of the car and the rough patterned designs of the woman's clothes help make each important shape stand out from the background. The forceful irregularity of the letters helps them seem impromptu, speedily drawn in.

Now, how can you use *color* to help? All your ideas have originated in terms of black-and-white drawings. Again, you think back to your aims: you want to shock and surprise. You will therefore choose colors that contrast with one another. But you also want attention and interest; consequently the colors must not clash too violently.

If you stick to the photographic plan for the woman poster, everything will be in black and white anyway, except for the superimposed lettering. Red makes a bright, attention-getting splash for the rough letters.

The car poster can use more colors. The background will have to contrast with the car, the foot, and the lettering. It must contrast in value as well as hue. And the sharpest contrast ought to occur at the vital spot. How about using blue—a light blue for the sky, toning to a very dark blue for the street? The car can be buff yellow with black and white touches at the chromium trim and the wheels. The foot and leg will have to be light-colored to stand out, as will the lettering.

Now you try reversing these colors. Make the background buff yellow, shading lighter at the bottom. Let the car be bright, darkish blue with the black-and-white touches. Then the foot can be darkly silhouetted and the letters can be navy blue, perhaps with a splashy red underlining for "this time" and a red exclamation point. It looks better now.

The charts. Your main purpose for the charts is to explain a somewhat complicated idea. You want to make clear certain comparisons or show details in some visual way in order to make them easier to understand. Because of these needs for clarity, the tools of design have a specific job to do.

Space must set off ideas, separate them enough to make them easy to see, yet not so much that the chart lacks unity. *Shapes* must be simple and easy to understand. Details must be subordinated to the general effect. The map is already made up; all that can be added are the figures and the copy, and they must both be easy to read, large enough, and simple in design. The lettering need not be forceful, rough, with "personality"; it should be careful and conservative in design. The same is true for the letters and figures of the other charts.

The symbolic pictures of people or of cars must be simple enough

not to call attention to themselves and away from the idea of the chart, yet characteristic enough so they are readily identified. You decide to look up in the library the pictographs of Otto Neurath and Rudolph Modley, who pioneered in this field.

The use of all these tools of design ought to work toward *formal* rather than informal balance. Here you are appealing to logic and reason, not to emotions. You want to make these ideas seem solid, conservatively accurate. For the same reasons, you plan the lines of the charts to be horizontals and verticals. And you plan the progression of ideas on the charts to move from left to right because that will seem logical to the people who will see it.

Smooth and plain *textures* help you most by soothing the eye and making the charts look simple and easy to understand. *Colors* should contrast in value with the background so that the figures and letters and symbols stand out well, but you need not be much concerned with hue contrast. Keep your charts conservatively black and white, with one color for emphasis—probably red or blue, because most people like them best and right now you want your audience to be agreeable to these new ideas.

Examine again the unique qualities of the medium. You have everything pretty well decided now except which poster and which chart to make. You have already thought out why you need a poster and a chart. But let's check each idea against the unique capabilities of the medium. Would any of the sketches be just as suitable or more suitable to any other medium?

Both of those posters look like posters. The woman will not be so easy for everyone to identify with as will that foot and leg in front of the car. And so large a photographic enlargement will be rather expensive. But you could draw it. You may want to use this poster for several years; will the style of the car and the woman's clothes go out of date? Probably not too soon. But how long will people continue to be amused by the caricatured face on that automobile? Might there be a time when that poster would be in bad taste? If someone from your city had recently been killed in a hit-and-run accident, you'd hardly feel like displaying

this joking poster. But you could revise your idea a bit and make it a plain car with the copy, "It stopped this time."

The poster is intended to help you by stimulating interest in what you are going to say, by stirring up a wish to do something about traffic safety. Which of these posters will hit the hardest? Which will stimulate the most discussion? Which shows the most obvious mistake? It looks as though the woman wins. She is not looking; you don't know whether or not the man is. She is stepping off the curb in the middle of a block; you can't see where the man is. The car is on the wrong side of the street. People will think about it, first saying that the artist made a mistake, then thinking that perhaps this is a one-way street, then thinking that pedestrians should not rely on what *ought* to be. This woman will be hit by that car no matter whose fault it is, no matter if driver and pedestrian are both at fault. So the woman poster wins.

Now for the charts. Is there any one of them that could be better done in some other medium? Yes. The graphic representation of the number of feet it takes a car to stop would be better done as you talk, with the chalk and the board. You can whisk the lines on the board, adding a nice touch of the dramatic as you and the chalk become the car traveling at slow and at fast speeds. Children can say "stop" for you as you get to the stop line, and you can clearly show them how much longer it takes to stop when speed is increased. You can add the official figures to the graph as you clinch the presentation. The action implied in the flat chart can be included when it goes on the chalkboard.

If the accident chart is going to be used for several years, perhaps the map of the city should be prepared so that the figures can be changed from time to time. It won't mean much unless it is up to date, because your best reason for using this idea is its immediacy. Perhaps the map should be transferred to a slide so that it can be projected against the chalkboard and the numbers filled in as you talk. You might explain the kind of accident as you write the numbers on the projected map. Or perhaps the map should be used against a bulletin board where bright-colored numbers could be pinned in place. Anyway, it does not seem a good idea for a chart that will be used for months and possibly years.

That leaves only the chart showing the ages of the people who have

had pedestrian accidents. It, too, must be kept up to date if it is going to register the accidents in your city. But perhaps you can use instead the figures from the National Safety Council for the whole country as given in the yearly summary, *Accident Facts*. This chart can help you by giving the general expectancy picture and you can fill in local details as people ask you questions.

SO NOW TO WORK

From here on, the work is technical. You have done your creative thinking. Now you gather the materials and the equipment and go to work. You will need:

Heavy white cardboard, a few inches larger in each dimension than the finished poster and chart, so that edges damaged while you are making the chart or poster can be trimmed and used for an easel.

T square	Poster paint
Ruling pen	1/4" brush, square tipped
Wide-pointed lettering pen or brush	Tracing paper
India ink	Photographic film
Colored paper, probably red	Camera
	Models
Facts about accidents and ages	

For the chart, you will first get the facts you need, because the layout of the chart will depend on them. You will have to decide how many age groups to show and how many people to let each symbol represent.

Then you will lay out the spacing on the cardboard and plan the height and approximate width of the lettering spaces, as well as the sizes for the symbolic figures. With the T square, you draw in faint guide lines. Then you sketch in the letters. If you didn't trust your ability to make good letters, you'd have checked with your stationery store for paste-on letters or stencil sets to use as guides. But, having practiced on scraps of paper, you feel confident that the T square and the ruling pen will work well for you in outlining the letters and figures you need. The lettering pen or the brush fills them in. Be careful to use just enough ink, because any puddles left may chip off as the ink dries. And small mistakes that cannot be erased don't worry you much because you can paint over the ink with white poster paint.

The symbolic figures you might paint on with poster paint, but you decide that they will be more uniformly regular if they are cut from colored paper and rubber-cemented in place. You have planned them carefully, using ideas you found in other pictorial charts, so that they are simple yet distinct. They go on the chart in their proper rows, and you are through.

Now for the poster. First, you consult a photographer. You show him your sketch and ask about the possibility of an enlargement of this size. Then you talk about getting the original exposure. It will have to be carefully planned for spacing, for natural appearance. The woman will have to dress conservatively and simply. The photographer suggests that you take the picture from the second floor of a building, getting the woman, the curb, and the car in the correct respective positions, but not necessarily trying to get close enough to make your subjects fill the whole photograph. The negative can be "cropped" to fit the poster.

You take the picture. We will presume, for the sake of our hypothetical situation, that everything goes easily and smoothly, and that the enlargement is delivered to you shortly.

You have found that "dry mounting tissue" does a very good job on photographs, and you use it to mount the enlargement on the cardboard. Then you are ready for the lettering.

You lay a piece of tracing paper over the photograph, and on it sketch in the letters where they fit best. You use all capitals for greater force, and you keep them rather chunky, about three fourths as wide as they are high. They are of various widths, of course, and various spaces apart. As you fit them together on the tracing paper, you plan the width of the strokes you will use. You transfer these guide lines to the photograph.

Then you get out your paint and brush. After mixing the paint smooth, you fill the brush and work the paint mostly out of it on scrap paper. When just a little paint is left in the brush, you paint a letter with it, lifting the brush at the end of each stroke. This is called the dry-brush technique and it requires some practice. It makes bold letters that look as though they had been written in a hurry.

You fasten on a protective piece of tracing paper, hinging it at the top so that it can be tucked in back during display, and there is your poster.

CAN YOU MAKE A POSTER AND A CHART?

This has been a detailed account of the thinking that goes on as a person plans a poster or a chart. It does not always take this long, and the thinking is not nearly so detailed as it seems when you read about it. The more of this kind of work you do, the more you will be able to short-cut certain steps in this process. Poster artists seldom think through all these steps consciously; they get their ideas "instinctively" and make up their mind. However, for that word "instinctively," read "from years of experience." *You* had better begin with the long, roundabout thinking.

The technical part of making posters and charts has been skipped over lightly in this chapter. This you must learn from experience. Practice will help you much more than reading.

To learn how to make a poster or a chart, put yourself back in your own shoes now, with a problem of your own. Then go back and reread this chapter.

The Bulletin Board

If a student brings in a clipping from the morning paper for the class to see, he could just hold it in the air and say "Look!" You would see it—as a scrap of newspaper. But unless it was read aloud, you would have no idea of the message it carried. So he tacks his clipping on the bulletin board next to the items that other people have brought in to share with the group.

Most of us think of this bulletin board as the section of the wall, made of cork or some kind of composition material, upon which we tack notices and announcements and other materials of interest. This is the general definition with which we shall work, but we are going to expand our conception of the uses of the board and the materials from which it is made until the "bulletin board" fills its role as one of the most versatile and important devices that a group can use.

WHO PREPARES A BULLETIN-BOARD DISPLAY?

Whenever a person pins something on the bulletin board, he is hoping that someone else will see it. He is trying to communicate with other people, to express his thinking, and to show these thoughts in some visual way. Perhaps the thing he pins up is of vital importance to the group and he wants them to be sure to see it. Or maybe the material itself is not especially important, but the experience he is having, the expression of his thoughts, the attempt to communicate with other

people is of very great importance. A bulletin board can be of value in both ways, to the person who sees it and to the person who prepares it.

As we said when we were talking about slides, you must decide whether you will prepare the bulletin board or whether an individual or committee from your group will prepare it. Your own display may be more professionally expert; it will be more nearly what you want; it will probably take less time to arrange. But the student-prepared display will give the student a tangible reason for studying, for accumulating ideas, for organizing those ideas and the material representing them. And he is more likely to remember the facts, concepts, and attitudes he learns through his own efforts than those he learns through your expert presentation.

Display will have no meaning unless it is for a person and for a purpose. You must decide who is to profit from the display work and how he is to profit. If you decide that one of your group is to prepare the display, you will have to think carefully about ways of getting the interest and cooperation of the individual. You probably have many ideas of your own already, but watch for other suggestions as you read this chapter.

TWO WAYS OF USING A BULLETIN BOARD

A bulletin board may be used as the familiar "pin-up" board, on which a boy tacks his clipping, on which the fire-drill notice is put up, on which you pin the pictures that illustrate an activity. As a pin-up board, it is the home of a collection of miscellaneous materials. The bulletin board may also be used as a poster. The "poster" board displays one idea in a forceful, dramatic way. The materials are arranged for a specific purpose, for a certain group of people to see. The board uses effectively the power of design.

On page 241 are two examples. Which is which? They are easy to identify, aren't they? But you see, too, that these ways of using the bulletin board are not mutually exclusive. Although the pin-up board is used primarily to display many different things, these things are related to the same topic and have one general purpose. The organization, the use of design principles, helps you to see unity in what would otherwise

be just a clutter. The poster board has vigor and strength. It makes its point quickly. Yet it, too, is composed of various materials.

You might differentiate between the two types most clearly by noticing the different effect of each. Do you want the viewer to be interested in the materials displayed? Or do you want him to be quickly impressed by the "message" of the display? Which of these two arrangements impresses you more quickly? Which invites longer study?

THE "PIN-UP" BOARD

Whoever plans the bulletin-board arrangement—you, or one of the people in your group, or a committee from the group—the bulletin board is successful only if someone looks at it. And this can never be taken for granted. Because the pin-up board is usually full of miscellaneous materials which may or may not have much in common, it is likely to have little initial attraction power. It may not invite attention. In fact, it may discourage attention by giving the impression that you would need a road map to find your way through the clutter.

A successful bulletin board is one that people can't help looking at. Some obvious attention-getting device must be used; and then, after people look, their eyes and thoughts must be led to other information or ideas or articles or objects. Newspapers use the principle in their front-page stories. The banner headline is big, bold, and brief. It usually contains some sensational idea. The next headlines give a bit more information, but these "lead" headlines are still in the brief, bold form. Your interest is carried, thought by thought, until you are reading the article itself. This is what we must try to do with our bulletin boards.

The poster board is designed to attract attention and shout its story quickly. But the main purpose of the pin-up board is not so simple. In this case, the materials themselves are of interest. In order to learn from the display, the viewer must take more than one quick look; he must stop and read and think. So you must plan carefully your "banner and lead" approach. Think about this problem as you read further. See how many ways there are of catching and holding people's attention.

ORIENTAL PUZZLE

understand what's happening



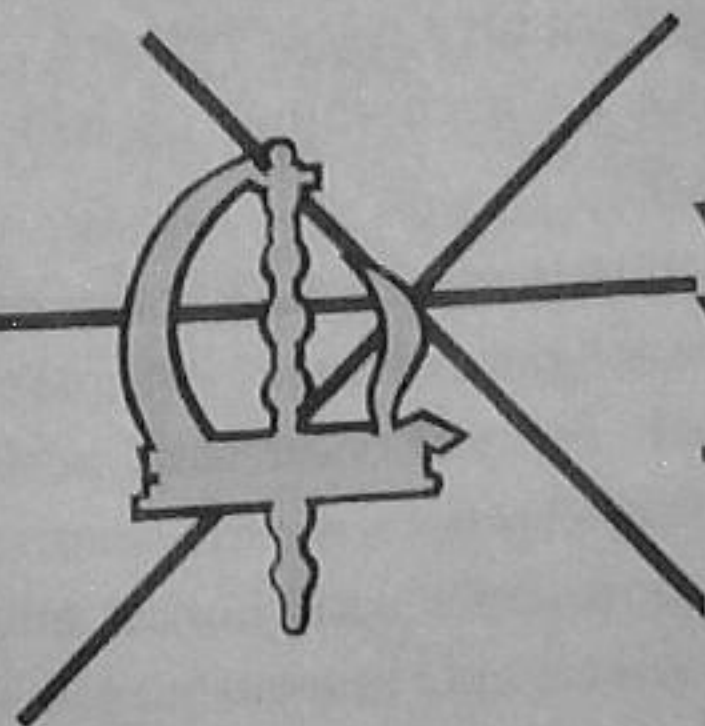
少年中國

Lattimore Brands Bodenz a 'Glib Liar'

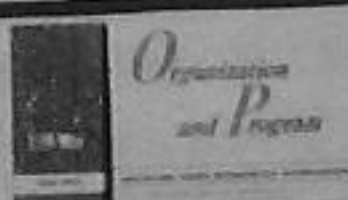


宏昌祥

社經味精



YOUR EMBLEM YOUR ASSOCIATION



JOIN A.H.E.A.

Routine announcements must be posted. The fire-drill notice may be routine, but it is important, too. It explains what to do in case of fire, which exit to use. It is very important at times but, because these times are infrequent, the notice usually gets covered by other things or left in a corner of the bulletin board to gather dust. Is this another case like the leaky roof? When it's raining you can't fix it, and when it isn't raining you don't need to fix it.

The best place for "do this" announcements may not be the bulletin board at all. The fire-drill sign had better be in a conspicuous place where people will see it and notice it repeatedly. If its instructions are seen often enough, they will be remembered so that the right action comes automatically. So put the sign in the direct line of vision, probably in the front of the room, and call attention to it by a red-lettered label: "What will you do in case of FIRE?" The sign saying, "Turn out the lights when they are not in use" might go at eye level on the door frame, where it must be seen every time anyone opens the door. The sign "Wear your goggles" ought to be placed just over the lathe or the drill press. A mirror usually attracts adolescents as a flame attracts a moth, and beside it would be a good place for a sign saying, "Yes, you look fine. But HOW CLEAN ARE YOUR HANDS?"

However, many announcements belong on the bulletin board. Absence lists, class schedules, administrative requests, special subscription offers, new book notices, news of available scholarships, all these are examples of announcements that are important for a day or perhaps a week. The pin-up bulletin board is the place for such things of temporary importance.

Student work may be posted. If you put up students' efforts for group consideration and discussion, you ought to be very careful not to compare the students with one another. For you want each person to grow in his own way, not merely try to keep up with the level of the group. You have to find something good about each honest effort of each student. This may be difficult sometimes, but perhaps teachers should be more like Will Rogers, who never met a man he didn't like. Just look carefully enough and you will find something good. It may be wise to select student work for display on the basis of the effect such a

choice will have on the student, rather than on any basis of excellence or perfection of the product itself.

The girl who has difficulty being neat may succeed in writing out her mother's invitation to the tea party without a single blot. For her it is an achievement, and the invitation might well go up for temporary display. The boy who is very shy may come to know of the other children's interest in his ideas if his picture of a happy house is pinned up and if you help him to tell why he has painted it in that lovely color of pink.

The pin-up board can be the focus for group contributions. When the student brings in that clipping for the rest of the group to see, he is symbolizing his interest in being one of them. If he uses the bulletin board to illustrate his reports or to display his hobby, his posted material is helping him to an increased status in the eyes of his friends. He wants to be one of them; yet his acceptance depends on their opinion (and his, too) of his importance.

If the student works with others on a committee that takes the responsibility for the bulletin board, he will be learning about the subject being illustrated but, much more important, he will have a chance to learn how to work with other people. He will *have a chance* to learn but, without help from you, he may not learn very much. Here is another important reason for using the bulletin board. Use it as a focus, a center, around which individuals or small groups can work. They will give their attention to the bulletin board and you can give your attention to them and to how they are growing.

Will you make an assignment like this? "Tomorrow a committee is going to put up a bulletin-board arrangement. I am appointing Mary and Anna and Philip as the committee. The rest of you are to look through the newspapers and find a current event and bring it for them to put on the board." Of course you won't. But what will you do to get people in the group interested *on their own* in bringing materials to share?

You will bring in things yourself, things of interest to the group, not merely of interest to yourself. And you will comment on them as you put them up, indicating where you found them and saying that you thought the pupils might be interested in them. You may casually mention that you don't see all the newspapers and magazines or that you

don't have access to all the good sources of ideas and would be glad if anyone else could bring in things, too.

The first time someone brings something in, call attention to it. Give credit to the bringer. See that he feels rewarded. Every time something is brought in, see that it receives recognition. The surest way to discourage contributions is to ignore those that are made.

Have at hand materials that people can glean. Some town libraries are disturbed because their magazines and books, too, are torn up by children who feel they must bring something to school for the bulletin board. Don't be guilty of requiring such contributions. And don't praise contributions to the point where a child feels they are his passport to your affections. Do have old magazines and newspapers in the classroom. Bring yours while they are still fairly fresh. Suggest that your school or town library have special piles of things that may be torn up.

Help pupils send for materials they'd like to see. When you write for information or booklets or free samples, tell the pupils about it. Call their attention to offers of information and samples. Have stamped envelopes and stationery handy. Arrange for one person from the group to make the request, though, since a flood of student requests is not always appreciated.

When you get these contributions from class members, how will you post them so that they will call attention to themselves and lead people to want to read further? You will have to be ready with ideas to suggest to your pupils in case they have none of their own. Here are a few:

If your group is studying some controversial question, such as "Are labor unions misusing their power?" your board can be filled with clippings presenting different answers. The board might be headed with the question and subheaded with the words "What do *you* think?" Colored question marks can mark passages in the stories which call for critical evaluation.

Organize the materials in such a way that they are not just a jumble. Make them easy to see and easy to read. Perhaps your group keeps a record of good radio programs and rates them on their quality. A section

of the bulletin board can be set aside for this record. If your group is working toward a safer community, a section of the board can be set aside for recording news of accidents and safety measures. Perhaps your group is studying the problems that face families in your community today, and many clippings are brought in that tell of domestic problems. They might be arranged in related units so as to indicate the areas in which the problems lie.

The bulletin board can be a wall newspaper. This pin-up board does not have to be limited to things brought from other sources; it can be the spot where original news is placed for all to see. If a group does not publish a newspaper about its activities and interests, these items can be written out in regular journalistic style and posted on the news board. Photographs, drawings, cartoons can join the news as they would in a real newspaper.

A school news board can be "published" twice a week in the main corridor. It can be divided into regular departments—news, social events, editorials, advertisements, sports, and so on. The student editors will acquire useful experience, and the news can reach the readers sooner than if it had to go to press.

A faculty bulletin board is too often just a mass of overlapping papers. It need not be. With some organization into departments, it can become a faculty news board. The materials will become easier to see, more interesting to read, and more likely to be discarded after they have been seen. Letters from former students can go up. Clippings of interest to all can have a place. Announcements can have a special corner all their own. Urgent notices can be mounted on red paper.

Some small towns that lack a local newspaper find a centrally located wall newspaper a great help. Sometimes the large tackboard is in the one general store. Sometimes it forms one large wall of the post office. Perhaps it is a glassed-in board set up in the town square. Here the editor and his staff "publish" their news. Photographs of local people and events, as well as regular news stories, editorials, favorite recipes, announcements of church and school events provide materials which are of interest to all. A classified-advertisement section can carry notices of

houses for rent, tractors for sale, bicycles wanted. One little boy carried on a thriving rental business on comic books through his announcement on the local news board.

Most of this news will be strictly local, of course. In the few places out of range of some big city newspaper with world-wide coverage, people rely upon their radios. The news board does, however, reflect the world events as they affect local conditions. Powerful editorials can stir up controversies and can smooth out ragged arguments. The news board can try to carry out on a local level the aim of one big city newspaper, to "comfort the afflicted, and to afflict the comfortable."

THE "POSTER" BOARD

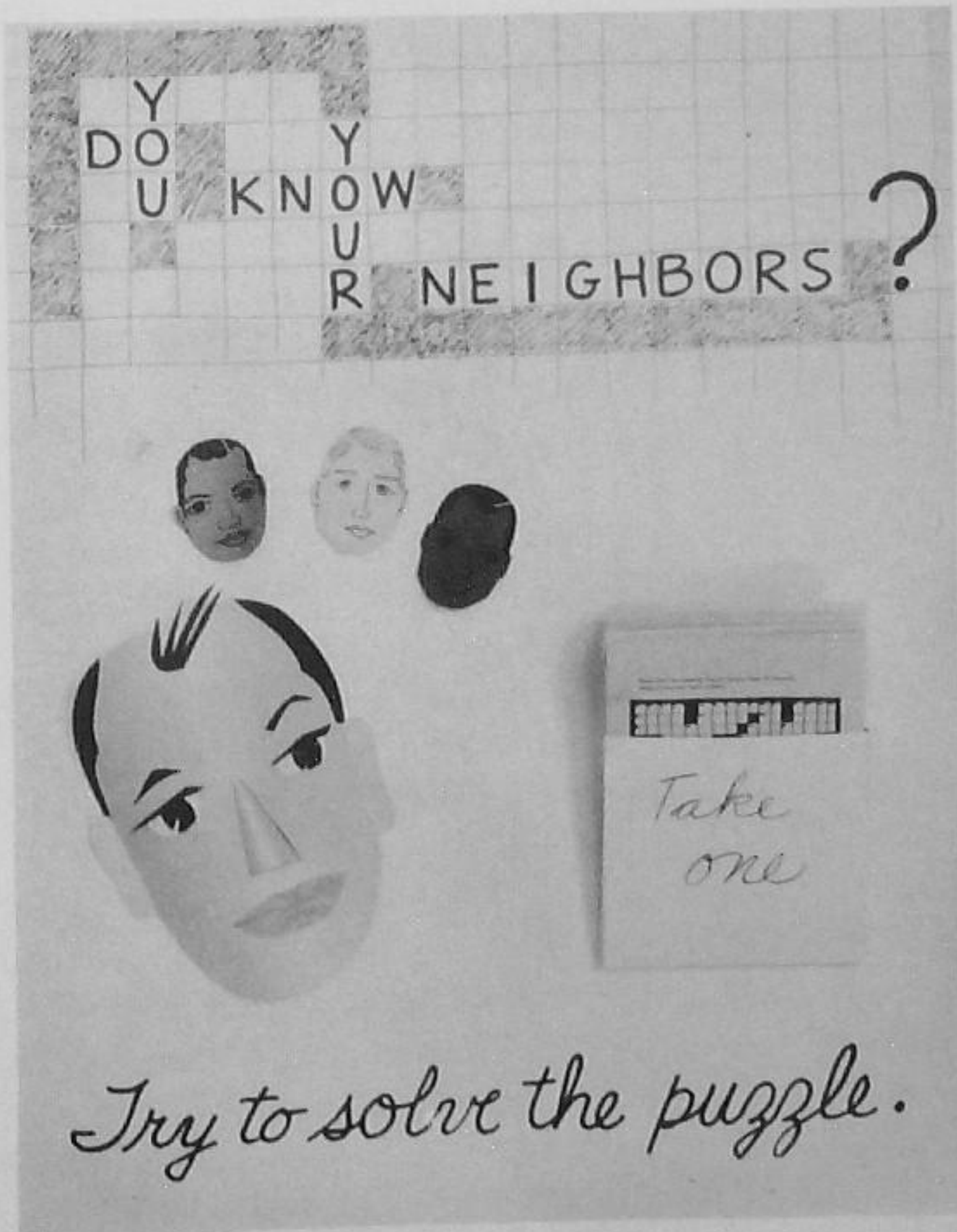
When you make a poster out of the bulletin board, you use the powerful boldness of a real poster. You use the simplicity of the one central idea. You use the brilliance of color, the sparkle of texture contrast. You use the copy and the design to urge the viewer to some kind of action. Like a real poster, the poster bulletin board stimulates its creator to accumulate a great deal of information, sort it out, select from it, and then pack his "message" into simple visual forms.

Then how does a poster bulletin board differ from a poster? Why bother to learn about another way to make a poster? The bulletin board can sharpen and narrow the poster techniques by applying them to a small, specific group of people. A poster is usually directed at the "public." Of course, you always define this public as carefully as possible and try to aim your poster accurately. But the poster bulletin board is very easy to aim. The people who will see it are individuals whom you know. You are fairly certain of what they are thinking, how they will react. So your poster board can be planned to hit the target.

A poster bulletin board can be arranged quickly by assembling materials and pinning them in place. A wide variety of materials may be used—many small articles that would be too heavy for a separate poster can be fastened to the wall. These articles and the pictures, the graphs, the symbols, and other materials can temporarily be a part of one arrangement—then removed from the board to be reassembled later for another "poster" board.

Various materials are used on a poster board. Here are two ideas for using three-dimensional materials on the bulletin board. As you look at the photographs and the drawings, think how you can adapt these ideas to your own needs. And use your own imagination to work out other ideas.

This "poster" board is planned for a group of adults who are meeting to discuss the problem of intercultural understanding as it applies to their community. As an ice-breaker, this display gets attention, stimulates conversation, and gives people something to do while they are waiting for everyone to arrive. Either individually or with their friends, they can work on the crossword puzzle while they wait. The definitions of



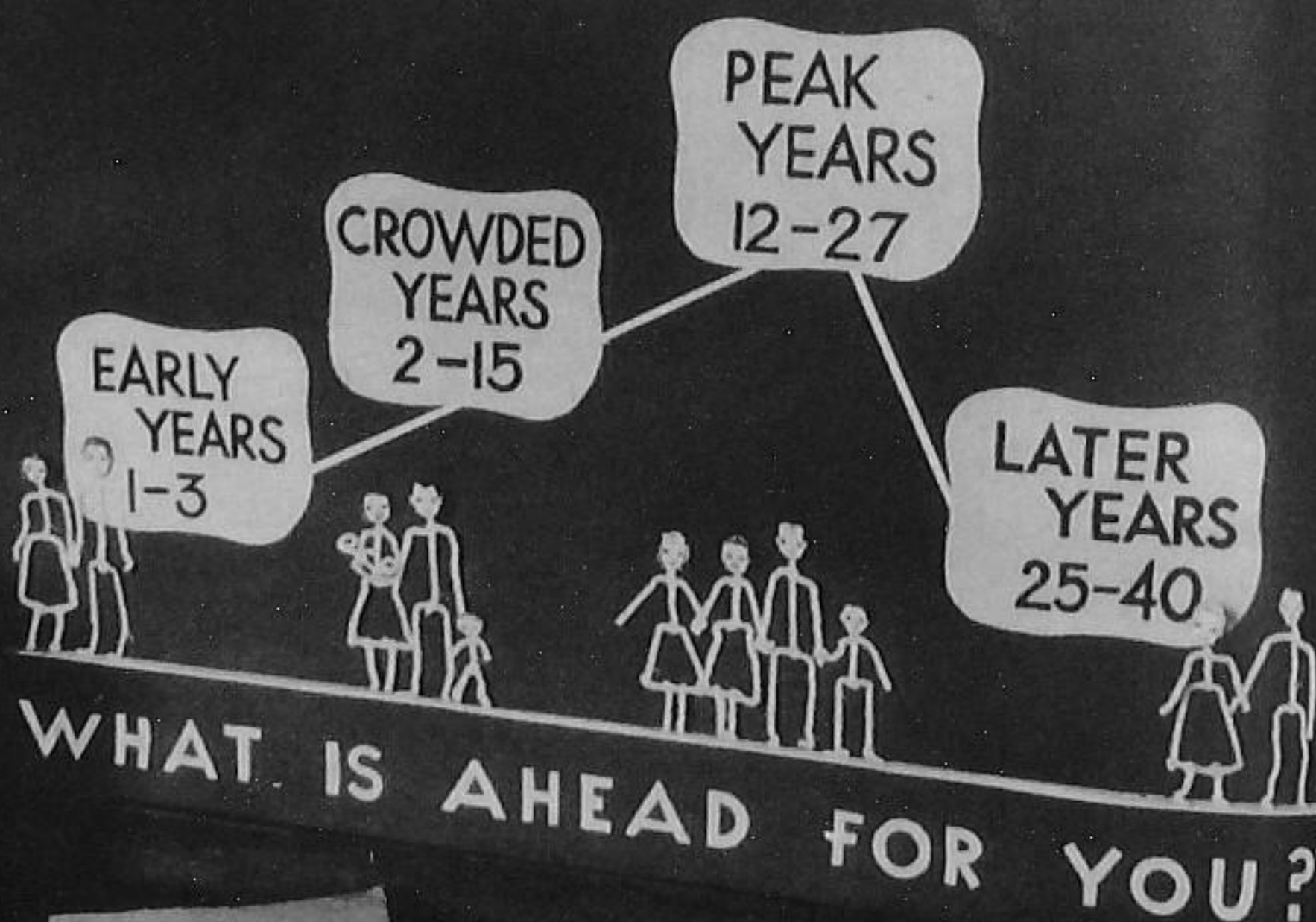
the puzzle and the words they fill in can remind them of some of the important reasons for good relations among peoples. And some of the statements on the puzzle are controversial enough to stimulate some thinking and get people primed for discussion.

Notice how the three-dimensional effect is achieved. The paper sculpture figures attract attention. The pocket for the duplicated puzzles makes one want to see what's there. This is a poster with the added versatility and directness of a bulletin board.

The "poster" board below is adapted from a drawing by Dong Kingman in the booklet *Houses for Family Living*. It uses the graphic form to show the housing needs of an average family. Its simplicity is apparent, yet it calls for more than cursory attention because each person who sees it starts to think about his own family. You did, didn't you?

A unique feature of the poster bulletin board is the possibility of attaching small objects to the permanent wall surface to form part of a temporary display. Here there are small paper shelves tacked to the board, each holding a pipe-cleaner, stick-figure family. What can *you*

THE FAMILY THROUGH THE YEARS



HOUSES
FOR
FAMILY
LIVING



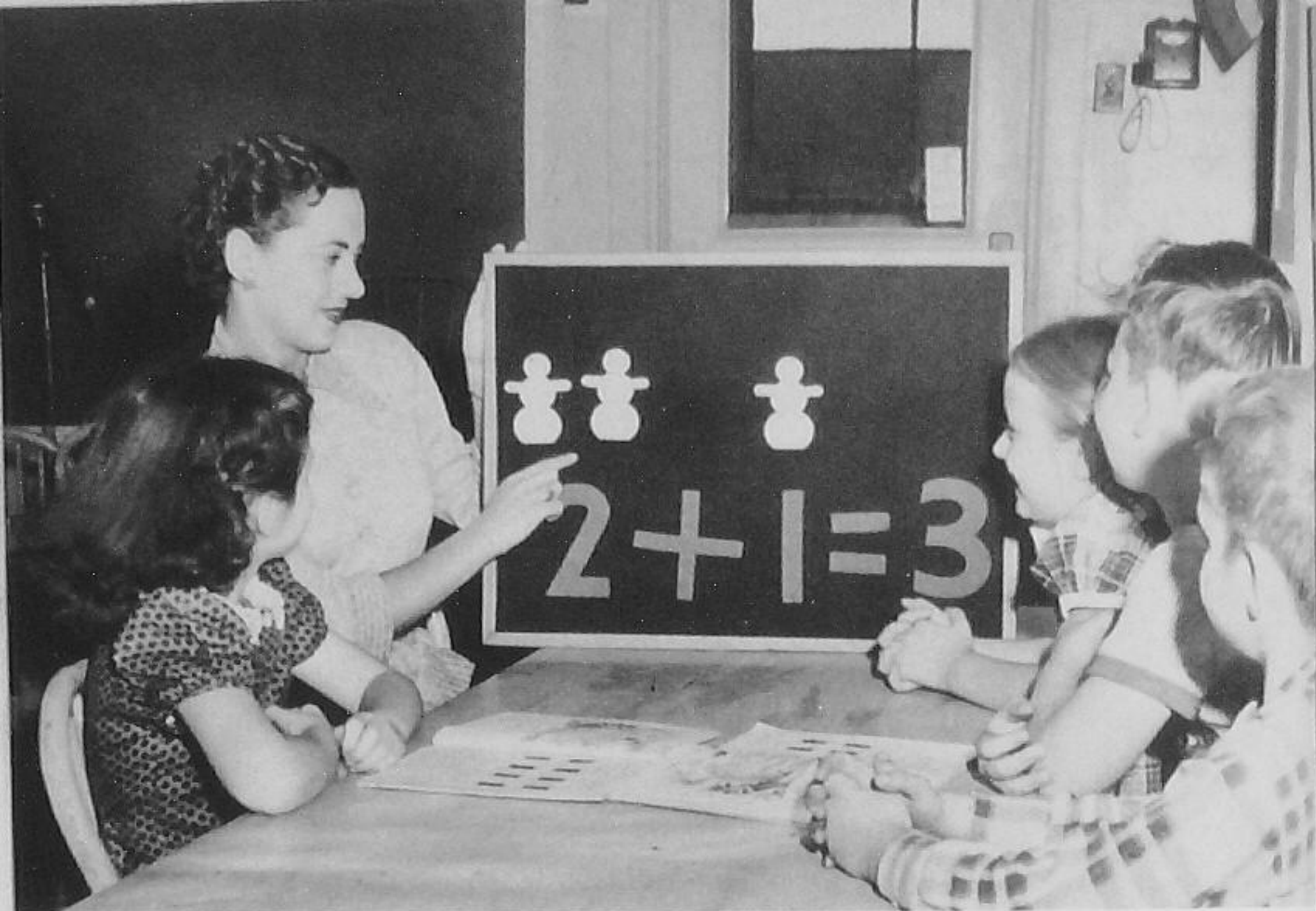
do with shelves like these? Use them for "give-away" booklets? small models? specimens? What would you like to arrange as part of a poster arrangement?

The poster board can be an action board. Here is an idea for you that promises genuine group interest. You can have your bulletin board "work." The viewer can *do something* to the board, either for his own amusement and instruction or for the group to watch.

Above, for example, is a "quiz-master" board. The viewer signifies his answer to each question by pressing a button. If his choice is correct, a musical note sounds and the heart-shaped "Right" lights up. If he is wrong, he gets a raucous buzz and a lighted "Wrong."

The flannel board is an action board. "It's magic" is what the children say about the flannel board. For pictures, cards, letters, symbols, can be placed on the board and they stay there without visible means of support. No pins, no tacks, no hands.

The flannel board consists of a napped piece of material, such as flannel, felt, or velvet, stretched smoothly across the wall or around a piece of wood or cardboard. Each of the pieces of paper or cardboard you wish to display has a piece of the same napped material pasted to its back,



A flannel board helps these children to become acquainted with numbers.

napped side out. To attach the picture or article, just press it against the flannel-covered board. The two napped surfaces will stick together and the picture will stay there until you pick it off.

Small pieces of paper will often stay up by themselves without any flannel on their backs, and even larger, heavier pieces need only a small patch of flannel on the back. Experiment to find out how much. Some people like to cut out silhouette shapes from colored flannel and use them to press against the flannel board as they illustrate a story they are telling.

The unique value of this kind of poster board lies in its novelty and its ability to keep up with you as you talk. You can build up your display, part by part, illustrating your points as you make them, giving your listeners visual as well as verbal explanations. The flannel board can have much the same immediacy as the chalkboard, because it can keep up with you and help the group think along with you. But, of course, you must plan carefully in advance for its use so that you can paste the flannel patches on the papers. It is not an impromptu thing on your part, although it looks that way to the listeners.

The action involved in this board is the action of the group leader. Perhaps this will be you, but it can just as well be someone in the group who is giving a report or a talk. A speech is much easier to give if you feel that you are backed up by good illustrative material. Help your people to feel this same confidence by helping them prepare flannel-board illustrations for what they wish to say. Their talk will be dramatized and their ideas will be easier for other people to understand and remember because of their expert showmanship.

THE BULLETIN BOARD ITSELF

We have been talking about how to use this versatile piece of equipment; now let us look at the equipment itself. What is it made of? How can it be improvised? Where shall we put it?

The materials. Most bulletin boards that are constructed as part of the walls of school buildings are made of cork or of composition. Cork makes the most durable bulletin board and is very easy to put pins or tacks into. But the composition wallboard is less expensive and very satisfactory. It can be painted to match the walls or to bring a cheerful background color into the display center. Thumbtacks leave small holes in this board, however, and if you object to the "pock marks," you had better use pins or staples. Or spatter-print your board with two colors of paint that blend together well as a background for posted material. Among the "spatters" the thumbtack holes won't show.

Some rooms are planned so that one whole wall is covered with this wallboard. This is a very flexible arrangement, because the users can make their own borders for displays and can put up as much or as little as they wish. When a framed bulletin board is vacant, it looks noticeably empty. And yet sometimes a display may not be necessary. A blank wall does not appear so empty, and you are therefore not tempted to keep a display beyond its usefulness in order to keep the space full until you are ready for the next display.

Some boards are constructed with grooved slots at the edges for brackets that can hold up glass shelves, thereby providing for three-dimensional exhibits. Swinging bulletin boards are available. One of them

is like a large book, with the pages hinged at the wall. It is useful for showing many things at once, although you do not really see everything at once, but only as you turn the pages. It will be more difficult to stimulate people to want to look through the "book" than to get them to look at a display which they can see in its entirety with no effort. But you can make good use of this "bulletin book."

Many other materials are being tested for display boards. A type of plaster lath that is firm and hard with small holes every inch or so has been used for display purposes by pushing golf tees in the holes to attach the articles and pictures. A type of wire mesh has been attached to a wall and the corners of pictures and pamphlets slipped under the wires and held in place.

Improvising a bulletin board. The new and unusual materials and ideas are most valuable to the person who must improvise a bulletin board. It is possible that the place in which your group will be meeting has nothing that seems usable, and yet you want to make use of the educational possibilities of a bulletin board. If you have money, you can buy a large piece of composition board and ask a friend who is handy with carpenter tools to put a simple frame around it and hooks at the top to hang it with. Then you will have a bulletin board as good as any.

There are other easy makeshifts. Some of the same composition board can be fastened to a folding screen to make a portable bulletin board. Old linoleum, hung face up or face down, will make a good surface to which it is fairly easy to tack things. It may bend and curve unless it is mounted on a firm base, but if fastened to the wall or to a wooden frame and then painted, it will do very well. Sometimes one can get large sheets of corrugated cardboard from furniture and appliance stores. These sheets are not very durable but they can be useful for many months. Or you may wish to try the plaster board with the golf tees, or the chicken-wire mesh.

Don't overlook the walls and the unused chalkboard spaces. Burlap or monk's cloth fastened to the wall or chalkboard can form a good base for pinning articles to. Or you can use cellulose tape to fasten pictures and clippings directly to the wall if you wish. This tape is very useful, but when it is removed, it sometimes damages delicate surfaces or leaves

light marks on soiled surfaces, and it often leaves a sticky edge on the papers and pictures. If you plan to file them for future use, better cut off the tape.

If none of these ideas seems quite the thing for your situation, try using a wire strung tightly across the wall at eye level. Pamphlets and clippings and articles and pictures can be hung up with clothespins. If several wires are stretched across a space, materials may be hung in carefully arranged display.

The place for the bulletin board. Where shall you place your bulletin-board displays? If you want them to be seen, you will have to place them where the seeing is easy. And even though you hope that they are so attractive that they will compel attention, they will do a better job if they are intelligently placed.

If your display is in the room where your group meets, it might best be located in front or at the side. You can arrange time during your meeting for people to see the board, and you will probably draw attention to it as you go along. The person who prepared the display can explain it. But the board will do its best work if it is seen easily while people are just sitting and looking and thinking. If your room has its bulletin-board space already built into the front wall or in the front of the side wall, your problem is solved.

If your bulletin board has been installed in the back of the room, don't despair. But plan more carefully so that it is seen and appreciated. It can't reach out and tap a person on the shoulder and say, "Turn around and look at me." You must do the tapping. You may be able to arrange the tables and chairs in your room so that the people can see the bulletin board easily. Or you may help the group to become so interested in keeping the board up to date that it becomes really their board, not yours, and they will not need to be urged toward it.

If you have a choice of bulletin boards for your displays, place your materials appropriately. Brief important notices should go where they cannot be missed, where people have to pass and look. Big, bold "poster" boards are seen easily from a distance. Put them on boards that are to be seen from part way across the room. Some materials on the board require

a close-up look. The clippings and cartoons must be read. Post these on a board that people can get next to, that has space around it for standing and sitting and reading.

Of course the bulletin board should be placed approximately at the eye level of the persons who are expected to look at it. For children it will be low; for adults, higher.*

You can overcome to some extent poor placement of the board by the arrangement of the materials. Post those requiring close scrutiny in the best position and those that communicate their message at a glance above or below the best reading level.

USE YOUR BULLETIN BOARD

When the bulletin board is used as a poster, it can shout out bold, clear, simple messages. When it is used as a pin-up board, it can keep your group work closely associated with the reality of today's events. It can help the person who arranges it to clear up his own thinking and to acquire some basic understandings about his problem. It can help this person to stand out in his group. It can help him to fit in with his group, too.

The bulletin board *can* do all this, but it won't unless you spend some time and effort to see that its promise is realized. Keep a record of successful arrangements; brief notes on a card will help you remember if you cannot get a photographic record. Plan to use the bulletin board as part of your work, not merely as a decoration for the wall.

*If the majority of your audience wears bifocal glasses, post things slightly below their eye level. If they can stand close to the board, the most comfortable height seems to be at about their chin level. If some table or other piece of furniture keeps them a foot or two away from the board, the materials need to be posted even lower for reading comfort.

Most people prefer to see a thing rather than to read about it or to listen to someone else talk about it. Words are merely symbols of real things and events. The function of an exhibit is to show us these real things in a carefully arranged fashion so that we not only see the objects themselves but also understand some particular ideas associated with the objects.

When you hold up a magazine to show the members of your group an article you want them to read, you are showing the magazine as an object pertinent to the discussion, but you are not "exhibiting." When you arrange a number of magazines in groups according to the kind of articles each of the magazines contains, open one or two of them to appropriate pictures, and label the display in a way that shows the organization of the magazines and encourages people to select a magazine to read—then you have "exhibited." Your display becomes an exhibit when it depends primarily upon visual means to communicate ideas and when it shows materials carefully arranged so that these ideas as well as the objects themselves are easily apparent to the viewer.

The materials used in an exhibit are most appropriately three-dimensional objects and models such as those we discussed in Chapter 3. But other visual materials, such as pictures, drawings, and graphs, can join the object and models to help explain the ideas. The other display mediums we have discussed—the chalkboard, the bulletin board, the slide, the duplicated page—can also be used to form parts of an exhibit. The exhibit is, in a sense, a culmination of display art.



While they were studying the Basic 7, these children made this model train to express what they had learned. Now it can go on exhibit to show to their parents on Visitors' Day.

KINDS OF EXHIBITS—FROM SIMPLE TO COMPLEX

In our discussion of the several kinds of exhibits and the important problems you may face with each kind, let us start with the simple ones, those that are set up for your own group in your meeting room.

Exhibits in your room. When you know who will look at the exhibit and exactly why you want them to look, you can arrange an exhibit with a maximum impact. In your own room, the arrangements will be seen from close range and their effectiveness will be increased if people can touch or pick up and examine the things in the exhibit. The organized piles of magazines are an example.

A simple way of arranging such an exhibit is to place the materials on a table below the chalkboard, writing the identifying labels and drawing suitable graphs or illustrations on the chalkboard. Or you may place the table below the bulletin board and organize the exhibit to show the relationships between the objects on the table and the pictures, pamphlets, or clippings on the bulletin board.

Shelves in your room are very convenient for display purposes. Their horizontal surfaces support small objects, and the vertical backing of the

Speech is an important part of the training of the deaf child for normal communication. This exhibit is set up near the chalkboard so that the teacher can help this girl to identify and say the right word for the buildings of the town.



shelves can be used to support charts, pamphlets, pictures, or other materials. If you plan to use several shelves for the same exhibit, each shelf can contain similar articles. You may need to give special attention, however, to keeping the display unified. You can use the same colors on all shelves, use a uniform style of lettering the labels, or perhaps use some suitable symbol repeatedly on all the shelves. In this way you can help the viewer see the basic theme of the exhibit as well as the separate parts of it on each shelf.

For small exhibits that are decorative as well as instructive, consider making a "shadow box" from an old picture frame. Build in small shelves (perhaps cardboard will be sturdy enough), tack on a backing of fabric or colored paper, and then hang up your own miniature display case.

The foregoing suggestions for exhibits in your room are for temporary arrangements, planned for a specific use and intended for close examination. You may, however, wish to arrange a more permanent exhibit—one that is built up by contributions from the group over a period of months or one that contains materials that are basic to your entire period of work. For such exhibits, a glassed-in case is appropriate. Here can be placed articles which should not be handled or allowed to get dusty. Think carefully, though, before deciding to use those glass doors.



The Basic 7 in three-dimensional graphic form will be part of the room exhibits for Parents' Night.

People are not so likely to feel personally involved in an exhibit which is glassed in. To help your audience participate in a display which is not so fragile, you might consider removing the doors of the case.

"Open house" in your room. Occasionally you and your group will wish to show your work to your friends, and you will plan to organize your whole room toward the double aim of hospitality and exhibition. In this situation, some of the foregoing suggestions for room exhibits will be useful. However, your audience now includes not only your own group but also the friends and relatives of the group.

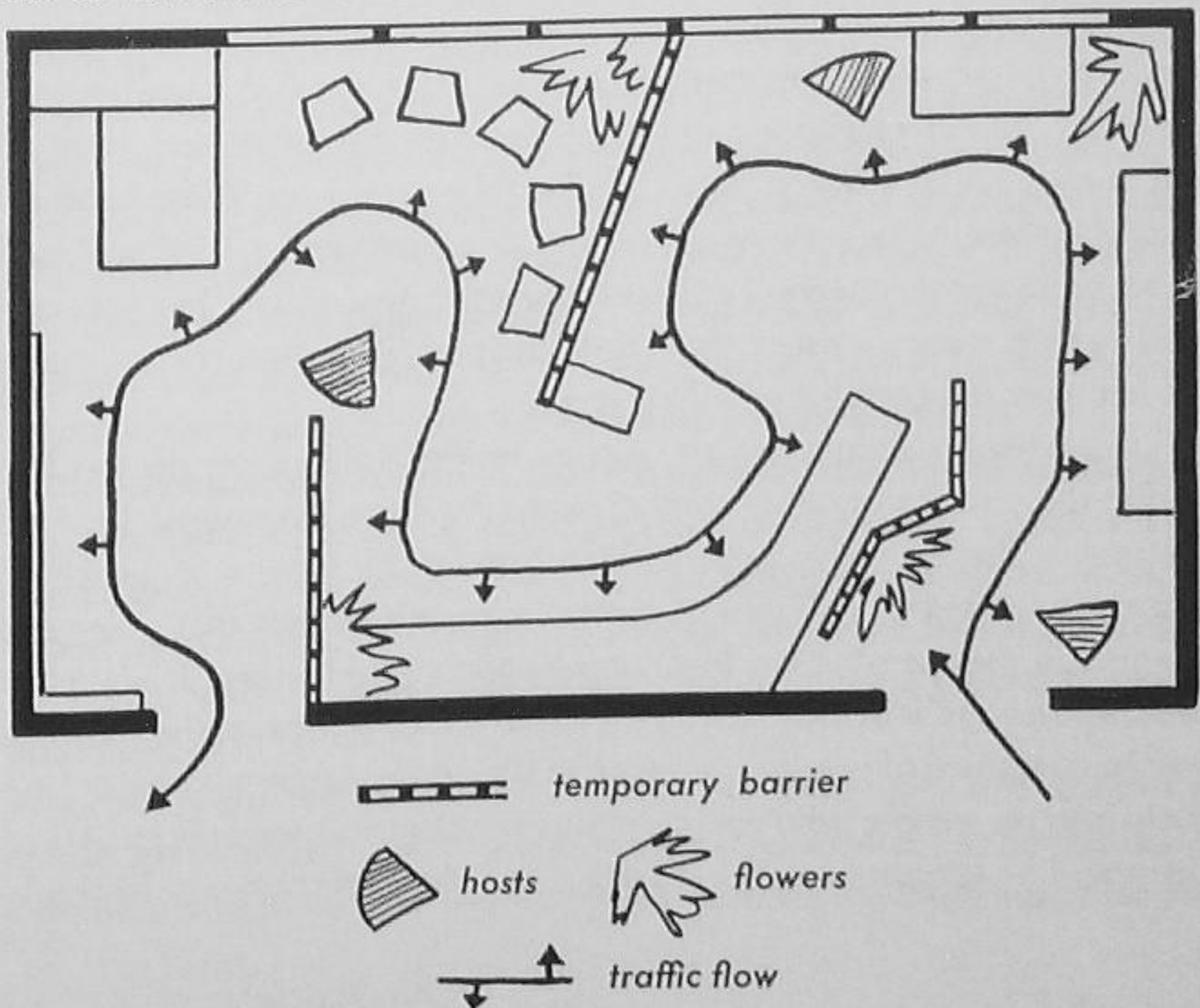
Since you know that each of these visitors is interested primarily in some one person in your group and is thinking of him while looking around, you will organize the exhibition and the hospitality along personal lines. It is important to show and tell *who* has done things as well as *what* has been done. It is a good policy to have something to show for each member of the group, with each article plainly labeled with the name of its creator. It might be sensible to label each seat in the room with the name of its regular occupant—to give the visitor a greater feeling of identification with the activities of the room.

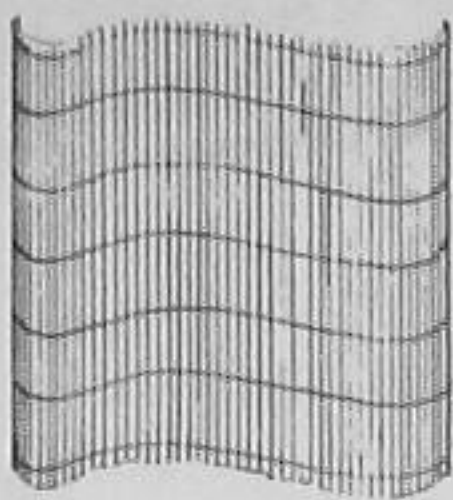
The mechanics of the room arrangement, too, should reflect your interest in the people who will be visiting you. A planned traffic route, for example, can smooth away many of the minor irritations to the visitor. He will want to be welcomed, to see things he is interested in, to talk

with you or hosts from your group, to rest if he wishes, to thank you for your hospitality, and to leave—and he will be able to do all these things easily if you plan ahead for him. Try to foresee from what direction the visitor will enter your room, or have a welcoming host guide him to the right entrance. Plan the exhibits so that he can see them easily and so that he can move unhindered through the room, toward people he wishes to talk to, or toward the exit. Place chairs at suitable intervals, at places where he may want to sit down to examine a display or to talk with friends or to rest.

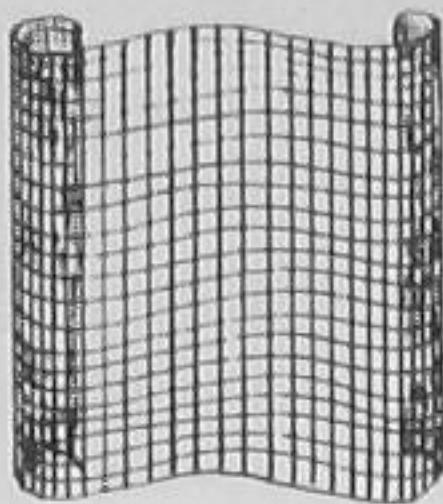
Guiding a visitor through the room depends on guiding his attention as he looks at the room. This can be accomplished by providing only one thing of interest for him to see at any one time. Look at this diagram that plans for traffic flow. The hosts can, by movement or gesture, direct the attention of the spectator without seeming to do so. As the visitor walks along, another display comes into view and he looks at it. So he goes, his feet following his eyes.

This diagram for traffic flow shows how rearranged furniture can act as barriers to divide the room and to separate individual displays.

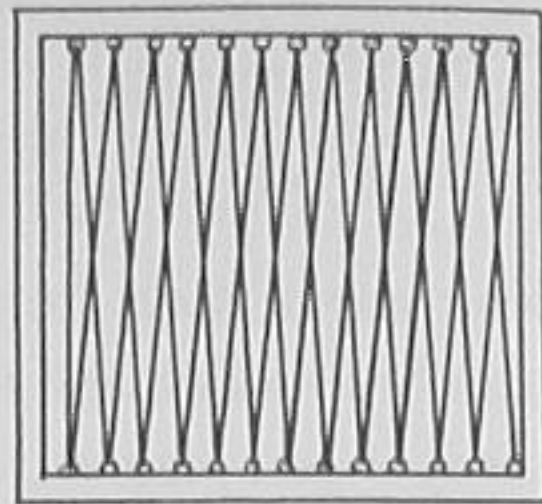




Bamboo blind



Wire screening



Cord-threaded frame

These barriers can be the desks, tables, or shelves that are already in your room, or they can be screens borrowed or made especially for display purposes. Cloth drapes suspended from the ceiling may be used—or a split bamboo blind either suspended or set on its side as a screen—or a piece of wire mesh curved to fit your need—or heavy string, yarn, or rope threaded through screw eyes and stretched tight across a frame to form a transparent screen.

You may not wish to direct your visitors so authoritatively; you may prefer to rely on more subtle methods of directing their attention, such as repetition of color or shape or texture in the displays around the room. But at any rate, you will wish to plan your open house for the convenience and comfort of your visitors.

Exhibits for corridors and lobbies. Although the people who pass by in the corridors and lobbies may be looking around them as they go, they are not primarily interested in looking at an exhibit. Usually they are using the corridor as a passageway between one place and another and, if they are in a hurry, the exhibit will be passed by. These exhibits must therefore be tailored to appeal to the casual viewer. You will not know these viewers as well as you know your own group, but you can predict with some accuracy their ages, their interests, and their reasons for being in the corridor or lobby at all.

In a school building, you may exhibit for the children, for the faculty, or for the parents or other visitors, any of whom have some kind of interest in the educative process. Here you might show a sequence of paintings created by children of several ages, with labels that point out changes in the use of color, form, imagination, and realism. If you plan to set up an exhibit in the lobby of the local electric company, the audience will be composed of people who work in the office, people who are paying their bills, or people who are shopping for electrical appliances. All of them will be concerned with electricity, and many of them will be think-

The large letters, the arrow symbol, and the three-dimensional materials all help to attract attention in a corridor.



ing about electricity in relation to their own homes. This might be a good place to show the types and candlepower of lighting considered best for different types of work.

The subject matter of the exhibit is vitally important to its success, but also of importance are the architectural details of placement, size, and shape. If there is no built-in display case and you may choose where to place the exhibit, put it where people are logically going to look, where they will easily become interested. An exhibit placed just across the hall from the bottom of a flight of steps will be noticed by anyone who comes down those steps. Placed opposite an entrance, it is likely to catch the eyes of all those who enter. Placed beside the school lunch line, it will be seen by all who wait in line for lunch. Placed near office entrances, it will be seen by those who wait for appointments.

These exhibits for corridors and lobbies may be arranged on strategically placed tables or shelves. But, because you are not going to be able to watch over them, most of these exhibits are placed in glassed-in cases. Cases are available in all sizes and shapes: they may be long or short, narrow or wide, shallow or deep. Each one calls for a different kind of arrangement.

Your primary objective in working with these cases is to make the exhibit easily visible. Place the detailed, intricate parts of the display as close to the viewers' eyes as possible and the larger, more easily under-

stood parts in the harder-to-see spots. If the case is very deep, restrict your display area by placing the exhibit out in front and filling in the back of the case with false backings or stand-up charts.

A case that is too shallow presents a more difficult problem. Here you will need to use every bit of space. Even if you have only six inches of depth, you can arrange many materials for display, but you may have to fasten the titles on the outside doors. You may even paint the letters right on the glass with washable poster colors.

While you are thinking of the viewer's ease in seeing the exhibit, consider the direction from which he will be approaching the display. If he will be walking down the hall toward it, perhaps a bright-colored shape projecting into his line of vision will entice his attention to the

This is a well-designed exhibit case, with provision for movable shelves and artificial lighting, space both above and below eye level, and enough depth for general use. Notice the use of newspaper as a background in this exhibit of printing materials.



rest of the display. If your exhibit case is placed opposite a flight of stairs, perhaps the people using the stairs will see the top of the case first. If so, that is the place for the attention-getter.

Be sure, too, that the light is strong on your exhibit. If there is no natural source of light, plan for electric light. Perhaps add the drama of a spotlight; in a three-dimensional display, the brilliant light contrasts sharply with the shadows it creates.

Or you might take advantage of the darkness of the corridor by using a slide projected on a screen as the background of your exhibit. A very effective exhibit could be arranged showing a color slide of a typical Mexican village market place with a collection of fabrics, clay pots, tin wares, and other objects spotlighted in the exhibit foreground. If the projector has a fan and if the slide is protected by glass, the slide should be safe from the heat of the lamp, and for short-distance projection such as this a low-powered lamp is adequate. The spotlight on the objects can be focused so as not to interfere with the slide projection. The two related spots of light and color in an otherwise dim corridor would be very effective.

Exhibits placed along the walls of a corridor may not be able to command attention, especially if the corridor is used mostly by people in a hurry to get somewhere. Here you must plan an especially attractive display, one that shouts out its message with brilliant color or sharp contrasts in light and dark (as in the spotlight-and-slide display) or uses some other surprising device.

Music with your exhibit will attract attention. If the music class is exhibiting a specimen violin with samples of the woods that were used to make it and with some of the partly carved pieces—the pegs, the tail-piece, the neck, and so on—they might play a Jascha Heifetz recording while people look at the exhibit.

A light that flashes on and off catches people's attention. The simple flashing mechanism can be obtained from your local electrician. Plan your exhibit so that the light helps you put across your idea. You might arrange an exhibit of books about international cooperation with a foreground in drab colors showing drawings or photographs of people with sad faces and the words *prejudice*, *bigotry*, *nationalism*, *fear*. The books

could be arranged on pedestals of differing heights in the center of the case. A background mural in clear, bright colors showing happy people standing before a rippling United Nations flag could be spotlighted with a flashing light placed behind one of the pedestals. The over-all title for the exhibit might be: "KNOWLEDGE MAY MAKE THE DIFFERENCE," and the flashing light could symbolize the uncertainty of the future.

Give the spectator some moving object to watch. All you need is a lot of ingenuity and a little electric power. An old electric phonograph slowed down to about 5 or 6 revolutions per minute or a simple turntable mechanism purchased from a display supply house can be the basis for many kinds of moving displays. An electric fan can put motion into exhibits, too. It can make flags fly in the breeze. Placed flat on the floor with sticks and logs laid over and around it, it can make orange crêpe-paper flames and grey wisps of paper smoke appear to flicker and dance, and the campfire seem almost a reality. If your audience is the kind that will not misuse the privilege, install a switch on the front of the exhibit which they can operate to turn the motion on or off. But since movement is so powerful an attention-getter, it may keep people from even seeing the rest of the arrangement. You had better keep the display very simple and the motion a vital part of the display idea.

You may be able to include a novelty in your corridor exhibit that will capture attention. Place a mirror in the center of the exhibit with the label "DO YOU LOOK YOUR BEST TODAY?" Then, all around the mirror, fastened to the wall, hanging on threads from the ceiling, lying on the shelves or floor, place the things that can help to improve one's appearance, such as soap, hairbrushes, and toothbrushes. Or perhaps you can set your version of a ventriloquist's dummy in the display with a pointer to show people what to see, or use paper-bag masks to illustrate the smiles and frowns accompanying a "DO THIS—NOT THAT" display. An exhibit for a corridor or a lobby must use powerful methods to attract attention.

Exhibits in store windows. If merchants are willing to provide window space to help a local group achieve some important purpose,

your group might consider this means of communicating with the public. Don't wait for the storekeeper to seek you out and make the offer. Work on an idea with your group; make sketches or models; then ask the storekeeper for his permission. Try the drug store, the grocery store, and the hardware store. Consider the store at the corner bus stop, where people will stand and wait and perhaps look at your display.

You won't know all the people who are going to see your store-window exhibit; you can only guess about their interests and their needs. But you can make that guess fairly accurate by posting someone at the window to watch the passers-by. Careful attention to such details as this will help you aim your display accurately.

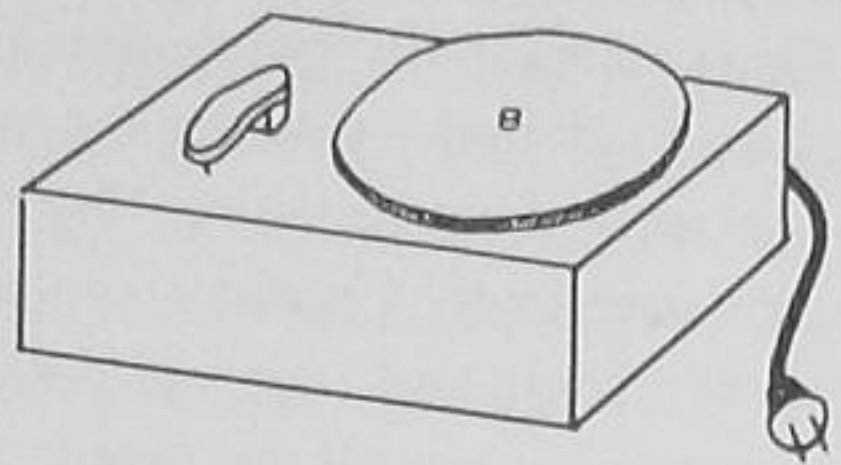
People who are passing a store window usually have some place to go and something on their minds. They are not always in a looking mood. So, even though you know who these people are, your window must be very attractive to catch the interest of a hurrying passer-by. And its message must be so clear and so simple that "he that runs may read."

The display can well include details; in fact, explanations and examples may be very important to show the development of the theme or the relationships between the display and real-life situations. Nevertheless, the display must present one central idea in a direct, forceful way so that everyone who looks at it can find some meaning in it, whether he looks for ten seconds or ten minutes.

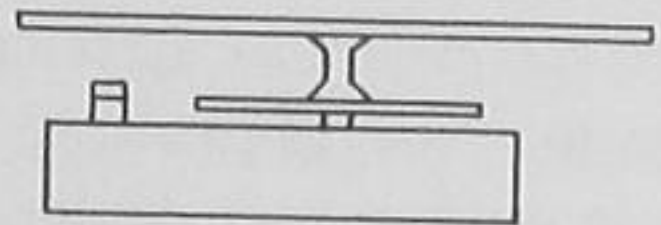
Usually the space of the store window is already defined and you must create the effect you desire within a limited area. Often the floor of the window is considerably below eye level and the display area extends well above eye level. Hitherto we have suggested that the most important details of the display be placed at eye level, but this principle is based on the theory that the spectator is standing still and looking straight at the display. Most of the potential spectators for a store-window exhibit will be walking until they are interested enough to stop and look. Their eyes will be focused alternately on the ground, to guide their steps, and straight ahead of them, to distinguish people they know or things they would like to see. Your window display should be planned to catch their attention whether they are looking down or ahead. Ask the merchant about his experience with the window—which spot he finds to be the

MAKE YOUR

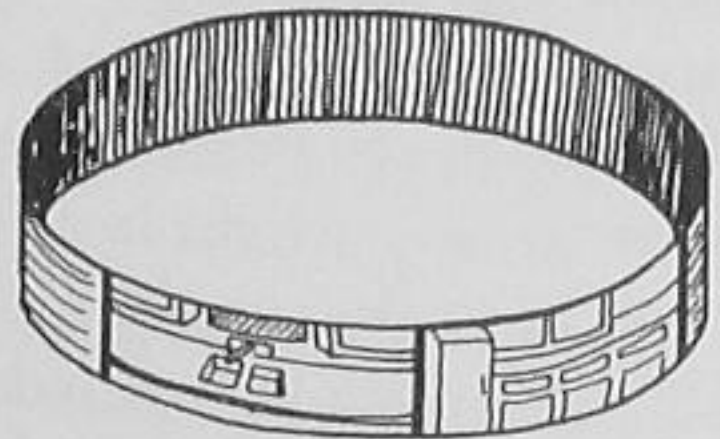
Heavy articles placed on the turntable will slow its speed somewhat. But for lightweight objects, ask an electrician to slow the revolutions to 3 or 4 a minute, or use a commercial turntable.



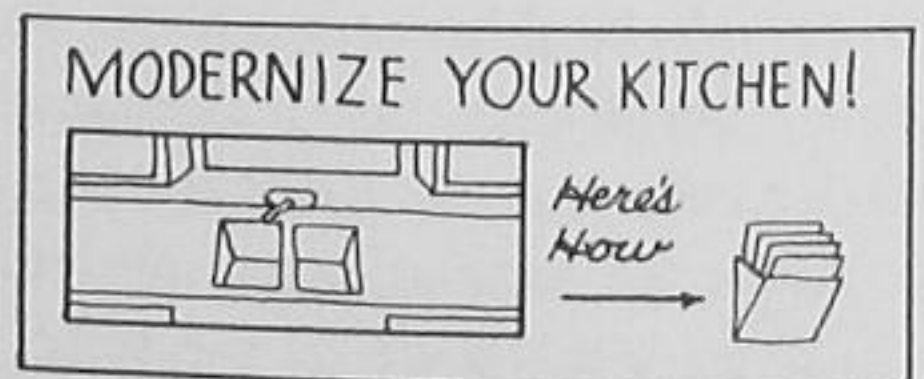
Make a new, larger turntable of cardboard, and fasten it to the original with a spool that fits tightly on the center knob.



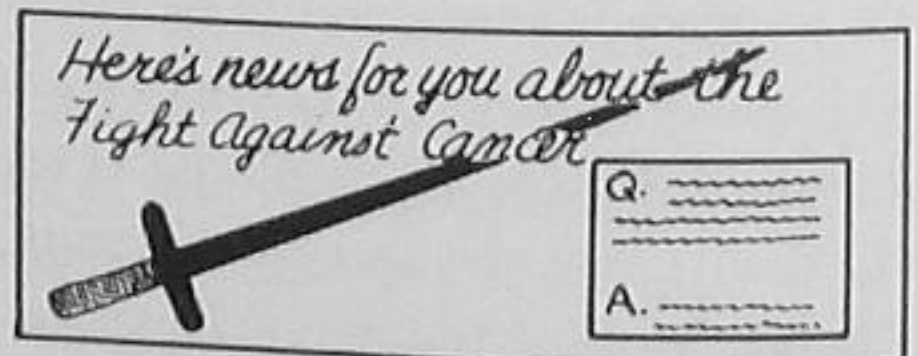
Then fasten an "endless belt" of pictures to the edge of the turntable.



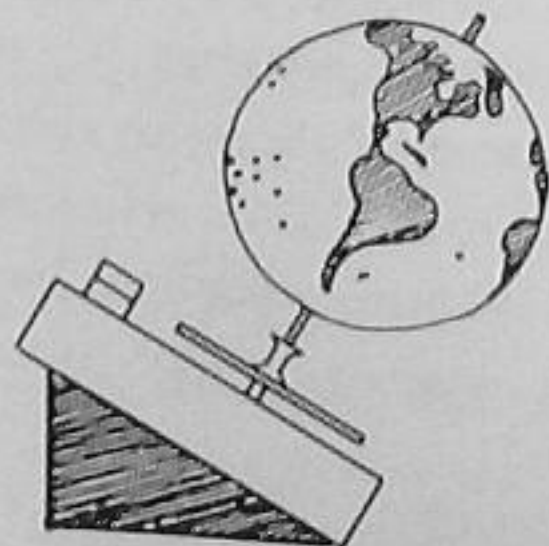
Place the apparatus behind a cut-out window in the poster-background of the exhibit.



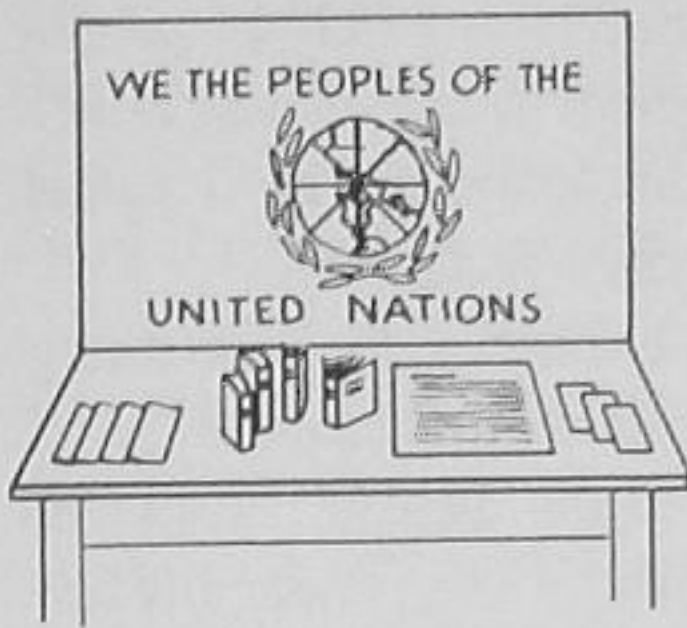
Or place the turntable on its side with an endless belt of questions and answers.



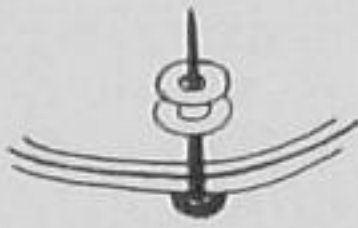
Glue into the spool hole a tight-fitting dowel. This can support such turning things as a light globe. Tilt turntable to the earth's axis. Hide the mechanism with other parts of the display.



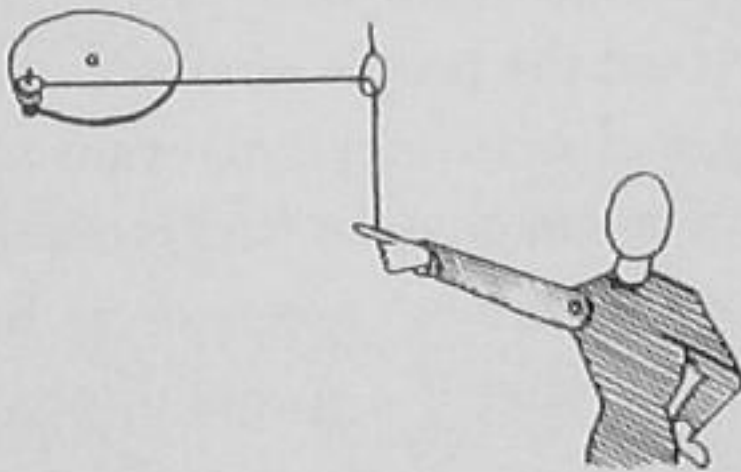
EXHIBITS MOVE



Tip the turntable on its side, with the circular surface facing forward. Fasten to it such circular symbols as the color wheel, the "wheel of good eating," or this hemispheric projection.



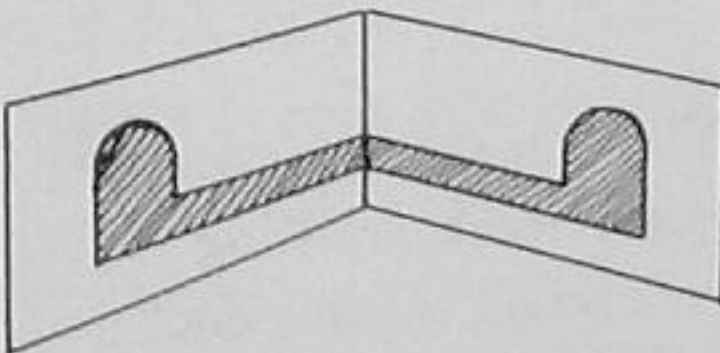
Fasten a nail to the edge of the turntable with wire. Slip a sewing-machine bobbin over the nail; tie a string to the bobbin, thread it across a pulley, and fasten it to a small object. As the turntable goes around, the object will go up and down, rhythmically.



This arm hinged at the shoulder will go up and down. The rest of the apparatus can be hidden with other parts of the display.



On the enlarged turntable, put small figures or objects, such as these small models.



Cut out of the background an opening for the turntable and the figures.



most attention-getting one. If you station an observer to watch the people who are to be your audience, suggest that he watch their eyes and notice where they seem to look most often. If you can locate the focal points within the space, you can plan your exhibit more accurately.

You will usually have the advantage of electricity for interesting lighting effects and for power to operate a turntable or other devices to create movement. You may also have access to the display "props" of the merchant—his background materials, his fabrics and papers, his furniture, manikins, and old advertising displays. Probably your most valuable resource, though, is the merchant's experience in displaying things.

Exhibits in large auditoriums. If your club is responsible for a booth at the school carnival, for an exhibit at the Rotary convention, or for a display at the county fair, you will be faced with new problems. You and your group are not quite so sure about the people who will see your display—what they will be thinking, and what they will want to see. Your first task in planning will be to try to imagine the background, occupation, age, interests, and thoughts of your typical spectator as he passes your show. Your exhibit will be most effective if it speaks directly to the individual viewer on his own terms.

Perhaps he will be in a holiday mood, excited by the carnival atmosphere. Perhaps he will be tired from a long day of tramping about the fair grounds. Probably he will be in a mood for looking at displays or he would not be walking through the auditorium; yet, he will be somewhat jaded by exhibits, too, since there will be so many competing for his attention.

How will you meet this competition? You can shout louder with brighter colors, larger signs, noisier barkers, or more arresting ideas. Or you can plan to do a more expert job of analyzing the audience and then an equally expert job of appealing directly to it. As you plan, think of what your "competitors" will do, not merely of what you will do.

You will probably be assigned a certain floor space and allowed to fill it pretty much as you wish. There will be certain restrictions, however, which will affect your plans, and there are questions which you should get answered before you go ahead with your plans. May you build your exhibit to any height you wish? May you use any colors? May you

build walls, backgrounds, charts, and so forth in the auditorium? Will there be tools available there? Will there be someone to help and advise you? Are the entrances to the hall large enough, should you decide to build the parts in another place and move them to the auditorium for assembling? Will there be any supports, counters, tables, or other furniture supplied for you? Is there electric power? A.C. or D.C.? Is there plumbing near by?

Your group will have to decide, too, whether to use your allotted space as though it were a large display case to be looked at or as a room to be walked into. You must decide whether to use all of it for the exhibition or to present the "show" at the front and use the rest of the space for behind-the-scenes activity. The solution to these problems will depend on the purposes of the display and the way in which you plan to achieve them.

HOW TO PLAN AN EXHIBIT

We have discussed many different types of exhibits, from the simple display of magazines in your room to the complex exhibit for a county fair. Planning for an exhibit involves the same steps, however, whether the results are to be modest or elaborate. A description of the planning that precedes an elaborate exhibit may help to make clear these steps.

Let's assume that you are advising several 4-H Clubs who will work together to prepare an exhibit for the county fair. They will do the planning, make the decisions, construct the exhibit, manage it during the fair, and profit from its success.

Think about the people who will see it. The club members will probably have many ideas about things to show—animals, pies and cakes, dresses, or furniture. After discussion, however, they will see that some further thought is necessary before they can agree on one idea. You may be the one to suggest that the exhibit will be successful only if it shows the people something they would like to see—and that the only way in which to be sure of what the viewers would like to see is to study the viewers. Mentioning that many business firms make detailed studies of their markets as a basis for advertising may help the club members to

realize that successful display depends upon successful communication, which in turn depends on knowing the people with whom you wish to communicate.

Help the group make up a series of notes about the people who will be looking at the exhibit: their ages, occupations, reasons for coming to the fair, probable mood as they look at the exhibits, and questions they may have about the work of the 4-H Clubs. By interviewing parents and friends, the club members can obtain enough data from which to generalize for all the spectators. Let us assume that their sample turns out to have an age range of 6 to 60, with the largest number between 30 and 40; that the occupations of the sampled parents and friends are widely varied, with the largest number housewives, farmers, clerks, and small storekeepers; that they come to the fair for excitement and pleasure, to see their friends, to learn things that will help them in their daily lives, and to enter their own animals or food in contests; and that they already know quite a bit about the 4-H Clubs but are interested in seeing what the clubs have done during the past year and how the club work has helped the young people to grow up into happier, healthier citizens.

Think about your reasons for exhibiting. While one committee is collecting data on the people who will be looking at your exhibit, another committee can be interviewing club members to get a list of their reasons for wanting to set up an exhibit—to show the completed projects of the club members, to encourage more young people to join the clubs, to raise money for the clubs, or to show how the club is helping to improve the life in the county.

Each of these reasons, if used as a single theme for an exhibit, will produce a different kind of exhibit. And, as the club members think about the reasons, they see that each reason can be amplified to include others. For example, in showing the projects of the members, the group will be building feelings of pride in the members, feelings of pride and appreciation in the members' parents, and perhaps feelings of admiration in other teen-agers which will lead them to join a club.

Another committee from the clubs should be surveying what was actually done by the clubs during the past year. A list of individual

projects as well as group activities could be reported to the committee so that all members would have a common understanding of the work they were trying to interpret to others.

After this gathering of facts, the clubs will spend some time in analyzing them—thinking of how the three sets of facts fit together, how “What have we done?” fits with “Why do we want to have an exhibit?” and “Why will people want to look at our exhibit?” Several ideas for the display will present themselves, but probably the group will find that no one idea will exactly suit all the accumulated facts. For example, a collection of projects, such as clothing or canned food or fine animals or garden produce, would show what some individual members had done, but it would not show the work of every member, nor would it make money for the clubs. An exhibit of this kind would be very interesting to the parents and friends of the members whose work was exhibited, and it would arouse interest in other young people who admired the projects, but it would be less interesting to the casual viewer. It would not appeal to the person looking for excitement, nor would it be very educational for the people who were looking for new ideas.

Plan for audience participation. As your club members think about their exhibit, perhaps you can show them the importance of audience participation by asking them what very good motion picture they have seen lately or what class at school they have enjoyed the most. In probing for the reasons why these experiences were so pleasant, probably you can help them see that their enthusiasm is directly proportionate to their identification with the actors in the motion picture or to their personal participation in the lesson. They should then be able to see how audience participation can help their exhibit to be successful.

When they have accepted the idea that the viewers should have some personal contact with the exhibit, the club members will be off again collecting ideas. They will look at advertisements and listen to radio programs with a critical eye and ear. They will think of memorable displays they have seen at other county fairs. They will ask their parents to recall such fine displays. They will read books on advertising. When they have accumulated many ideas they will meet together again to share their

thoughts about carefully worded copy, moving parts in the display, demonstrations, free samples, contests, and so forth.

Examine each exhibit proposal. Once the club members feel that they have enough facts with which to work, they set up certain criteria which they feel their exhibit should meet:

It should be of interest to most of the people who will see it—the housewives, farm workers, storekeepers, and other rural and small-town people.

It should do more than interest these people; it should catch each person's attention and participation.

It should be a true representation of the program of the 4-H Clubs.

It should be in harmony with the ideals of the clubs.

It should bring some reward to the club—in money, new members, or added prestige.

Each club member who thinks that he has a good idea for the exhibit now presents his idea to the group and discusses with them the way in which it meets the criteria.

Janet would like to exhibit some of the carved leather work she and her friends have done. She would not only show belts, billfolds, book-ends, book covers, and a prize saddle, but she would like to have some artist at work during the exhibit to show how the leather carving is done and to explain the use of the tools and the quality of the leather used. She feels that this display would be educational: it would show what some of the club members have accomplished, encourage new members, and perhaps raise money by selling some of the leather articles and getting orders for others. People would like to watch the artist at work and they would enjoy choosing among the leather things. Perhaps audience participation could be increased by having some kind of contest—maybe guessing the names of the different kinds of leathers.

The club is enthusiastic about Janet's idea for its artistic merit; it would make a beautiful display. But they question its subject, since only a few of the club members have done this leather work and the exhibit should represent them all. And they think it would be impractical to expect the clubs to fill many orders for leather work; Janet and her friends

would have to do all the work. Still, they think the demonstration plan is good. People would stop and look and ask questions—a fine participation idea.

David would like to build an exhibit around the similarities and differences between a balanced diet for his cattle and for himself. In calculating the balanced ration for his Herefords, he has become conscious of his own need for a balanced diet, and he thinks other people would be interested in the comparison. He would like to show the actual foods that go into the mixed feed for a steer and those that make a balanced diet for a teen-aged boy. He would compare by means of bar charts the nutritional value of the two diets. Small folders would be given away to explain simply the nutritional needs of animals and humans. He thinks that his exhibit would interest fathers and mothers, farmers, and some boys and girls. It would not only show something of his own project but would emphasize good health, one of the basic aims of the 4-H Clubs.

The club members like David's idea very much. It fits in well with the aims of the clubs, and its subject matter is descriptive of the projects carried through the year by many of the boys. The girls complain, though, that it does not represent them very well. Everyone likes the give-away pamphlet. But all feel that the exhibit as a whole is rather quiet, that people will be interested but hardly fascinated or excited. Nor would this exhibit bring the club anything tangible except prestige.

Carol would like to have a booth that sold doughnuts and coffee. She would set up a real kitchen, where girls could mix, cut, and fry the doughnuts and make the coffee. The delicious smells would attract people to the booth, and they could be served at a counter while they watched the young cooks at work. Doughnuts could be sold by the dozen, too, to make more money for the club. This idea would appeal to the audience, who could eat and rest a minute on the counter stools. They would enjoy watching the demonstration, and the clubs could show off the ability of the cooks and make some money.

Carol has evidently thought about what the audience might like. She is thinking of its comfort and its pleasure. She is also expecting to profit from people's interest in a delicious smell. The group approves the

demonstration kitchen idea as a real attention-getter, but her idea arouses opposition from the club members who disapprove of doughnuts and coffee as not representative of the high health standards of the 4-H. You point out the dangers of hot fat. And the boys ask what this idea has to do with their projects; it really doesn't tell anything about the 4-H except that some girls can cook.

Bob's idea is to show the 4-H Club projects that center about wheat flour. He would like to arrange his exhibit to show the sequence from wheat seed to wheat bread. He suggests pictures of some boy's wheat acreage, together with actual wheat plants growing in boxes to show the common varieties. He plans to have photographs of local people harvesting the wheat, photographs that show something of the machinery and the processes. There will be sacks of wheat, with various types of grain exhibited and labeled. Next he would show photographs of the local cooperative elevator and of the milling processes, with samples of flour, wheat germ, and bran as they are produced by the mill. He would like to show samples of the flour that is obtained from the different varieties of wheat. Next in his sequence he would have samples of foods prepared by club members from flour and other wheat products. He explains that his exhibit would be truly educational yet would appeal to the audience because so many of them are concerned with wheat flour, either growing the wheat, selling the flour, cooking, or eating the foods. He thinks that the exhibit would show many of the activities of the club members, both boys and girls.

The rest of the club members agree with Bob that his exhibit would represent them well. They like his plan to use photographs of local people and places. They approve of the examples he has chosen to illustrate his story. But they all think the exhibit tries to say too much and that the spectator will be bewildered. Bob has tried to show a great deal more about wheat than the spectator will be able to understand in the brief time he will spend looking at the display.

Choose the exhibit idea to use. The club members consider voting on the ideas that have been discussed, but they decide that none of

the ideas is exactly right. They realize that no one exhibit can satisfy all the criteria, yet they think that they may be able to work out an exhibit that combines some of the best features of each proposal. They list on the chalkboard the things they liked especially about the suggested exhibits:

- A demonstration by club members—as in leather working or cooking.
- Give-away pamphlets—as in the comparison of animal and human diets.
- Photographs of local people and places.
- Nice smells of things cooking.
- Money-making possibilities of selling food.
- Good coverage of club activities—as in the story of wheat.
- Emphasis on nutrition and health as an aim of the 4-H.

Can all these things be combined into one fairly simple, logical idea that can be explained through the medium of an exhibit? After much thought and discussion, the group does work out such an idea. They decide to show that wheat is an important food.

The focus of attention will be a small kitchen where 4-H cooks, both boys and girls, will be preparing B₁ Cookies, made nutritious and delicious with wheat germ, nuts, and spices. Behind them will be a large chart showing the nutritional value of the cookies. At one side will be a table and chairs where customers can sit and eat as they look at a bulletin-board arrangement that tells about the activities of club members in growing, harvesting, selling, and using wheat. Small leaflets containing the recipe for the cookies and information about the activities of the 4-H Clubs will be distributed.

Plan for the materials to be used in the exhibit. This new idea seems to appeal to everyone, and the members enthusiastically offer suggestions. Carol says her club has some good-looking chefs' aprons. Bob wants to get started collecting photographs for the bulletin board. David has used wheat and wheat stubble for feeding his cattle, and he'd like to have a corner of the bulletin board to tell about it. William thinks milk should be served with the cookies. Phyllis wants news of the recent cake-baking contest to appear on the bulletin board. The group approves all these ideas. But as their enthusiasm grows, it soon becomes obvious that

further careful planning will be necessary, and they start writing down lists of things they will need.

For the kitchen:

a stove with an oven,
a counter or table for mixing,
water and space for dishwashing,
a near-by refrigerator for storing
the ingredients overnight,
a storage space behind scenes,
the measuring and mixing tools,
cookie sheets, spatulas, pot
holders,
the ingredients for the cookies,
aprons for the cooks (chef hats?),
boxes for selling the cookies by
the dozen,
paper napkins and straws.

For the bulletin board and chart:

wallboard,
heavy paper,
paints and brushes, ink and pens,
photographs and drawings,
small real samples.

For the booth as a whole:

lumber for posts to support the
chart and bulletin boards,
large sign,
decorations,
table and chairs,
give-away folders.

As these things are listed, each is discussed, and many problems arise. For example, what kind of stove can be used? Are there fire regulations that prohibit the use of a stove and so cancel out cooking altogether? Where can water and refrigeration be found? A volunteer kitchen committee is quickly organized to get the answers to these crucial questions. Later it reports that the assigned space for the booth will be near a kitchen and that wiring of the correct voltage for an electric stove is available.

Other committees are set up: a building and furnishing committee, an executive and finance committee, a bulletin-board committee, a chart committee, and a pamphlet committee. Each committee considers carefully its over-all job and organizes a time schedule. It prepares a budget. It thinks about the materials it will need and where to find them. For example, the chart committee goes to the library for books on graphic representation to see how best to show the nutritional values of the cookies. The pamphlet committee checks with the commercial department of the high school to see which of the various methods of duplication will be most suitable to their needs. The bulletin-board committee studies other effective displays in schools, in stores, and on billboards, and talks to local sign painters for tips on lettering.

Plan the design of the exhibit. When each committee submits its plans to the executive committee, it soon becomes evident that there will have to be an agreement for unifying the exhibit. The committees gather to consider the appearance of the exhibit booth.

A floor plan of the county fair auditorium shows that most people will approach the booth from its left. They will have just finished looking at an Extension exhibit of home-canned foods. To contrast with this welter of detail, the 4-H booth should present large, simple shapes to the spectator's eye and a calm, uncomplicated color scheme.

The kitchen mixing counter will have a solid front extending about six inches above the counter. This large, plain space can be used for big, simple letters announcing the theme of the exhibit: "EAT WHEAT FOR HEALTH." (Better to title the exhibit here, near the eye level of the spectator, than across the top of the booth, where no one is likely to look.) The large graph planned to back up the kitchen can be simple, too, though brightly colored. It should have plenty of white space with clearly defined contrasting shapes that will attract attention. If the counter and its chart are placed diagonally within the booth, the approaching spectator will look directly at them and can't miss them. Of course, the active cooks and the spicy odors will help to attract his interest.

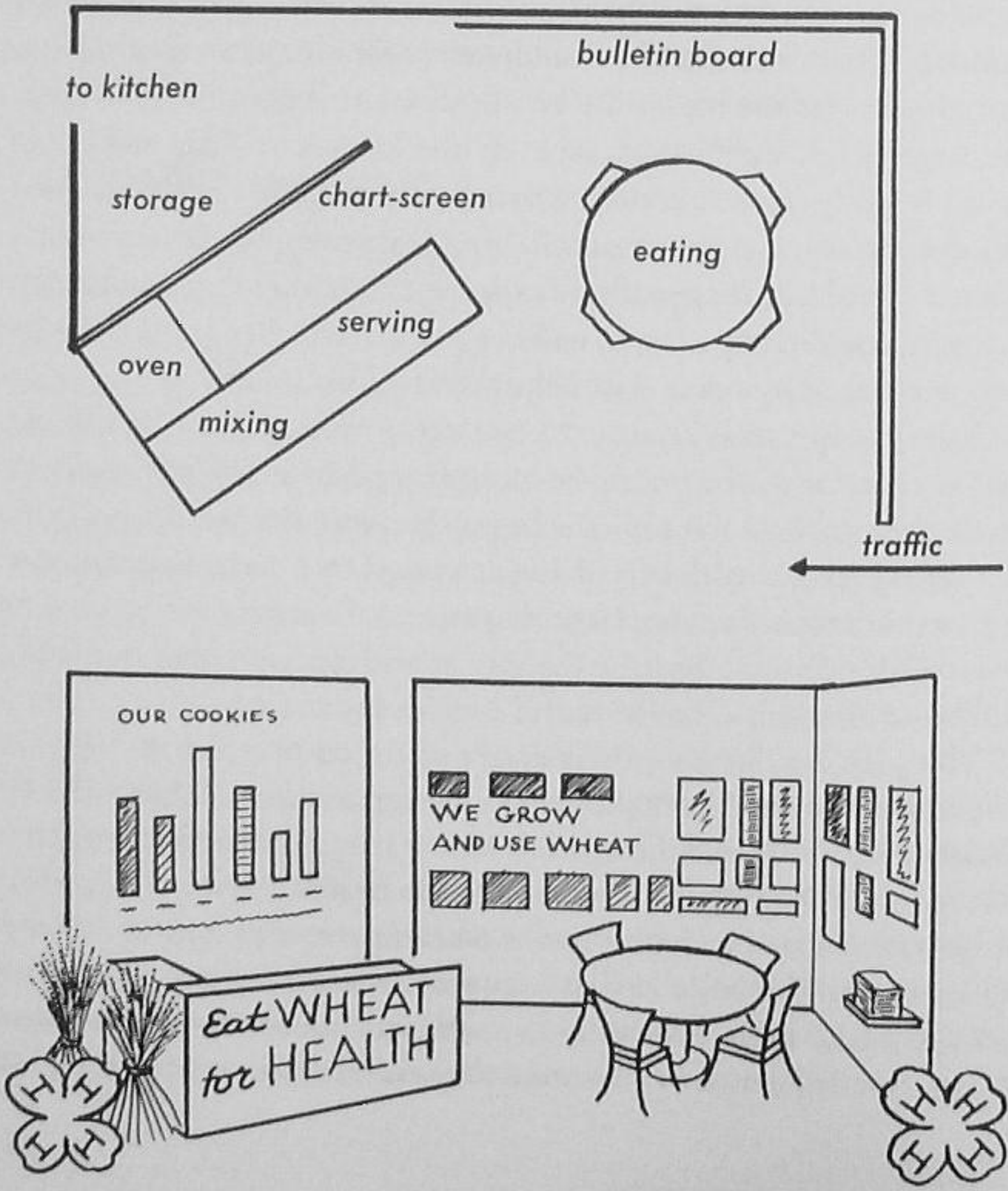
After the spectator is attracted by these obvious devices, he will continue to examine the booth. As he looks around, he is likely to notice the details presented on the bulletin board. He does not see them directly after seeing the many details of the canning booth next door, but after an interval of seeing action, large shapes, and the letters announcing the theme of this display. Perhaps the viewer will get interested in the bulletin board as he sits down to eat his cookies and milk.

This plan for directing the viewer's attention from left to right can be reinforced by the letters printed on the counter front. They will help to take the eye back into the booth, where it may be caught by the action and the color. The large title for the bulletin board should be here, where the spectator might first look when he takes his attention from the counter and its action. The bulletin-board sequence should progress around the back and side of the booth with both large, easily seen materials and some smaller, detailed materials to reward the careful observer. At the end of

the display, at the extreme right of the booth, should be the pile of booklets for the visitors to take with them.

Since wheat is the theme, and since the fair is to be in October, just following the harvest, the tawny beige of ripe wheat is an obvious color choice. The dark, bright green of the 4-H emblem will be used as an identifying motif, and the same green will blend pleasingly with the wheat beige, giving some contrast of dark and light. A more startling contrast is needed, so scarlet is chosen as a third color to add that bit of shock where it seems important—perhaps as a key color line to guide the viewer's eye as he looks around the booth.

The textures of the exhibit will be kept smooth and rather dull-sur-



faced, because the spectators' eyes will be tired enough after looking at exhibits for hours. Only the stiff, rather scratchy texture of wheat spears and the similar texture of the beige wallboard will vary the smooth surfaces.

The club members think about these plans for the exhibit but some of them cannot quite visualize the proposals. The executive committee therefore decides to build a scale model to show the placement of the furniture, to test the plan for leading the viewer's interest, and to try out several color arrangements. Later, this model of the exhibit is put on display to advertise the coming fair.

This has been a detailed account of the planning that may precede an elaborate exhibit. The steps that have been outlined for the 4-H Clubs to follow are important to the planning of any exhibit, even the simplest, although the steps need not follow this particular sequence.

WHAT MAKES AN EXHIBIT SUCCESSFUL?

Whenever you show something to someone else, you do so for a purpose: you would like to make that thing so real to him that he will fit it in with what he knows and will go on to attach new meanings to it. A more elaborate display is planned for the same purpose. The window of a store is an exhibit planned to make the displayed objects seem real to us, to make us fit them into our lives or our dreams. But in order to achieve this aim, the window artist must make sure that several conditions have been fulfilled. And so must you when you plan your exhibits.

People must look at it. Before the exhibit can say anything to anyone, it must first be seen. It must attract and concentrate attention upon itself.

People must get interested in it. You want people to be interested enough in what the display says to do some thinking about it. You want to catch the surface interest, yes, but you also want to get the kind of deep interest that starts the "wheels turning" inside the brain. You want to get participation.

People must think about it. Your purpose in exhibiting is to stimulate new combinations of thoughts. You want to help people build up

generalized ideas and concepts that can become part of their working equipment and can be used as foundations for other concepts. You want to make these new thoughts so much a part of the person that he will act upon them even without conscious thought. You want the new learnings to be accepted and fitted into the self of each person.

These are the aims of all education, not merely of a good exhibit. All learning is based on attention, concentration, absorption, and evaluation. The exhibit is one more medium which you can use to help people learn.

PART 5

EVALUATING *Display*

A good display is one which actually does the thing it was meant to do. And in deciding whether or not it has accomplished its purpose, we must be quite sure what the original purpose was. So, in this chapter, we complete the circle. That is, we return now to the first chapters of the book and re-examine the purposes of display and our plans for achieving them.

We arrange things for people to see for one purpose only: we want those who view the display to act or think somewhat differently, to be changed in some small way from what they were before they saw the display. We want them to live different lives—high-sounding as this goal may be. This is not an easy thing to accomplish. And it is even more difficult to tell whether or not it has been done. We can only make an estimate.

One of the ways to judge the success of a display, then, is to study the people who see it and try to find out how, or whether, they have changed in any way. However, because it is difficult to evaluate the end result, we must sometimes study the process to see, by inference, whether it is likely to produce the result intended.

STUDY THE DISPLAY ITSELF

Since the creator of a display had certain standards in mind before he began to arrange it, he can easily compare the finished product with

his original standards. Others, too, can judge the finished display according to their own standards of excellence.

These standards are actually based, however, on considerations of what will happen to the people who see the display. For example, one museum exhibitor always clips off the heads from the pins he uses in his display because he has noticed that even so small a detail distracts the attention of viewers. As he looks over his finished work, he insists on beheaded pins, not because of any arbitrary rule of his own esthetic senses, but for the sake of the people who will look.

As you work with display techniques, you will be establishing your own criteria for good display. You will notice how people react to your efforts, and you will set up your standards accordingly. But always your standards will reflect your original plans.

This book has proposed a series of steps to take in creating a display, a formula to follow. If you follow it, this formula can be the basis for an appraisal of your display.

Is it planned for certain people to see? The display will fulfill its purpose, hit its target, if it is aimed directly at a specific group of people. The more exclusively defined the audience, the more accurate can be the aim, and the more successful the display.

There should be evidence that you have defined your audience and have given serious thought to its interests and needs. People must be able to answer at a glance their question "What does it have to do with me?" Perhaps your copy has referred to some immediate problem of the viewer, as in the illustration on page 21. Or perhaps the objects you have used are of particular interest to your intended audience (see the illustration on p. 38). A good display shows evidence of careful aim.

Is it planned to accomplish a specific purpose? Your reasons for using display techniques may or may not be the same as those discussed in Chapter 2. But, in any case, you will need to define them specifically. It is not enough to say: "This display is to tell about other languages." You must plan: "This display is to help my sixth-graders see that other peoples think in ways different from ours and that a study of other languages offers us clues to these different patterns of thought." The drawings on page 10 might be part of such a display.

Is there some device for developing audience participation? You can develop audience participation by means of the copy, as in the example on page 247, or through unusual use of motion, as on pages 266-267, or it may come from the general theme of the display itself, as in the illustration on page 261. In any event, your display will be truly successful only if it gets the viewer to think or to act while he is looking at the display. Start the wheels of behavior moving, and further changes in behavior will come more easily.

Are the materials chosen carefully and used appropriately? Part Two of this book discussed the materials for display and their uses. Perhaps the most important generalization to draw from all those words and drawings is this: have a reason for using each object, each picture, each graph, each word, and be sure that the reason and the use take advantage of the assets peculiar to that material.

Are the tools and the principles of design used to reinforce the purposes? Possibly the major generalization we can make from Part Three is that color, texture, line, size, and shape should be used in such a way that they help the audience to come to the same conclusions by seeing as by thinking. Once you have discarded the aim of decoration and have concentrated on your educational purpose, art principles no longer must be obeyed and are now ready to do your bidding. You may use them as you need them.

Are the peculiar merits of the medium being used to advantage? Each of the mediums for display that we discussed in Part Four has some specific characteristics that fit it for certain uses. If you thumb through pages 179-237, you will see that the chalkboard explains immediately pertinent questions; the poster presents a bold, carefully planned message; the duplicated page shows something to many individuals at the same time. Each medium should be used only for the thing it can do the best.

These questions can be asked about a display, and the answers will give some indication of its effect on the people who see it. Sometimes it is the only way in which to judge the success of your efforts, because people may not stay to answer questions; you may never see those who

look at your display. But the display sits still while you judge it. The more you work with display and see how people react to it, the more efficient this kind of appraisal becomes. Still, no matter how efficient, judging the display itself is merely a substitute for a real evaluation.

STUDY THE PEOPLE WHO SEE THE DISPLAY

Trying to find the changes in people is much more difficult than looking for certain things in a display. But this is the only reliable way of finding out whether the audience learned from seeing. You aim to teach—and to test your success, you had best try to find out whether people have learned.

The process of educational evaluation usually includes four steps: (1) deciding what you want people to learn, (2) deciding how they will act if they have learned it, (3) setting up situations in which they will have to act, and (4) judging their actions to determine the success of your teaching.

What did you hope people would do? When you check the success of your display by this method, the first step is to recall your original objectives. In Chapter 1 we outlined some of the things display might be able to accomplish. The person who sees the display may:

1. concentrate his attention and interest;
2. break down abstract ideas and relate them to concrete things;
3. relate scattered ideas and form new concepts;
4. see clearly the basic structure of an idea;
5. turn ideas into words;
6. express himself and so learn.

You usually intend that your display will do one or more of these things. But of course your objectives will have been much more specific. The policeman in Chapter 14 wanted the people who saw his poster of the woman stepping off the curb to look at it closely, to feel surprised and somewhat apprehensive, to recognize the dangers in jay-walking, and to determine never to do it again. His objectives are related to numbers 1 and 3 in the list above, but they are stated in terms of his specific situa-

tion. He also has an objective not on the list: he is hoping to get an emotional reaction from the people who see the poster.

Whatever your objectives are, they form the first step in judging the success of your display.

How will people act if the display is successful? Your next step is to define your objectives in terms of behavior—the behavior of the person who sees the display. Let us amplify in those terms the six objectives listed above.

1. If a person has concentrated his attention and his interest, he will look carefully at the display. He will probably respond to it in some verbal way—ask questions about it or comment on it. He may refer to the ideas later when he talks or writes.

2. If a person has broken down an abstract idea into more easily grasped units and has related them to concrete things, he will use that abstract idea correctly. And he will probably refer to the displayed realities when he tries to explain the abstraction. He may analyze other abstractions more successfully as a result.

3. If a person has related scattered ideas and has worked out a new generalization, he will use that new concept. And he will probably explain the concept in terms of the ideas shown in the display.

4. If a person sees clearly the structure of an idea, he will use that idea with precision. Probably he will use the displayed "outline" as he explains the new thought—*e.g.*, the structure of the United Nations.

5. If a person has successfully turned ideas into words, he will use those words accurately in other situations. He may define the new word in terms of the display ideas.

6. If a person has learned by the process of expressing himself through display, the display itself will stand as evidence of his learning. If it is accurate, logical, and clear, presumably he has learned his facts in the same way. If his display follows the rules for good showmanship, he has probably learned another communication skill.

Of course you can do a much more precise job of defining your objectives in terms of behavior, because you know the people and the display—the facts of the case, not just the theories. You can say, "Jimmy will use the words *cirrus* and *cumulus* in describing cloud formations."

How can you examine this behavior? This hypothetical person of ours will show whether or not he has learned our lessons either by what he says or writes or by what he does overtly. We can observe these actions, provided he is available to be observed.

Take a few tips from commercial exhibitors at conventions. They usually have someone in their booth to answer questions, and often this person keeps a tally on the type of comments that are made as well as the number of people who stop to talk. Occasionally a wire recorder keeps track of everything that is said. Sometimes an observer with a stop watch stationed near by records the time that each viewer spends at the exhibit. These convention exhibits are big business, and the audience reaction may indicate the size of future profits.

Learning is important, too. Adapt some of these audience checks to your display. Watch people as they look. Mingle with the crowd around your exhibit and keep your ears open. What are they saying to one another? What questions are they asking? Busy yourself with some small job near the poster you have just set up and watch people's eyes as they look at it. Are they following your design plan, looking longest at the most important points? As you draw on the chalkboard, be sensitive to the reactions of your audience.

In these ways you can get a good idea of the amount of interest and attention the display arouses in people and you can see how your plan for audience participation is working out. Sometimes you can find out whether or not the rest of your objectives are being met.

But if you turn back to our behavior definitions of the objectives, you will see that many of the tests of the display rely on the future use of the information. So you will have to work out situations in which your viewers will need to use the display-taught facts. Ask Jimmy to report to the class on his cloud observations during the past month. Then see whether he uses the words *cirrus* and *cumulus* correctly. Or perhaps the situation is already there. The policeman will find the ultimate evaluation of his poster and the rest of his safety campaign in the future number of jay-walking accidents.

Remember, however, that in these "tests" you are rating not the

learner but the display. If Jimmy does not name the clouds correctly, it is not he who should get the low mark but rather your display. It has aimed to teach the new words and, in this case at least, it has failed to teach. Of course, if your objective was to help Jimmy recognize the words when he saw them later, you might test that and find that you had succeeded. But if your objective was to get Jimmy to know and use the words, your display has failed—your display, remember, not Jimmy.

WHAT CONCLUSIONS CAN YOU REACH ABOUT YOUR DISPLAY?

The final step in evaluation is to check your data on the learning that did take place against your original objectives and your display. What did you accomplish and where did you fail? If your display did miss its mark, which mark? Why? How? Go back to your original plan and check through the steps again. It is remarkable how much clearer hindsight is than foresight. Perhaps it is too late now to improve this display, but there is always another chance to teach.

Possibly the fault lies in your original objectives. Perhaps you expected too much. If so, pitch your next display somewhat lower. As you work with display, you will find that it can't move mountains. But it can, perhaps, move one molehill at a time.

Suggested Readings

Index

Suggested Readings

The following references have been selected because they seem most useful to teachers who do not have an expert's knowledge of display methods and materials. They are reasonably easy to find in libraries and are inexpensive enough for the teacher to buy from the source.

Part One

Baker, Helen Cody, and Routzahn, Mary B. S. *How to Interpret Social Welfare: A Study Course in Public Relations*. Russell Sage Foundation, 1947. This small book shows how to tell your story by means of the spoken word, the written word, and pictures. Though planned for social workers, it will provide anyone with constructive ideas for improving everyday contacts with people.

Fine, Benjamin. *Educational Publicity*. Harper & Brothers, 1943. Read this if one of your aims in display is to improve your public relations. It provides an intelligent explanation of the principles and practices of educational publicity.

Kleppner, Otto. *Advertising Procedure*, 4th ed. Prentice-Hall, Inc., 1950. A comprehensive textbook used in advertising courses. Read it for a general understanding of the field. It will make you a more intelligent consumer and, by showing you which methods to disdain and which to make use of, it will make you a better teacher.

National School Public Relations Association. *It Starts in the Classroom: A Public Relations Handbook for Classroom Teachers*. Washington, D.C.: National Education Association, 1951. (\$1 a single copy.) Clear, sensible, and simply written, this handbook is a fine beginning text for every teacher in the growing field of public relations.

Young, James W. *A Technique for Producing Ideas*. Chicago: Advertising Publications, Inc., 1944. A small volume which gives a surprisingly simple explanation of the creative process as Mr. Young uses it in advertising.

Part Two

Arkin, Herbert, and Colton, Raymond R. *Graphs: How to Make and Use Them*, Revised ed. Harper & Brothers, 1940. A copiously illustrated discussion of many types of graphs, their construction and use.

Buckley, Robert D. *A Basic Guide to Lettering*. Greenberg, 1951. An easy-to-understand explanation of lettering forms and techniques. Many examples of letter forms are given, both simple and complex, modern and traditional.

Carskadon, Thomas R., and Modley, Rudolf. *U.S.A.: A Measure of a Nation: A Graphic Presentation of America's Needs and Resources*. The Macmillan Co., 1949. 80 cents. This is a veritable idea-mine, containing many excellent examples of graphs in use.

Dale, Edgar. *Audio-Visual Methods in Teaching*. The Dryden Press, 1946. Here is the "why, what, and how" of teaching with audio-visual materials. The best comprehensive text in this area.

Dale, Edgar. *How to Read a Newspaper*. Scott, Foresman & Company, 1941. Though planned for high school students, this book provides basic information to anyone about the parts of a newspaper and the men who prepare them.

Grossnickle, Foster E., and Metzner, William. *The Use of Visual Aids in the Teaching of Arithmetic*. Brooklyn, New York: The Rambler Press, 1950. A discussion of simple visual aids, including a good list of available films and filmstrips to help with the teaching of arithmetic. Watch this press for further booklets on elementary social studies and other areas.

Hoban, Charles F., Hoban, Charles F., Jr., and Zisman, Samuel B. *Visualizing the Curriculum*. The Cordon Co., 1937. Not new, but still very good. Check it for general information about many visual learning materials.

How to Make Good Pictures, 29th ed. Eastman Kodak Company, 1951. A simple explanation of the processes of taking and developing photographs.

Kinney, Lucien, and Dresden, Katherine. *Better Learning Through Current Materials*. Stanford University Press, 1949. Here is guidance for the teacher in the use of newspapers and periodicals in the classroom. It suggests many ways for students to learn from these materials.

Loomis, Andrew. *Successful Drawing*. The Viking Press, 1951. If you know very little about drawing and want to learn more, start with this book as a guide. Following a very good section which explains basic steps is a detailed discussion of perspective and of light.

McPharlin, Paul. *Paper Sculpture: Its Construction and Uses for Display and Decoration*. Hastings House, 1944. Contains a brief explanation of shaping techniques and paper types and many photographs of paper sculpture as used for display.

Pictorial Symbols, 2nd ed. New York: Pictograph Corp., 1943. A catalogue of pictorial symbols. Look at it for ideas to use in your teaching displays. You may use symbols from this catalogue in your own publications by paying a reproduction fee to the publishers.

Weaver, Gilbert, and Bollinger, Elroy W. *Visual Aids: Their Construction and Use*. D. Van Nostrand Co., 1949. Here you will find especially good chapters on models, charts, slides, and the use of commercially supplied materials.

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