DEVELOPING PEOPLE IN INDUSTRY

Principles and Methods of Training

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CONTENTS

FOREWORD

by Howard W. Files

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Books on training available to the industrial trainer in recent years seem to focus mainly on the central theme of the value of programmed training in industry. They seem principally to be concerned with the question of whether a modern business firm should or should not adopt one or more formalized training programs.

Now, this is no longer the big question. The value of industrial training has been established. Today the vital questions appear to be:

Whom shall we teach?

What shall we teach?

Who shall do the teaching?

The search for an answer to these questions has resulted in this book.

Like other companies, we saw the need for a supervisory training program in our plants, but we also saw objections to having it carried on by training specialists who had no first-hand experience or acquaintance with our line supervisory force. We could not see our way clear to staffing ourselves with a group of teachers. We felt sure that if we tried it that way, our supervisory training would falter.

It was with the aid of material now available in this book that we were able to solve our problem. With the insurance that the training program itself would be designed with professional competence, we chose from the ranks of our production people one or more representatives from each major plant who not only had potential possibilities as management men but had a leaning toward training others. A one-week course was developed, designed to give this group the theory of training and practical experience in methods and techniques. In other words, we tried to train trainers in a one-week, forty-hour intensive course of theory and practice.

To provide the material for their training, we needed a combination text and reference manual. From all of the available training literature, we could find nothing that embodied everything we needed, from the theory of learning to the practice of role-playing, expressed in a way that could be readily grasped and put to use by nonspecialized people. It was for that reason that we undertook to build our own manual, which has now become this book.

We commissioned Drs. Douglas H. Fryer, Mortimer R. Feinberg, and Sheldon S. Zalkind of Richardson, Bellows, Henry & Co. to draft a manual for our production people, so that they might train supervisors in their departments. This manual has been in use by us for more than a year and has fulfilled the purpose for which it was designed. It has been read and reread and used as a reference for determining training needs, and to evaluate training results by those who are serving as trainers in our plants.

The authors have now adapted our manual for a more general industrial audience. We think they have done a good job in providing what is needed in the language of the man on the industrial firing line. Their book should earn a place on the desk of all men and women responsible for the training of others.

PREFACE

Why do people want to improve themselves?

How can they best be encouraged to go about it?

Under what circumstances are they stimulated to try hardest?

These are the questions that must be answered first by anyone who undertakes the training or the development of people in industry.

Without the answers to them, no training program will really work.

This book concentrates on those answers. It talks about people and the ways in which they accomplish their own development. It describes the kind of climate necessary to encourage people to learn, whether they be managers, supervisors, or workers. It tells, too, of advanced methods of training. And it defines the necessary organization. But it emphasizes that training, to be successful, must be rooted in the purpose or motivation or desire of an individual to do something for himself.

Much of the contents of these pages has been available previously in training manuals prepared to meet specific company needs. This work has been done by the consulting firm of Richardson, Bellows, Henry & Co., with which the authors have been connected in various capacities. The effectiveness of one of these manuals is described in the Foreword, written by Mr. Howard W. Files, vice president in charge of the Human Relations Division of Pillsbury Mills, Inc., where the principles enunciated in the manual were put into practice by Pillsbury's training director, Mr. Ludwig Huttner. Thus the usefulness of this book in developing industrial trainers is well established.

Because automation is becoming more widespread in industry, the authors are gratified to include an introduction by Mr. John Lear, formerly associate editor of *Collier's* and consultant on publications to the International Business Machines Corporation, now Science Editor of *The Saturday Review*. What Mr. Lear says leaves

no doubt that under the impact of automation a knowledge of the basic principles of development and training will become increasingly important.

The future may bring some revision in our present knowledge of the ways of developing people in industry. Specific methods of training, and of work, change as material inventions and new information appear. But, as described in this book, the self-starting individual and his personal aspirations are still likely to provide the motive force for the development of people.

DOUGLAS H. FRYER
MORTIMER R. FEINBERG
SHELDON S. ZALKIND

INTRODUCTION

PASSPORT TO AUTOMORROW

by John Lear

Science Editor, *The Saturday Review*

I have just become acquainted with a new kind of menagerie. It is made up of *inanimals:* robots that behave like beasts.

These curiosities are the handiwork of electronic scientists intent on enlightening man through mimicry of nature. Every creature in the company is in some way remarkable. But bizarre among them all is one that insists on ignoring the world around it.

Unless it is forcibly disturbed, this robot lies prone and motionless. When it is roused, it fidgets only long enough to settle itself in a new position of comfort. Thereupon it flattens again and returns to oblivion.

Machina sopora—the drowsy machine—fascinates its scientific keepers because its behavior is an automatic response to electronic impulses traveling over circuits arranged like the reflex nerves of a human spinal cord. Among the 360,000 possible connections in its wiry innards, the fleshless, bloodless, brainless monster somehow finds one to restore its repose after each interruption. Even the men who built it can't tell, without tearing the thing apart, which "nerve-ways" the robot is using at any given time to hold itself aloof.

That is what fascinates the scientists.

What interests me about this exhibition of mechanical stubbornness is the similarity between it and the state of mind of many businessmen I know.

Although these men are living among robots which have begun to reproduce robots with little human midwifery, they tell themselves and anyone else who will listen: "There's nothing new about automation. It's just a little more of what we've been having for the last couple of hundred years."

It is understandable that an ordinary workman, with nothing to

go on but the headlines in his daily newspaper and some pictures hurriedly whisked across his TV screen, should fail to grasp the full significance of what is happening around him. Having personally witnessed the replacement of the mule by the tractor, the cowhand by the automatic milker, the pick-and-shovel by the power-scoop, the wheelbarrow by the bulldozer, and the streetcar conductor by the hydraulic hinges on a bus door, he has been gradually and subtly conditioned to accept the machine almost as a fellow.

The corporation executive naturally shares a degree of this blurred perspective. His judgment is further skewed by machinery manufacturers who announce as realities new inventions which turn out to be experimental models in laboratories, drawings on drafting boards, or merely ideas in engineers' heads. If justice were poetic, any judge on the bench would absolve the harassed board chairman, president or vice president who pleads, "Maybe automation is just a mirage. If I keep my eyes closed long enough, it will go away."

But the rules of competition scan no more easily now than they ever did, even though the most gifted public relations minstrels phrase them. The executive still has no escape from the sad duty of scorning his own wishful thoughts. In this instance, he cannot even plead surprise as a mitigating circumstance. For his business journals, his newsletters, his technical advisors, even his bankers have apprised him of the revolutionary implications of feedback mechanisms (nature's original model for all of them is the nerve network that lifts your foot when you step on a tack—*before* you feel any pain to tell you what happened) operating at electronic speed (3 million times the normal pace of human nerve impulses) in automatic control of offices and factories. He has likewise been acquainted with the relationship of feedback to data processing, the versatile new science of industrial mathematics.

Data processing is the application of known mathematical laws, broken down into thousands of tiny steps, so as to fit appropriate numbers to a multitude of mechanical details. In this way performance of intricate mental or physical tasks can be expressed accurately in terms of arithmetical equations. In the last few years, mathematicians trained in processing data—"programming" is another word for their specialty—have proved the feasibility of giving such numerical instructions to electronic computers.

Computers are moronic brothers of *Machina sopora,* but because they are energetic they are known as "brains."

The mathematicians are instructing the "brains" to direct such diverse operations as machining motor car engine blocks from rough iron castings . . . engineering bigger and faster airplanes . . . exploring mysteries of atomic behavior . . . filing, checking, confirming, and telegraphing flight plans for plane pilots . . . routing buses through crowded city streets . . . calculating tax bills . . . taking department store inventories . . . predicting the outcome of Presidential elections . . . translating Russian into English . . . and even forecasting weather.

Robots are being "programmed" today to memorize and recall, count, compute, calculate, sort, measure, and give orders like "start" or "stop," "up" or "down," "right" or "left," "forward" or "back." They can make decisions like "too hot" or "not hot enough," "empty" or "full," "too fast" or "too slow," or any other choice that does not involve more than two alternatives. (The choice is limited because each of the electronic switches inside a man-made "brain" can turn only on and off.) Furthermore, the robots can gather their information by sight, touch, or sound.

The newest electronic wizards of the International Business Machines Corporation can talk, one to another, on the telephone—two at each end of a single line, simultaneously, each discussing a different subject—and act on what they hear. Using a beep-beep language of their own, they swap information at the rate of one thousand numbers or alphabetical characters a minute. Other robots play juke boxes stacked with records grooved with numbers instead of musical notes. A British robot with an electric eye reads two hundred characters of standard teletypewriter tape per second, and scribbles down the messages in a magnetic tongue any "brain" can understand.

Robot detectives sift clues to criminals so discerningly that suspects they finger have been nabbed in the act by waiting policemen. Robot bank clerks verify and clear most of the nation's enormous flood of checks. Robots are beginning to calculate premiums on insurance policies and mail out light and gas bills. Robot chemists direct the blending of gasoline, and robot geologists decide how fast the oil in underground pools is pumped from the wells. Oil refineries are manned chiefly by switches which flip one way or the other

when thermocouples say "hot enough" or "not hot enough." One big electric power generator in Oregon watches its own fluctuating pulse under the supervision of a single human whose main reason for being there is psychological.

Steel mills have robot searchers on tin-plate rollers to spot pinholes and order the shearing knife to chop out and discard those sections of tinplate—and only those sections—where the pinholes are located. There is a robot which hammers nails into wooden slats and automatically crates electric refrigerators. The Canadian Post Office is experimenting with robots which sort mail.

Robot elevators are commonplace in city homes and apartments. Office buildings are beginning to employ whole banks of elevators which not only run without operators or starters but adjust their ups and downs to meet the shifting needs of traffic during the day: from the incoming A.M. rush through coffee breaks and lunch to the homegoing at five P.M.

Perhaps it is just as well that this hasn't happened yet to an elevator. But papa robots are automatically begetting robot offspring —not in sets of twins, or triplets, or even sextuplets; but in batches of thousands, all identical.

Only a decade ago, Harvard University threatened to outlaw Prof. Howard Aiken for daring to argue that a mechanical "brain" could be anything more than an intellectual toy. Today Harvard offers a master's degree in acknowledgment of the urgent need for data processors competent to guide the growing army of automatons. One form or another of this heretofore esoteric but now vital learning is also available at California, Columbia, Cornell, Georgia Tech, Illinois, MIT, Michigan, New York, Penn State, Purdue, Wayne, and perhaps other schools. And practically every business machine maker in the country has its own on-the-job courses for young mathematicians. For the first time in centuries, students of numerical science are climbing into the income brackets of top engineers, physicians, and lawyers.

Although the event passed almost unnoticed in the popular press, there was convened at Wayne University in Detroit in June 1954 the first national conference on training personnel for computing machines. Three of the observations offered there are enough to make any thoughtful person uneasy.

"There is no doubt that the supply of highly trained people will

be far short of the number of jobs available," was the conclusion of Dr. Franz L. Alt, of the National Bureau of Standards. "Thousands, even tens of thousands" of people will be needed, said Dr. G. Truman Hunter, of IBM. "No matter how we look at it," declared H. R. J. Grosch, of General Electric, "we must count on a total of the order of one million in the field at the end of the next decade."

How are these thousands, tens of thousands, or million jobs to be filled?

Certainly not by the guaranteed annual wage. Labor union propaganda for it does the disservice of focussing attention on imaginary threats of immediate displacement, and away from the truly urgent need for planning long-range programs of retraining. The one sure expectation of automation is that eventual unemployment of older workers can be avoided only to the extent that those workers are taught to broaden their skills to keep pace with the rising versatility of the robots.

"We need to . . . start . . . the biggest vocational training program this country has ever seen," Dr. Cledo Brunetti, director of engineering and development for the mechanical division of General Mills, told the 1955 National Conference of Social Work in San Francisco. As chairman of the committee of scientists who review and appraise all automation developments for the Defense Department, Dr. Burnetti can hardly be classed as an alarmist for adding this thought: "If we want to know how it's done—read the vocational trade journals of the USSR."

How can this enormous task be approached without resort to Russian totalitarian techniques? I have heard one common-sense suggestion. It comes from Victor Borella, vice president in charge of operations at Rockefeller Center. A modest and retiring man, Borella is an unsung contributor to the enlightenment of labor relations throughout the Western Hemisphere. His answer to automation fears is simply this: extend Social Security to cover technological unemployment of workers during a variable period of retraining jointly financed by management and unions.

It is not the purpose of this book to argue for that scheme, or for any other. Indeed, there is no argument at all in this book. What is offered here is a study to help determine whether any plan can be made to work. Derived from the accumulated experience of the

authors in university instruction and in industrial and military consultations, confirmed by actual practice in business, these are the findings of fundamental psychology involved in teaching men to use their minds and their hands capably in a new environment.

No exaggeration is intended by the phrase "new environment." For although I do not share the belief that push-button offices and factories will spring up overnight, I am convinced that their gradual appearance in this current decade is unquestionable. And the facts at my disposal do not permit me to accept the optimistic notion that the automation they represent is "only a little more" of man's tool-making past.

The gulf that I see between yesterday and tomorrow is deep and wide. I can suggest its real dimensions only by going back to a piece of science fiction written by an Englishman named Jonathan Swift.

Swift called this work *Gulliver's Travels*. He did not think of it as science fiction. He wrote it as a satire on the miserable behavior of the humans he lived among at the turn of the eighteenth century.

One of the imaginary places to which Swift sailed his hero, Gulliver, was the land of the Houyhnhnms. There the ruling gentlefolk were horses, and the second-class citizens were filthy, quarrelsome humans known locally as Yahoos.

Long after Gulliver and the Yahoos passed into literature, science discovered evidence that far back in the evolutionary process, ages ago, man and the horse might have been closer relations than man and the ape. The evidence consisted of a single fact: whereas all mammals possess a natural feedback system to regulate their body temperatures, only the horse shares man's particularly ingenious regulating mechanism—perspiration.

The common ability to sweat enabled both man and the horse to survive as species. Without sweat, both would have succumbed to alternating convulsions and deathlike sleep as their nerves responded to the exciting heat of day and the depressing cold of night. With sweat to act as a thermostat, man's brain was freed to occupy itself with pleasanter pursuits. The horse enjoyed the same opportunity. But somewhere along the evolutionary line the horse put all its sense of direction into muscle while man used some of his elbow grease to scratch his head.

Speculative though this examination of human and equine family ties must necessarily be, the time for it is opportune. Because the

horse at last is reaching the end of its long, labored road. After seventy-five years of prominence, work harness for draught animals is gone from the Montgomery Ward mail order catalog. Even the name of Swift's noble and gentle animal, enshrined in the word horsepower, is giving way to a new symbol of force: electronics.

Horsepower was a comfortable concept, easy to live with. An electron is an elusive wisp of electricity, whirling around the edge of an atom. And none of us ever has seen an atom.

Atoms are so minute that it would take the entire population of the earth ten thousand years to count the number of them in one drop of water. Before this count could be made, each of us would have to shrink to one billionth of an inch in height to see what we were counting. What we could count then would be mostly empty space. For 99 per cent of the matter in an atom is in the nucleus. If the nucleus were as big as a period on this page, the atom would be as big as your living room at home. But an atom really is only one 250 millionth of an inch across.

Like the abominable snowman of the Himalayas, electrons can be observed only by their footprints. It takes a lively imagination merely to conjure them in the eye of the mind. Is the businessman willing to push back the horizon of his mentality far enough to follow the lightninglike hurtlings of electrons through the myriad convolutions of electronic "brains"? Or will he leave the scientist alone to cope with this new phenomenon, taking refuge in creature comfort as the horse fell back on its muscle power long ago?

Fanciful?

Let me quote the opening sentence of the foreword written by J. H. Curtiss, chief of the National Applied Mathematics Laboratories, for a recent publication of the United States Bureau of Standards:

"It has been recognized by many persons . . . [engaged in the development of electronic computers] . . . that the demands of such machines upon men will be much greater than the demands of men upon the machines."

Surely this is a reversal of man's experience with all the machines he has devised since the night he first threw a burning ember at a wild beast prowling outside his cave. How can it be?

To begin with, the so-called "thinking machines" on which automation depends cannot really think. They were called "brains" be-

cause some of the circuitry inside them constitutes a rudimentary type of memory, and because the electrical networks that keep them going are roughly comparable to the human nervous system which reaches its peak performance in the brain. But thought as we know it is far beyond their power. They are morons, utterly incapable of understanding or judgment. They do what they are told to do—not one iota more. Even the telling must be incredibly simple, in minute detail.

In trying to explain what it would be like to live with so backward a being, an accountant for the Commonwealth Edison Company in Chicago, William E. Eggleston, imagined himself at the dinner table with an electronic "brain." Here's how the conversation went:

EGGLESTON: May I please have the cream?
"BRAIN": Yes.
The cream stayed where it was.
EGGLESTON: Would you please pass the cream?
"BRAIN": When?
EGGLESTON: Now.
The "brain" got up and walked past the spot where the cream pitcher was sitting.
EGGLESTON: Would you please have the cream passed now?
The "brain" picked up the cream pitcher and passed it to the waiter.
EGGLESTON: Would you please have the cream passed to me now?
At last the "brain" comprehended, and passed the cream to Eggleston.

Stupid? Well, to put his idea across Eggleston had to endow his tablemate with greater intelligence than a "brain" actually has. For instance, a computer couldn't ask, "When?" That question would have to be anticipated and answered in advance at just the right point in time to fit the logical sequence of the "brain's" movements. And before the computer could pass the cream to Eggleston, it would have to be told exactly where the cream pitcher was and exactly where Eggleston was sitting. If the house were to catch fire and burn the table at the moment the "brain" started to pass the cream, the firemen would find the fireproof computer going round and round hunting Eggleston in the midst of the ashes.

Remember that the typical businessman is accustomed to carry half his particular system of management around in his head, and

you begin to glimpse how painful will be the transition to automation.

It is the prevailing custom in business now to put off decisions, to let Joe handle it when the time comes. The man who runs his business with the help of electronic computers will have to abandon this "when and if" technique. He will have to take longer and bigger gambles on his judgment. Whole series of decisions must be planned together, with full knowledge that they in turn will dictate still more remote decisions.

If all this travail is inevitable, why bother with automation?

Because of speed. Unbelievable speed. With an electronic "brain" a man can solve—in days, hours, or minutes—problems that would occupy him alone for several lifetimes. Business details that today must be forgotten, to gain time, will be taken into account tomorrow, easily and profitably. The way is open for hundreds of thousands if not millions of dollars in operational savings. The pressure of competition will drive automation ahead as soon as businessmen learn electronic "brain" language.

This acquisition of a new tongue is the second painful step man must take if he is not to decline into an evolutionary "sport."

"Brains" were first built to accommodate science in fighting World War II. Naturally, the scientists instructed them in the language of science: mathematics. The simplest form of that language was chosen; that is, binary arithmetic. Made up only of zeros and ones, it could be recorded mechanically by the presence or absence of electric current, and could cause switches to turn unerringly either one way or another. Since the words of math—"add," "subtract," "multiply," and "divide"—never vary in meaning, there was nothing to confuse the computer's moronic ruminations.

Business has no explicit language, however. The formula for success has never been fixed. Only now is anyone beginning to consider an equation to represent the factors involved in making a profit. Studies are being advanced in this direction, though, and the goal is not impossible. Even math was not truly consistent in its symbols until the demands of movable type made it so. It may be that the current worldwide surge toward higher living standards will force adoption of a language through which business can translate its concepts on a global scale.

Before the corporation executive can give anyone, human or ro-

bot, an analysis of his operations, he must think the process through for himself. He must be able to define precisely what he is doing now, and to compare that to what he wants to do. Few men are yet prepared to undergo this rigorous discipline.

I will not be surprised if we have to wait for a new generation of managers to put full automation into effect. I suspect it will take that long to develop the new perspective. Even then the universities will be able to complete the evolution in time only if they modernize their mathematics courses (most of which now stop three hundred years back) and add computer laboratories where physical and social sciences can be studied as the intertwined realities they are in the off-campus world.

While this intellectual seachange is taking place, interim automation will proceed. As competition dictates new machines with the ability to direct and inspect their own work, speed of production will increase and the cost of shutdowns will rise. As human operators decline in numbers, their need for exact knowledge of their tools will grow. Specialized jobs will be merged into amalgams. Instead of maintenance teams of narrowly skilled craftsmen, there will be general mechanics. Supervisors will become analysts, and will have to know why something happens and how to prevent it, as well as what to do after it happens. In many cases, supervision will be exerted by remote control. The psychology of leadership will be subjected to unprecedented strains.

Foremen and workers alike will have to be taught broader skills to continue to fill their own steadily broadening jobs. This teaching the universities will have no time for; it will have to be done in the office and on the factory floor.

In this interim realm, this book will be an indispensable guide. Not that it answers, or tries to answer, all the intricate complex of problems automation will bring; no book could do that. But it does assemble the raw materials and the tools any trainer needs for training others. Through these pages, we of today can choose our path to tomorrow.

We can move toward a happier time, with fewer hours of work, longer leisure, no fear of unemployment, because management will need an undisturbed market for goods even more urgently than labor will seek a steady income; regular salaries for everyone, because management will not be able to afford piecework rates at robot

speed; one-story factories freed of smoke and grime by atom power, and scattered in garden communities through a countryside no longer dependent on slum-breeding cities for great pools of ready labor; perhaps even a peaceful world slowly brought about through unprecedented translations of every tongue on earth.

We can move toward that dream. Or, if this book makes us think too much, the noted historian of mathematics E. T. Bell has pointed out an alternative:

"Our shaggy ancestors got along for hundreds of thousands of years without science or mathematics in their filthy caves," he observed, "and there is no obvious reason why our brutalized descendants—if they are to be such—should not do the same."

DEVELOPING PEOPLE IN INDUSTRY

Principles and Methods of Training

1. *Industrial Training*

TRAINING for all levels of industrial skills, from mechanic to manager, is the greatest challenge facing the growth of American business. All of the trends on the horizon of the industrial scene point up dramatically the need for better understanding of people. The energy, creativity, soundness of judgment, and systematic approach that have gone into building America's economic empire must be devoted to human potential. The development of people is now ranked by enlightened management as equal to, or even surpassing, their other important economic functions.

This book is based on faith in people's ability to learn and in management's desire to teach. De Tocqueville, the French analyst of the American scene, expressed over a hundred years ago what we hope will eventually be the future code of American industry. He said, "It would seem as if the rulers of our time sought only to use men to make things great; I wish they would try a little more to make great men; that they set less value on the work; and more value on the workman."

OUTLOOK FOR TRAINING IN INDUSTRY

The trend toward understanding people and toward their development in industry will continue. It is necessary to the improvement of every function of an industry. All the signs point to an even greater orientation toward training and to a need for those specialists who can do a training job. *This book will be a guide for the industrial trainer* whoever he may be, manager, supervisor, or instructor. It will describe the problems that beset any training program, how they can be overcome, how the program can be implemented, and most important, the principles of human learning that must be incorporated in order to make the understanding successful.

THE HORIZONS

The face of the world is being lifted by the introduction of two formidable forces. The first is the industrial application of atomic energy. The second is the development of new machines which will automatically do complex jobs. Both of these are combining to reshape the future of American industrial life.

All the details of this change are not clear—the picture is still blurred; but one thing is certain: *there will be an increased need for emphasis upon training of people.* The development of people who can wisely use this dual inheritance from nature and invention will be one of the most important priorities in the new business world. The problem, in Norbert Wiener's words, is "the human use of human beings."

Where once we hoped for steady upward progress, we must now contend with jet propelled acceleration. E. V. Murphree, president of Esso Research and Engineering Company, says, "Anything appears possible now, and nothing is surprising any more with the atom under man's control. We are no longer startled by any predictions, no matter how Buck Rogerian they may once have seemed." Atomic energy and automation will make it so.

Before atomic energy is harnessed fully for industrial use, the effects of increased automation will be felt. The introduction to this book describes accurately and dramatically the revolutionary changes taking place.

These advances mark the beginning of the second Industrial Revolution even before the first Industrial Revolution has ended. For we live in an "overlap of ages," in Winston Churchill's phraseology. Today we are still learning to adapt to an economy where leisure has become a business and luxury is a door-to-door item. At the same time, the second Industrial Revolution is upon us, already indicating consequences that may change the structure of a business corporation, the access to raw materials, the length of the work week, the meaning of a "day's pay," and even more important, man's relationship to his job. Enlightened management is beginning to make the changeover and labor unions are seeking wage formulas to guarantee additional income for those men temporarily replaced by machines.

These innovations will have a profound effect on the manpower resources of industry. *The people at all job levels will have new*

kinds of jobs and need new skills; most important of all they will have to work with each other under new conditions.

THE FUTURE AND THE TRANSITION

The pace of technological change opens up vistas of unparalleled abundance and comfort. Some interesting findings emerge from a recent study of "American Needs and Resources" under the sponsorship of the Twentieth Century Fund. Dr. J. Frederic Dewhurst, executive director of the Fund, and his staff worked five years to complete the project. The survey revealed that our net output of goods and services in 1950 was twenty-five times that of 1850 and we did the job with only eight times as many workers. It took an 1850 worker three weeks at his average seventy hours per week to produce as much as an average worker turns out in today's forty-hour week. If present trends continue, in another century or sooner the average worker will be able to produce in a seven-hour day as much as he now does in a forty-hour week. Coupled with this abundant productivity may well be man's final emancipation from the drudgery of repetitive tasks.

But with these blessings may also come a liberation from a regular paycheck for large numbers of workers. At Ford's Cleveland engine plant, 41 men are now doing the work of 117 in two-thirds the time; the Raytheon Company produces radio and TV circuits with one-hundredth of its regular work force. In the white-collar field, General Electric has installed a computer which is expected to save $300,000 in clerical costs. A Westchester bank has cut its accounting staff by almost 75 per cent with electronic typing machines and computers.

Secretary of Labor James Mitchell has told the country that its survival may be threatened by the decline in certain critical work skills. But there is some hope that the transition period may be successfully bridged if industry, labor, and the community are willing to shoulder their training responsibilities. Unions are asking the federal government to take the lead in working out a retraining and adjustment program to prevent widespread unemployment. The same concern is behind their powerful campaign for a guaranteed annual wage. By guaranteeing an annual wage, they hope to help a man pay his bills while he is seeking another job or training himself for a new type of employment. Management groups are not

sure that the guaranteed wage is a solution to the problem. They feel that it will impose a crushing financial obligation on an industry, preventing it from changing over to new machines as rapidly as the new situation requires.

The guaranteed annual wage is only one attempt at a solution. There are others. New York State Industrial Commissioner Isador Lubin urges that labor and industry create a pool of skilled workers to which all would contribute and from which all might draw. Trainees would be encouraged through a scholarship system for which costs would be shared by industry, labor, and government. Whatever plan is finally accepted to solve the problem of layoffs due to automation, it must include training for the new skills demanded by the world of tomorrow.

Industry must face up to these new responsibilities. *Specialists with the know-how for the development of people are needed now more than at any other time in the history of industrial America.* To win for all of us the promise of the new life, the American community must prepare to meet the new challenge. The men who plan, administer, and guide the training of industry must answer this call to leadership.

THE TRAINING PROBLEMS AHEAD

This book will focus on one aspect of the complex problems facing the industrial world—the human side of the picture. *No machine will ever entirely replace the human being.* Some industrialists after a hard day struggling with a human relations problem may wish for this, but fortunately it will never come to pass. Human beings will always have work to do. This book can contribute, we hope, by pointing up and suggesting methods for handling one of the most important aspects of work—the problems of training and retraining. Not only will new skills be required but the older ones will need reshaping.

Aaron Levenstein, an editor-in-chief of the Research Institute of America, has pinpointed some of the problems which training directors may face as a result of the new technology: *The rapid obsolescence of equipment and of skills.* There will be a *shortage in the type of personnel* needed to handle the new methods and equipment. We may be facing a new kind of illiteracy in a mathematical society. A new kind of executive will have to understand what new

machines can do and how they can be put to work to solve specific business problems. Executive retraining will be necessary because of the changed financial problems. *New markets* will have to be developed. Market research will become a major area for training on and off the job. The nature of *employee relations* is bound to change. Training directors will be forced to increase their skills in certain areas, particularly in the relationship of the worker's job to the end result. The old artisan had a proprietary interest in his job; but today, the worker is divorced from the end result of his work. Automation will increase this "depersonalization" of work and make human relations training even more important.

Colleges and universities are giving increased attention to the requirements of this new industrial technology. This attention is not limited to specialists in engineering. It extends to preparing men and women in the humanities so that they will be better equipped to guide our complex society along a more constructive path, to think through industrial problems, to help people use their leisure intelligently, and more important, to explore the elusive problem of obtaining job satisfaction in a complex and depersonalized society.

Thus we have surveyed some of the training problems of the future. Everyone agrees that if we can handle them there is incalculable promise of economic betterment. The question is, can we plan and train early enough so that we will get there without hardship and dislocation? Specialists in training are urgently needed.

The New Profession: The Training Specialist

The developer of people is a new specialist on the American industrial scene. No longer is he thought of as a mechanic who trains an apprentice, or as just a job trainer. He must know training in all areas of personnel development. The "trained trainer," or training specialist, who has the know-how, ability, resourcefulness, and energy to carry through a sound program of training anywhere in industry will become increasingly valuable to management. He is the forerunner of a new profession.

This profession is developing skills of its own. *Training skills exist, just as do engineering skills and marketing skills.* These skills are different from those used in doing the jobs for which training is provided. Applicants for mechanical jobs have much greater probability of job success when trained by a good rather than a poor

trainer. Training skills are required for training people, just as are teaching skills for a kindergarten teacher or lecturing skills for the college professor.

THE JOB AHEAD FOR THE TRAINING SPECIALIST

The development of people for eventual top level responsibility must start early. Who knows where the great industrial leaders of the future will come from? Many of today's presidents, vice presidents, directors, and managers of big business started in the factory, in the office, or on the line; and many started with college degrees in the arts and sciences or from professional schools. Who knows who will be the future leaders?

Training must start with all who show promise, and it must start early. It should begin with the first-line supervisor in the factory, with the chief clerk in the office, and with the sales manager in the field—aimed toward their own growth and toward the development of those they supervise. The directors and executives begin their upward climb at these lower supervisory levels. They rise not only because they are good supervisors but also because they know how to bring out the best performance in those they supervise. *Any program of training in the development of industrial leaders must begin with the early identification of potential.*

WHO HAS THE POTENTIAL?

What industry is looking for at supervisory and executive levels is more educated people. By educated people we mean people who know what they do not know, who have honest perplexities about their own behavior, who are always curious, who "stop, look and listen," and who benefit and grow from life experiences. The educated person is not one who has all the answers, or one who always knows what is right, or one who lives by the rules, without reflection or consideration of others. *The educated person is one who develops and grows with experience.*

Professor W. H. Kilpatrick, one of the greatest educational philosophers of our time, reminded all teachers that "we learn what we live, we learn each item as we accept it, and we *learn* it to the *degree* that *we accept it.*" Individuals with training potential can learn and most important of all they can accept the lessons taught by life's experiences.

TRAINING *vs.* EDUCATION

Training is defined in the dictionary as a rather narrow form of education which increases the specialized skills of a worker. Education, on the other hand, is defined as a systematic preparation for a field of endeavor, with a stress on personal development and general skills. For example, *the training specialist must know the specific techniques of his training job. In addition, he must be armed with a great deal of general information about people: how they learn, what motivates them to change, why they sometimes resist learning and personal growth.* This book will prepare the training specialist with the specific tools of his profession and help to give him the broader foundation.

In order to increase the proficiency of people, to start them on their climb to more responsible managerial jobs, to make them developers of men, a great deal of what is defined as general education is needed in addition to the specialized skills. The exercise of military skills by those in command positions best illustrates this need for specific training and general education. A commander in battle must know the general principles of strategy, tactics, logistics, and the history of previous engagements in similar terrain. But in addition, in order to know what the enemy is up to at a certain point, he must draw on his knowledge from military school, the techniques of troop movements. Putting the two sorts of knowledge together, the training and the education, he will be able to counter the enemy's offensive.

We need people who know how to answer questions; we also require individuals who know what questions to ask. This can be accomplished only through the perspective of history. Dr. Ordway Tead tells educators, "The total learning experience for the individual should come through satisfying outcomes, a certain confidence and assurance about one's sustained attack on *learning, living, striving,* and *growing.* And a final value which merits greater stress is the ability to see *human affairs* over the centuries in some realistic historic perspective."

This does not mean that education is theoretical, impossible of application. *All knowledge must be applied.* We can also make a more effective application if the foundations upon which the knowledge rests is better understood. Professor Alfred North Whitehead states it this way, "I regret the notion that students should first

learn passively and then, having learned, should apply the knowledge. In the process of learning there should always be some application. Unapplied knowledge is shorn of meaning."

THE CHALLENGE OF TRAINING

We all marveled at the number of airplanes and ships that were built in America during World War II. This high production has been credited to two things: first, to the efficient organization of the work, and second, to the rapid training of workers. The production miracle was the least surprising part of this picture. The greatest accomplishment was in having people trained to do the work, to man the ships and fly the airplanes as they came off the production line.

This was not achieved by hit-or-miss or emergency methods of training. It was done by taking advantage of all the collective know-how that had been accumulated by trainers and instructors in industry, colleges, and government departments. There was no uncritical acceptance of traditional ways of training. A way of training was to be accepted only when the methods, content, and time consumed contributed to the over-all goal. Whether it was called education or training did not matter as long as the purpose of turning out an efficient war machine was accomplished.

In the past training has saved lives; in the future it must save livelihoods by helping thousands to learn the new tasks required because of the second Industrial Revolution. The training specialist is a privileged person in industry. Skills are his product. This time the skills are for peace, not for war. The task of the training specialist is difficult, but the rewards are great. To him falls the direct and personal gratification of observing the progress of individuals "under his hand."

HOW IT CAN BE DONE

The training specialist or instructor in industry will borrow ideas and know-how from many sources. He has before him the experience of other industrial training programs. Unfortunately, he may venture into blind alleys. Salesmen of leadershsip and training courses will impress upon him that they have "the only solution" to his problem. All he has to do is sign on the dotted line and they will provide the answers. *These overnight "solutions" must be*

avoided. For years, people in the teaching profession have been studying the best ways of teaching, of catching the interest of their students, and of stimulating their imaginations. This information is based on experience and must be tapped. The industrial trainer should use only the authentic "tricks of the trade." He should pursue knowledge wherever he can find it. He should hold an open mind in applying all methods of training to his problem of the development of industrial manpower. He should always strive to know himself better—his own strengths and weaknesses. Most important, he must strive to learn all he can about people, how to estimate their potential, and what methods can be used to encourage their growth.

Research has resulted in many new concepts of training. Trainers are now taught why and how people learn. Techniques for the attainment of specific objectives have been worked out. With changes in method have come changes in what is considered a good trainer. Training is no longer a mere hodgepodge of isolated facts and methods. Today the trainer is a specialist just as is the industrial engineer or accountant. He has a new status, a technical field of work, and an acceptance earned by the successful fulfillment of a recognized industrial need.

Lawrence Appley, president of the American Management Association, in a recent article asked that additional incentive be given to talent builders. He said, "We have incentives for stepping up production, increasing sales, reducing waste, improving quality and developing new products. Why can't there be *incentives* for *building* management talent?" The individual with the ability to develop others is finally being given adequate recognition.

The Outcomes for the Training

These are difficult to set but they must be established in advance of all training. They are the goals, the objectives, or the needs for training. *What is wanted is improvement* in something: improvement in terms of skills, rate, turnover, safety, satisfaction, communications, human relations. *These are the needs that must be determined in advance of planning the training program.*

The outcomes for skills training in the jobs of the office, shop, and factory can be established in terms of quality and quantity of production, that is, output according to job standards. Job standards

tests and trade tests are used to measure the results of this type of training.

It is more difficult to establish the outcomes for training in other areas, and particularly for supervisory and managerial training. Even more than for other jobs, a training program for supervisors and managers must fill a need which they feel in performing their jobs. It must establish goals in their minds toward which they will strive. These goals can best be established on the basis of various studies of what good managers and supervisors do and of how they think and feel.

SUPERVISORY METHODS

The ways in which supervisors and managers get results differ, of course, as one might expect. Some interesting differences have been found in various research studies. *Those in charge of high producing units use different methods in supervision than do those in charge of low producing units.* The supervisor who is in training can improve by adopting the methods of good supervisors and by modifying their behavior according to what works best.

Supervisors of high producing units do not find it necessary to put their employees under pressure for production. They find that production comes through cooperative effort. On the other hand, the supervisor of a low producing unit strives to get production up by putting pressure on his workers. This supervisor's manager is likely to be of the same kind. Pressure for production will characterize his discussions.

The high producing line supervisor is "employee-centered" in the sense that he spends more time in supervision and less on production. Such supervisors consider the interests of their employees of primary importance. *They treat them as having a right to their preferences* for tools, ways of work, time off, etc. They try to understand them, and mold a working relation in which differences can be settled without issuing orders. They encourage group participation and discussion in making decisions, and modify their own viewpoint if this seems best. *They are, in the language of today, democratic leaders.*

First-line supervisors in the low producing units function more as employees, spending considerable time on straight production. Of course, this saves man-hours of cost, but it leaves the unit without a

leader who can tap the potential of worker capabilities. In fact *the less effective supervisor is inclined to treat his workers pretty much as a mechanic uses a helper,* forgetting that the limitation is in him and not in those who assist him.

Managers and supervisors of high producing units allow more freedom of operation to their employees, whereas those of low producing units keep their workers under close direction, seldom delegating responsibility, and they handle most of the details themselves. Also, this is true of their supervisors! *Where a manager delegates responsibility and stands behind the decision of his supervisors, where he lets them run their units but helps when help is needed, the supervisors are likely to follow his example.*

SUPERVISORY ATTITUDES

Some interesting observations of supervisory attitudes have come from studies made in major industrial concerns by Richardson, Bellows, Henry and Co.

The *good managers and supervisors in industry are distinguished from the less successful in their feelings or satisfactions as well as in their behavior.* The attitudes of good supervisors can be cultivated by all, and in training supervisors it can be said, in the words of the New Testament, "Think on these things."

The good manager or supervisor enjoys his job as a source of achievement. He enjoys striving for accomplishment. His work is not frustrating as it is to the poor supervisor. The poor supervisor is likely to say: "I want to know just where I stand; I like clearly defined rules." But the good supervisor says, "It's new, it keeps you going all of the time, always something different." He enjoys the challenge of creative planning and meeting new situations. He is not content to attack problems by old methods, as is the poor supervisor, but enjoys the struggle to improve the methods of work and the devising of new procedures.

Unlike the poor supervisor, *the good supervisor feels that those above him use their position of authority to assist him* in his efforts. He does not feel it necessary to seek them out for all decisions. He is satisfied with his latitude as to responsibility and initiative. But he feels free to go to his superiors should he need their assistance. In contrast, the poor supervisor complains that his performance is hindered by inadequate communications with his supervisors, and

that they do not demonstrate confidence in his ability. *There is a wide difference between the good and the poor managers and supervisors in the confidence felt about their relations with their superiors.*

The good and poor are miles apart in their feelings of job security. The good manager or supervisor says, "As long as I keep doing a good job, I will always have a job." The less successful supervisor doubts his own effectiveness. He questions his competence and thinks of his present job as "all right," but not the place to stay for long. The feeling of the good supervisor is that "I make the job secure for me." The poor supervisor does not get such satisfaction. He feels insecure.

In a sense the feelings make the man. If he feels free, he chooses freedom. If a manager or supervisor feels right, he can act right. If he feels right toward his job, toward his boss, and toward those working for him, he is likely to be a good supervisor. This is not all there is to it, of course, but *to cultivate the proper feelings is a large step toward finding the best methods to work as manager or supervisor.*

Essential Objective of Training

The methods of training are complicated; the outcomes are difficult to attain. There is no easy course but to practice methodically the procedures of training in order to attain its goals. That is the job of a training specialist as described in this book.

There is another part to his job, an important part, one of communicating to management the truth about training: that there are no short cuts, that one cannot sit in an office and dream up training, that people cannot be trained at odd moments, and that people will not train unless they want to do so. This "want to" is important enough alone to convince management that before any training is started, those who are to train must be brought to the point of view of wanting to train.

This "want to," which will be discussed in detail in a later chapter, is the essential objective for all training: for management, to provide an understanding of the problem of training; for the trainer, to have an understanding of how people learn; and for the trainees, to improve their performance. This is necessary in order to realize the desired outcomes of training in any company.

2. *The Management of Training*

To be successful, a program of training will always involve the top management of a company: *most frequently training must start with top management.* Unsatisfactory conditions which training can be expected to improve have their roots in management. No one further down the ladder of the management hierarchy will take training seriously if at the top management level the goal of training or the needed outcomes are ignored by management's attitude or behavior.

Such statements as those above were made by one of the authors to the top management group of a large combine. They were treated with silence, but in the ensuing discussion two heads of departments got into a heated discussion, one complaining of lack of coordination with his department by the other's staff. Then, the manager responsible for training injected the important point. He said that among the managers down the line in both of these departments no one took his training work seriously. Thus it became evident to all that the trouble lay in lack of communications between the two top executives and that all executives needed training.

Every advance or improvement in an industrial company coincides with an advance or improvement in management. *Useful ideas may come up from the bottom, but their use depends on management's cooperation.* There is little hope to achieve desired outcomes through training unless management, and top management in particular, participates in the training.

Some Traditional Attitudes of Management Toward Training

To provide the necessary leadership for training, a training specialist must have a clear picture of his specialty. This does not mean that other executives will not have rather set ideas about training.

For example, they will prefer to label training designed for them as "managerial development" or "leadership development." According to them, "training" is only for mechanics and office personnel. Even this training may be called "employee development." But when all the labeling is said and done, it is training in the training specialist's book, no matter what the others call it; and the one being trained is still the trainee, even if he is a top executive.

Education in changing traditional managerial attitudes toward training will come only gradually. This is an outcome which the training specialist must assume as his personal objective. Some of the more pronounced traditional attitudes of managers toward training, with which the training specialist should be prepared to deal, have to do with its purpose and content. Let's see what some of the views may be, as they have appeared in studies of managers' attitudes. Being forewarned about some of these diverse points of view will help in getting effective executive support in the management of training.

ATTITUDES TOWARD THE PURPOSE AND CONTENT OF TRAINING

The training specialist will perhaps hear his boss say, "The major goal of all training is to develop skill; training should be limited to those procedures necessary for successful job performance." At first hearing this sounds all right as policy. It appears as sound business sense. But in such statements the trainee is ignored, and he is really the man who is doing the training.

Here is where the manager is likely to be limited in his viewpoint concerning the content of training. Management wants the trainee to be trained to perform a job. *But any instructor knows that all training is actually self-training, self-guidance, self-endeavor.* What one learns must always be sought after. *Instruction contributes nothing unless the trainee feels the need to learn.* All additions made to a worker's know-how are products sifted according to his own purpose. We learn only what we deeply want to know, or as Hadley Cantril, the psychologist, put it, "no occurrence is an event for us unless it has some bearing on our purposes." Much specialized, specifically applied instruction bounces off the surface of the trainee's mind because he does not want it. The mind of the worker is like a weather vane, turning this way and that, according to the direction

of the wind. The wind is his own purpose, desire, need, or will to learn, to improve himself.

Many companies think of training "on company time" in these terms: The company will contribute the time for the training of the skills required by an employee to perform his job; all other training is to be on the employee's own time. Such policy statements may be necessary controls. This is not the issue the trainer faces. His problem is to get the trainee to want to train.

This raises the question of finding the right content of training, whether it be for a mechanical job, or a clerical job, or a supervisory job. *Job training is most successful when it provides all possible content about the work-place or job situation, and when this is related to the trainee's total life.* The individual seeks what he learns, and the purpose of training is to stimulate that search. No two trainees can be expected to seek exactly the same skills, know-how, or knowledge. When it is known that the trainee needs to learn a certain skill, or acquire certain knowledge to perform his work, then this content goes into the course of training. The trainee will accept or reject such content according to the way that he feels in performing his job as he sees it. It is the old story of "You can lead a horse to water, but you can't make him drink." *The trainee will interpret any material according to his viewpoint.* He will call the course "academic" if he does not understand it, by which he means that it is impractical. This should tip off the training specialist that the trainee has not acquired the need for training or that the instructor has not found the proper avenue to sparking this need. However, even with the best trainer there will always be some who will regard the training as useless.

The main focus in establishing the content for training, at any level or for any skill, is to provide a sufficiently broad scope so as to include all the varied and possible needs of most trainees. Nothing brought up by trainees should be considered irrelevant within this definition. Examining the trainee's thoughts, we find questions such as these:

What happens to the work I do?

How does one go about practicing this skill, without other people's knowing that I do not already have it?

What controls are exercised over my work?

Will this be like going back to school?

What kind of people are they hiring to do this work?
What can I tell my friends about what I am learning?
How will this help my future in the company?

These are but a few of the questions running through the trainee's mind, all involving himself, which must be answered if he is to learn.

These ideas, then, are dealt with by the training specialist in discussing the purpose and content of training with management. There is no quarrel with the statement that training should be limited to the procedures of the job, if interpreted in the light of the individual's needs and purposes. After all is said and done, *the goal of industrial training is to change attitudes and behavior so that a better job is done.*

"TRAINING IS A LUXURY"

This is another management attitude which must be considered. Managers will agree that "getting the work out" is the end-all of supervision at any level. Traditionally, it is interpreted that training is a luxury and takes a secondary position to production. "Production above all" is the theme-song of unenlightened management. Trainees will be pulled out of the training room and put on the production line whenever there is a deadline or a rush order. A journeyman will be promoted to supervisor without supervisory training because an additional supervisor is needed to meet an emergency demand. All these acts are committed under the name of production efficiency.

But once the trainee is put on the line his value as a learner may be lost. If he feels he can get by without training, it is easier for him, he can put forth less effort; less persistence is necessary, less patience, and less humility is required of him. He has "passed" the requirements of production. This narrow point of view, which regards the immediate needs for production as foremost, defeats the goals of achieving both quantitative and qualitative standards for production. The enlightened manager understands this. *Training takes time. Both the trainee and management must learn to be patient.*

Is the work—though poorly done—more demanding than the training to do it right? This is a question which managers up and down the line must face, and much depends on the manager's de-

cision. Its answer relates to the acceptance by the purchaser of the company's product, the achievement of qualitative and quantitative standards, and the willingness of workers to train.

The real answer to the problem is planning ahead for adequate training; this will reduce the number of production emergencies. But it never seems possible to avoid all production emergencies even with ideal planning. "The best laid plans of mice and men . . ." If the training specialist and the manager think alike, *training will be placed in its proper perspective as a part of production* and not as an adjunct or a luxury. *Management must recognize training as a major tool in maintaining efficiency.*

An actual on-the-job case historv will illustrate the point. The general manager of a factory was asked to set up a similar production unit elsewhere in a rural region, but near a rail spur. He did an efficient job. The building went up in jig time. The machinery arrived. The raw materials were on flat cars at the nearby juncture. He set the date for the opening of the factory on the following week and wired the personnel manager at the central office to send in the technical help. Also, he wired the company president that the job was accomplished. Imagine how he felt when he got a wire from the personnel manager stating that it would take six weeks to fill a small part of his personnel requisitions; that those who qualified would require considerable training; and that of those interviewed so far, more than half were doubtful about taking their families to "that God-forsaken place." He had forgotten the human side of the job. Planning ahead for training was neglected and the general manager learned a costly lesson. This company will always remember that a limited time spent in training pays rich dividends.

VIEWS ABOUT HOW YOU DO THE TRAINING

How training will be done is a subject on which there is strong opinion among managers. We are concerned at the moment about the methods of training—whether there will be lectures, readings, conferences, discussions, and so on—and not about what will be taught. Generally, the lecture method is condemned for supervisors; conference leadership is applauded; great enthusiasm is expressed for the "case method." Each new method is hailed as the panacea to get workers, or supervisors, to accept training. This places the training specialist on the horns of a dilemma. Management thinks

it knows the answers. Executives expect the trainer to incorporate into the program with enthusiasm each new "advance" they read about in *Fortune* or other popular business magazines. Such emphasis on new methods rather than content has led to the offering of many supervisory training courses from outlined material. The course leader is required to improvise the content as he goes along. If he is a busy supervisor or manager, the work of building a course just does not get done, and the training collapses of its own neglect.

Actually, this is common in supervisory training throughout many companies. Discussion is carried on more or less at random from a list of topics, which does not get anyone anywhere. Experts in training never let the cart come before the horse. *Content is the major concern; a stress on method with a complete disregard of subject matter is a sure way to ruin any training program.*

Often any method will succeed if the content is really needed. But the right method of presenting the content is essential. For example, well illustrated readings, realistic participation, interesting demonstrations, and motion pictures or other training aids will certainly help to put over the subject. All these aids and their contribution to successful training will be discussed in later chapters. An appraisal of these methods of training should be a part of the instructor's know-how.

The preparation for good training involves job analysis, training analysis, curriculum construction, and curriculum evaluation. This is just as true in clerical and craft training as it is in supervisory and managerial training. Such preparation involves a great amount of work. This work is worth while, for the training is a waste of time unless the content fills the needs for training. It is necessary to spend the time and cost to get the right content; then methods can be determined. These will differ according to the content for training and the kind of trainees.

WHO SAYS THAT TRAINING REALLY TRAINS?

Is the value of training self-evident, as many a manager has said? Why doesn't he find this out as he does the saleability of a product? Training trains, of course; but does it train

in the right responses or movements?
in the shortest time?

gest numbers?

ost?

raining can be improved to the greater satisfaction of those trained, and for greater efficiency in the industry. We do not e to recall that it was only a few years ago that a trainee equired two, three, four, five or more years to become a journeyman, because training was so ineffective. Studies have shown that many crafts include 60, 70, 80, or even 90 per cent of their operations for which people can be trained in two weeks to six months. Only a small fraction of the work of a job requires the experience of years to give needed understanding and judgment. By way of illustration, it was found that some machine operators could be perfectly trained in two weeks. But it took two years of training in safety procedures before maximum effects could be obtained.

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along. Why should you now feel I need training?"

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When he is pulling, he can't kick.
When he is kicking, he can't pull.

The task before the training specialist is to lead the trainee t
that training will help him to use to the fullest those qualities in
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The feeling that any training is good reflects a traditional attitude not tolerated in product improvement and development. Employee development should be just as efficient as product development. All aspects of training should be studied for possible revision. *All training should be evaluated to find out if it is doing what it is supposed to do or if it could not achieve its goals better and more easily.*

The manager or superintendent or supervisor will make the decisions. The training specialist is his assistant. But time spent together in understanding the problems of training is as well spent as time in work methods improvement.

The training specialist has the task of weaning managers from the traditional attitude in which a man is said to be trained as one whittles a stick, and educating men instead to the notion that a man trains by seeking knowledge and skills according to his own desires. The training specialist can do this best by establishing a partnership in ideas with management in which managers will come to recognize him not as knowing more than they do, but as knowing more about his own specialty, training, than they do. The wise manager is the one who has a good training man and who leans heavily upon his thinking.

Personal Resistance to Training

We should not be surprised when people feel some resistance to the idea of being trained. If a supervisor has been doing his job well

enough to hold it, we cannot blame him if he says, "I've been getting along. Why should you now feel I need training?"

A man is like a mule.
When he is pulling, he can't kick.
When he is kicking, he can't pull.

The task before the training specialist is to lead the trainee to see that training will help him to use to the fullest those qualities in his make-up which enable him to do his job best, while cutting down on undesirable behavior; *the trainee may not previously have realized that some of the things he does have not helped him.*

Even enlightened managers and supervisors, as well as workers, may feel some unpleasantness or even resentment at the suggestion of taking a course in training. *It would be surprising if anyone deep down were enthusiastic or even interested in training when it applied to himself.* That is why most training goes by other names, such as employee development or managerial development, and it is why managers are so concerned over the methods of the training. They feel they must sugar-coat the pill.

Let's look for a minute at why any employee might feel this way. Perhaps it will help us to understand why human beings so often resent any attempts to train or change their behavior or attitudes.

DISRUPTION OF REGULAR WORK

One big reason why people who already hold jobs of responsibility resent a training program is that they feel it is interfering with their regular work. Regular work may accumulate which has to be done later. The manager, the supervisor, is not sure whether the work will go smoothly if he is not on hand, despite any arrangement that he may have made in delegating responsibility. It may take time for them to realize that *training is part of their regular work.*

FEAR OF THE TRAINING

Some people may feel that being asked to participate in a training program carries some implication of having fallen down on the job. "Why do I need training if I am doing a good job?" they ask themselves.

In addition, they feel apprehensive about taking on an unknown task. They fear that they might not make a good showing in front

of others taking the course or those giving it. They feel "on the carpet." Attitudes and feelings such as these are natural even if unexpressed. *The instructor or trainer must understand the basis of such fears and learn how to deal with them.* These vague apprehensions may show up in the resistance to or resentment of training.

It should be made clear that *it is the purpose of a training course to help everyone to perform his job most effectively;* that it is *not* the purpose of the course to check up on anyone or to show up anyone in front of everyone else. *It must be perfectly clear when a group is gathered together in training that there is no intention of putting them "on the spot."* Rather, it should be stated that those concerned with the training recognize that everyone needs to be given the tools, the know-how, and the opportunity to train themselves. They should be helped to the realization that self-training is a necessary function in our changing industrial world.

SCIENTIFIC MANAGEMENT AS A THREAT

Most large companies are headed in the direction of more scientific management. Some trainees may feel that the company is becoming more impersonal. They need to be reassured that *scientific management today means even more, not less, concern with people.* Any manager or supervisor and even the workers themselves should see that they are going to be called on to do many more difficult things than they have in the past. This trend will increase as automation spreads. Managers will have to face this problem generally as they are being entrusted with new tasks. All employees must have more understanding of the scientific processes of industry. The training specialist will need to let the trainees know this, so that they do not feel as if their abilities or past performances were being questioned.

We should not be surprised, then, if people resist training. But we can try to make them feel as *the people who are responsible for training feel:* first, *that everyone, even when he is doing a good job, can improve more rapidly* if given the chance to enter a training course in his field of work; second, *that there is no criticism implied* or intended of what has been done in the past by anyone; and third, *that nobody is "on the spot"* in entering a training course.

It is now clear that the future will require training at all levels of management. From the company president down to the filing clerk,

we are going to be trained and re-trained. Everyone is in the same boat!

Training Is Guidance

Man is an adaptable and creative being. Each day brings a new appreciation of what he can do if his energies can be coordinated and directed. The leaders in industrial training require this insight, for their responsibility is to assist human beings who can and must adjust to the revolutionary changes in the conditions of industrial life. This is the key thought in the management of training.

People have always needed help to adjust themselves to new conditions of living when they can do little to change the conditions. A part of the process of growing up, in which we are helped by both formal and informal education, includes fitting ourselves and our behavior into the customs and ways of our social group. This point of view is aptly expressed in the following lines:

> God grant me the serenity to accept the things I cannot change;
> The courage to change the things I can;
> And the wisdom to know the difference.

Guidance is an integral part of the job of the teacher, instructor, and trainer, and of the manager, supervisor, and executive. *Guidance is their technique for accomplishing their responsibilities toward people: counseling, tutoring, and encouraging;* not dictating, not telling, and not ordering. Stanley C. Hope, president of Esso Standard Oil Company, says in this connection, "We want to have every supervisor in the company aware of and actually practicing the basic principles that we believe will give us the finest type of cooperation and an effective operation." These are the ways of the training specialist in meeting the challenging need to assist people in adapting to a changing world.

A thorough knowledge of what is necessary in industrial performance, that is, the content of training, remains a requirement. But it is no longer the sole measure of a trainer's qualifications. *The training of human beings requires a familiarity with their characteristics.* Only on this foundation can a realistic approach be made to the guidance of others.

Such is the ideal condition for training: one in which the trainee takes the responsibility for his own training and receives guidance

from mature and experienced people. It is the condition which the specialist in training hopes and prays for; and it is the goal of this book to help him achieve it, with the trainee training himself through information imparted to him in meeting the demands of his life. The demands, for example, placed by automation and atomic power, and indeed the discovery of these tools, only emphasize Bacon's precept: "Knowledge is Power."

A Forward Look in the Management of Training

Through the cooperation of industry and labor, and with the assistance of government agencies, the scope, skills, and standards for several thousand occupations have been recognized and accepted. Apprenticeship training, labor market demands, union jurisdiction, time and motion study, job evaluation, invention of machines and the development of assembly-line methods, all have played a part in establishing the jobs of an industry. The training specialist, in large measure, takes over from this point.

In the management of his job, *the training specialist has to look in several directions. He must know work organization and how to study it in order to establish the needs for training.* This is the next step to be taken in our discussion. Here there are definite techniques to be used.

He must look discerningly in the direction of the one who is to be trained. *There is much to learn about trainee motivation and about the way skills are attained.*

Looking in another direction, he will discover various aids to training with the assistance of which the training specialist can do a better job. *There are special devices and procedures which interest the trainee and assist him over a difficult piece of learning.* This area should not be neglected, for some valuable work in training techniques has occurred here.

Finally, *training in a company of any size requires organization.* Training requires an organization of places, people, and things, just as do production, selling, and other industrial operations. This is the organization which the training specialist manages.

Subsequent chapters will deal with the directions in which the trainer must look. These areas: training need analysis and work organization, trainee motivation and learning techniques, training aids and procedures, and training organization, should become familiar to anyone who plans to perform the work of a training specialist.

3. *Establishing Training Needs*

THE training man must be specialized in methods of establishing just where training is needed. He may find that everyone from the laborer to the works manager believes in training and says that he wishes to develop his own skills on work knowledge. But the methods of determining the "where," the "what," and the "how" of training are quite foreign to their thinking. What is wanted is: training where it is needed, and with the people who need it. This is the training man's job. To accomplish it requires special techniques of analysis of the performance of workers on the job: employees at any level in the organization.

The establishment of training needs is the primary task before setting up any training program. It comes before the preparation of content or materials, or the selection of aids and devices, or decisions as to methods; in fact, it comes before any plans are made for a training program. It may be decided upon information gained in the study of training needs of a working unit that no training of the formal sort is required or that some specialized training such as the reading of measures is needed. This can only be determined after a study of training needs.

Training needs may exist because of lay-offs due to increased automation of the working processes. Or they may stem from such familiar causes as increased turnover or retirement, seasonal fluctuations in the labor force, rapid expansion of production, new installation of machinery, reorganization of departments, new specifications in the labor contract, the complexity of required skills, and changes in the labor market.

A tabular flow chart indicating various phases in the determination of training needs will be found in Fig. I. References are given to the pages in this chapter where the separate phases are discussed. As can be seen from the flow chart, the survey on which decisions

FIG. I. PHASES IN THE DETERMINATION OF TRAINING NEEDS

Information Being Sought	What the Training Specialist Does	Results of Information Obtained at Each Stage of Need Determination
1. General areas in which training is needed (e.g. Safety, Human Relations) *Key question:* For what jobs is training needed?	Area search (Pg. 40) 1. Gathering Opinions 2. Operations Check-List 3. Vocational Check-List	*Participation of managers:* List of jobs in which training is needed
2. Specific elements of the job skills (e.g. carpenter: plane a board; aviator: rev-up a plane engine; supervisor: apply rules) *Key question:* How are these jobs performed properly?	Job analysis for training (Pg. 43) 1. Detailed notes describing each job operation 2. Classifying operations into sequence, into "job steps" 3. Specifying "key points" of each job step	*Job breakdown:* in detail for jobs in which training is needed
3. Plan for training needed to do a given job *Key question:* What is the content of training for these jobs, in proper training sequence?	Reorganization of job breakdown (Pg. 47) 1. Specification of training stages 2. Determination of the specific training steps for each stage	*Job training outline:* the detailed statement of what must be taught, and in what order
4. Individual worker training needs *Key question:* Who needs to be trained, in what specific tasks?	Individual training need determination (Pg. 52) 1. Group discussion 2. Supervisor's evaluation 3. Job or achievement tests 4. Crew analysis	*Individual trainee record:* to serve as detailed individual training outline

as to training are to be made aims at increased specificity in the accumulation of information concerning training needs.

How to Find Where Training Is Needed

The first task in establishing where training is needed in an industrial company is to isolate the areas of ineffective operations. Once the problem areas have been established then the training remedies can be developed. Is the critical need a matter of orientation, or of safety, or of job skills, or of human relations, etc.?

The training specialist goes through the plant observing conditions, and as he talks with operating personnel he asks himself questions: "Is there a need for training in the clerical skills? Is skills training on the job haphazard and without purpose? What could training accomplish that would stop the company from losing money through inefficient performance? *In what area will the most benefit come from training?*" This latter question is always foremost in his mind. The answer may not be in just one area. There may be a need to establish different parts to the training program. There are, of course, many different ways for obtaining this information.

Opinion Gathering

The training specialist gets some of his answers to the question of needs by talking with the managers of departments and the foremen of shops. He circulates and watches and questions those concerned with production. What he is attempting to do is to narrow the focus of needed training. It is something like searching for a ball in a limited area. The searcher starts somewhere and circles the whole area, with narrowing circles, until he spots the ball.

Supervisors and managers usually will be glad to assist the training specialist. They will have definite ideas of where training is needed. However, *a training specialist must ask his questions so as to elicit problems which can be solved through the training of human skills.* Too often the executive will tell him problems at length, but they will have little to do with training functions.

During this exploratory questioning period, it might also be desirable to point out to supervisors and managers that the results of training are long term, not just around the corner. Those concerned with training have a much more difficult task in the development of people than does the production department in the development

of the product. The answer must always be: "We'll be working on it, but it will take a long time. Don't expect miracles—but we can do a lot if we know your problem."

AN OPERATIONS CHECK LIST

A more systematic search for the areas of needed training can be made with an operations check list. Such a check list can be used for the evaluation of the effectiveness of the performance of managers, supervisors, clerks, mechanics, or even laborers. It is usually desirable to start with the more general operations which go into performing a job and then become more specific as the areas for training are isolated. This check list should grow out of the training specialist's observations as he follows through in his search for the areas of needed training.

To illustrate, Fig. II lists items checked either "yes" or "no" from a part of a check list prepared by a training specialist as he observed the work of a production unit.

FIG. II. CHECK LIST FOR NEEDED TRAINING

Items Recorded by Training Specialist	Is Item Seen in This Production Unit?		Possible Training Need
	Yes	No	
Downward communications to supervisor slow	x		x
Frequent gripes by supervisors about tools		x	
Supervisors use suggestions from workers		x	x
Many rejects returned to production		x	
Customer's complaints from sales ignored		x	
Turnover in shop higher than seems necessary	x		x
Many lost-time accidents		x	
Paper work up to date		x	x
Raw material delays		x	
Supervisors use specialists of Company		x	x

What the training specialist does is to check an item every time it is mentioned, whether performed adequately or inadequately. As the items are recorded and the frequencies with which they are mentioned are accumulated, it is possible to select areas of greatest need for training. If those responsible for training agree, then the specialist can proceed.

CHECK LIST FOR A VOCATION

The training specialist then can follow the same procedure for a vocation, or for study of the training needs in a shop, office, or unit of production. In so doing he prepares his check list for more specific occupational tasks. Items are prepared for inclusion in his check list based, as before, on his observations of the work.

At the supervisory level, by way of illustration, he might include in his check list such items as those listed in Fig. III.

FIG. III. SAMPLE CHECK LIST FOR SUPERVISORS

Items Recorded by Training Specialist	Checked for Adequate Performance		Possible Training Need
	Yes	No	
Keeps inventory of tools	x		
Prepares training outline for apprentices		x	x
Takes unsafe machinery out of service	x		
Checks all repairs	x		
Maintains "hours of work" record	x		
Inspects regularly for quality of product		x	x
Informs on elimination of waste		x	x
Plans workplace layout		x	x
Instructs on cost of materials		x	x
Explains company policy to workers		x	x

Such check lists as those illustrated in Figs. II and III may be prepared in advance of their use from items the training specialist has assembled for this purpose. In this manner he can determine from experience the things he will be looking for.

As yet the training specialist is not studying any job to establish what will be the content of the training. He is still narrowing down the needs for training by areas and vocations—based on his own observations and on the opinion of supervisors and managers—to the point where he can say, "Training is needed, according to the evidence I have accumulated, here and here and here, in this, in this, and in this; such training can best be accomplished through specific skills training, through orientation training, through supervisory training," and so on.

If the training specialist has worked with management in the manner described and obtained their cooperation then there should be no difficulty in obtaining the necessary approval for the recom-

mended program. After receiving the green light, his next task is to determine the content of training. This requires a careful, and thorough, study of the job or jobs in which the training is to take place. Once the specialist knows in which general areas or for which types of jobs the training is most needed, he must then find out the specific elements that need to be taught.

How to Perform a Job Analysis for Training

The next step in the development of any training program is the setting up of a job analysis. We have all heard "job analysis" used in many different ways. This can be confusing, but the following discussion should help to clarify the different meanings of the term.

There are at least seven kinds of job analyses. You will probably recognize some of them. These analyses of the job all have in common a description or measurement of the operations or tasks of the job. But their varying purposes or methods make it necessary to seek different job information and to assemble it differently for the various uses to which it will eventually be put. Here are the seven kinds of job analyses:

Analysis for job specifications, for use in recruitment, selection, and placement.

Analysis for hazards, for use in safety procedures and safety training.

Methods study, for use in work improvement.

Motion study, for use in work improvement.

Time study, for use in work improvement and for the setting of quantitative standards.

Analysis of job factors, for use in job evaluation and wage setting.

Skills analysis, for use in training.

The last of these, *the skills analysis for training, is assembled in the form of a job breakdown.* This is an old technique of the training specialist and one that will be sketched out here. This is theoretically the way it should be done, although the specific procedure may vary from company to company, or according to the needs for training, and the individual preferences of a training specialist. The skills analysis for the purpose of constructing a job breakdown requires the following phases of work:

1. Describing each task or operation of the job by taking detailed notes of all skills used.

2. Arranging or classifying all operations or tasks in the order performed, as units called "steps."

3. Specifying from the notes the key points for the successful performance of each step of the job breakdown.

A job breakdown is shown on a later page of this chapter (Fig. IV). Let us examine each of these three phases of the skills analysis in more detail.

1. DETAILED NOTES OF THE JOB

The skills analysis begins with the observation of each task or duty or operation performed in doing the job. The analyst talks with the supervisors or workers to determine what the worker has to do. He may also use in his analysis the operating manuals for mechanical jobs, or company policy statements for managerial positions.

By way of illustration: if a task of the carpenter is to plane a piece of board, then the angle of holding the plane, the pressure exerted upon the plane, the depth of the cut, as determined by the setting of the knife, and so on, all should be noted and recorded. *These are the perceptions and actions necessary for the effective performance of this skill:* the trainer records them. If a part of the job of the supervisor includes the handling of employee relations, the knowledge of the rules, the methods of decision making, the time that it takes to solve worker problems, the health record of his shop, the satisfaction of his workers with the rules and methods of handling their problems, and so on, then all of these will become a part of the record. The insights necessary for the supervisor into the thinking of his employees must also be included. Of course, the tasks of the supervisor are more varied and complicated than are those of the carpenter, but they should all be considered in the analysis, and listed in the analyst's notes.

The important thing to keep in mind is that *the job must be fully described.* The notes the analyst makes in the course of this description form the material from which the job breakdown is constructed.

2. STEPS OF JOB BREAKDOWN

From the detailed notes about the job it is possible to *arrange the tasks or operations performed into a series of job steps or production units necessary to the accomplishment of the total job. These are arranged when possible in the sequence in which the job is per-*

formed: each job step will combine certain detailed operations or tasks in such a manner as to make it evident that a "step" has been taken toward the successful accomplishment of the job. This is necessary so that the trainee in learning the job will have the immediate goal of learning one production or performance activity.

The tasks and operations necessary in the performance of the production unit, called a step in the job breakdown, are listed in considerable detail. This is necessary in order to achieve the best results in preparing a training program. To illustrate, a step in the job of carpenter could be the sawing of two-by-fours by hand to the length and the angle required. Operations or tasks in this productive unit would include placing the two-by-fours on horses, measuring and marking, sawing as prescribed, and so on. In a job breakdown for supervisors a step might be called "housekeeping." This would include such operations for the supervisor as cleaning inspection, posting signs for disposition of waste, and instructing sweepers. Another might be "discharge," which would include such operations as reference to union contract, company regulations, absentee record, etc. The steps of the job breakdown may be regarded as limited production jobs in themselves. In fact, a man could be productive if working only on one job step continuously. These small tasks, when placed in sequence, as on an assembly line, form the steps of the job breakdown which eventually make up the total productive job.

3. "KEY POINTS" OF JOB BREAKDOWN

The next thing wanted from the detailed notes taken during the job observation are the key points of the skills, or the critical methods of performing the job step. *These key points are the sights, sounds, feelings, and movements which make or break a successful performance,* such as the angle at which the blade of a plane is set, or the satisfaction of a worker complaining that tools are not properly sharpened.

"Key points" is a term that was applied to training during World War II by an agency of government called "Training Within Industry." *It is a critical act or part of the performance, the part which must be done in a certain way.* To isolate these key points and combine them with the steps of the job breakdown is the most important part of the job analysis for training.

In performing a job analysis for training, the analyst must have clearly in mind what he is looking for, to be designated as key points. Measures, timing, weights, distances, and satisfactions which must be seen, heard, or felt, are what the analyst seeks. Such things as reading ahead while adding, for the bookkeeper; placing a crane at a certain angle when at rest, for the crane operator; or achieving smoothness of the end stroke of the brush for the painter, are examples. The key points are those precise cues to action and those exact actions which are essential to a successful performance.

Referring to the job steps mentioned above for a supervisor's job breakdown, a key point for housekeeping would be sweeping iron filings away from, not toward, a saw blade; and one for discharge would be retaining workers who are subject to discharge if recruitment cannot replace them. For any supervisory job illustrative key points might include such items as: work assignments prepared the night before, authorized signature matching delegation of authority, hospitalization insurance claim forms available in office, and date for submitting budget. Such key points of the supervisor's job are his controls for the various steps of his job.

Isolating the key points is critical in any job breakdown. It will require all the sensitivity and skill the analyst can bring to bear. *He must sometimes be sensitive to these cues which even the skilled worker himself may not be capable of verbalizing in connection with his own job.* This is particularly true in preparing the breakdown for managerial and supervisory jobs.

The need for establishing key points for the various steps of the job breakdown, which would be used in preparing a training program for shop supervisors is illustrated by listing a few of the problems that can arise in a possible day's work of a supervisor:

Keeping workers waiting between assignments of work
Failure to make orders clear for work to be performed
Not seeing that workers are supplied with proper tools
Putting too many men on one task
Not having work routed or scheduled at time it should begin
Not listening to suggestions from workers
Allowing defective work to pass
Scrapping materials that could be salvaged
Permitting brooms, shovels, stationery, etc. to be abused
Not protecting machines from dust, fumes, weather, etc.

Allowing use of small machines for heavy work
Scrapping tools and machines that could be repaired
Allowing mechanical safeguards on machines to be removed
Improper storage, piling, or binning of materials
Allowing absenteeism contrary to regulations
Delegating training to unqualified journeymen
Allowing tools to be scattered about work place
Ignoring health provisions for drinking water

4. ILLUSTRATING THE JOB BREAKDOWN

The goal of a trainer or instructor is to train in the skills, methods, procedures, and know-how of a job, wherever that training is needed. Training may be needed only in certain operations of a job or it may be needed in the total job. A complete breakdown for a job is probably needed in any case, so that it may be on file for reference.

The job breakdown is prepared, as previously indicated, *from the list of detailed operations. These are placed in their proper sequence, called job steps, to which are added the key points,* indicating the degrees of perfection, or the limits of perfection, or *the specific ways in which a step in the job is to be performed.*

An actual job breakdown is illustrated in Fig. IV. It is taken from the work sheets of the analyst who prepared it, for the job of saw filer, a special function of the carpenter's trade.

This job is selected for illustration because of its compactness, which is characteristic of most mechanical or clerical jobs as contrasted with managerial or supervisory jobs. A managerial job, as a rule, breaks up into several functions for which the steps of each can be listed in sequence. The process of communications by a works manager to his shop foreman is a job comparable to that of saw filer. So are the tasks of assigning work for the shop foreman.

Four steps for the job of saw filer are shown on the next page. These are steps 10 to 13, which are about in the middle of the step sequence for that job.

How You Prepare Training Outlines

After a carefully made breakdown for a job has been prepared, the training specialist is ready to prepare the job training outline.

The job training outline differs essentially from the job break-

FIG. IV. JOB BREAKDOWN SHEET

Location: Carpenter Shop. *Job:* Saw-Filer. *Task:* Filing Handsaw by Machine (Foley saw-filer)

Job Steps	*Key Points*
Performance that advances work	Anything that will make or break the job—knacks, skills, tricks, safety, "feels," etc.
10. Check and oil Foley saw-filing machine	With common round paint brush, clean off all dust, end filings, from the machine. Clean with air, aiming air jet away from working parts. Oil with SPM-SAC No. 20 all working parts. *Do not* flow-wipe off drips because they collect dirt and filings which will cause wear on bearings. Check especially: 1. Can 2. Can roller 3. Vertical slide beds 4. Oil cups in gib slide (above file arm) 5. Oil cup leading to main bearing 6. Oil motor bearings every week 7. Oil hole in socker arm. *Caution:* During operation, never blow filings toward moving parts—brush filings away from work with small brush.
11. Check hand saw to be sharpened	Hold saw in bends. Hold saw at right angle to body with handle toward face. Sight down teeth longways. Check to be sure it is straight. The saw to be sieved broadside. Check teeth for even size. Set for future use. Dusty or dirty saws to be placed in kerosene bath, then rubbed with emery cloth. Straighten bent blades by hand, bending to saw straightener machine (see operation of straightener machine later).
12. Measure points per inch on hand saw	Place rule on teeth. Measure 1 inch from the point of any tooth. Count number of tooth points to the inch. (If inch ends at a gullet, it is counted as one-half tooth.) Saws are designed by the number of teeth per inch, e.g., 8 pt. saw, 2½ pt. saw.
13. Select proper file for job	*Saw Points per inch* — *File to be used* 2½ to 6 pt. — 7″ extra slim taper file 7 to 12 pt. — 6″ extra slim taper file 14 pt. — 4½″ extra slim taper file *Note:* Ripsaws (5½ pts.) usually have finer teeth at tip end of saw than over body of saw. When measuring teeth of ripsaws, select regular teeth near butt end of saw. *Note:* Length of file handle is not measured when determining length of file.

down in that *the outline* provides the sequence in which the tasks or skills are *learned*. The job breakdown shows the sequence in which the work is *performed,* how the job is done. As we have seen, the job breakdown is an analysis of the job into its operating steps with the key points for these steps isolated.

The job training outline is a specific plan for training people to perform a whole job. The information of the job breakdown is used in the preparation of the training outline, but *the outline is a reorganization of the job tasks into a more effective sequence for training.* Often a simple step ends the performance of a job or a difficult step is performed early in the sequence of the work. *In general, in the training outline the tasks to be learned are organized in sequence from the more simple to be more complex.* An example will help make this clear. When a person is an acrobat, the final job step is landing—landing on the ground or in a net. The training of an acrobat often begins with landing. There is a sound reason for inclusion of landing early in the sequence of training the acrobat. He must learn to fall safely! Thus the job training sequence may and usually does differ from the job performance sequence.

TRAINING STAGES

The training stages of this job training outline are usually determined according to the needs of production. *Each stage of training should prepare the trainee for some productive work.* It is assumed that proficiency will have been established in this work before he enters the next training stage. Trainees enter different stages, of course, according to their level of past proficiency or according to the future needs of production. They enter more advanced training stages only as production plans provide for them.

A training stage may be any combination of job steps or any combination of key points of various steps. Training stages may combine the items of the various steps of the job breakdown in a sequence from easy to difficult, or again, as is usual for raw recruits, into orientation training, pre-job training, vestibule or job-site training and on-the-job training.

For journeymen who are undergoing training as supervisors, the program might begin with leadership training, where all of the human relations items of the job breakdowns for various kinds of supervisors are assembled into a course for all supervisors. This

might be regarded as the first stage of training for supervisors. A second stage might be concerned with the rules, regulations, and services of industrial or employee relations; a third might deal with the training program. The final and fourth stage might be broken up into specific unit or departmental courses concerned with job methods, materials, and accounts. This latter stage may be carried out on the job.

Using again the saw filer job for illustration, the following training stages were prepared to develop productive workers as rapidly as possible.

Stage I. Learning to sharpen hand saw and narrow band saws by hand and by machine; also, learning to use automatic welder on narrow band saws.

Stage II. Learning to sharpen circular trim, mitre, cut off, circular combination, rip, and circular inserted tooth saws by hand and by machine; also to change bits and holders in sockets of inserted tooth saws; also, to sharpen dado, outside, and filler blades.

Stage III. Learning to sharpen drag saws by hand and chain saws by machine; also to sharpen jointer and plane knives.

Stage IV. Learning to sharpen hand chisels, hand plane blades, knives, sugar bits, twist drills, hollow chisels; also, sharpening knives on tenorer machine; also, to sharpen and to make shaper or molder knives.

It is evident that a saw filer would become a productive worker after Stage I of training, but that he wouldn't be a journeyman until he had had all four stages of the training. He may never be given the training of Stage II if this training is not needed in production. Pay scales, of course, would be related to the level of skill demanded on the job.

TRAINING STEPS

To complete the training outline for a job, *each training stage is organized into training steps. Here, the rule of easy to difficult training is usually followed,* unless prerequisite material, e.g., measurement or vocabulary, is required for the whole stage. In that case, an orientation course is introduced to provide this information before the training stage proceeds. In the earlier illustration of training stages for supervisors, the training in leadership, industrial relations, and training procedures might be regarded as orientation training.

FIG. V. TRAINING STEPS FOR STAGE I OF SAW FILER JOB

1. Terminology: Learn and identify tools, parts, and supplies used in operation, including location. This step would be taught gradually as information is needed in the training.

2. Read fractions and read rule to measure saws and files. This step might be learned in job related training.

3–6. Steps in hand saw filing by hand: 3. Checking saw for conditioning (cleaning); 4. Joining a hand saw by hand: place saw in saw clamp, place jointer file in holder, operate jointer; 5. File hand saw by hand: reset saw in clamp, make point count of saw, select proper file for filing, filing position of operator, hand filing operation —1st operation, filing position of operator, hand filing operation—2nd operation, special instruction for rip saw filing, cautions. 6. Set saw teeth on hand saws by hand—purpose and definition of set, depth of set, use of hand saw set tool.

7–28. Steps in operating saw filing machine for hand saws: 7. Check and oil Foley saw-filing machine; 8. Check hand saw to be sharpened; 9. Measure points per inch on hand saw; 10. Select proper file for job; 11. Check file for straightness; 12. Placement of file in sockets, then in machine; 13. Adjustment of file for hook—use hook gauge; 14. Joint saw as previously learned; 15. Select proper carrier for saw type; 16. Method of placing each type of saw in carrier; 17. Fasten saw in carrier; 18. Use of carrier gauge; 19. Adjust file for depth of cut; 20. Adjust file for hook without gauge; 21. Adjust filer for filing angle of cut; 22. Close vise on clamp; 23. Adjust feed pawl and rocker arms; 24. Set filer in operation, checking operation, adjustments; 25. Causes of feed pawl jumping; 26. Modification for rip saw filing; 27. Maintenance of filing machine; 28. Clean and prepare machine for operation—understanding table for setting dials.

29–35. Steps for operations of automatic welder: 29. Read thickness gauge to measure saws; 30. Prepare narrow band saw for welding; 31. Position band saw in machine for welding operation; understand welding operation; 32. Understand process of annealing; 33. Prepare machine and saw for annealing; 34. Annealing operation; 35. Filing and finishing saw; 36. Special instructions and cautions; 37. Maintenance of welding equipment.

38–45. Steps for operating machine saw filer for narrow band saws: 38. Check narrow band saw for condition and strength of weld; 39. Set up machine for band saw filing—Erect pedestals and wheels; 40. Install band saw attachment; 41. Place band saw in machine; 42. Select file for saw; 43. Set file and use hook gauge; 44. Filing operation and adjustment of machine during operation—as previously learned; 45. Final inspection of filing.

How carefully a training stage should be outlined is illustrated by the training steps for Stage I of the saw filer's job, illustrated in Fig. V.

Preceding Stage I, providing the saw filer trainee is a raw recruit, have come certain orientation training and safety training. Orientation training included the names and positions of persons in authority in the shop, shop organization and the rules of its operation, location of sanitary and eating facilities, an outline of the training program for a saw filer, including a statement of goals.

Safety training included a demonstration of safety devices and practices (also included in all stages of this training), safety rules of operation, first aid equipment and use, fire hazards and fire fighting practices, including the trainee's responsibility in use of fire fighting equipment.

Fig. V illustrates the kind of outline necessary for training in a production job, either mechanical or clerical. Such training would probably be performed on the job site with possibly four to eight trainees learning the operation under a job trainer. The actual training outline would be in much greater detail than the above, and would include such items as tolerances allowed, illustrative sketches of work place positions, and check tests for the completion of critical steps.

For a managerial or supervisory job, the source material would be more varied. It would be intensive according to the level of supervision exercised. For example, the leadman would have little or no training in cost accounting and budgeting, whereas the foreman would receive elementary training and the manager more intensive training in these functions. Low levels of supervision would be trained in work scheduling; higher levels in material handling and quality control, etc. *Thus the training outline for supervisors and managers would have different stages* according to the needs of the organization, just as does that of the saw filer.

Helping the trainee to climb each training step, of course, requires much more than the assembled content described in the training outline. There are many other considerations, involving how people learn and what motivates them. But in this chapter we are considering the essential content of the training and not the methods of instruction.

How to Find Out Individual Worker Needs for Training

Each man may have a different viewpoint concerning his job. No job exists without a man at work. The units of a working organiza-

tion should be described as man-job relations. Every man makes a different man-job relation even though the tasks may appear similar in work organization.

So far, the job has been dealt with as separate and distinct, having an existence all of its own, and as accomplishing certain work through the exercise of specified human skills. For practical purposes this sort of description of the job can be made. The average worker's performance represents the norm for what is accomplished on the job.

A job training outline spells out the training in terms of what is typically needed to perform a job. To accomplish the training of people in industry, however, the gap between what a trainee knows or can do and what is required to perform a job must be closed. Determining individual needs for training has yet to be done before any training programs can be installed. The training specialist must next find out what specific persons need to learn in order to do what they are supposed to do; that is, *what training stages and training steps must be administered to which individuals.*

ESTABLISHING INDIVIDUAL NEEDS

Workers can be examined upon their abilities and skills to perform the operations or tasks of a job. Such an evaluation tells the extent and limitations of workers in the skills and knowledges required to perform the work of a job, a shop, or an office.

In doing this, it is desirable to work from the training outline, although the job breakdown may serve as a rough guide. *What the training specialist wishes to find out is,* first, *what the specific employee knows and can do;* and, second, *what he should know but does not,* or what he should do that he cannot do in order to accomplish the operations of a job.

The way the training specialist establishes individual training needs will vary from job to job. In working with managers he may *assemble problems for training by way of the group discussion.* For production jobs *the supervisor's evaluation of the workers skills* listed in the job training outline may provide the information needed. *Job tests or achievement tests may be used* to analyze individual employee's needs. The training specialist will work with others, such as managers of departments and unit supervisors, who have had an opportunity to observe the needs of their employees for training.

After the analysis of individual needs for training is made, it is then possible to classify or organize units of training or courses of instruction. In this manner those with the same needs can be scheduled together, and the content and materials can be assembled to serve them. Usually this results in certain specialized courses routinely offered as a part of the training program.

THE CREW ANALYSIS

A survey method of establishing individual needs for training is frequently used for a shop or office or unit of production. This is often referred to as a crew analysis.

Analyses of this kind may be accomplished by having each employee of a unit checked by his supervisor for the quality of his performance in the various steps of the training outline for his job. The employee may be a mechanic, clerk, leadman, or manager. The supervisor may be a leadman, foreman, or manager. Such an analysis should provide the information necessary for the classification of skills in which individuals need training.

The manager or supervisor may keep an individual record of each employee's development, showing what he can do and has learned to do. Thereby the manager is making a continuous performance evaluation. He may include as a part of this record the dates of employment, of increases, and of promotions, any attendance figures, merit ratings, and outside courses taken in college or other schools. Much of this information may be kept in the personnel office. A line supervisor may keep only the record of qualifications for work under his direction. From this information, the supervisor can assign employees to different productive work, according to the demands of his unit, or he can assign them to training wherever it is needed.

The situation usually faced by the training specialist is that he must perform a crew analysis on his own, in order to establish individual needs. He asks the supervisor to estimate the quality of work of each of his employees in the various steps of the training outline for that employee's job. Where the supervisor cannot do this, if in a shop or office, he may be asked to test the employee on the steps of the training outline. If the employees being studied are themselves supervisors, then a check list is teased out of the job breakdown in which activities performed adequately by the individual supervisor

can be checked by his superior. Where performance evaluations or merit ratings are part of the regular procedure, these can be consulted in establishing specific needs for individual employees.

The usual procedure is for the training specialist to prepare a form with the names of the employees of any organizational unit (in which it has been established that training is needed) down the left side of the page. The skills required to perform the work are listed at the top of columns running down the page. As an employee is checked or tested, the spaces opposite his name for the knowledges and skills required are filled in completely or partially to indicate the degree of his performance. This form is particularly useful in surveying the knowledges and skills of personnel working on mechanical and clerical jobs, where specific operations such as typing, grinding, and assembling can be listed. It is effective for supervisory jobs to check on the knowledge of paper work, labor contracts, and budget methods, or skills in scheduling work, handling complaints, communications, and the maintenance of equipment.

The Individual Trainee Record

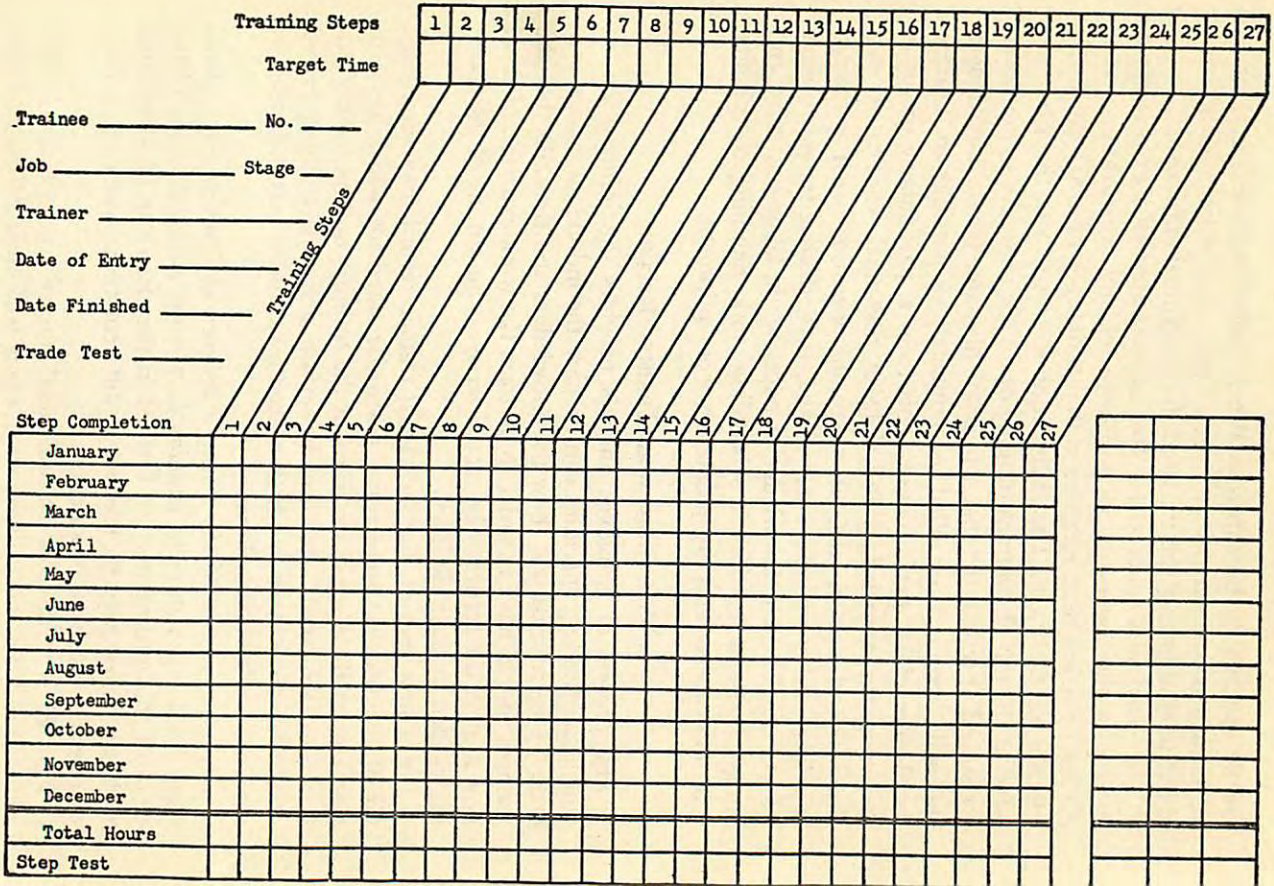
The process of employee analysis provides the information on which the training specialist can prepare the individual trainee records. These records will show the knowledges and the skills that the trainees should have in order to perform the work expected of them now and in the future. The record serves as an outline of the training needed by the individual.

For a new recruit, the individual trainee record may simply list all of the training steps for a particular stage for which he is in training, as these steps are listed in the training outline for his job. For the "old hand," deficient in certain skills, the training record would list those steps in which a need for training was indicated by the analysis described above.

A careful record of the trainee's progress in learning each of the steps for a given stage of training in a job is essential. Some of the steps of this outline may be learned in the classroom of job-related training. Some may be learned at different times when the trainee can be relieved from production.

Fig. VI is an illustrative individual trainee record form. *It provides for a list of his training steps,* along with their *estimated target*

FIG. VI. INDIVIDUAL TRAINEE RECORD FORM



time for training and a record of the date of completion, the hours required, and the passing of the test for the training step. This serves as a permanent record of the employee's development in job skills.

Becoming a Trainer

We have been concerned here with the technical matters of training. Practice in performing them is required of the training specialist just as practice in filing is required of the saw filer. "Practice makes perfect," is an old saw, but never more appropriately applied than in developing a trainer.

This is less than half of the story. The training specialist must know people. People are the raw materials upon which he works. He must know how people work and how they learn. He must know how he can stimulate or encourage them to work and learn. This is background knowledge, or what has been called education as contrasted with training. The next few chapters will be concerned with this background knowledge about people.

4. *Trainee Motivation*

What Makes Men Tick?

We are all familiar with the idea that sometimes people don't learn, not because they can't, but because they don't really want to learn. We would like to avoid having to say, "You can lead a man into a training situation, but you can't make him learn." We would rather say that *the training expert can help men to want to learn and to learn more easily.*

UNDERSTANDING PEOPLE

Many executives and supervisors have been slow to realize that people have reasons behind their actions. We all assume at times that we know why someone did something—sometimes we are right and sometimes we are way out of line. Let's take an incident which was humorously illustrated a few months ago on the cover of a national magazine. The first picture shows a boss bawling out his subordinate; in the next, the subordinate bawls out his wife; then, his wife takes out her aggression on her small son; and finally, the small son, having no human being on whom to release his feeling, starts to pick on his little cat. This incident is known as "scapegoating." However comical, it can be serious especially when it occurs in the industrial scene.

The results of being unaware of one's own motivation, the reasons behind one's action, can be disastrous. Suppose that a supervisor, due to some marital misunderstanding, starts complaining to his subordinate about an infringement of some trivial rule. The subordinate thinks this bawling out is inappropriate and mumbles some negative comment under his breath. This upsets and psychologically threatens the supervisor, and he reacts by transferring the man or just not promoting him. Possibly this has never happened in your experience; maybe it seems exaggerated to make a point. But we

all know, sometimes from bitter experience, how a whole chain of events leading to the junking of a human being can be set up in just such a fashion. How much better it would have been if the supervisor had tried to understand the reason behind his own action.

Of course the situation can be reversed. A subordinate can "blow up" when his supervisor, even in a friendly way and in the line of duty, makes a routine check of the subordinate's production. The anger which may really be directed toward a family problem of the employee might now be focused on anybody who is handy. We are more likely to control our tempers if our supervisors are around, but it can happen. The accumulation of petty annoyances can blow up even in the face of the supervisor.

In many situations the person is unaware of what makes him do what he often, in a more serious moment, regrets. All of us know how valuable the sober second thought can be. But why don't we wait for that sober second thought, why do we jump in first and feel sorry later? Let's see if we can find some of the answers.

A FRAMEWORK FOR THINKING ABOUT MOTIVATION

There is no simple, sure set of answers which will tell us why people act as they do. *There are no simple formulae, no bag of tricks to tap the deep secrets of human motivation.* All of us act the way we do for many reasons. Sometimes we are completely aware of the reasons for our behavior and at other times we can only guess at them. This is what makes the whole topic of human motivation so exciting and often so mystifying.

Trainers as a group of people who will train others must be aware of some of the causes of human reactions, of the principles which guide and direct human behavior. They must have a framework around which to organize certain thoughts about the behavior of people. To describe this framework we will draw upon psychological principles. We will try to see what makes human reactions so typically human. We will try to answer the following questions:

What Are motives?

How do motives develop?

What classification of them would be helpful?

How do they influence our behavior?

How do confusion and conflict of motives lead to difficulties in our job adjustments?

How can industrial peace of mind be gained?

DEFINITION OF MOTIVES

Looking for the reasons for human behavior is not new. All of us are excited by this search. One of the best sellers on the fiction list of a few years ago was entitled *What Makes Sammy Run?*. The detective in a mystery story catches our attention when he looks for the deep underlying motive behind the slaying. Let us now define this important term, motives, which will help in understanding some of the problems in motivation.

Motives are anything that arouse, direct, and sustain behavior; they are the reasons for behavior. For example, needs, wants, desires, and urges are types of motives.

The Development of Motives

PHYSIOLOGICAL DRIVES

Our first motives are basic physiological needs. We are born with a need for food when we're hungry, water when we're thirsty, and when older, a mate as we look at a picture of Marilyn Monroe. (Sometimes we feel this way without pictures.) These three—and other—basic physiological needs are conditioned by our culture. That is, *we learn how to satisfy or relieve these inner pressures or tensions.* We learn to like certain foods and dislike others, even though it is physiologically possible for almost any food to satisfy our hunger needs. We want cake made from Pillsbury flour even though physiologically Gold Medal might do. We learn not only what foods we like but also such complicated psychological processes as honesty, ambition, and cooperation.

It is often difficult to go back in time and locate how drives developed through the years so as to appear in their present form of behavior. While it is possible to try to do this, the somewhat involved process need not concern us here. We are primarily interested not in the development of each motive, but rather in its influence upon our behavior.

Motives develop from basic physiological needs which become associated with certain "relievers," incentives, and satisfiers. When these inner tensions build up there is a search for the relievers. Responses are made which are appropriate to the satisfaction of these needs. *Those responses which satisfy our tensions are for the most*

part learned and not inborn. We learn to behave in those ways which seem to satisfy our needs best.

STUDIES OF PRIMITIVE PEOPLES

Studies of primitive societies show that some people learn different satisfiers and relievers than do other people. A little boy or girl on a South Sea Island in the Pacific does not act the same way as a boy in London, even though they both started life with the same physiological equipment. Within our own country, economic level may affect the way people learn to satisfy their needs. "Mrs. O'Grady and the Colonel's lady" may be sisters under the skin, but you can be sure that in most situations above the skin each will have a different response to the same incident. Although all of us start life with the same basic bodily tensions of hunger, thirst, and later sex, the ways in which we satisfy these conditions are learned, not inborn. We learn to behave in those ways available to us which best satisfy our bodily needs.

What do we mean by available to us? Here *we must take into account the influence of culture, or ways of living or reacting, and their combined effects on our individual lives.* American culture is merely what some people refer to when they talk about our way of life: our baseball games, frankfurters, chicken on Sunday, church socials, community meetings, Fourth of July picnics, PTA's and everything else that is specifically American. Even our kidding of ourselves is part of our culture.

Everyone knows about how the natives of a summer colony chide the guests who come down for their season in the sun. At Bar Harbor, Maine, it is said that there are three classes of people—the residents of old families who have been there for generations are called Bar Harborans, the recent summer residents are called Bar Harbarians, and the fishing folk are called Bar Harborigines. The Bar Harbarians, however, refer to the old families as "a lot of crumbs kept together by their dough." All of this is part of our culture.

The Frenchman, the Spaniard, the native of the South Seas, all have their own ways of reacting, joking, and doing things that are theirs and differ somewhat from our way of life. This is what we meant earlier when we said the ways "available to us."

Cultures, and what is available to us in those cultures, differ radically in different parts of the world. The differences are so ex-

treme that *what passes for normality in one social setting may be taken as criminal action or insanity in another part of the world.* For example, in our society to be extremely suspicious, to feel persecuted, to be fearful, without cause, of one's immediate family are grave signs of mental disorder. However, the same behavior seemingly so deviant and odd in the light of our standards is the accepted way of doing things among the Mundugamor of the New Guinea Islands. In this society each member of the family cooks his own food in a guarded spot and protects it zealously from the rest of the family for fear of poisoning.

In our culture we believe that men should be aggressive, dominant, and the masters of their home. They shall wage war, earn the bread for the family, and conduct the political affairs. However, among the Tchambuli of New Guinea these roles are reversed. Men find themselves completely dependent upon women for the necessities of life. They cannot even arrange their own marriages. (Some men think this is true of our culture, too.)

Among the Tchambuli the women wage war, do the heavy work, are aggressive in love making, and leave the care and rearing of children to the menfolk. Toward one another men are suspicious, sensitive; toward women they are timid and uncertain: their security lies largely in what women give them. Women are hardy, casual, easygoing, and friendly among themselves and inclined to take the initiative in their relations with men, whom they regard as the weaker sex. One of the few ways a western man could tell men from women in this society would be to determine who bears the children.

Cultures vary. They have different rules and *every culture imposes its rules on its members and these rules determine how the people behave.*

INDIVIDUAL MOTIVATION

Not only does learned behavior differ from culture to culture; it may also vary within the same culture. Different economic levels, educational levels, religious background, and, in general, different experiences bring about a variety of means to satisfy our motives. For the individual person, what are the greater determiners of how he will satisfy his motivations? First, and of paramount importance, are parents; then, to a lesser degree, teachers, ministers, and other persons of importance in his environment; finally, the state, the clubs

to which he belongs, the newspapers he reads, and so on, direct his motivation. *All who interpret his culture to him are determiners of how he will satisfy his motivations.* It is they who show the way and direct his manner of behaving.

Often, however, what we actually learn in a situation may be quite different from what the "teacher" believes we are being taught. For example, the parents who tell their children money isn't everything and then spend three-quarters of their time discussing money matters are in reality teaching the child by their own actions the exact opposite of what they intend. Or the father who tells his son to be honest but lauds his own shrewd stealing to his wife teaches the child only dishonesty. The idea you think you are teaching may not be what the other person is learning.

Studies with children, for instance, have shown that their concept of honesty varies with the economic background of the child. There is no guarantee that a child who is honest in one situation would be honest in another. Children from high economic levels would cheat the pants off their friends when playing pin the tail on the donkey but would be completely honest in school. The reverse was true at the lower economic levels. Boys at this level had intense loyalty to their friends and would rarely cheat when playing with their buddies, whereas they would cheat in school.

These motives influencing behavior are learned and develop from background experiences, and the religious, economic, and cultural history of the individuals. Many other studies from our own and other cultures illustrate how motives are learned. However, for our purposes it is sufficient to say that some motives are developed from physiological needs and we can learn through our experiences how to satisfy them.

Classification of Motives

It is difficult, if not impossible, to include in any list, however extensive, a complete file of all the motives propelling human beings into action. We could list what are often called the physiological drives, such as thirst, hunger, and sex. But many of our motives are learned, including such activities as love or the need to be given love and affection by other people, and the search for esteem and accomplishment.

THE "NINE BASIC HUMAN NEEDS"

One of the more comprehensive lists of the motives which are particularly important in the work situation is called "The Nine Basic Human Needs." This list has been developed by Richardson, Bellows, Henry & Co. and it has been variously adapted for the purpose of helping executives to think in more specific terms concerning human motivation. The list is presented below in the form of orientation for training. Under each of the "Nine Basic Human Needs" are included some of the factors which may affect it.

A. *Food and Physical Welfare Needs,* may be affected by:

1. Working conditions—dust, light, arrangement of tools, noise, fumes, temperature, moisture
2. Shelter
3. Transportation
4. Living wage—wage sufficient for minimum physical requirements
5. Food during working hours
6. Facilities—lockers, etc.
7. Clothing
8. Rest periods
9. Freedom of motion—opportunity to change physical position and relieve muscular fatigue
10. "Housekeeping" at work—cleanliness of surroundings

B. *Personal Development Needs,* may be affected by:

1. Housing—opportunity for making a home
2. Social recreation
3. Living wages—family requirements
4. Working hours and schedule (hours at home)
5. Transportation (hours at home)
6. Community opportunities for children
   a. Education
   b. Social groups
   c. Religious activities
7. Confidence in the future

C. *Desire for Achievement,* may be affected by:

1. Having a known goal
2. Knowing what is expected of one
3. Having some measure for individual accomplishment

4. Having available proper training to achieve what is expected of one
5. Having a clear understanding of the limits of the job
6. Having a proper reward as recognition for desired achievement
7. Guidance into activity appropriate with individual ability
8. Provision for steady progress

D. *Desire for Activity, Variety, and Novelty,* may be affected:
   1. On the Job, by:
      a. Determination of proper limits of job
      b. Opportunity for physical movement
      c. Relief from monotony
      d. Rest periods
      e. Recognition of individual differences
      f. Change from job to job—within limits
      g. Change of job within group
      h. Opportunity for initiative in thought
   2. Off the Job (company and non-company sponsored), by:
      a. Having proper recreational facilities
      b. Social activities

E. *Need for Release from Emotional Tension,* may be affected by:
   1. Opportunity for physical activity
   2. Having proper grievance outlets
   3. Having clearly understood company policies, particularly regarding status
   4. Counseling—listening by others
   5. Social contacts on and off job
   6. Religious activities
   7. Security
   8. Proper organization and selection of working group and supervision
   9. Enough properly trained supervisors, sympathetic and easily available
   10. Home atmosphere
   11. Confidence in fairness of wages, promotion, and task assignment
   12. Belief in justice of management
   13. Smoking on rest periods
   14. Miscellaneous relaxers like gum and candy

F. *Need for Security of Status,* may be affected by:
   1. Security of employment and income
   2. Pension systems

3. Seniority
4. All types of insurance
5. Definite and understood promotion policy
6. Company stability
7. Company reputation
8. Good company discipline
9. Impartial treatment of employees
10. Freedom from coercion by unions or management
11. Stability of purchasing power
12. Confidence in management
13. Opportunity to maintain personal habits
14. Confidence in social order

G. *Need for Worthy Group Membership,* may be affected by:

1. Recognition of a good job (performance rating)
2. Belonging to a good company
3. Chance to join safety committee, fire brigades, first aid unit
4. Acceptance by group
5. Union membership
6. Group pride or morale
7. Intergroup competition
8. Congenial grouping
9. Companywide occasions and symbols

H. *Need for Sense of Personal Worth,* may be affected by:

1. Democratic disciplinary system
2. Recognition of individual effort
3. Execution of suggestions made
4. Being consulted
5. Being treated as a person
6. Having one's opinion treated with respect
7. Being made to feel important to supervisor
8. Being made to feel important to members of the group
9. Being called by name
10. Sympathy toward individual problems of others
11. Recognition of religious feeling
12. Having absolute value as a unit of life
13. Having a feeling of worth-while accomplishment

I. *Need for a Sense of Participation,* may be affected by:

1. Knowing what is going on
2. Knowing why it is going on

3. Knowing the use of end products
4. Helping determine the conditions under which one works
5. Knowing the relation of the job to the finished product
6. Knowing the relations with fellow workers
7. Knowing the relation of one's group to other groups
8. Helping in the administration of policies
9. Knowing relation of the job to supervisor's job
10. Having knowledge of future plans
11. Knowing how outside conditions affect the job
12. Sense of citizenship in the community
13. Knowing the relation of one's job to others in the group
14. Opportunity to participate in group recreation

All of us could probably expand this list or would wish to change it in detail. For our purposes, however, this survey of possible motives will help us to formulate our thinking about motivation within the industrial scene.

A REVIEW OF MOTIVATION

At this point it might be well to summarize briefly where we have arrived in our discussion. *Human motives are important in industrial training. Managers and supervisors need to understand the operation of these motives among themselves and among their workers.* Trainers should be exceedingly conscious of this point.

The first motives are bodily needs. At birth people do not differ in the physiological drives, but as time goes on they learn to satisfy these bodily tensions in different ways. In other cultures, and even within our society, people learn different methods to satisfy their physiological tensions of hunger, thirst, and sex. They also learn many motives which become basic in life. One can make a list of motives, as is illustrated in "The Nine Basic Human Needs," but such a list will differ from society to society and even in some degree from industry to industry.

The obvious application to industry of what has been said is that *we should not judge all people by our own motives.* As one saying puts it, "Don't try to figure out why your friend chose his wife; he may have different tastes." This statement pinpoints the problem of differences in the development of our motives. But the training expert cannot leave it there. He must try to learn more about human motivation if he is to become an effective trainer of others.

Conflict of Motives

Problems in the area of motivation are highlighted when people are in conflict. In every drama the exciting climax is reached when the hero is in a conflict of motives. Shall he be true to his moral code or turn in his trusted friend for embezzlement? Should he be loyal to those ideals he learned as a child or tell a "white lie" to get the job? Should he leave his wife and family for the beautiful widow with lots of money? Unlike the soap opera, we shall not say "tune in tomorrow," but will examine now the problem of seeing what happens when men are in conflict.

AWARENESS OF CONFLICT

At times we are all too aware of conflict raging within us. We know that we are in conflict when we should go to work in the morning and at the same time we would like to "goof off." We should like to be a kindly, forgiving supervisor and at the same time we are fearful of gaining the reputation of being a soft touch. Many times we would prefer to sit and relax rather than play with the children after a hard day's work. All of us have had moments of conflict such as these.

We know that a decision has to be made, yet we are being pulled in two different directions at the same time. We cannot have our cake and eat it. We cannot act like the donkey in the old fable who, being both hungry and thirsty and caught between water and food, could not make up his mind which to take first. Therefore, he died. Nor are we like the old philosopher who listed the ten best reasons for marrying and the ten best reasons against it. Twenty years later he was still a bachelor, trying to decide which were the stronger reasons.

FRUSTRATION

It is true of human beings that in most cases they act and decide on one course of action when they are in conflict about the most appropriate thing to do. But what is going on inside of them during this time? *What is going on inside of a man when he has to decide about taking a new job with higher pay, but where he loses some independence, must spend more time away from his family, and has less time for leisure?* What happens inside of you when your superior bawls you out and you want to tell him off, yet you do not want to

lose your job? All of us could add further examples of conflicts. Men are frequently in conflict both at home and in their jobs.

What happens during these moments of conflict? *How do we feel when we cannot satisfy all of the motives pulling on us at the same time? Mostly, we feel frustrated.* This is a favorite and frequently misused term. Frustration means that a person is blocked in the satisfaction of one of the motives driving him. The conflict simply indicates that a person cannot do both of the things that he wants to do. For example, you cannot tell your boss off and at the same time be sure of retaining your job. So, you are frustrated. You want to do both but you must decide on doing one of these things and forgo the other.

An Analysis of the Conflict

Conflict is not simple. We do make the decision; we do keep our job, but we do not forget the other possibility of action. We are still bothered by self-doubts; maybe it would have been better, we think, to "be a man," and to tell the boss off. "There are other jobs," we think. We whisper these things to ourselves. All of us have passed a man on the street, possibly drunk, who was carrying out this argument with many gestures to the satisfaction of his inner motives. Inside of ourselves we have not resolved the conflict by taking action; we are still bothered and we are still in conflict. We cannot gratify both of our needs and so we act to satisfy one of them. The other remains to plague our mind.

What is the nature of this conflict and how is it expressed?

THE UNCONSCIOUS NATURE OF CONFLICT

We are frequently unaware of the nature of our conflicts. The reasons are hidden from us. *Conflict is much like an iceberg. We see only a small percentage of it on the surface, the really dangerous part is submerged under the sea.* We know we are frustrated; we know we feel anxious. On the job we express certain of our frustrated feelings with hostilities toward others, petty jealousies, and mild self-pity. We feel excessively tired and are extremely irritable. We worry, too, about our behavior. We act and feel in this way without really understanding the nature of the internal conflicts. We may be absent from our job a great deal; we may constantly complain to our wives about our boss. We say that our boss does not

understand us or he is an SOB; or that the people under us are too careless and stupid. In other words we try to find causes for the way we feel and act toward other people. We "cover up" so as to not disclose the inner conflicts that are bothering us. We are unaware of the reasons behind our behavior.

Just as a physician does, so *we too must distinguish causes from symptoms. We must look behind the behavior to get at what is really eating on a man who shows the symptoms of conflict.* A physician listens to complaints. Then he looks for the real cause behind the complaints. After taking the blood pressure, temperature, etc., he makes a diagnosis of what causes the symptoms. In the same way, when your car "acts up," the motor mechanic checks the oil pressure or asks if the motor knocks, squeaks, or rattles. Does it stop when you slow down for a traffic light? Is there too much play in the steering wheel? The answers to these questions provide the mechanic with the clues necessary for a diagnosis of your car trouble.

The manager or supervisor has this responsibility of searching behind the symptoms to look for the causes of human problems. In one shop a worker constantly complained about defects in his machine or materials. The supervisor checked, found nothing wrong with the machine, the raw materials, or anything else concerned with the operation. The supervisor was patient at first, but eventually became annoyed with the worker's complaints. He finally told him "to put up or shut up." This sort of direct frontal attack on human problems just does not work. If the supervisor is really to help this employee, he must try to understand why he is such a chronic complainer. Possibly the employee is unsuited for the particular job, maybe his vision is below standard for the job, maybe he is unhappy with or afraid of his supervisor. Actually what he is doing is drawing attention away from himself and his problems by his behavior. But he is, of course, completely unaware of this.

The symptom and the cause may not even seem connected. One study in an industrial plant found the employees constantly complaining of the food served in the cafeteria (although it was actually cheaper and better than they could obtain outside). The psychologists who studied this morale problem found that the real cause was the lack of adequate recognition given by the executives and supervisors for the work performed by these employees. Poor human rela-

tionships rather than the cafeteria food was the true cause of the complaints.

To understand human motives we must recognize symptoms. We must get at the reasons behind the reasons given. *A teacher or trainer, to understand the many and difficult problems involved in the day-to-day routine of training, should always ask himself: "Is this the real reason for the complaint, or must I search further to uncover the true nature of the conflicts?"* The search for the reasons behind behavior is difficult and the road is winding, but the rewards are great. Mysteries of human behavior unraveled by this search will be of inestimable value to the training expert in his work.

ANXIETY

Inner conflict due to frustration expresses itself in a feeling which psychologists call "anxiety." Anxiety is experienced by all of us, but we usually do not call it that. We say, "we're nervous today," "we're in a bad mood," or in the words of a popular song, "we're as jumpy as a puppet on a string."

This anxiety, the inner jumpy feeling, is similar to fear. But there are major differences. *When an individual is frightened he has some real or potential threat bringing on this fear. With anxiety there is no obvious perceived threat.*

A soldier going into battle has all the psychological and physiological symptoms of fear. The palms of his hands perspire; beads of sweat stand out on his forehead; his heart beats faster; he feels tension in the bladder. Other physiological processes get him ready for "fight or flight." These responses are appropriate when the individual's life is threatened.

When these same responses occur, as they often do, without any real threat, then we call the state anxiety. In other words, *when the threat comes from within the individual as a result of his own conflicts, then it is anxiety and not fear.* If a man's business or job is in jeopardy, as measured by the accountant's balance sheet or by his bosses' displeasure, then it is realistic fear. But if he is always nervous about his job when everything is going along normally, then it is anxiety.

Anxiety is related to the future while fear is an emotion of the present. With anxiety the individual is always concerned about what may happen. With fear he is apprehensive about present dangers

and calamities, without excessive and undue concern about the future.

Anxiety has a persistence about it that fear does not. Fear is more transient in character. When we are fearful about a reorganization of our company and the reorganization is accomplished without too many problems and changes, then we feel relieved. However, if the tension of anxiety persists long after the reorganization has been successfully executed, then it is not fear that bothers us but anxiety. We had better look, not to the company as a reason for our anxiety, but to ourselves and our own inner conflicts.

Anxiety is shown in a different manner than fear. An example of this concerns a young man whose boss persisted in giving him a "hard time." This boss had a big handle-bar mustache. Finally, he fired the young man, who then had some trouble finding another position. Later as a mature executive the same man noticed that his vice president had sprouted a mustache. All of his old anxieties were rekindled. He had no reason to be frightened, for he got along well with this vice president. But the similarity, though superficial, brought back all of his youthful fears about job security and success. This is another characteristic of anxiety. It can be brought about by any superficial and, to others, seemingly unimportant, aspect of the environment in which one works and lives.

By way of summary *we might describe anxiety as a fairly characteristic human response which usually stems from our inner conflicts,* rather than from anything in the outer world. When the individual is blocked or frustrated, when all his needs cannot be satisfied by a given course of action, then anxiety starts cropping up to plague a peaceful existence.

Psychological Mechanisms for Handling Conflict

Conflicts exist for all of us to a greater or lesser degree. We are often blocked and frustrated. If these conflicts remain unchecked, they destroy the ability to enjoy work or even leisure. Anxiety is the result.

Fortunately, *human beings have methods for handling their conflicts.* In order to keep on enjoying life in spite of inner conflict, *they have developed certain safety valves. These are called psychological mechanisms.*

A person in conflict may become hostile and aggressive; he may

rationalize; and he may even return or regress to childlike behavior in order to reduce anxiety. These are some, but not all, of the mechanisms. How does he reduce anxiety in this manner? Even without an understanding of the psychological mechanisms by which this is accomplished, it is possible for most people to recognize them in action.

HOSTILITY

Hostility is not anger. We have probably all slammed a door when we were angry. We have felt like letting off steam when some plan of ours has been interfered with and we have been blocked from doing something. What is your reaction, for instance, if you are driving a car and someone else blocks the road when he could easily move his car and let you get by? It would be surprising if your language or at least your thoughts had been completely polite. This is anger and not hostility.

Hostility and anger look much alike. But the training expert will be able to learn to tell them apart. *Hostility grows out of conflict and shows itself in feelings that are out of all proportion to the situation.* Anger on the other hand flares up for the moment, but is usually short-lived. A person may get angry when someone does something stupid or careless. But once the blow up is over, he forgets it, and tries to find the ways to prevent the mistake from happening again. Hostility lingers on. Responsible supervisors and trainers can disregard anger. But *ignoring hostility will cause trouble.*

Hostility is an important industrial problem. One author has referred to it as the H-bomb of employee relations. Hostility takes many forms in industry. When an employee is constantly griping, it may be an example of aggression. This does not mean that we can ignore the gripes simply because they are a sign of some conflict or frustration in the individual. It means that we should examine the content of the gripes to see what needs attention. But, more important, it means that *we should look behind the specific gripes to see if we can discover their cause, that is, to understand why the employee needs to gripe.*

We are taking the easy way out if we say, "Oh, he just likes to complain." That a man needs to complain does not mean that he likes to. It may mean that there is some decision bothering him, or, some problem that he cannot solve.

In other situations, hostility may take the form of refusing to take orders from one's supervisor. The worker claims he is being "picked on" and he just hates that guy! Often when he gets transferred he hates the new supervisor as much as he did the man who gave him the orders before. Watch for hostility in the man who hates everybody because he thinks they are out to "get him."

Hostility does not always show itself directly. And *it isn't only the employee who will show it.* Managers or a supervisor may enforce rules strictly or impose the maximum penalties permitted. Enforcing a rule strictly may not at first glance appear to be hostility. On another similar occasion, however, when there may have been less tension preceding the decision, the rules may have been interpreted more leniently.

We all recognize this background for hostility when we say such things as, "Don't go into the boss's office today—he's on the war path." We recognize that some frustration or conflict has preceded the boss's mood when he is all set to blow his top. Although the hostility may be taken out on us, we sense that it was started by something else.

It is possible to recognize hostility in oneself too. Before expressing anger or resentment because of the behavior of others, one should look within himself. Am I using this person as a target for my hostility? Am I misplacing my wrath? Am I really sore at myself or at my failure; and am I using this other person as the butt for my hostility? We all should *look for reasons behind our own behavior before acting in a hostile manner.*

When another person shows hostility, there are always reasons for this behavior; the behavior is symptomatic of some underlying feeling, the causes for which lie elsewhere than in the target of the hostility. By gaining the confidence of the person, perhaps through a personal interview or some other technique, one can discover the causes of the behavior. In this way a satisfied employee may be made out of a disgruntled one by his supervisor or manager.

RATIONALIZATION

Do we always know, or give, the real reasons for behaving as we do? *When we are in a conflict, we sometimes offer reasons to others or to ourselves for our actions. Are these always the correct ones?* Let us assume that we have found some money in a coin telephone.

How often do we put the money back into the slots? If we keep the coins, we might say, "the phone company makes enough anyway." This is a happy rationalization which most of us use.

The common practice of calling an expense account "the swindle sheet" is another illustration of the rationalization process. It is generally rationalized that one should cover his total expenses by padding all the authorized items. The conflict between our desire to get the most money and the desire to be honest, or at least to appear so, results in our saying, "everybody does it," when a somewhat bloated account is turned in. Thus, the anxiety created by the conflict is lowered by saying that the group permits (possibly even encourages) turning in an account that does not cheat the individual.

COMPENSATION

Another commonly used method of handling frustration and the resulting anxiety is through compensation. *Compensation is overreacting in one field of activity because we have been blocked in the satisfaction of a particular motive.* A familiar example during the last war was the unsuccessful business aspirant who, upon entrance into the army and with the receipt of a commission or a few stripes, became the impossible, overbearing autocrat. The GI's had a name for this individual. They characterized him as a "person who found a home in the army." He was compensating in military life for his frustration and his unsatisfied needs for power in his earlier civilian activities.

We all know, of course, about the short, fat man who smokes big cigars, or the young man paralyzed at an early age by poliomyelitis who drives an automobile with reckless abandon. It has even been theorized that Teddy Roosevelt became the "Rough Rider" of the Spanish-American War because of his early and somewhat sickly childhood. In fact, *many men may even achieve or drive themselves to eminence in life's activities because of some real or imagined conflict, for which they feel that power and success will somehow compensate.* In industrial situations a man may demand all the trappings of status: two telephones, big desk, secretaries, and even a fine pen set. Feeling unworthy and inadequate deep within himself, he requires these symbols to compensate for his real or imagined inferiorities. One must be careful, however, about jumping to conclusions

of this sort. We should not assume that everyone with two telephones, etc., is compensating. There may be other, more reasonable, causes for this behavior.

PROJECTION

This process is seen when *one attributes to others those actions, emotions, or motives which are driving oneself* but for social reasons one feels the necessity to disavow. We all desire to present a favorable picture of ourselves to the outside world. The young child who is himself afraid of the dark believes that all children are frightened unless there is light. Psychologists are somewhat suspicious of the man who claims that all men are dishonest, or of the hard-driving executive who fires all his assistants because they are too ambitious.

Shakespeare may have implied this same thing by calling to our attention the possibly confused motives of Brutus in slaying Caesar: Remember when Brutus says of Caesar, "as he was ambitious, I slew him"? Who can tell at this long distance in time whether the men who slew Caesar really were dominated only by lofty democratic ideals.

REGRESSION

Regression is a return to childish behavior in order to resolve conflicts. At rare times even a mature adult will regress and burst into tears at what looks to him like an insoluble problem. When a young wife, after her first fight with her husband, starts crying and threatens to return to her parents' home, it is an example of regression. In industry, regression may be seen in follow-the-leader tendencies, childish tantrums, lack of responsibility, unreasoned fear, not speaking to friends, responsiveness to rumors, and pouting or sulking.

FIXATION

The operation of this mechanism can be observed in *the continuing of behavior which does not result in any solution to the problem.* Once we hit upon a method of solving a problem, we tend to stick with it and resist any change. The older worker, fearful that he is slipping but unwilling to admit it, may cling tenaciously to the older more secure methods. Fixation can also be observed in the younger employee who cannot accept change.

A WORD OF CAUTION

The mechanisms we have just described are used by all of us. It is not unusual for us to become frustrated, to experience anxiety, and to use these psychological methods to alleviate and escape from our somewhat unhappy state. Everyone experiences this anxiety; in fact, for many of us it provides that extra push, that high octane gas, which helps our human machine to overcome the obstacles which are always a part of life.

The absence of psychological tension is not an indication of perfect health. Rather, *the extent and degree of anxiety provides the best clue to our mental health.*

If we are too anxious, too often frustrated, blow our tops at every provocation, then and only then is our behavior a source of concern. *We cannot expect to be devoid of frustration in our work and with our families, but we can expect, with increasing maturity, to learn how to handle our anxieties and direct the extra energy into productive channels.*

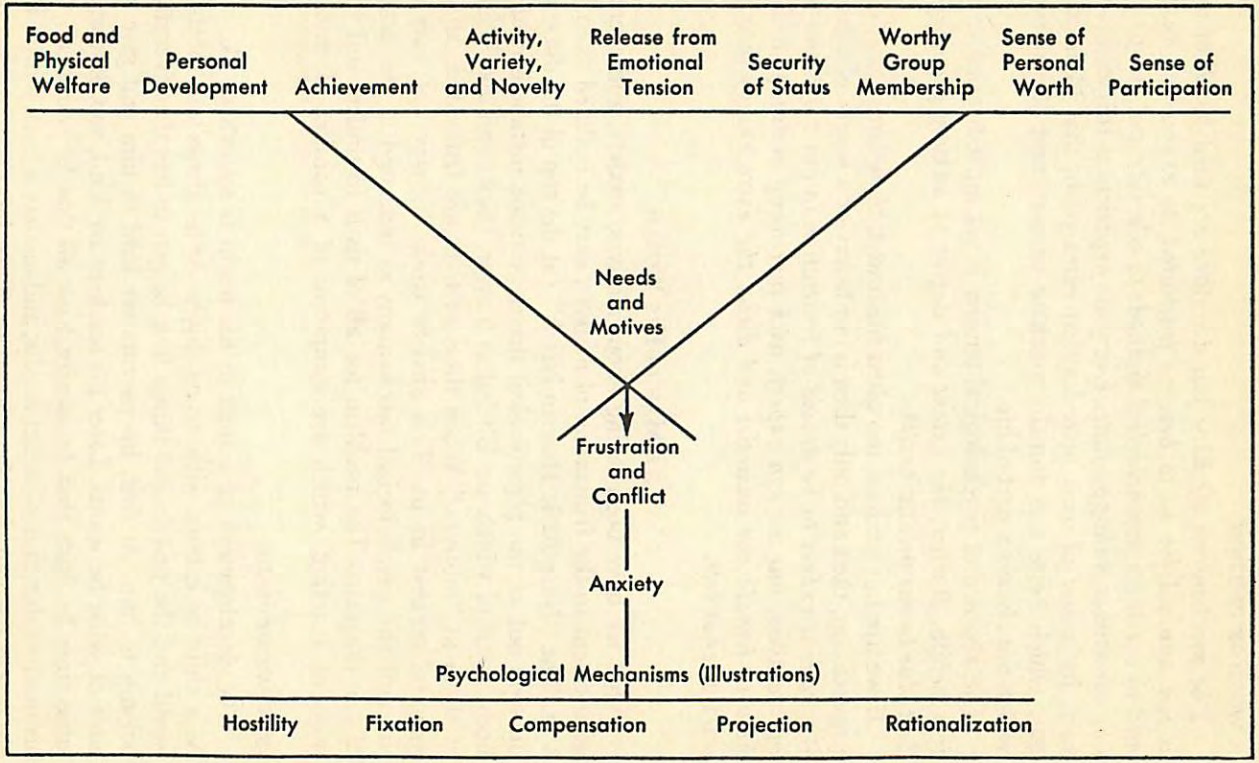
The Man in His World

What we have been saying about motives, anxiety, and eventual adjustment to the frustration of motives, may be outlined as in Fig. VII. The "Nine Basic Human Needs" (at the top of the diagram) develop out of the physiological drives or tissue metabolism of the body, some of which are labeled as hunger, thirst, and sex. We talk of them as "motives." When these motives are frustrated, anxiety may be created in us. This anxiety works its way out variously through the psychological mechanisms as indicated at the bottom of the diagram. The problem for all of us is to understand these ways of reacting, which are symptoms of a conflict of motives.

HOW WE DEVELOP

The development of a man in his world is something like this: As a child he is born with strong drives. As he grows and meets the world and the people and things in it he gets to feel that everything belongs to him. At first, his parents are kind to him and give him most of what he wants. Later his teachers are kind, too. But at the same time he finds that he cannot have all that he wants, all that his motives demand. Conflict results, and anxiety is born within him. He works hard to overcome obstacles. Then he tries to get what he

FIG. VII. ADJUSTMENT TO HUMAN NEEDS



wants by by-passing the obstacle causing the conflict. Psychological mechanisms are learned which alleviate the anxiety. Thus, he makes as satisfactory an adjustment as he can to the world about him.

Sometimes the man goes beyond the point that most other people stop at in the use of these psychological mechanisms. He refuses to face any of the obstacles of life. He takes a "flight from reality." It is called "building a castle in the air," calling himself Napoleon, Christ, God, or what not, in order to satisfy his motives and reduce the anxiety. When this happens we say the man is psychotic, or in everyday language, insane. Most of us do not become psychotic. We use the mechanisms described above, perhaps with our "tongue in our cheek," to satisfy our motives and reduce anxiety. We think as the Quaker expressed it: "Everyone is a little queer, except me and thee, and sometimes I wonder about thee."

The woman who believes that she is a queen has achieved satisfaction of her motives and reduction of her anxiety by leaving this world. The trainer, the manager, the supervisor, the worker in industry must stay in this world. And to do so each must have understanding of his own motives and of the motives of others, and of the ways they show themselves in behavior.

HOW THE TRAINEE LEARNS

This is the title of the next chapter. Whether the trainee is a manager, clerk, or mechanic, he will approach the problem of improvement in much the same way, according to what he wants to do.

The present chapter has described important by-ways affecting learning. We would like learning to move straight toward our goal or purpose. But this is not always possible. There are many pitfalls to be avoided. The training specialist must constantly be aware of the role that motives, conflict, anxiety, and the psychological mechanisms play in the training situation. This is the back yard of training. The thwarting situations and the resulting anxieties must be considered before we step into the front yard to answer the question of how the trainee learns.

5. *How the Trainee Learns*

LEARNING *new ways is not easy.* When a baby begins to talk or walk, he makes lots of mistakes for a long time. It is easy for us to remember how difficult homework was during our school days. The airplane pilot who is in the midst of learning to fly a plane will vouch for the fact that he can not take off with ease. The man learning to ski may get quite a few extra bruises before he can move along as smoothly as the expert. *Learning a new skill is difficult for all of us.* It is harder than work.

Getting along with other people is a skill, just as is learning to run a machine. It is a social skill. We sometimes forget the "bumps and bruises" that we acquire in learning how to deal with people. *Being a good manager, supervisor, or employee generally involves learning certain skills, some of which are mechanical and some of which are social. These skills are never easy to learn.* But there are ways in which the road over which one travels in learning can be made less bumpy.

What is known about helping people to learn? How can we help the trainee in any position to acquire new skills and if necessary to break some of the old habits which are getting in the way of doing his job as easily as he might? This is the responsibility of the training specialist. *Knowledge of how people learn is as essential to the trainer as a knowledge of engine operation is to the engine trouble shooter.*

To understand how the trainee learns, it is first necessary to have some appreciation of him. What are the characteristics of the usual trainee? How should he get ready to learn? How can the trainer assist him in preparing to go into training?

The answers to these questions are concerned with such matters as perceptions for the learning, and with the recognition of what needs to be learned. Incentives can be established that make it easier

to learn and to retain what has been learned. There are many aspects to the problem of learning.

Trainee Characteristics

What are the characteristics of the trainee which affect his learning? No two people are exactly alike. Even identical twins, who are more alike than most people, still differ from each other in a variety of ways. Any instructor will find—as you might expect—that people react differently to the ideas that are presented. This provides a challenge to any trainer. *The people whom he seeks to train are all somewhat different from each other. Whereas the same general principles of motivation and of learning apply to all of them, they differ in personality, in background, and in their ability and willingness to learn.*

It takes time for people to learn anything. Nobody who drives a car, or who operates a machine, or who supervises a group of people does as well at first as he does after a lot of practice of these skills. *Not only does learning take time but it takes different people different lengths of time to learn the same skills.*

It is not to be assumed because of this that these people are stupid. Any manager will be able to think of some person working for him who "only needs to be told once what to do and he does it." He should be pleased that there is such a person and not be annoyed that everyone else is not like this man. A trainer should not become discouraged with people who do not learn something just because he has told it to them once or twice. *People differ in both their capacities and abilities to learn.* If we can actually do something, we say that we have the ability to do it. We all speak English, for instance. We have the ability to speak English. If we can learn what we cannot at present perform, then we have the capacity, that is, the potential to do it. If we cannot speak French, we probably have the capacity to learn it.

The trainees, like any other group of human beings, will include some people who find it tougher or easier to learn than others. This may be due to less ability, or it may be due to the lack of capacity to learn quickly.

Getting Set to Learn

A runner gets ready to run at the sound of a gun; the muscles of

a dog are tensed and he pricks up his ears in anticipation from hearing his master's footsteps; a horse is excited at the post waiting to start a race. These are examples of getting ready for something to happen. They are labelled "set."

WHAT IS "SET" TO LEARN?

For the most effective learning, the trainee must be set to learn. *Learning does not occur just through repetition. We must be ready and prepared to learn,* just as the runner must be set to win a race.

An interesting illustration is seen in asking people their car license numbers. In spite of the fact that they look at their plates innumerable times during the course of the year, many people still have difficulty in recalling their numbers. Ask people to draw a telephone dial from memory. It is surprising how few can do it accurately in spite of the hundreds of times they have seen the telephone. Your adolescent daughters and sons would be amazed, after spending half their waking hours on the telephone, at their inability to sketch the dial. The reason is obvious. They just had no intention of learning anything about the dial, its shape, or its lettering. *A trainee will learn practically nothing unless he is ready to accept the instruction.*

EXPERIMENTAL EVIDENCE ABOUT SET

There has been a good deal of experimentation with set and it may be helpful to summarize a few of the more interesting and pertinent points from these studies as they apply to the learning of trainees. Attempts have been made to find out what happens to our bodies when we are getting set to do something. Two Germans started working on this problem way back in 1889. They used a weight of 627 grams to which they compared weights of 826, 870, and 926 grams. Those who did the lifting all reported the last three weights as heavier. After this, another weight, much heavier, was substituted for the original three. This was judged heavier than the 627-gram weight as would be expected. This was done a number of times. The weight lifters, of course, were blindfolded. Then the lifters were given the three weights again and they said that they were lighter than the 627-gram weight. They reversed their earlier judgments! They had been set to lift a much heavier weight. These three weights now felt much lighter. This was, of course, a muscular set.

You can try the weight lifting experiment yourself. If you are lifting heavy objects, and then lift lighter ones, the lighter objects will appear much lighter than they would otherwise. If you are set to receive a heavy weight and you get one that is not as heavy as you expected, then it will feel lighter to you, even though it is not so. That is why baseball players swing two bats together before stepping up to the plate, to get set to swing a lighter bat.

In the same way, some people always expect the worst, so that whatever happens to them seems better than their expectations. If you expect a big pay raise, and you only get a small one, then you are disappointed, even though you did get a raise. In other words, *if a person is set to receive something and it differs from his expectations, he in turn is likely to behave differently than he would normally.*

In another experiment illustrating set, a mechanic was instructed to do various tasks while the tensions of his various muscles were recorded. The heavier the work, the more muscles of the body became tense, even though the other muscles did not help to perform the task. When the worker got beyond his ability to lift, then the spread of tension to all the muscles was tremendous. This is what happens when we are working under pressure. We are describing our body condition accurately when we say we are "all tensed up."

Three muscular groups are involved in any job: The primary muscles concerned with the task; the intermediate muscles which assist these primary muscles; and the peripheral muscles that have little to do with the task but which adjust the whole body toward the accomplishment of the work. *Whenever we do anything, the entire person is affected.* Therefore the adjustment of an individual to a task does not mean just training a specific group of muscles, e.g., the fingers or arm, in the skill, it means training the whole person.

When a person plans to lift something, and before any lifting is done the muscles become tense, they are getting set to do the work, even though the tension in the muscles is not so great as it will be later in doing the work. Our bodies prepare us for our work, they help us to get ready. The trainee, just as the runner, must get set. He may get the wrong set. Or, like the runner who isn't ready when the pistol goes off, he may not be set to learn.

Set applies to our perceptions as well as to our responses. We

usually find what we are looking for if we are set to find it. *If we are set to learn about one aspect of a situation, we often do not notice the other things that are there.* In one study many years ago, designs were presented to a group of trainees with instructions to learn the designs, nothing else. Then, other trainees were instructed to pick out only the color or only the position of the objects in the designs. The results of this study indicated clearly that when the learners were set to learn something specific they did much better, about twice as well as they did without any specific set as to what to learn. In other words, *when you intend to learn something specific, you will learn more of it than you would if you vaguely tried to learn whatever there was to be learned.* But if you intend to learn one thing and it is the wrong thing, then you will perform much worse.

If an instructor can point out the things for the trainee to watch in the learning, he is serving a good purpose. For example, what should a trainee look for that will tell him when to stop the grinding of a knife or the filing of a saw; or what is the danger signal in the behavior of a worker when he is being bawled out for excessive waste? This is what will assist the trainee in learning. These are the key points, referred to as a part of the job breakdown. *If the trainee can get set toward the correct tolerances, goals, and outcomes of his training, he will learn much more rapidly.*

RESISTANCE TO LEARNING

It is easy for a trainer to say: "Ready, Get set, Go!" The trainer must be ready. So he feels, "Let's get on with the learning without further ado."

Unfortunately, training is not that simple. Getting set to learn is sometimes difficult. *Almost anyone is reluctant to learn.* It is not easy to learn new things. Advertising experts know of the reluctance of people to change from one well-known brand product to another. Sometimes we resist learning with all our power. We may have to give up some favored method of doing things. "We won't do it," we say to ourselves. When learning, we feel challenged by the change. *As training specialists, we should be aware of these resistances to change or to learning new things.*

If a trainee seems unwilling to learn, there is a reason for his resistance. This unwillingness to learn may be shown indirectly. The

trainee is not a child who may stamp his foot to say, "I won't." His unwillingness shows itself more subtly. *He may not realize that he resents the training.* He may criticize some minor point in the program because the whole idea of a new method upsets him. An instructor may have a chance to correct such a set. If a trainee gripes in class about some specific point that he has made, the instructor should permit the gripe, so that the man gets it off his chest. Thereby he is on the way to getting set to learn.

Many of us, at different times, when presented with something new, have said, "I like it, *but* . . ." Then we proceed to take the idea apart. After this we feel better and are ready to get down to the business at hand. *To spend three-quarters of the time of a training conference in griping may be the best method of training in certain instances.* And let's not forget the other side of it: some of the criticisms may be of value in understanding the problem under discussion.

EASE OF CHANGING SET

Some people find it easier than others to shift to new ways of doing things. For this reason, training is a difficult job. For example, it will take time, skill and patience to get some supervisors to be willing or able to try a new way of dealing with their men.

An analogy may make this clear. *In trying to solve problems, we frequently go wrong because we never question our basic assumptions or set.* Let's illustrate this with an old puzzle. Take the following pattern of dots:

Without lifting your pencil from the paper, draw four straight, connected lines which will go through all the dots, but through each dot only once. After you have tried a couple of ways, ask yourself if you are adding any restrictions to the problem that were not in the directions. Possibly you made the assumption that you could not

go beyond the square pattern formed by the dots. Or you may have made the assumption that the lines could not cross each other. Now that you have puzzled over it for a time, look on page 87 for the solution. There are probably many other examples you can think of to illustrate this same principle of resistance or refusal to question our basic assumptions. Most of our difficulty in dealing with people is due to our failure to question our basic assumptions about them and their behavior.

Managers and supervisors may be encouraged in their training to avoid similar obstacles to learning. They should not make assumptions about incidents which crop up in dealing with people. They should realize that *if a man does not do his job the way the supervisor wants him to, it is not a question of who is right or wrong. It is a problem for which a solution may be found.* The supervisor can look for a way to help the man to change his behavior.

Many people cannot change easily to new ways of solving problems. A few can. Several studies have shown that there are differences in this sort of flexibility. This is not unwillingness to learn, but difficulty in trying to learn new ways. It is necessary for all to realize that *it is helpful, when the solution to a problem is not found, to think about giving up one approach and trying another.* Managers and supervisors should see that in human relations they are looking for solutions, not for someone to blame.

PERSISTENCE OF SET

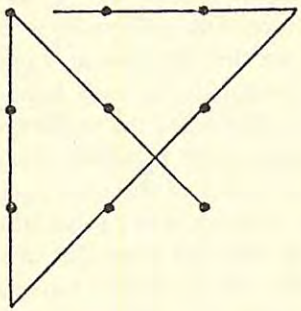
The set to do something shows before we start to do a task. Set is present in trying to finish tasks once started. It is evident in our muscles. *It is also evident in what people recall about what they have finished or have not finished.* In one study people were given fifty short tasks to do, e.g., stringing beads and writing statements about things. They were stopped from finishing half of these tasks, but were allowed to finish the other half. They recalled afterwards more of the tasks that they did not finish than of those that they had completed. This is called the Zeigarnik effect. The set to complete these tasks persisted. Thus they recalled them better than the ones that had been finished.

This Zeigarnik effect will cause a worker to resist being switched from one task to another. A worker likes to finish one job before he goes on to another. He can avoid being left with the tensions result-

ing from unfinished business. He will remember various interrupted tasks. They may persist as gripes against his work or his supervisor. But these ill feelings can be prevented.

If supervisors are required to interrupt the work of their people, if it is "in the cards" and they cannot help themselves, the razor edge of the Zeigarnik effect, the feeling of incompleteness, can be blunted by taking steps like the following:

1. Do not jam on the work brakes. People cannot come to an abrupt halt without some screaming. *The wise supervisor lets his people know that he may have to interrupt them.* Being forewarned, they can bring their work to a natural stopping point satisfactorily.



2. *Praise the partial job.* If a supervisor interrupts with words like this, "You are doing fine. I will have to interrupt you now because you're needed on something. But we'll get back to your present work as soon as we can," the Zeigarnik effect may be removed.

3. *Give them reasons.* If an employee knows why you had to interrupt him, it will help. Usually the supervisor has a good reason. It might be a change of schedule or a deadline. But whatever the reason, it will release the tension in the worker to know why he was forced to stop a job while deeply involved in it.

All of this indicates that *a job may not have to be finished in any real sense as long as it is finished to the worker's own satisfaction.* In a study of persistence of set, the experimenter told his subjects: "When I stop you, you have done fine. You have finished what I wanted." The subjects interpreted this to mean that they were not doing the task properly if they were allowed to finish. Under these conditions, they remembered more of the completed tasks, and did

not recall as many of the ones which they had not finished. Their own goal determined whether or not the set to complete persisted.

Sometimes when we have finished doing something, but are not pleased with the results, it keeps nagging at us, even though it is supposed to be "over and done with." *The goal which the person has in mind is the important matter.* If the goal being sought is found, the worker is happy.

GOALS

What goals does a person have for himself? To answer this we are required to examine the whole field of incentives. How can we encourage and motivate a trainee to achieve his goals?

When starting to learn, we set our sights higher and higher as we learn more and more. The golfer who scores 105 wants to break 100; when he has done this, he aims at staying below 100 or even shooting below 90. Eventually, he may hope to knock only one or two points off his score, instead of ten or fifteen.

Our level of aspiration, as it is called, *changes with the situation.* There is a story of the addict of the race track who said before betting one day, "I hope I break even; I can sure use the money." His level of aspiration had changed from that of the usual gambler. He no longer hoped to win, only not to lose too much.

In training, as in work, it is important to have realistic goals. If we set our sights too high, we are more likely to be disappointed, or to feel that we have failed. Actually, we may have accomplished something. It may not be what we want to accomplish in the long run, but it is worth while to take the first steps.

Breaking a job down into steps and learning step by step gives a feeling of accomplishment to the trainee. As he completes each step, he is encouraged to go on to the next step. When a baby is learning to talk, we are delighted when he says his first word, or adds one new word to his vocabulary. We do not expect the child to make a speech. We certainly do not punish the child for not using full sentences. The instructor or trainer must have realistic goals for the trainee according to his abilities and capacities.

When adults are in training, we sometimes forget that they need a feeling of accomplishment. It is not enough for a trainee foreman to have the goal of eventually being a better supervisor. *He should be made aware, during the learning, of the skills and the knowledge*

that he has acquired. This can be done through realistic methods of training. *He should realize that he is getting some place even while he is on his way* and before he is at his final destination.

Dependence of Training on Right Perception

Perception is the process of getting information from the world surrounding us. We construct our life, our job, our operations out of these perceptions. We learn new things in this way, as we are motivated to better our conditions. When we perceive, we organize our impressions into a meaningful pattern. We learn by the senses of sight, hearing, taste, touch, and so on. We seek the right sight or the right touch to help make an incomplete pattern into a meaningful whole.

The good instructor understands that each trainee learns through restructuring his perceptions. We often say in conversation, "I don't see it that way." This statement, although somewhat trite, has a good deal of significance. It is an expression of individual differences in perceiving relationships. In order to train, *a trainer must be aware of what the trainee sees.* He must help him to see what he should see. *The trainee needs to view things in a somewhat different fashion from the way he did before.* He should perceive things which he hadn't noticed or realized or understood before.

Within our own experiences, we can point to many instances where our view of the world has changed with training. Helen Keller, who is deaf, dumb, and blind, learned to tell the difference between night and day by becoming sensitive to the rhythms of the air which went with the noises peculiar to each period of the day. The camera bug, when first starting his hobby, may not know a Brownie from a Leica. Gradually he learns about lenses, picture angles, lighting effects, proper diaphragm openings, and all that goes into the makings of a photographer. He perceives all the objects in his environment with a new look. The announcement of a new filter in the daily newspaper, which he would have passed by without notice a few months ago, is now perceived with interest.

Basically, learning shifts the emphasis of what we see or what we perceive. It gives us different learning sets, helps one to be selective and to perceive more sharply parts of a situation that went unnoticed before the learning. The instruction of the trainee in what to

watch for in doing a job is a critical element in his training. He must become set to perceive the key points of the task.

Frequently the reason why a trainee does not remember what he has been told to do is because the instructions, which are part of his total perception of what to do, had no meaning for him. He may have said, "yes, yes." His trainer may have realized only too late that he did not have the slightest idea of what was meant. Thus the training was a waste of time.

During the early stages of training everything may be a mass of confusion to the trainee. He sees no meaning in the operations of the job in which he is being trained. Only later with specific training do his perceptions of the task clarify. With good instruction the trainee gets the point, sees the relationship. When he does, to his great satisfaction he may exclaim, "Aha—I see it now!" It is a trainer's job to bring him to this point of understanding.

Training is, above everything else, training in perception, training to pereceive the right thing at the right time. An instructor or a trainer must see the skill as the trainee sees it. Then, and only then, can incorrect perceptions be changed and an effective search be produced for the right cues to learning. These cues are, of course, the key points of the job breakdown. A training specialist knows them in advance, if the work of preparation for the training has been done. *The trainer's job, in essence, is one of pointing out the things that the trainee should perceive in order to perform correctly.*

Incentives to Learn

Up to this point we have been discussing problems besetting all trainees, problems which must be overcome if there is to be any learning. What the discussion really boils down to is that *we must overcome the resistances within us to training and get the proper direction to learn. Incentives can help us break through this training barrier.*

What sort of incentives can we give the trainee that will help to keep him learning? We saw in the last chapter some of the motives that men have. The motives of the man are inside of him. *What incentives are there on the outside of the man that will help him along the path of learning?* How can they be harnessed to the man's motives so as to help him learn, or help him to do a better job? How can we use incentives in training and on the job?

We know that no one incentive by itself, not even several combined, will work any miracles. We also know that *if we do not make use of incentives, if we ignore the motivation of the trainee, then we are making the job of training much more difficult, if not impossible.* Studies have shown the big differences in the ease of learning when there is an incentive and when there is not. We have all seen at times some of the depressing and sometimes serious effects on people when they feel that they "have nothing to work for." What, then, are some of the things that people will work for? What are some of the incentives which can be used to help people to do a more effective job, whether they are training or working?

We may assume, as many supervisors do, that we do know what will give a worker satisfaction, or will assist him in achieving his own goals or purposes in life. But are we right? *Do we really know what men want from their jobs?* Let's look at the record.

Employers gave their idea, in a recent study, of what their workers think is important by ranking eight incentives; the employees also ranked the importance for them of these same incentives. Were these rankings the same? No! "Fair pay" was ranked first by the employers as being what the workers wanted. But it was ranked third by the employees. The employees ranked "credit for work done" as first and the employers gave this vital incentive seventh place in the list of eight items. The greatest over-rating by employers is "job security." They placed it second and the employees last in the list of eight. Employers rated "counseling on personal problems" at the bottom, whereas workers rated it fifth.

From this study and others, *we have reason to question whether managers, supervisors, or foremen actually know what is on the minds of their employees, and whether they are really aware of what will help to motivate their employees to learn or to work.*

Another illustration comes from an attitude study in a large chemical firm. We will take just one item. The question was, "Is there favoritism in the distribution of work?" Sixty-seven per cent of the men at the supervisory level said there was not favoritism in the distribution of work. But when the mechanics who worked under these supervisors were asked, 78 per cent said there was favoritism. Only 22 per cent said that favoritism did not exist. Even among the helpers of these mechanics, only 34 per cent said that the situation was as it should be. In other words, *right at the level of those*

supervising them, the workers' feelings were completely misunderstood. There are many such illustrations which show misunderstanding by management as to what are the real incentives for work and training.

The effectiveness of any incentive depends on how it is used and who uses it. No one incentive will always work in the same way. We all know that the same words can bring about different emotional reactions at different times. Suppose that you have been disagreeing with someone, and he calls you "an old no good so-and-so." You might get angry; you certainly would not be pleased. Suppose, however, that you suddenly bump into a dear old friend whom you haven't seen in years. He says, "you old no good so-and-so," to your great pleasure. You react with similar reflections on his ancestry. The words are the same, but the meanings are different. There are different goals and perceptions in the two situations. Hence, there is a difference in the resulting feelings and meanings.

What happens during a man's working hours affects and is affected by the rest of his life: where he lives, whom he lives with and what they do, how far he has to travel, and whom he travels with, the things that interest him or bother him, as well as all the things that he does during the working day. Our aim cannot be to create or discover a specific incentive that always will act upon the person as a trainee or as a worker. Our effort should be expended *to see how specific incentives have sometimes operated in the right framework to help learning and production.* These incentives are not only important in training. They are important for the manager, the supervisor, and the leadman to use in the day-to-day supervision of their men. There are, of course, other incentives in addition to those listed below, which go with the various needs.

PRAISE

Praise, honestly given, is a strong incentive to learn and to work. It is often easier to tell a man, "You did that wrong," than to find something that will encourage him. Yet we all like to be praised for doing things properly. Naturally, no one believes that we must repeat, as a parrot would, "That's good," every single time that a trainee pushes the right button on a machine. But there is a lot of evidence today that *sparing the praise can spoil the learning.* We

will all take criticism better when we do something wrong if we feel that we will also get sincere praise when we do something right.

All of the studies in industry indicate that praise is better to use than reproof, but reproof is better than doing nothing at all. This gives us a clue for an incentive in training. *Praise the trainee if you can; bawl him out if you must; but never ignore him.* Be sure he knows what you think of his performance. *And, if you must bawl him out, do it in private.*

PARTICIPATION

Participation is an essential incentive in most learning. *A man will learn better if he feels that he is a part of things.* We all like to have some say in making decisions that affect us. We like to feel that others have confidence in us, that they trust us. We know that we make mistakes, but it is important to help a person to learn from these, not merely to point out that something is wrong. Tell the trainee what he should do, not what he didn't do. A popular song of a few years ago had much psychological wisdom when it said, *"Accentuate the positive."*

PAY

Pay has not been mentioned up to now as an incentive in training. There are reasons for that. People being trained may feel that they will some day get better jobs (and possibly better paying jobs) because of their training. Or they may require training in order to do their present jobs in the best possible fashion, or to be able to keep their present jobs. *The incentive effect of money is more long-range for the trainee.* Training is helping him to perceive the difference between the correct and the incorrect activity. Money cannot easily be used as an incentive in this situation. Of course, the trainee's pay must be maintained at the level of that of his previous work, and it must include regular advances, for him to participate in a training program.

ATTITUDES

Attitudes of the instructor, conference leader, or trainer toward the training will affect a trainee's learning greatly. *A trainer's behavior can make or break training.* It follows that the attitudes

which management shows toward training and the attitudes supervisors have toward the training of their workers are key factors in maintaining effective training.

BELONGING

Belonging means much to everyone. *Each employee, no matter how high or low a level of skill his job requires, wants to feel that he is accomplishing something for his company.* We cannot ignore this need in training. For instance, a man was told to dig holes in various spots in a field, and then to fill up each hole after he had dug it. Seeing no point to this, he eventually threw down his shovel. However, when the foreman explained that they were trying to locate a pipe-line in the field, he was then willing to start digging and filling holes at random.

RECOGNITION

Recognition or "credit for work done" was put at the top of the list of incentives by the employees quoted above. We can probably all remember various times when we have done some work which we thought was worthy of recognition, only to have the work ignored or taken credit for by our boss. Our feelings toward the boss at another time, when we were *given credit where it was due,* were certainly more favorable.

SOCIAL CLIMATE

Creating a social climate in which people are free to learn and work involves treating them as you yourself would like to be treated. There was a song that said, "It ain't what you do, it's the way that you do it." This expresses what has often been found in industry, whether in supervising people or in training them. The old autocratic supervisor may have thought that he was getting the most out of his men. He wasn't. *Some supervisors in industry may still have the view that the boss must be tough or he isn't boss. This may be one of the hardest views to change, and it will take time.* Frequently the "bull-of-the-woods" foreman was given no opportunity to learn any other methods. A trainer now has the chance to demonstrate to these people the advantages and the benefits, as well as the pleasures, of more democratic methods of supervision.

Factors Which Make Learning and Retention Easier

What is known specifically concerning the best conditions for learning? What principles of learning will help in training? How can we get the most out of our training time? What procedures, tried and tested in the experimental laboratories, in the vast military training programs, and in industry can be supplied to help the training specialist? *No one principle by itself will guarantee learning.* This is understood. *They must all be used as they apply. None of them will help at all unless the person is set* both physically and mentally *to benefit from the instruction.* A consideration of the following principles will help an instructor or trainer to "put across" his material in the most effective manner.

KNOWLEDGE OF RESULTS

The trainee asks, "How'm I doing?" *Everybody likes to know how well he is doing when working on a job, or when learning something new.* When learning to drive a car, somebody usually is there to tell what is right and what should be done differently. If not, the telling is likely to be done by the man who repairs the car.

Learning progresses better if not too much time elapses before telling the trainee how he is doing. You do not help a driver to get closer to his destination if you tell him, "Say, I think you should have turned right, not left, twenty miles back." An error should be corrected as soon as it is made.

This principle of giving knowledge of results was used with great success by the air forces in the training of aerial gunners. The targets were wired in such a way that whenever a bullet hit the target, the trainee could see a record of how close to the bull's eye the bullet had landed. This enabled the trainee to obtain immediate knowledge of results related to his own goal. Thereby, the training time was cut down significantly. Better marksmen were produced in a shorter time.

Telling the trainee how he is doing is important. But the way that you tell him is equally important. *When you inform a trainee of his performance or progress, it must be done in a manner that will be accepted,* not resented. The instructor must inform; he must guide, but he should not control. He may suggest, but he must not command. Most of all, *he must communicate the feeling that he is helping the trainee in his progress towards the trainee's own goal.* The

trainee is doing the training. The moment a trainer tries to show a trainee who is boss, the guidance relationship is lost. But do not be afraid; as a trainer you should correct and criticize. It will be effective if you are sincere in both your manner and approach.

DRILL

Does practice make perfect? The place and value of drill in learning has been the subject of controversy in recent years. Practicing the same material over and over was once regarded as the most valuable technique to cause learning.

Drill, just repetition of the material, will never do a good training job. Mere repetition without regard to understanding of the goals for the learning is inefficient. Sentences or new ideas will be learned and memorized without a great amount of practice if they are well understood and are of interest to the learner. On the other hand, sentences of little meaning and interest to the trainee will have to be repeated many more times before they are remembered. Memorizing "nonsense words" is done with great difficulty because they have no meaning. *To be effective, training must be meaningful. Blind repetition without understanding will serve merely to produce fatigue, not learning.*

Is practice useless, then? The above comments are not intended to imply that practice and repetition are unimportant in the development of knowledge and the perfection of skills. Practice makes perfect, of course. Repetition is necessary for any permanent learning.

An instructor or trainer should know when and how to make use of drill. Drill may be used effectively in:

1. Memorizing definitions or principles, and in
2. Developing a physical or mental skill such as typewriting, driving, or machine operation.

Even in these situations meaning and understanding are important. *Whenever it is necessary to make a skill stick or to learn particular facts or definitions for exact repetition, then, and only then, will long practice be required in the learning.*

METHODS OF PRACTICE

Blind drill is not recommended in most learning. What, then, can be used to help the trainee to retain what he has learned until he needs to recall or use the material? Experts are generally agreed

that active learning is most effective. Active learning involves frequent reviews and frequent recall. In short, telling a person is never sufficient. He must do it himself.

A cardinal principle in training is to "get the trainee in motion." Have him underline in his book, recite, talk to himself, take notes—in other words, get involved in the learning. An actor does not go on stage after reading his lines silently. He rehearses aloud. If anyone should complain to the trainee that he is talking to himself, he can respond with the old conversation stopper: "I want to talk to someone who understands what I am talking about!" We can read all we want about driving a car, but really to learn, we have to "get the feel of it." The trainee should get active in learning.

He should get practice in the key points of the job, as they are indicated in the job training outline (See Chapter 3). The trainee must acquire as part of his own behavior the important sights, sounds, feelings, and movements which go into doing the job correctly. Even for the complex human relations skills which a supervisor uses, practice can be obtained through role-playing.

THOROUGH LEARNING

Being able to do something right just once is not the same as being able to do it right consistently. The person learning to operate a car is not considered to be a good driver merely because he has managed one safe trip through traffic.

We must do what is called overlearning. That is, we must be able to repeat a successful performance. Overlearning is necessary in acquiring any skill, whether it be reciting the alphabet, hitting a golf ball, or getting along with others on the job. The odds are that we have previously practiced some of the wrong actions. Once we do something right, therefore, we must practice and overlearn the right way.

WHOLE *vs.* PART LEARNING

How big a training lesson should we give? How large should the learning unit be so that the trainee can take it in at one time? Considerable experimentation and much discussion has been conducted in trying to decide whether it is better to learn a task as a whole or to learn the parts separately and then to put them together.

The study of this problem seems to indicate that whether one

learns best by the whole or by the part method depends, to a great extent, upon how much has to be learned and how difficult are the tasks to be learned. *The whole method is better if the task requires few operations and if all parts are of equal difficulty.*

Learning one part at a time is better when the task is extremely long or its parts are difficult to coordinate. It may be necessary, however, to use the part method of training with some people who seem to need approval for every step they complete. We have to realize that *what looks like a short, easy task to us may appear as a big one, and it may be, to the trainee.* In order to keep such individuals learning it may be necessary, at least at the beginning, to train them by the part method. The trainee wants to know what he is doing right. He seeks knowledge of results.

Wherever possible one should use the whole approach. No satisfaction is gained from learning a piece of a task, or without a conception of the whole job. It is difficult to master single elements of a complex operation without understanding the total operation. Shifting of gears from high to neutral in a car has little meaning except as it is related to the total purpose of driving. The parts of a task have little meaning except as they are viewed within the overall pattern. This explains why practical art instructors stopped forcing their students to do such formal exercises as making points; why typewriting instructors have increased emphasis on writing real material in whole sentences instead of practicing separate letters of the alphabet; why we teach children to read words first, and then to learn their abc's later.

This "whole" approach must not be carried to an extreme. It is not advisable to try to read a whole manual in one evening just because the whole method is recommended for learning certain tasks. *It is best to teach material in natural units.* These units may be part of a larger whole; it does not matter what you call them, but *they must appear natural and logical to the trainee.* They must be manageable within the capacity of the trainee. *Once a unit of study has met these specifications, then it can be tackled as a whole.* The rule is to learn the way it "comes naturally."

LENGTH OF TRAINING PERIODS

Trying to learn everything all at one time is disastrous. The length and spacing of practice periods is extremely important for

the most efficient learning. *We learn more easily by spacing our learning and by taking rest periods between practices.* The most marked improvement in learning occurs when both mind and muscle are relatively fresh. Intervals for rest, recuperation, and relaxation must be interspersed with practice periods.

Several short periods are usually more valuable than a few long ones. Five lessons of half an hour each will produce better results than one session lasting two and a half hours. Practice needs to be long enough so the trainee can get thoroughly warmed up, but not so long that fatigue and loss of motivation neutralize the results.

An expert sharpshooter in the army was reported to have made his best scores after a period of idleness between practices. Probably this was due to the consolidation of learning which takes place in between practice periods. We think about the task during our leisure. Quoting from William James, an early twentieth-century psychologist and philosopher, "we learn to ice skate during the summer and swim during the winter." This is an apt description of the value of *having some breathing spaces when we are learning.* The period between active practice sessions allows a chance for meditation and brings about better understanding of our task. It is not merely the number of repetitions that determines learning. We need to practice, but we need time to consolidate the learning.

The great of the world have made wise use of leisure. Archimedes sprang out of the bath shouting "Eureka" (I have it) in making an important scientific discovery. Newton was relaxing under the apple tree when the apple fell on his head, enabling him to integrate his physical theories of gravitation. Few trainees will discover earth-shaking theories during their rest pauses, but they will learn better and more effectively if they have these pauses. They need some time to understand what they are trying to learn. All this leads to one principle: *Space your learning.* In many industrial training programs it has been found most effective to provide longer and more frequent rest periods during the early stages of training, with shorter and less frequent rests between later practice periods.

CRUTCHES

We have all heard of memory systems. A variety of suggestions have been made to stimulate our learning and memorizing: the use of rhythm when working; singing commercials to stress an adver-

tisement; memory ladders for association of new material; even starting a fire in the wastebasket to emphasize remembering something. Some of these tricks may be successful depending on the circumstances.

Another crutch is the habit of always checking with the training specialist. These crutches must eventually be removed. The surgery often is painful, for the false sense of security derived from their earlier use is lost. The question then is, "Why bother with the crutch?" If the trainee uses the principles on which many of these tricks are based there will be no need for crutches. *Training may seem to be more difficult and somewhat slower without them. But it will be much more certain to take hold.*

TRANSFER, POSITIVE AND NEGATIVE

Does the learning of one task help us to do some other task? Educators have long been interested in the problems of negative and positive transfer of training.

Positive transfer simply means that the learning of one task will make it easier to learn new and similar material. The language student picks up a new language quicker than a science student. *Negative transfer refers to the fact that on certain occasions the learning of one thing will block the learning of another.* The country boy who chops wood when batting a ball, or the person who writes last year's date on checks are illustrations.

The instructor or trainer must know how to stimulate learning through taking advantage of the principle of positive transfer. Training in one subject will make it easier for the trainee to learn similar subjects. But without a knowledge of certain precautions, much time and effort can be wasted in an endeavor to utilize this principle. For example, during a time of reorganization in one company it was decided to train some men in certain operations which had become more essential to the survival of the company. Joe, from the factory maintenance shop, was retained in a new bullet proofing job because both this job and his old job required a knowledge of blueprints. Joe had a hard time because he did not know how to transfer his knowledge to the new job. He finally quit. This loss of a man could have been prevented with an understanding of transfer.

Transfer of the skills learned on one job to another with apparently similar operations does not happen automatically! One must

understand the conditions under which such transfer flourishes. An understanding of the principles of transfer will be of great value in our new age of automatic machinery, where both positive and negatives transfer will occur and must be controlled.

In order to obtain positive transfer the trainee must consciously and actively seek it. If a trainer points out the applications of the skills to the other operation, it will help. Group conferences in many industrial plants have been used successfully to obtain a form of positive transfer among supervisors. In these conferences men from various divisions of the company get together and discuss their mutual problems around the table. Consciously attempting to transfer skills to the solution of problems in another part of the company will help enormously in obtaining positive transfer. *The instructor who uses analogies, who makes applications, and who relates the instruction to other fields will assist the trainee to reap the benefits of positive transfer.*

The more a trainee understands the principles involved in a given task, the more he is able to transfer these principles to other tasks. *Rote memory has little transfer. But understanding helps transfer immeasurably.* When your friend shows you how to operate his power lawnmower and you learn the principles of its operation and maintenance, then when you buy your own outboard motor boat, you will be able to transfer the knowledge you have gained. If you just learned the mower's operation without any understanding of the principles of its operation, you will be at a loss with your new boat motor as far as transfer is concerned. *Transfer of training will occur when the individual has learned not only what he is doing but why he is doing it.*

A difficult problem in training is how to avoid negative transfer. Negative transfer occurs when the learning of one task interferes with the learning of a new and somewhat similar one. *When an old situation calls for a new response we may get negative transfer of training.* For example, many of us can recall instances in which we have changed the location of our hat rack, but constantly look for our favorite fedora in the old place. Switch your wrist watch from your left to your right wrist and see how frequently you start to look at your left wrist to find out the time. Remember how often you put a nickel in the telephone slot, waiting for the dial tone which now never comes for less than a dime. If a manufacturer of automobiles,

due to some mad notion, reversed the location of the foot brake and gas pedal, he would be likely to decrease the population because of negative transfer among drivers. One experiences negative transfer upon changing from a traditional gear shift car to an automatic shift. How often one looks for or starts to reach for the gear shift lever, or to press the clutch, even though it is not there?

Two similar kinds of material have the possibilities of negative as well as positive transfer. Taking a lesson in French and then an hour later one in Spanish will surely interfere with remembering the French. Many years ago a consultant was called in by a trolley car company to find out why it took so long to train new conductors. This consultant went through the apprenticeship program. As an expert observer he was able to look at it from its various aspects of transfer. He found the main problem to be with the trainers. A trainee on a car would be told something one day by a trainer, which usually was the trainer's pet way of doing some task. Then, the next day, when the trainee went out with another trainer, he would be told something different. The shifting of trainers without any standardization of what they were communicating to the trainees caused tremendous confusion and loss of efficiency. The consultant recommended changes which resulted in a marked increase in the over-all effectiveness of the program.

The following suggestions are made to avoid negative transfer in training or to keep its effects down to a minimum:

1. *Explanation pays. People will be better able to offset the confusing effects of habit interference if they know why the change is necessary.* Some companies have been successful in combatting negative transfer by explaining ahead of time why new machinery is being installed. Their people, once prepared, have fewer accidents, accept the change and lose much less time in overcoming their old responses. Forewarned, they know specifically why the change was made and how the new machinery works.

2. *Remove the old props.* Contrary to common sense, *the best way to handle negative transfer is to make the new situation less, rather than more, like the old one.* In one company when a switch was made from a hand- to a foot-operated drill press, the hand lever was removed to avoid negative transfer. The company even went so far as to paint the foot pedals a different color. It worked like a charm because the men now saw the situation as something really

new. Their old ways of doing things did not interfere with their mastery of the new.

3. *Do not expect miracles. A new way of doing things takes time.* Do not expect results overnight, especially if your men have been doing the same thing in the same way for a long time. The air forces shifted pilots to the new jets without sufficient retraining. Accidents occurred at critical moments due to a confusion in the operation of the controls. The damaging effects of this negative transfer were conquered by moving slowly and never rushing the results.

4. *Standardize the training conditions.* Do not train one group one way and then shift the conditions for another group. Avoid what happened to the trolley car conductors where each new day of training brought with it the need to unlearn what the previous instructor had told them the day before. It is possible to allow for individual differences in the trainers and yet train with approximately the same procedures.

INTERESTS AND ATTENTION

How to get the trainee's attention and hold it; how to make him a self-starter and keep him going; how to provide him with appropriate incentives; how to find out what will make him perform: these are the problems in learning on which the training specialist will spend a great deal of time to seek appropriate methods. The advantages of knowing results, of setting realistic goals, of understanding the trainees' needs have received considerable attention. The following might be considered as a summary of what will help to increase the trainee's desire to learn.

1. *Understand the trainee,* his goals, needs, desires, hopes, and aspirations. Give the trainee knowledge of his progress.

2. *Praise his performance* if you can; criticize if you should, but always communicate the feeling that you are there to help and not hinder his progress.

3. *Utilize training aids effectively.* Determine what they should do; fit them properly into the training program and periodically evaluate their effectiveness.

4. *Take advantage of the principles* involved in whole versus part learning, positive and negative transfer, etc., and use them in training.

If these rules are followed, learning should progress with less interference than is usual in industrial training programs.

A Final Principle

Familiarity with all that is said about learning, and familiarity with all of the aids to learning which are discussed in the next two chapters, will never make a good teacher or trainer. Knowledge of how to teach is no guarantee of good teaching or of good training.

Learning is not automatically applied. A knowledge of ethics will not guarantee admission through the "pearly gates." An officer during the Civil War trained his men for hours in the technique of loading their muskets while lying on their backs, then rolling over on their stomachs to fire them. He was shot in the leg at the battle of Chickamauga because he knelt behind a bush in order to load his musket. He paid with his blood by making the same mistake he had spent hours in instructing others to avoid.

This final principle might be stated in familiar language: *"Learn to practice what you preach." The fallacy underlying our whole educational scheme is to assume that knowledge can first be taught and then applied to practical situations later when it is needed.* In order to avoid the gap between theory and practice the instructor or trainer should gear his learning to his utilization of it in training others. Let it not be said, "He who can, does; he who cannot, teaches." The training expert should transfer what he gains in theory by practicing it in the laboratory of life.

6. *Mechanical Aids to Training*

One who has chosen the profession of aiding others in their development must understand the nature of the product with which he works: He must know people, what motivates them, and how they learn. With this background for his job, he can help others to help themselves through training.

This book is based on the philosophy that *the trainer, the teacher, or the instructor is the most important factor in any training program.* In addition to a thorough knowledge of the people with whom he will deal, there are valuable tools which can help him to make his work more effective. We will be concerned now with the mechanical aids to training available to him.

"Training aids," "simulators," and "devices" are dressed-up labels for the mechanical tools and techniques used to assist a trainer in his work. *Training aids are the helpers of the instructor or trainer. They do not do anything by themselves, but they act as fine assistants,* particularly if they emphasize the key points (see Chapter 3) of the job for which the training is being given.

Words Are Not Enough

An old Chinese proverb says, "One picture is worth a thousand words." According to another version, "To see a thing once is better than to hear it a hundred times." These old truisms refer primarily to visual training aids. Modern training procedures range from the old blackboard and chalk, which we remember from childhood, to the complex machinery used today in the training of radar experts. Motion pictures, slides, models, leaf-overs, and cutaways, to cite just a few, are employed in industrial training programs. It is necessary for a trainer or instructor to understand something about these tools of his job, their value and their limitations, if he is going to make effective use of them.

During World War II, when our military organization was required to train men in a wide variety of skills, much reliance was placed upon training devices. As with most things, there was more enthusiasm engendered than light as to the real usefulness of training aids. *It is necessary for a trainer or instructor to avoid the extremes of either too great dependence upon training aids or neglect of their use in his training because of ignorance or because of fear of their novelty or complexity.*

What Makes Training Aids and Devices Valuable?

Why should we use training aids at all? What purposes will they serve; and, if they are useful, how can a trainer or an instructor really get the most out of their use? One finds a partial answer to this question through an understanding of the principles of training underlying the use of aids and devices.

DEMONSTRATION VALUE

As anyone involved in training well knows, it is often difficult to get the desired knowledge across to the trainee by lecturing to him. The trainee is lost in a maze of words and facts in his effort to grasp the main points of a lecture. Training devices can be effectively used as an aid to overcoming this "breakdown of communication." Through the use of training aids, the trainee will grasp the meaning of ideas or concepts from the concrete demonstration of them.

DEVELOPING INTEREST

Few training sessions are really complete without some kind of training aid. The use of training aids can arouse and hold the trainee's attention. It can bring the topic to life. Thereby, learning is accomplished more efficiently and thoroughly. *People remember things that they both see and hear much longer than they do information they receive through a lecture or through reading and discussing in general terms.*

APPEALS TO MANY SENSES

The statement that "to see a thing once is better than to hear it a hundred times" emphasizes the inadequacy of words as means of communication. Man is given other sensory abilities to allow him to meet the demands of life. He can hear, taste, and smell, as well

as feel, and he has the powers of understanding and reason to evaluate the things around him.

Needless to say, some people have greater acuity or keenness in vision than others; this is true of the other senses. How much is inherited and how much is developed through training is a matter of conjecture. Some people also have a more keenly developed sense of hearing than of sight. Given the capacities, training has made one of their senses more acute than the others. A person who reads Braille or who can feel the tumbler fall in a combination lock has a highly developed sense of feeling. In training, as in life, we must use all that the individual has developed in sensing impressions.

Experiments have shown that from the outside environment approximately 75 per cent of what we know comes through the sense of sight, and 13 per cent through the sense of hearing. The remaining 12 per cent is distributed as follows: touch 6 per cent; smell and taste, 3 per cent each.

With these facts in mind, an instructor or trainer will realize that the *impact of his teaching upon the trainees should be greater if he imparts knowledge through the use of training aids that stimulate more than one of the senses.* A developed teaching technique that utilizes as many as possible of the trainees' senses will strengthen the impressions made.

A visual training aid such as a chart makes its appeal through the sense of sight. An auditory training aid such as a phonograph teaches the trainee through his sense of hearing. An audio-visual training aid such as TV or a movie provides for learning through its appeal to both hearing and sight.

Briefly, the value of a training aid lies in its:

1. power to demonstrate—on the concrete level—difficult ideas.
2. possibilities for increasing interest and motivation in learning through dramatizing the ideas of training.
3. appeal to more than one of the trainee's senses (e.g., seeing as well as hearing).

When searching for an aid to training, one can well keep these three points in mind as a check against misuse or unnecessary use of additional equipment in the training program.

Kinds of Training Aids

Any classification of training aids will show the variety of helps

means of a projector. The projector is operated by the instructor who can hold each picture on the screen for as long as he deems necessary. While not as spectacular as the motion picture, the slide film is an exceptionally valuable training aid.

A new development in slide film projection is an arrangement where illustrations are projected from a text or book, and their implications are discussed while reading from the same book. The instructor lectures from a portable dais, and he may stop at any time and enlarge upon the subject illustrated on the screen or he may encourage discussions by asking questions. A usual procedure is to give the trainees a copy of the book from which the pictures have been projected, to be used by them for future reference and study.

The preparation of diagrams for slide projection is comparatively simple. With proper photographic equipment, ground glass viewer, and lens extension, line work can be copied in contrast copy film or microfilm. The development of the negative makes it possible to present the picture so that lines and printing appear white on a black background. The negative is mounted onto glass slides.

Film strips may be equipped with sound. This is accomplished by means of a phonograph or wire recorder on which is recorded the discussion of the picture. The two presentations can then be coordinated by the lecturer. Such presentations have the following advantages over the motion picture film:

Minimum skill is required of operator.

Equipment is portable and easily set up.

Operator can re-show individual scenes or views.

Medium is adaptable to any type of classroom.

There are always disadvantages. The trainee cannot take notes easily because of the darkened room. Also the darkened classroom often results in those time-consuming siestas which are coordinated with the flicking off of the light switch. One company, plagued by the catnaps of trainees, hit upon an effective remedy. Interspersed between the informational material were slides from Marilyn Monroe's calendar. The men, not knowing when to look for the pictures of Marilyn, kept awake.

4. CHARTS AND BLACKBOARD

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Kinds of Training Aids

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available. Their selection, of course, will depend upon their contribution to the goal of training. A simple classification follows:

1. Textbooks, manuals and pamphlets (handouts)
2. Motion picture films
3. Slide films and still pictures
4. Charts and blackboard
5. Chalk-talks and leaf-overs
6. Display boards
7. Cutaways
8. Scale models and mock-ups
9. Trainers
10. Television

Each of these classes of aids will be described and their possible advantages indicated.

1. TEXTBOOKS

Magazines, books and newspapers constitute an important source of our knowledge and information. From earliest recorded history, there has been a reliance on the printed word for training purposes. The greatest weakness of such devices lies in the fact that an instructor or trainer is tempted to let the printed material do the training job, without more than a slight assist from discussion. Too often, instructors simply say, "Read the book." *Textbooks and manuals should be used to supplement, never to replace, the knowledge which must be obtained through other media or teaching techniques.*

There are, of course, special cases where it is possible to learn only "from the book." It is said that Abraham Lincoln developed his wisdom from reading by the light of a log fire, but let's not forget that this great President also learned a good deal from passing the time of day with friends over the country store cracker barrel. Books gave him information to develop ideas in discussion. Discussions stimulated him to read more. Lincoln appreciated the knowledge to be gained from books, but observation, experience, and all available avenues of learning remained his chief instructors, as they had always been. *Textbooks are a valuable aid to learning, they provide easy reference material, but they should not be used as a substitute for other training procedures.*

2. MOTION PICTURE FILMS

Motion pictures can be used in many ways to assist in training. For example, rapid operations can be viewed in slow motion so that every movement is analyzed. It is also possible to show the inner workings of a machine not otherwise visible to the human eye. In many schools today such complicated materials as theories of electrons are explained through the use of animated cartoons. Motion pictures are also excellent in putting over the company message. They can show the extent of an organization's manufacturing facilities or how the company distributes its income or markets its products. This can be done best through the medium of films. It is claimed that films increase interest as much as 40 per cent, cause a subject to be 25 per cent more understandable, and add to the amount of learning retained for a year by approximately 33 per cent.

In spite of all the advantages of motion pictures, they also have certain limitations as training aids. *They are not effective without an introduction and a summary. They are never a substitute for the instructor.* He must be sensitive to the reactions of the viewers and interpret for them many of the implied meanings portrayed on the film. Constantly he must ask himself, "Do I anticipate the trainees' questions?"

Films are not adaptable to outdoor use, except in the evening. They require a darkened classroom or theater. *Films are one of the most expensive types of training aids.* They cannot be modified without a great deal of work and expense. They require the services of a qualified operator. Special equipment and facilities are necessary. *Participation, which is a great aid to learning, is not easily obtained with films.* Inasmuch as the motion picture projector operates at a predetermined speed, it cannot be stopped at any time to allow for explanation or elaboration on a given point. The machine is so operated that it is difficult for the trainees to take notes. These are all matters to consider in the use of motion pictures in training.

3. STILL PICTURES AND SLIDES

The slide film, sometimes called *the film strip, is a series of still photographs, drawings, illustrations, or other visual material.* The slide film is usually photographed on 35 mm. motion picture film. The images on the film are thrown one at a time on a screen by

means of a projector. The projector is operated by the instructor who can hold each picture on the screen for as long as he deems necessary. While not as spectacular as the motion picture, the slide film is an exceptionally valuable training aid.

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4. CHARTS AND BLACKBOARD

Charts are basically an outgrowth of the old blackboard presenta-

tion. The blackboard, of course, is still used widely to good advantage in training. But the material on the blackboard must be erased, while the charts can be retained for permanent use.

Charted material can be displayed either on individual cards or on a large pad of paper hung on an easel. The size of the cards may range from miniature designs, for presentation to a single person, to cards of mammoth proportions for display to large groups. Charts are adaptable to presentation of pictures, graphs, diagrams, and almost any kind of visual display.

The advantages of charts over the blackboard are fairly obvious. *Charts are portable, adapted to any type of classroom, easily stored, economical and require little special equipment beyond the crayon and cardboard.* They can be utilized practically anywhere. They may be posted in work rooms, on bulletin boards, and about the classroom. They have the disadvantage, as does the blackboard, of providing a static presentation. They have fixed dimensions, as does the blackboard, beyond which material cannot be displayed.

We have all seen charts so involved that they defeat their own purpose in the training. *Charts must be simple to be effective.* A chart should present material that is understandable at first glance.

Handling and transportation of training aids are important considerations. This is the primary advantage of a rolled chart over a rigid one. A bank of rolled maps or charts can be arranged on spring rollers, one behind the other for convenient showing.

Legibility is, of course, of prime importance in constructing charts. All work on charts should be done in flat or semigloss colors to eliminate glare. Desired viewing distance should be established for layout so that all features are clear and discernible. Details should be minimized. The areas to be distinguished from one another are the important elements in selecting size and color of lettering in chart construction.

5. CHALK-TALKS AND LEAF-OVERS

Chalk-talks are known to almost everyone through their use by artists who forecast the weather over TV. Chalk-talks are usually performed by means of a flat board mounted on an easel to which a number of large pieces of paper are attached and on which the drawings are made. A blackboard may be used for the same purpose, but with obvious limitations. The drawings in chalk-talks are

usually developed in sequence to illustrate the story. When prepared in advance, they are called leaf-overs.

The lecturer needs to be somewhat of an artist in the chalk-talk. Lecturers have been known to have the drawings traced in lightly in advance by an artist, so that the pictures can be filled in with heavy lines during the lecture.

The chalk-talk enables the lecturer to develop his story graphically before the eyes of the audience while he is talking. This can be done in black and white with charcoal, or with colored chalk. Cartoons are especially suitable in chalk-talks because of their simplicity, expressiveness, and humor. As each picture is developed, it can be stripped off and displayed on a wall. This is the great advantage of the easel with paper over the blackboard. Suppose that one wanted to present a number of related diagrams, or steps in instruction, or a lengthy organizational outline. By removing sheet after sheet, one can preserve the material for future reference and exhibit it all together. One loses it after each erasure in using the blackboard. With careful planning, chalk-talks can be a most effective training device.

6. DISPLAY BOARDS

A display board is a flat surface on which is mounted an object or group of related objects. It will usually carry printed identifications and explanations of the objects. The display board may be of any size needed. It may display objects vertically or horizontally. It may contain any number of related objects arranged so as to constitute an independent exhibit. It may serve as a lecturer's aid to be used before a group for purposes of demonstration. The objects may be mounted permanently or be detachable.

The layout of the display board is extremely important. Where size is predetermined to fit a given space, or it is necessary to use standard sizes, the layout should be carefully prearranged to allow for proper balance and to avoid crowding. Under other conditions, where the display board may be of any practical size, the layout of the objects to be displayed can determine the size of the board.

A primary consideration in the construction of display boards is to provide for handling, transportation, and storage. These features should be built into the design, not afterthoughts. If articles are displayed which may be easily damaged in handling, or become dirty and marred, the board can be built with a box face which fits onto

it like the cover of a typewriter. Two display boards may be faced together so that they open out on hinges to produce one exhibit.

7. CUTAWAYS

A cutaway is any object, prepared for training purposes, where sections or areas are removed to reveal the inner workings or contents. We are all familiar with the cutaway of an automobile's motor or a power transmission. These allow for the examination of the working parts in motion. The cutaway is the real thing and not a diagram or a model, but it has been so altered that its operations may be observed for training purposes. A cutaway can be made for any type of object; for example, a packing box can be cut away to show how packages of flour are packed for safe shipment.

Cutaways are helpful in emphasizing the three-dimensional perspectives of an item or components. They are useful in showing the inner workings of even such simple objects as locks and brakes. To display a cutaway to its best advantage, it should have all parts accessible and open to view. *The parts should be clearly marked.* Also, the cutaway should be mounted on a suitable stand which will tilt and rotate according to the needs of the group to observe the inner workings.

8. MODELS AND MOCK-UPS

These two training aids have many similar characteristics. A *scale model is built to resemble the article on a scale that may be larger or smaller.* Parts may be operable or removable. We specify "larger or smaller" because the model of a locomotive would necessarily be a small-scale model, whereas the model for teaching a group how to operate a slide rule would probably be a large-scale model, perhaps three feet long.

At a training center of a large oil company, there is a model of a catalytic cracking plant operation which is contained within a very small area. This model is faithful to the plant in every detail. It is used to explain the entire operation of the plant. The trainees move along the length of the small model and view the operation in its entirety.

A mock-up is a realistic model resembling as nearly as possible in size and shape the article being discussed. Component parts may be operable or removable. For example, a full-scale model of a freight

car, which would be used in the instruction of modern storage and shipping techniques, would be constructed of wood, complete as to design of body and size. If it were to be used only in demonstrating shipping procedures, it would have omitted the rails, wheels, and undercarriage. The mock-up is a model built to actual size, but in which *details not essential to the training may be omitted.*

The scale model is ineffective for training purposes in putting across to the trainee the actual size and operation of an item, which is an important point in industrial training. But *the scale model stresses detail and design,* which is also important. The mock-up, on the other hand, clarifies the actual size and shape of the object being discussed. Scale models have their best use when teaching trainees in the mechanical field. They are seldom used when explaining a process or an operation. Scale models deal with the concrete and rarely clarify the theoretical.

9. MECHANICAL TRAINERS

A mechanical trainer is a device used to indoctrinate trainees in actual operations by simulating as nearly as possible the real device or instrument. Trainee participation is necessary, of course, in the use of the mechanical trainer.

These trainers come under the category of the more specialized training equipment. *They are built specifically for training purposes,* as a substitute for the real equipment or machine which the man is being trained to operate. The Link Trainer for airplane pilots used by the navy and the air force is a good example. Such trainers are complicated and are developed to fulfill a specific training purpose. They may duplicate the original and may allow for a simulation of conditions which would be impossible to obtain otherwise. Mechanical trainers are seldom used in industrial training, but they have had extensive development for military training.

It is possible that mechanical trainers could be developed in industry which would release equipment now used for training and would save a good deal of training time. While, however, the mechanical trainer may be desirable, and in some cases almost essential, it is apt to be costly and its development should be considered from an over-all view of practical training application. *Like all other training aids, it must be fully justified in view of training needs and results.* Some elaborate trainers have been built and used in training

when it was revealed eventually that a man with a blackboard could duplicate the total training result with much less effort and cost.

10. TELEVISION

No review of training aids would be complete without a discussion of television. Television is still in the experimental stage as a training aid. However, once it is developed, it can become an important procedure. The army and navy have become interested in the possibilities of using television as a medium for military training. Its greatest advantage lies in the fact that men can be trained at their own working locations. Experts in every field can be televised. Closed-circuit television for industrial purposes is now being explored. *The future of mass educational media may well rest upon advances in television training.*

WHAT TO LOOK FOR IN A TRAINING AID

It is necessary to inject a word of caution before we go on to some of the more specific points to consider in deciding upon a particular training aid. First, and most important, *training aids are a means of helping a trainer or teacher to reach the goals of the training program. They are not substitutes for good instructors.*

The finest training aids by themselves can prove ineffectual, but they are most valuable when they are in the hands of training experts who know how to use them properly. Unfortunately, manufacturers and producers of many training aids have been too willing to play up the advantages and disregard the weaknesses of their own product. For example, many motion pictures and slide films have been sold to the uninitiated training man as the answer to his problem, frequently with unsatisfactory results. *The trainer or instructor should make certain before using a specific training aid that it will do the job with greater speed and clarity than would another aid or a simpler training method.*

AID NOT AN END IN ITSELF

All studies on the use of training aids stress the point that aids and devices cannot be isolated in the educational program as a means to an end. Rather, they must be regarded as an integral part of the program. *The aid must fit into the planned presentation.* Too

often a training session is built around an aid, rather than building the aid into the appropriate spot in the training. Will the device actually help in the presentation of the required material, or will the subject matter of the course have to be changed in order to use it? Only those aids that contribute directly to the training should be considered.

TRAINING AID CHECKOUT

The following ten-item check list will help the trainer to select the most effective device:

1. *The aid must help the trainee to be more critical.* In the use of films and film strips, their dramatic appeal must not lull the trainee into passive acceptance of the subject matter. The aid and the manner of presentation should stimulate independent and critical thinking.

2. *The aid must give an accurate picture of the concept which it represents.* A training aid must not distort the presentation. The scale must be accurate so as not to confuse or exaggerate the object.

3. *The aid must be suitable to the level of abilities and experience of the trainee.* A training aid must be selected that is neither too advanced nor too simple for the intelligence and educational background of the trainee.

4. *The aid and all its significant parts must be seen clearly by both small and large groups.*

5. *The aid must be easy to maintain and repair.* An aid that breaks down frequently and requires frequent readjustments will be too discouraging to use.

6. *The aid must be economical to ship or store.* Nothing on it should be so small or unique as to encourage pilferage.

7. *The aid should provide for a test of learning progress.* The trainee should be able to recognize the actual article after seeing the aid and distinguish it from among several similar objects.

8. *The aid should be inexpensive, rugged, and safe.*

9. *The aid must be properly designed.* Glare must be controlled, height of mounting should be realistic, and all matters of set-up should be arranged properly before the presentation.

10. *The aid must have "appeal."* It must be attractive in color, movement, or form, but not at the expense of clarity and accuracy.

For example, the improper use of a bright color might direct the attention of the trainee away from significant parts.

Demonstration or Participation with Training Aids

It is frequently necessary to decide whether to demonstrate a training aid or to permit the trainee to work on the device in laboratory session. Both instructional methods have their advantages. Learning by doing is an excellent method as a rule, but frequently this is not justified in the light of the space and time available and the expense involved in such "laboratory" training. This section will deal with procedures for demonstration by the instructer and participation by the trainees where training is performed with aids, devices, or operational equipment.

The chart in Fig. VIII has been prepared to assist in evaluating the relative usefulness of training aids. In training, as in life, one must learn to be versatile and to use to the best advantage all available techniques. Laboratory participation and the demonstration of training aids are both highly effective teaching techniques. An instructor or trainer should understand how to utilize them under various circumstances. Once it has been decided *what* method to use, the next consideration is to learn *how* to implement it effectively.

The Training Aid Demonstration

Before conducting a demonstration with a training aid, an outline should be prepared of what will be said and of the materials to be used. The instructor should rehearse his demonstration. All of the equipment necessary should be checked for its operation beforehand. One risks the loss of interest and attention of the audience when a demonstration is interrupted to look for parts or repair a device.

Written material summarizing the concepts to be demonstrated can be distributed to the trainees to advantage before the demonstration. This helps in establishing the goal of the training. These handouts can be retained and used by the trainee in review of the demonstrated concepts or materials.

Rules for the Demonstration

The conduct of the demonstration can be reduced to a few simple rules which if followed will contribute materially to successful use of training aids in training.

FIG. VIII. DEMONSTRATION OR PARTICIPATION

When to Use a Demonstration

Demonstrations are instructional short cuts. Rather than trying to "put across" difficult ideas through straight lecturing, a trainer, by using demonstrations, can graphically illustrate what he is trying to explain. A study of the course outline will indicate many places where some new idea or principle might best be introduced. It is at these points that demonstrations should be included.

Which Demonstration to Use

What types of training aid and device, listed earlier, lend themselves to demonstration purposes? The answer to this question lies in the type of material being taught and its level of difficulty. Simple charts, diagrams, and scale models may be sufficient. On the other hand, to illustrate complex principles, cutaway models with movable parts may be called for. Also, actual equipment, which lends itself to demonstrations, may be necessary.

When to Use Laboratory Participation

If the trainee must have direct experience in doing something, e.g., learning a skill, then laboratory practice by the trainee is essential. More specifically, a laboratory set-up should be used when the training course requires: practice in manual skills; practice in construction or repair of equipment; a basis for the understanding of principles and laws, and their practical application; actual experience with the operation and maintenance of real equipment; and the development of favorable trainee attitudes toward the importance of doing careful and accurate work.

What Kind of Laboratory Participation to Use

The following factors should be taken into consideration when deciding which training aid or device to employ: the goals of the training problem (will the laboratory exercise really do what is required?); the availability of sufficient laboratory space; and the number of trainers. Careful supervision is necessary in a laboratory program.

1. *The demonstration should be kept simple.* The trainee should not be confused with detailed and unnecessary refinements. As an aid in simplification, the instructor might put the key points on a blackboard or chart.

2. *The aid should be placed where every trainee can see the demonstration.* A desirable procedure, frequently followed, is to have the trainees gather around the aid.

3. *Digressions from the main points of the demonstration should be avoided.* The instructor should follow his prepared outline. If a

trainee asks a question which is not pertinent, an answer should be postponed with an explanation that it will be provided at a more appropriate moment.

4. *The pace of the demonstration should be at the level of the trainees' ability to comprehend.* Continually checking for signs of inattention, lack of understanding, disagreement, or confusion is necessary to determine the pace that the instructor should follow.

5. *Constant summarizing of the various points will serve to clarify* and give the trainees time to note the important points. *At the end of the demonstration, the major points should be restated.* This will result in useful discussion, and it will help to weld the demonstration into a meaningful organization.

6. Following the demonstration, an informal examination of an objective nature, i.e., true-false, completion, multiple-choice, or matching items, may be given. The results of a test will help identify the points that failed to be understood. These, then, may be reviewed in further demonstration.

INSTRUCTION CHECK-OUT FOR THE DEMONSTRATION

To ascertain the effectiveness of the demonstration, a check-out procedure is recommended in which questions such as the following should be answered by the instructor:

1. Was the purpose of the demonstration clear?
2. Were the materials and equipment carefully selected, prepared, and arranged for presentation?
3. Were the generalizations and principles emphasized?
4. Was the speed of presentation too fast or too slow?
5. Were new technical terms introduced with a definition and written on the blackboard?
6. Was the trainee's reaction observed for cues as to the progress of learning?
7. Were questions permitted and answered to clarify understanding?
8. Was the demonstration tied in to previous learning?
9. Was the demonstration pointed toward future work?
10. Were the materials and equipment stored so as to be ready for future use?

In the event that the answers to one or more of these questions are

unfavorable, the instructor should consider carefully a course of action to remedy the deficiencies.

The Laboratory Exercise

Laboratory participation of trainees with training aids or operating equipment must be given careful planning in advance, perhaps more so than for the demonstration. Much that has been said about the demonstration applies to the laboratory exercise through use of training aids or equipment.

PREPARATION FOR LABORATORY EXERCISE

The following points should be considered when preparing for a laboratory session:

1. *The physical condition of the equipment should be checked* and the equipment should be laid out for use of the trainees.

2. *The trainee should be prepared for the laboratory exercise* by means of reading assignments and explanations. The assignments should include the plan for the exercise. Adequate explanation should be given to make certain that the trainee understands the objectives of the work.

The success of the laboratory exercise will depend in large measure upon its prepartion.

RULES FOR LABORATORY EXERCISE

The rules for supervising and assisting laboratory learning are not essentially different from those of the demonstration. If the instructor or trainer follows a few simple rules such as those given below, the training will progress in a meaningful manner.

1. *The trainer should keep in close contact with the progress of each trainee* in order to catch errors and prevent poor work habits before they get established.

2. He should *let the trainee do it*—just guide him. Trainees must learn to react to their own errors as errors, before they can really learn. They must develop for themselves the key points, the crucial feelings and movements which make for a good job performance.

3. It is helpful to *encourage the trainee* when it appears that he is confused. The trainee can try to find out where and why he is having difficulties. Some of the questions asked by one trainee may be bothering the others. Hence it may be desirable to introduce a

brief group discussion into the laboratory session to answer some of the problems with the whole group.

4. It is desirable to *permit cooperative work or discussion* among the trainees as long as this allows the individual to develop his own skills.

5. *Everyone should be at work.* Supervision is required to insure that the trainees do not waste their time through inactivity and "horseplay."

6. Good working habits can be established through *requiring the trainees to store their materials neatly and safely.*

7. *The work accomplished should be summarized* at the completion of each unit and at the completion of a segment of a course. The trainee should be allowed to question extensively at this time. The instructor can probe with questions to ascertain the degree of learning.

8. *A test* (performance, written, or both) *should be administered at the conclusion of various units of the course,* covering the principles involved. Supplementary assignments can be given to clarify points where examinations reveal understanding to be inadequate.

INSTRUCTION CHECK-OUT FOR LABORATORY EXERCISE

Essentially the same critical self-evaluation outlined earlier for the demonstration may be applied to determine the effectiveness of the laboratory sessions. Answers to these questions can be used by the instructor to improve his teaching.

Evaluation of Training Aids

Training aids and devices require evaluation to establish their practical effectiveness in a training program. The careful selection of aids to assist in accomplishing training goals and the instruction check-outs recommended above are all a part of the evaluation procedure for training aids. These forms of evaluation should be carried on as a part of the ordinary routine by instructors and trainers.

Too often a particular aid is adopted because it looks good or someone in authority thinks it will assist the trainee to learn, or the manufacturer had a good salesman who "sold" the training supervisor on its supposed value. It is easy to fall prey to exaggerated claims made for training equipment.

EVALUATION THROUGH RESEARCH

Even though a training aid seems to be doing a good job, *it is still necessary to find out if it is really effective. Periodic evaluation of all training devices through research is desirable.* As with good seafaring vessels which must be docked and have the barnacles scraped off their hulls, training aids must be adapted to changing training needs. They should be looked at with a fresh and unprejudiced point of view to determine whether they are really worth-while assistants in training.

Research men have the techniques for trouble-shooting the training aids and devices. These procedures will help to obtain the maximum benefits from their use. The underlying principles involved in such evaluation studies should be understood by all.

AN OUTLINE OF AN EVALUATION APPROACH

In a utilization study of a training device, different opinions will be systematically obtained to estimate the training value of the aid. *Three groups of individuals are used* to gather the necessary information for the evaluation: *the trainees* undergoing training, *the trainers* or instructors, and *the training experts* who observe the aid in actual operation. How does the aid shape up when viewed through these different sets of eyes? How does it look to the trainee; to the trainer who is attempting to put across a difficult point? Is the outside observer who sits in on the demonstrations or laboratory training satisfied that the aid is doing its job? *The integration of what is seen from the different points of view gives a picture of the effectiveness of the training aid*—its strengths, its weaknesses; and what is even more important, suggestions are received for improvement of the training aid and the manner of its use.

DEVELOPMENT OF NEW TRAINING AIDS

Through techniques similar to those just described, information can be secured to help to find out what new aids should be constructed to improve the training. For example, one company had a problem of training their cafeteria employees in the physiological concepts of nutrition. One of the goals was to teach the functions of the digestive system and about the harmful bacteria that might infect the body through the improper care, handling, and storage of food products. Through the use of methods similar to those described

above, it was concluded that slides, charts, and film strips might help the trainees understand these complex body processes. Charts were prepared showing the activity of bacteria. These aids proved valuable. What was a difficult session in training became, through the addition of training aids, a much easier and more pleasant one for both the trainee and the trainer. In the invention of new aids the principles of learning (see Chapter 5) should be reviewed. For example, a device might be designed to provide immediate knowledge of results or to minimize negative transfer.

Value of Training Aids

Training aids enrich and expand, clarify and develop, the training program. However, any aid should be selected carefully, whether it be a mechanical aid as discussed here or one of the methods of training described in the next chapter. The wrong aid or a poor method can do a great deal of harm to the program. *Each choice of aid or method should be judged as to its advantages and disadvantages in the training.*

All the different types of mechanical training aids which are at the disposal of a trainer or instructor should be considered in making a selection. When such an aid is selected, it should be used wisely. It is not a substitute for good instruction. Nor is any method or procedure.

Any method, procedure, or training aid should be evaluated periodically for training effectiveness. The full potentiality of training aids, methods, and devices can only be realized through a continuing and systematic procedure of appraisal of their value.

7. *Participation Methods*

THE training specialist faces one of his greatest challenges when he is called upon to plan the training of men who have "arrived" in a company. *Executives, managers, foremen, leadmen, and workers are alike in feeling little enthusiasm about the idea that they need training.* Even if they agree publicly that training for all is necessary and good, they do so with the mental reservation that they themselves do not need it. Particularly, this seems to be true at the higher levels. Something special is required to overcome this aversion to training by the mature person.

THE DEVELOPMENT OF THE MATURE PERSON

The men that companies are picking for management development programs have generally been working for some time. They have a common distaste for training, for going back to school as they think of it. *But they want to grow in company recognition,* in status generally, *and they are willing to work for this. They have the motivation to learn and they will learn how to be better foremen and supervisors if this motivation can be properly channeled.*

METHODS THAT WORK

In recent times industry has departed considerably from the traditional methods of education through classroom instruction. The reading of books, the listening to lectures, and the viewing of films and other training aids are not regarded as enough to accomplish the development of industrial personnel.

The trainee, whether manager or worker, wants to participate in his own training. *He wants to be involved in training situations which are practical and useful to him.* He does not want to be like a bottle into which information is poured. He wants to play a part in his own training. He wants to train himself.

People like to learn by doing. They like to take part in discussions. Being active in this manner releases blocked-up feelings which may have been created in the work situation under discussion in the training. This catharsis, as it is often called, reduces resistance to the training, acts as an urge to examine one's motives, and provides practice in new ways of response. *The more active an individual is in the training the more willing and able he is to change his behavior.*

The participation methods do not put a man on the spot. The trainee does not feel inadequate, for he sees others in the same boat. He can change his ways without feeling that he is crawling onto a frail limb by himself. The atmosphere is conducive to thinking out loud in a comfortable setting.

INITIATING PARTICIPATION METHODS

Training specialists have found that *participation methods of training are particularly effective wherever problems in human relations arise.* And most operating problems of supervisory and managerial jobs involve human relations. Thus the content of participation training, which is derived from an analysis of these jobs, concerns largely the working relations of people. Participation methods are the best solution arrived at by the training man today for the development of managerial and supervisory talent.

Educators have known for a long time through comparative studies that retention or *learning will increase with the degree of participation by the learner or trainee.* That is why the laboratory method is practiced so widely in science instruction in the universities. It is the reason training aids involving participation are so necessary in apprenticeship training. The techniques of participation, of getting the learner into motion, then, become the keystones for managerial and supervisory training. They are the building blocks of a successful program for the development of managerial personnel. They come under different labels, but all are based on the principle that to learn by doing is more effective where one must perform rather than just take in knowledge.

Classification of Participation methods

The methods of participation have a variety of names and connotations. The debate, symposium, conference, and panel are famil-

iar methods for securing participation in an attempt at the solution of numerous problems of society and industry. Newer group methods such as the "wild session" or "brain storming," where criticism and argument are prohibited, have the purpose of assembling ideas for later rational discussion. Committee participation is achieved by means of "Phillips 66" (in which groups of six people are formed from larger groups, and talk for six minutes), and the "risk technique" in the solution of problems. Methods of dramatizing a social situation by means of role playing, of demonstrating decision making through democratic action or by common consent, and the case method are widely used in managerial development programs.

DISCUSSION METHODS

Training is accomplished primarily through talking it over together in a variety of the participation methods. Such training is contrasted readily with the lecture method, in which the trainee is exposed to the content of the training, but is not necessarily active in its learning.

Discussion methods of some kind are the most widely used participation procedures. Variations occur, depending on the degree of emphasis on different aspects in the learning—for example, on the study of cases and on the making of decisions. Also, they occur in the degree of control exercised by the discussion leader.

1. *The Case Method.* An important variation of the discussion method of training is what has come to be known as the "case method." *The discussion starts in the case method with specific examples.* In other words, the situation for discussion is structured or has boundaries. *The discussion group deals with the problem without emphasizing generalities or principles, thereby seeking a specific solution. The discussion leader serves purely as a coordinator,* never guiding the group toward a solution. In fact, an acceptable solution to all participants may never result, and each individual may be left with his own solution. Thus the method is a contrast with a guided discussion which has the goal of arriving at a principle of action.

2. *Guided* vs. *Free Discussion.* The degree of control which the discussion leader exercises has been reflected in such terms given to specific methods as "democratic," "authoritarian," *"laissez-faire,"* "wild," "brain storming," "nondirective," "leaderless," etc. *These*

names are less important than the manner in which the control of the discussion is exercised by the discussion leader. If the leader has a necessary goal at which the discussion must finally arrive, such as some kind of action or solution, then guidance is exercised to follow as closely as possible a predetermined thread or pattern or outline in the discussion. If, at the other extreme, the purpose is to allow complete freedom to the group, even as individual members, in any solution or action, then the discussion leader is completely nondirective: he never commits himself to a solution, but keeps the discussion going until all are satisfied with their own solution. There are, of course, varying degrees of control that may be exercised by the discussion leader between these two extremes. These will be determined by the purpose of the training.

3. *Centered Discussion.* Depending on the focus of the discussion, different terms have been applied such as "member centered," "group centered," "problem centered," "decision centered," etc. This approach is seen in the application of such terms to the discussion as "problem solving," "decision making," "sensitivity training," and "creative imagination conferences." *These are, of course, ways of making the training goal or purpose acceptable to the trainees.*

Discussion in some form provides the method for much participation training in industry at all levels of responsibility and particularly among supervisory groups. Under such conditions training transfers readily to the work situation. The method of discussion requires adaptation to the managerial climate of a particular industry. The instructor or trainer, too, is called by various names for the same reason. He may be called a conference chairman, a discussion leader, or just the member who finds a room in which the group can meet.

REALITY PRACTICE

It calls for great ingenuity on the part of the specialist to create a feeling of reality in the training of supervisory and managerial personnel. He seeks to provide a sample of supervisory work for the training, that is, to use a method in managerial training comparable to a mechanical trainer, as discussed in the last chapter where an operation is actually carried on. The nearest approach is role playing or the dramatizing of managerial situations.

Role playing is a participation technique in which members of the group take the different roles of the people actually involved in a supervisory situation in which a problem arises. Later the merits of the practice are analyzed and discussed.

By repeated trials in role playing, the trainee gets practice in improving his behavior according to the standards set in the discussions of the training group. He tries out these new ways in meeting the supervisory problems of his job. As time goes on there are improvements in supervision resulting from changes in behavior afforded by this reality-oriented form of training.

Set-Up of Participation Training

The manner of the administration of participation training will contribute significantly to the success of the program. In this, the selection of training groups, the physical arrangements of the program, and the flexibility of the organization are important considerations.

SELECTION OF TRAINING GROUPS

Some of those who have been doing research on training have advocated *training groups made up of people who customarily work together.* This provides for a natural work climate in which the training applies directly to the interpersonal behavior of these people. There does not need to be a transfer from training to work if the situations discussed or roles played are taken directly from the work itself. Thus the problems of working together are solved for an operating group in the process of the training.

A training group may be set up along vertical lines, for example, including all in a certain line of responsibility from top manager to leadman. Thereby the various problems of downward and upward communications can be solved by discussion or role playing.

The horizontal grouping of managers, or foremen, or workers for training is the more common arrangement. This provides for considerable transfer of methods of work among different members of the group.

THE PHYSICAL SET-UP

A classroom or lecture hall should be avoided for training of the kind discussed here. A conference table can help to get people talk-

ing with each other. For the vertical group, representing a line of responsibility from leadman to top management, a round table, allowing no one to sit in a prestige position, is desirable. For role playing a raised platform can be used to advantage with the non-acting participants sitting around informally as in a stage rehearsal.

FLEXIBILITY OF ORGANIZATION

During any participation program *the set-up should provide for maximum flexibility in the use of methods of training.* The training specialist or leader may start by using a comparatively unguided discussion, with the purpose of establishing the needs of the group for training; and then he may drop into role playing of a critical situation. He may use a committee approach and then, as a case is established for discussion, draw upon the case method. Flexibility is particularly necessary in participation training.

The essential reason for this is that *the participation methods of training deal with feelings and attitudes primarily, not with facts and knowledge.* Despite the tendency in various books and articles to compare one method of participation training to another, to the advantage of one of them, there is probably nothing in this training that requires only one technique to the exclusion of all others. The training specialist will develop with experience a sensitivity to the appropriateness of a certain method, depending on the group and the stage of training. Like a baseball pitcher he needs to vary his delivery.

Discussion Methods in Detail

Getting people to talk things over in the hope that they will learn something is not a new idea. A number of different discussion procedures are being used by many companies today in their management development programs to induce changes in the attitudes and behavior of those who are responsible for the work of other people. These include methods known under such names as "conference method," "case method," "sensitivity training," "member-centered methods," "group-decision methods," "problem-solving conferences," and "vertical round-tables." They all have in common an emphasis upon the participation of the trainees in the discussion and verbal give-and-take.

THE ROLE OF THE LEADER

The training specialist is making a mistake if he decides that he will try a discussion method in order to get out of the responsibility of having to prepare for a lecture. If he thinks that he can just take it easy while the trainees do all the work, he had better forget about a discussion approach. *Participation methods in general are the most challenging of all training procedures.* The discussion leader can't "goof off" just because he isn't doing all the talking.

Even though he is taking up less actual time with his own comments *the discussion leader still is in the key spot,* and must be constantly alert and in control of the training period. This control is not of the disciplinary sort; it is much more difficult than that. *In a properly run discussion, the leader guides what the group is doing without making it appear forced. He must be sensitive to the ideas being expressed and to the feelings behind these ideas.* He must be able to start a discussion, get the major problems aired, summarize what has gone on, and impart a feeling of progress to the members of the group. In other words, *in a discussion group, the leader is not getting himself out of the situation; instead, he is getting everybody else into it.*

Discussion methods are not question-and-answer sessions. The discussion provides a chance to air the different aspects of a problem. Nobody can set down any magic words that will make every training session flow smoothly. But there are some approaches which will help to guide the discussion leader.

GETTING STARTED

A discussion leader can not just sit down and say "OK, start talking." *He has to prepare the ground that he wants to cover.* He must set the ball rolling. He may start by mentioning one of the principles which is the subject of his lesson plan. Assuming that the topic has to do with the ways of correcting a subordinate's mistakes, he might ask the group how they have seen people react when a supervisor corrects an error. Or, he might ask if the group can recall any situations in which this problem has occurred, and how the supervisors dealt with it. Then, he might ask them to think about how the supervisor feels in this kind of situation.

Whatever specific questions he uses, *the discussion leader aims at encouraging the participation of everyone.* He should see to it that

the discussion is not dominated by one or two members of the group. *He uses indirect suggestion.* He may say, "How do the rest of you feel about this? How about you, Bill?" addressing one of the more silent members.

ESTABLISHING THE ATMOSPHERE OF THE DISCUSSION

The atmosphere created in the discussion depends mostly on the attitude of the leader. He sets the tone. He must make it clear, in his manner as well as in his words, that *all are encouraged to air their feelings* as well as their ideas without fear of censure. By his attitude he must lead the members of the group to feel that their individual concerns are the same as those of others, that they are not alone in their anxieties about how to handle their work.

In guiding the discussion, *the leader must be sensitive to the feelings that are sometimes concealed behind the words used.* Some call this "listening with the third ear." If the leader suspects that some criticism of the way a supervisor handled a certain situation is hitting too close for comfort, he can soften the approach. He might say, "Well, why would the supervisor have acted this way? What might be bothering him?" Essentially, *the leader must see to it that the members of the group understand that they are not being criticized* but are being encouraged to see *why* certain sorts of behavior can occur. He is there to get full and honest discussions, in which everyone participates and from which everyone benefits.

KEEPING THE DISCUSSION ROLLING

It is up to the group leader to keep the discussion rolling. He must do something before it comes to a dead stop, after which it is almost impossible to gather momentum. We have all seen meetings or a social conversation brought to a stop by a vehement or hostile or thoughtless remark.

Such a conversation stopper once occurred when a chairman of a conference group was introducing the son of a famous person. He used the words, "You will never be as great a man as your father," and then he paused, realizing what he had said. A hush fell over the group. Recovering himself, he repeated, "You will never be as great a man as your father until you have a son as great as you are." There was a sigh of relief in the conference. Such blocks in

communications often occur in any discussion, though they may not be as extreme as this one.

The leader of a discussion group must be on the alert to pull anyone out of trouble. The leader wants a situation in which everyone expresses his feelings freely. This often leads to strong emotional stands by various members of the group. *Such individuals can not be allowed to lose face or get angry and pull out of the discussion.* The leader may help such a person out by saying something like, "Harry certainly makes a strong case for doing things that way," or, "That's a fine presentation of the way a lot of people feel on this subject." The discussion leader may then want to add a question, "Have any of the rest of you seen this same sort of occurrence?"

At other times, when the leader feels that the discussion is starting to bog down, he may say, "Suppose we summarize for a minute and see where we stand." *He should pull together the feelings and ideas expressed up to that point.* He then has an opportunity to ask if there is any part of the picture that has not been covered.

THE LEADER'S HARDEST JOB

The leader's hardest job is knowing when to keep quiet. One of the things a discussion leader has to learn, and usually through bitter experience, is when to shut up. This is difficult for all of us when we are in the position of a conference leader. We feel the necessity to justify what we are doing, to defend it.

The discussion leader's function is to raise questions, not to answer them. The chances are always good that if one person comes up with what seems to be a worthless notion, someone else will get around to exposing its weaknesses. That is one of the advantages of discussions, and of the democratic process. The leader must have patience and give the men a chance to learn by doing.

The fact that the leader does not do all the talking does not mean that he sits there like a dummy in a store window. He may bring in specific information he has prepared. He may discuss the principles which motivate people. He may tell how people learn. Presenting examples of personality clashes may help to keep the interest of the group.

TOSSING THE STATEMENT BACK

A group leader has to learn how to reflect people's feelings in order to encourage a further airing of views. Some of the principles

of nondirective counseling or interviewing are helpful here. One of these is to pick up what has just been said and repeat or reflect it back in question form: "You feel that . . .?" or "Then your view is that . . .?" or sometimes a question such as, "Could you [or can you] tell us more about that?" or "Can any of you think of some examples of this sort of situation?"

WATCHING FOR FEELINGS

It is difficult to *interpret the feelings behind the words,* but this is what a good leader does. This sensitivity will help him to pick out the clues to use in order to probe behind what the trainee says. If he thinks that a member of the group is disturbed by the discussion, he may say, "You felt annoyed when this happened?" Or, more generally, he may say, "Do people feel confused under these conditions?"

The leader needs to develop a variety of ways of not committing himself but, at the same time, of stimulating discussion. He uses such questions as: "What might occur under these conditions?" "What are some other possibilities?" "How might people react to doing that?" "What are some of the problems involved?" "What are some of the advantages or disadvantages of this method?" "Where would this lead us?" "Can you think of examples of this?" "Has any of you seen this sort of situation?"

These questions may be preceded by some comment showing acceptance of the worth of the feelings or viewpoint that has just been presented. Even if the leader does not think that the idea is good, it is best to have its weaknesses exposed in the course of the discussion by others, rather than by himself.

He may be thinking, "I've heard some goofy ideas in my time, but this takes the cake." But he will say, "That's an interesting view, let's add it to our list." *Nobody likes to feel that his idea is worthless. The atmosphere which the leader sets up will determine the extent to which people will feel free to speak,* even if they are not sure of what they are saying.

LISTING THE PRO'S AND CON'S

The leader of a discussion encourages the weighing of the pro's and con's of ways to handle problems. He may make use of a blackboard to do this, writing down the ideas as they are brought up. He

might say, "Let's see, what would be the advantages of this?" Or, "What risks are there in using this approach?"

The emphasis upon listing or stating risks has been shown in some studies to *give people a chance to air their fears.* This may be particularly helpful where the leader realizes that the men may be reluctant to show their fears in trying out a new method. By verbalizing their concerns, they will benefit much more than by keeping them bottled up. Hearing that other people in the group have some of the same worries also allows a person to feel more comfortable in acknowledging his problems, difficulties, or inadequacies.

ALLOWING CRITICISM

The members of the group must feel free to express what is on their minds; this is particularly so if they feel critical of their training program. The leader himself may initiate a discussion of the training to help the group members air their own feelings. He may say that no form of training is without its disadvantages, and that all programs have certain limitations. By then asking for reactions, he makes it clear that he does not consider the program above criticism. Thereby he should learn what problems need greater emphasis, from the group's point of view, and what ideas do not seem to be getting across.

This is where the leader needs to wear a check-rein on his tongue. He should not defend the program. *The criticisms may in themselves be less important to the trainees than the expression of them.* They are likely to be an opening wedge into further participation. Fifty minutes of griping may lead to a profitable ten minutes of purposeful discussion. At any rate the discussion leader will learn how the group feels. He should express an interest in the members' views if he wants to ride through such breakers into the calm sailing necessary in discussion training.

VARIATIONS IN CONTROL OVER THE DISCUSSION

An atmosphere that is free, in which each person can openly express his feelings, is conducive to attitude changes. But while still maintaining a free atmosphere, *there are variations in the degree of control or guidance which a leader exercises over the discussion.*

1. *The Free Discussion.* In the completely free discussion, a leader

attempts to *get the group members to respond to one another;* his contribution is to get as much of an interchange as possible.

2. *The Guided Discussion.* A greater degree of control over the direction of the discussion occurs in what has been variously called the "guided," "directed," or "developmental" discussion. The leader presents more specific problems, cases, or questions, he plays a more active role in the discussion, leading it into consideration of various aspects of the topics of the meeting. *Leading does not mean shoving.* The leader does not try to get discussion to move at a pace that is too fast for the group. Rather, *he moves the group along by the directions that his questions take*—e.g., "What might this method do to production?"—or by summarizing periodically—e.g., "Well, let's see where we stand."

The leader does not restrict himself to an either-or approach in controlling the discussion. He can change the extent to which it is free or guided as the group varies in its apparent need to express feelings thoroughly, or as it seems advisable to move along to consider new ideas.

One way in which a leader guides the discussion is through his initial presentation of the material. He may, for instance, present the results of various psychological studies showing the way in which new supervisory techniques operate. Or he may present a specific problem, e.g., how to handle the abuse of the time allowed for the coffee break. Or he may ask the group what specific supervision problems they have run into recently.

A certain amount of straying from the major topic is inevitable. Sometimes it proves helpful in bringing new ideas into a different context. Sometimes irrelevant discussion can serve as a breather, when everyone lets up for a while before tackling the topic again.

A leader never directly acts as a judge, ruling out evidence as immaterial or irrelevant. But, when he feels that the discussion is wandering too far afield, or is apparently unable to get back on the track, he may say something like the following: "These ideas are interesting to all of us; possibly we can talk some more about them at a later meeting. But right now, how do you feel about the problem we were discussing?" *The words he uses are important, but even more important is the way that he says them.* If he shows impatience, or if his manner implies to the listener that the temporary digression was foolish or worthless, then he will have injured the

pride of the wanderers. The freedom of further discussion will suffer if he ignores the fact that what is said is important to the persons saying it.

THE CASE METHOD

"Let's get down to cases" is a statement that we have all heard or used when someone is being too abstract in a discussion. The case method is a training approach in which the group gets down to cases. *These cases are specific situations gathered from and based on real occurrences.* Cases may be assembled from the personnel and grievance files. Various source books mentioned in the Reading List at the end of this book provide excellent material for use in the case method.

Unlike other discussion techniques, *the case method does not seek to develop or spell out principles.* As used by those who are among its strongest advocates, the discussion leader seeks to have the group analyze each case by discussing thoroughly the attitudes and behavior of the people involved.

The leader may present a specific example of some supervisory problem, e.g., the way in which a supervisor dealt with a capable employee found taking home samples of material from the stockroom. He might then ask if the situation was handled properly, how else it might have been done, what the reactions might be of each person, what the consequences of different approaches might be, and what factors play a part in the approach used.

Cases provide a realistic setting in which the complexity of human relations is seen. The members of the group view each case from all angles. Since the supervisor, when he actually is on the job, is going to have to deal with specific problems, the case method presents an opportunity to practice in discussion just how and what would be done. By conducting the discussions so as to cause the members of the group to question and to explore the situation thoroughly, they are encouraged to find out how they would react and what the consequences of their actions might be.

As with the other discussion methods, *the emphasis is on the feelings, attitudes, and reactions of people, not just on the facts.* While the leader does not seek to have the group spell out principles, the variety of situations used allows the trainee considerable practice in thinking through different problems.

In using the case method, the group leader will probably find that the members of the group, because of questioning each other and reacting to each other's ideas and personalities, may reach a stage of considerable uncertainty concerning their ability to handle supervisory situations adequately and appropriately. The trainee is helped to learn, through this procedure, that *there are no ready-made or pat answers to human relations problems.* In this period of transition the trainee gets new perceptions. He learns the intricacies of any situation. He becomes aware of all sides of a question. These new habits of approach can then be tried outside of the training set-up.

The trainee has had practice by use of the case method in seeing what can happen if other people's views, feelings, and attitudes are not considered. When he is on the job, he is more likely to solve new problems by using his new habits. During the training period he gains confidence in his ability to handle problems. In the discussions of cases, he gets to see quite clearly that there is no one correct answer to every problem. While this may disturb him for a while, *he will gain in confidence that he can handle problems, not because he has the answers, but because he knows how to look at the problems,* to be keenly aware of the possible reactions of others.

SPECIFIC AIDS TO DISCUSSIONS

A blackboard, or a large drawing pad on an easel, should generally be available in the room used for the training meetings. To get people to contribute their ideas, the leader may wish to post or list the problems which the members feel are important. Mimeographed or printed material also may be useful aids to the discussion. The leader may wish to bring in a case or a problem in printed form. The discussion may then be oriented around this.

Other training aids such as films may serve in the initiation of a discussion. A film is seldom shown unless a discussion can be held about it. Otherwise, the value of participation can easily be lost.

A GLANCE BACKWARD

Discussion methods are generally regarded as excellent ways to stimulate training among managerial and supervisory personnel. It is usual for trainees to participate actively in the solution of problems by this method. The atmosphere of the training resembles the usual

business conference, without any of the schoolroom odor, and is accepted as practical and worth while by participants.

From the standpoint of the training specialist, *these methods reduce the resistance to training* among managerial and supervisory personnel so that training at this level is highly feasible. *The trainee finds that he is one of many, with problems like the other fellow.* He finds that he enjoys getting together with men like himself to swap experiences and borrow from where he may to help him in his work.

Reality Practice in Detail

"Easier said than done." "Practice what you preach." Both of these familiar phrases apply to the difficulty of doing an effective job as compared to talking about it.

The method of training that really gets everybody into the act is called "role playing" or "reality practice," or "experience practice." In a discussion, the leader might ask a man how he would handle a given situation. *In role playing, several members of the group try their hand at acting out the situation.*

Role playing, then, is a participation method that gives those being trained a chance actually to practice the skills of dealing with people in the real situation. It is not a substitute for the discussion method; nor is role playing used in place of discussions. But role playing serves the dual purpose of giving practice in managerial and supervisory skills and in providing specific materials on which discussions can be made profitable.

Role playing provides the chance to try out new or different ways of dealing with people, without the usual risks involved on the job itself if the method fails. If the idea of role playing is presented as an opportunity to learn without the hazards of actions taken on the job, the manager or supervisor taking part in the training will appreciate that this is not just a way of being amused but *a way of rehearsing important behavior.*

This does not mean that the situations practiced will be exactly the same as those that the executive will face in his dealings on the job. *The emphasis on the job in role playing is not solely on the specific handling of the problem being practiced but on the how's and the why's of job-related behavior.* How he asks others to do things, listens and senses the feelings of others, gauges when and

when not to try to put across his own points, are skills that can be learned through role playing and will transfer to other situations.

The analysis of role playing offers an additional advantage. It can help the individual to become more aware of the reasons for his own feelings in relation to others. He has to reflect in role playing on why he acted as he did; he has others pointing out how his actions looked to them, and he can compare this with what he meant to convey. *Thus, there is a chance to get to know oneself better in role playing.* In doing this, he, the supervisor or manager, becomes more aware of what effect he has on others. Role playing acts as a mirror for one's own actions. Self-understanding and the understanding of others then go hand in hand.

INTRODUCING THE IDEA OF ROLE PLAYING

In introducing the idea of role playing, the training specialist may want to indicate that *this form of reality practice is like the laboratory part of a science course.* He might say that in chemistry, for instance, the results of combining one chemical with another under certain conditions is discussed, and then the student tries his hand at it in the "lab" and controls the reactions for himself. In a management development course, the trainee may discuss certain human relations principles. Then, *under controlled conditions, he can try out different sorts of behavior and see what the effects are.*

The training specialist should not introduce role playing as a form of a skit or a play. This is the wrong connotation. The trainee learns by going through the motions that he will use later, just as we do in operating a machine or driving a car. *It is the same as being helped over difficulties in performing any skill by some previous practice.* It is not playing for fun; it is practicing for results. As with the case method, the leader for the role playing session is prepared with a situation in which there is a problem for the role players to solve.

A TYPICAL SCENE

Let us suppose that the leader selected a scene which concerns a man who is relatively new in a supervisor's job. This young man is trying to get an older employee with much seniority to obey a company rule. It seems that the older worker is always coming in late. A member of the group is chosen to play each part, and the one

playing the part of the young supervisor is sent out of the room. The one playing the part of the older worker is then given the agreed-upon facts in the situation, such as company policy and procedure, and his length of service. Then he also is provided with information on the viewpoint, background, and attitudes of the role he is to play. Then he goes out of the room, and the man who will play the supervisor's role is brought in. In addition to the facts common to the situation, he is given other information which might influence the supervisor's point of view and attitudes. With the rest of the group observing, the two then act out the situation in which the supervisor talks to the older employee about observing the rule. Each man makes up his part of the dialogue without previous preparation beyond the briefing about his role which he has been given.

STARTING THE SCENE

When role playing is used for the first time with a group, there may be few who will volunteer to take the roles. The leader may ask certain persons ahead of time if they would mind volunteering. He must be careful in his selection of people to play roles, choosing ones at first who will give at least an average performance. This is desirable in order to have a sound basis for discussion. The leader should avoid pushing anyone into role playing. *But he must see to it that all members of the group have had some practice in playing a role by the end of the session.*

ANALYZING THE SCENE

When the scene has ended, *the observers and the actors discuss what occurred.* A recording of the scene may be played to refresh memories. Each actor may indicate what he had in mind when he said what he did. The opposite actor may tell how it looked to him. Those who observed both of the participants saw what each person's behavior brought out from the other. This is the basis of the analysis. Since the primary goal will be to influence those who will be in the supervisor's role in real life, *the emphasis of the discussions will concern primarily what the supervisor said, and how he said it.*

Suppose the scene ended in an unsatisfactory way, e.g., with the older employee getting stubborn and being unwilling to consider obeying the rule. This could easily occur if the supervisor was not sensitive to how the employee felt, or if he had ignored the employ-

ee's needs in the situation. The same actors, or two different persons, can be asked to repeat the scene using the information from the analysis to improve the performance. The supervisor may attempt to understand the employee's views more, rather than stressing the rule. The difference in outcome of the scene when those playing the roles approach the problem differently then becomes apparent.

While role playing may seem a little artificial to the group at first, they will usually get into the spirit of it; at times, the actors may get quite worked up, identifying with the parts they are playing. They will be likely to respond in terms of how they would actually feel if they were spoken to in the way that occurred in the situation.

The group will get a chance to see how the outcome of a situation can change if the behavior of the supervisor changes. A playback of a recording of the scene is helpful in this. They have an opportunity to see how their own actions and statements are interpreted by others. The fact that they can go over the scene again means that they can try out other ways of handling the situation, an action which takes into account their new perceptions gained from other persons' views.

THE OBSERVERS

The observers are not just passive spectators. They are prepared to note how each person's behavior has affected the other, and how the outsider's greater potential objectivity gets lost if the person takes a role and defends a given point of view. Those who are observers at one point are actors later, doing the role playing for other situations. They may even reenact the same scene that they have just observed to indicate how they would improve it. *The leader tries to get the group to emphasize why the individuals acted as they did, and to be aware of the effects of their ways of dealing with people.*

Even if it is only practice, the members of a role playing scene are concerned with the effects of their behavior. And, for those who are observers at the moment, with the task of keeping track of what effects result from specific approaches, there is intense concern with what goes on. The situations are of the sort which might be encountered in managerial and supervisory tasks of dealing with others; the members of the group know that the scenes tie in with

their daily job problems. Nobody falls asleep when role playing is going on.

LEARNING "TWO PARTS" AT ONCE

When role playing, a person is first, learning to acquire new and comfortable responses and, second, learning to develop a sensitivity to what the other person is doing, saying, and feeling. He learns how to listen and to understand the attitudes and feelings behind the words. In role playing, practice in listening, and in hearing what is behind the words, is as important as learning how to say your "own part." It is all part of the picture of *learning how to see the gap between your own and someone else's picture of the same situation,* of learning that "there's more than meets the eye" to human behavior.

In this process of role playing it is often possible for the participants to develop some insight into the "feeling" words which he himself often uses. For example one supervisor found that he was always saying "that's silly," without being aware of how his men reacted to this statement. During the analysis of a role playing session, this was called to his attention and he stopped using such inflammatory or emotionally charged statements. He developed insight into how his words were affecting the feelings of the people he supervised.

Just learning to listen to the words used by others is often an improvement. How many times do we all just wait without listening for someone to stop talking, so that we can have our say. We *do not hear what they have said, because we are so anxious to get our own words in.* Our words may be the wrong words if we have paid no attention to what it was that the other person said, and to the needs and feelings behind his words. In the analysis which follows the role playing scene, the actors have pointed out to them how they were ignoring the listening part by being too ready to talk. We may all like to hear ourselves talk, but that does not please others.

VARIATIONS IN ROLE PLAYING TECHNIQUE

It is possible to let the group make up situations to be played if it has already had some practice with prepared material. It is generally thought best for the group to avoid taking actual events which have occurred in their work. Otherwise, the members contributing the

events may feel that they must defend their original behavior. When the situations are being created, those who will play the roles should be out of the room. The rest of the group can establish an incident where there are legitimate differences of opinion about what is good practice and where there are different perceptions and motives of the people to be played.

It is possible to set up a situation in such a way that the actor must deliberately play a part and react differently from the way he usually does. Let us assume that a supervisor is asked to play the role of a new employee on his first day on the job. His boss thinks the new man is "pestering him with a lot of foolish questions." In playing the role, the supervisor gets insights into the fears of the man just starting out. Perhaps he recalls his own anxieties when he first started his present job; perhaps he was afraid to make any mistakes and did not know if it was worse to ask questions or to remain silent. After the role playing situation has been analyzed, the same man can then take the other role, that of the supervisor who has to deal with the new employee. From having played the employee's part the supervisor is now likely to be more sensitive to the needs of the other person. *The reversing of roles provides a useful technique for requiring a person not to "be himself."* Another way is to provide a sufficient number of details concerning the role: the background of the individual, how he has behaved before, what his goals are. The role must then be played within this framework.

SIZE OF ROLE PLAYING GROUP

The optimum or most efficient size of a role playing group may be anywhere from two or three persons to ten or fifteen. It is desirable to have an audience for the role playing, but the size of a group should not be larger than the number who are able to identify with the players or can serve as critics of the scene. For groups of ten to fifteen it seems desirable to divide the group, part participating in the scene and the remainder identifying themselves with the players, that is, thinking what they would say or do under each change in the situation.

For exceptionally large groups, various techniques have been used to obtain participation. *The simplest method is for the scene to be enacted before the group by a few selected role players, and after the players have discussed their problems, to ask the audience to*

comment. Another approach to increase participation is similar to that which is used with the discussion method. The problem is presented to the large group, after which *the group is broken up into several small units.* These small units then follow the usual role playing procedure, either going to other rooms or to parts of a large hall in which they may be meeting. Later, all of the small units assemble for a general discussion of the problem. Each unit may make a separate report of its own analysis.

Another approach, which has been reported as successful with very large groups, is to *ask all members of the group to imagine themselves as participating* as employees in a problem scene of relations between a supervisor and a worker. This might be a problem of faulty communications. The facts as the employee sees them are clearly presented by the leader, after which each member of the group fills out a multiple-choice questionnaire, where various possibilities of response for both employee and supervisor are listed to be checked for preference. This questionnaire is now put to one side for later reference. Then, the leader adds the information of the other side, that is, how the supervisor understands the situation and feels about it. The members of the group are asked to identify themselves with the supervisor and to fill out another copy of the same questionnaire. (A variation is to have them continue in their role as employees in doing this.) After completing the questionnaire twice, differences in responses between the two occasions can be tabulated, showing the change taking place as new and different information is added.

The total group, as above, can be separated into halves, with one half of the group receiving the information from the employee's point of view and the other half receiving the information from the supervisor's point of view. Comparisons of questionnaire responses, then, are made between the halved groups to illustrate how the differences in understanding of the problem cause differences in responses. A similar enlightening comparison can be made by giving to half of the group only the factual information about the scene and to the other half only the personal problems involved in the situation. Those receiving the factual information would hear all about the number of memos received, their delays, the dates materials left the production unit, when tools were unavailable, and so on. Those receiving information of personal problems would be told

why a certain supervisor can not get along with his employees, or why a certain employee can not get along with his supervisor, and about home problems, fears of discharge, etc. *A lively and profitable discussion can result from the different answers to a questionnaire made out by people having different information of this kind.*

Any participation method is more cumbersome with large than with small groups. Nevertheless it is desirable to give trainees in large groups an opportunity to understand other people's viewpoints by pretending that they are playing the parts of other people in different industrial scenes. Discussion which follows such attempts at this identification or imaginative participation is always profitable. *Whereas the large group techniques may not give as much participation as role playing in small groups, it does get the trainee to be more active and aware,* from having put himself in the situation of others, and through analysis of the feelings which others have.

TYPES OF SITUATIONS

Many different kinds of industrial situations can be used for role playing. *The specific content of a situation should provide for legitimate differences of opinion. The goal of practice is to work out one's own best responses.* It is not to conform to any particular rules of conduct, or to establish a fault or determine who is to blame.

Any of the many sorts of problems handled by a manager or supervisor can make up a good role playing scene. For instance, the introduction of new work methods to employees; handling of grievances; scheduling of overtime work during a rush period; the evaluation of an employee's work; timing the "coffee break"; firing or transferring an employee; deciding on interdepartmental responsibility; presenting an employee's problem to higher management; bringing new people into well-established groups—these are but a few of the situations used in this form of participation training.

Common Elements of Participation Training

All participation methods of training have certain common elements. Individual techniques have their adherents, naturally. This is due to the fact that almost everything done in training must be adapted to local conditions. But the common elements of the different participation methods are largely responsible for their successful use.

WHAT PARTICIPATION TRAINING DOES

The three purposes stated below are what any participation training must accomplish to be successful.

1. All such methods or procedures have for their purpose *getting the trainee to become active in self-training.* The trainee is encouraged to talk, to discuss with others, and to take actions related to others. Thus, *the leader's primary task,* according to this goal, *is to get everyone in the training group involved in the training.*

2. *Participation methods have a common goal of achieving in the trainees an awareness and understanding of other people, their feelings, their attitudes, and their behavior.* This is done through observing, listening, and interpreting what other people are thinking and doing in the training. The task of the leader in this is so to arrange the training that these understandings come naturally and do not affect individual status.

3. *The third common goal of all participation methods is to create a proper climate for self-training,* through emphasis upon freedom of discussion and action. *It is the leader's task to establish and maintain a permissive atmosphere.* Whether it is a case discussion, a role playing scene, a list of the risks for a change in supervision, or any other specific training item, *the leader is there to help the group members to make their own discoveries through the development of their own sensitivities, awareness, and habits of approaching the problem.*

SUCCESSFUL USE OF PARTICIPATION METHODS

When participation accomplishes these purposes, it trains. *But no participation method is a cure-all.* Any one who expects good training from the use of a participation method without proper leadership and administration is doomed to disappointment. We will get into these problems in the next chapter.

The trainees are definitely a part of this picture. What they bring into the session spells success or failure for the training. *Training has to be adapted to the level of potential for development of the trainees.* They may be unready for participation training, as discussed here; they may be bewildered by it, or then again they may be ripe to enter into this form of self-development.

Successful participation training is not automatic. There are times of enthusiasm and there are times of disappointment for the

leader. Progress may appear slow or at a standstill. But all learning is uneven, and progress may just appear to be stalled. Then, learning through participation training is hard to evaluate. The leader requires a great deal of patience, perseverance, and stability of character, and faith in the three purposes listed above. With these as his tools for leadership he should accomplish much in participation training.

8. *Administration of the Training Program*

TRAINING is an operation to be organized and administered in a manner similar to other operations. Those in charge of training are concerned with problems similar to those of other supervisors. What will be done; who is supposed to do it; when should it be done; how much and how well should it be done? These are common problems of all supervision. In addition to these, records must be kept and budgets and reports prepared, as in other supervisory jobs. The job of the director of training has common elements with all managerial work.

Just as the production department needs to know what products it has to supply and what the quality and quantity of the production must be, so those in charge of training must know the needs for training in similar terms of quality and quantity. Establishing the areas of needed training is followed by an analysis of the jobs in these areas, which provides the content for job training outlines. With job standard tests, based on this content, worker skills can be appraised, thereby indicating individual worker needs for training. Worker needs for training are assembled in the form of individual trainee outlines, a sample of which was illustrated earlier, and on which a record of employee development is maintained. *This study of job needs for training, with which is coordinated the employee needs for training, provides the basis upon which any program of training should be organized.*

A continuous program of orientation into changing operations might be organized to fill indicated needs for training; or one in pre-job or vestibule training for preparation of trainees to go on the job; or one in on-the-job training with, perhaps, job-site units to fill in specific technical needs; or one for leadership and human

relations activities among managerial and supervisory personnel, and so on. *What is said here about the administration of training programs applies to all such programs, although illustrations will be taken chiefly from managerial and supervisory training.*

Setting Up a Training Program

The syllabus is the master plan of what will be included in a training program. A syllabus is worked out in detail from job training outlines, perhaps combining parts of various outlines according to the needs of individuals for training (see Chapter 3).

The goal in the preparation of the syllabus for a training program is to fill the needs for training in the area in which the program is established. *Once the content of the training is outlined, the methods of training, the necessary facilities, and the scheduling of individuals or groups of trainees can be determined. All of this is included in the syllabus.* Measures of training progress must be added to the lesson plans. The kind of records to be kept and reports to be made should be designated. Thus, the syllabus provides the over-all direction or, looked at from the viewpoint of a supervisor, the blueprint and specifications of the training program.

PREPARATION OF THE SYLLABUS

The syllabus should state the outcome desired for the training program, outline what is to be included as the content of training, and tell how the training shall be accomplished.

The syllabus is often separated into a trainer and a trainee syllabus. It may be broken up into stages or courses of training. Each stage or course will include lesson plans which provide the specific material to be covered during each period of learning.

A syllabus will always include certain general items, an outline of which follows:

1. A statement is made of *the objectives of the program,* including relation of the program to other company training programs: for example, the coordination of the supervisory training program and the job training program. This statement should base the program on the needs for training. *It should be as specific as possible,* indicating what the trainee should know, what habits he should form, what attitudes he should acquire, what skills he should master, and what kinds of problems he should be able to solve.

2. A statement is made of *the standards of accomplishment:* for example, what a supervisor should know or be able to do at the conclusion of a supervisory training program and how well he should know the material or be able to perform the operations required of him. The general nature of the final examination and the kind and approximate time for other examinations covering more than one lesson should be specified. The statement should indicate specifically what rules, formulae, etc., should be memorized for exact reproduction, with what certainty habits should function, and to what degree of efficiency the major skills should be learned.

3. A statement is made of *the over-all time allotment of the program,* indicating the time allocated to stages of the training or lessons of the program. Included would be the hours for lectures, demonstration, practice, and outside study. This should be based on an analysis of the relative importance of the various training materials, of the background of the trainees as indicated by prerequisite and related training, and of the difficulty and complexity of the materials for training.

4. A list is included of *the lessons or the training steps to be covered* in the program. This should be organized in terms of some logical breakdown of the materials into training stages and lessons, topics, and problems. A program outline for supervisory training is shown in Fig. IX as an illustration of the training stages and lesson topics to be included in such an outline.

5. There should be a statement in the syllabus of *the basic text material to be used in the program, its purpose, and the outcome desired from its reading.* Appropriate assignments should be made according to the outline of lessons for the program. *A bibliography of all useful and available reference books and articles* should be added, with page references for each of the lessons designated in the outline. Each of these references should be followed by a brief note indicating what is covered as it relates to the purpose of the lesson for which it is assigned.

6. A list should be included of *useful and available training aids,* for example, films, film strips, slides, and demonstration models. These should be *classified for use in the various stages and lessons of the program.* The library, file, or storeroom in which each item is stored should be indicated in this listing so that these materials can be made accessible as needed.

All of the above items in the syllabus are preliminary to preparation of the lesson plans for instruction in the training program.

FIG. IX. AN EXAMPLE OF A PROGRAM OUTLINE FOR SUPERVISORY TRAINING

Stage 1. *Supervisory Know-How*
Lesson
1.0 Introduction
1.1 Skill in Mental Work
1.2 Knowing Materials and Equipment
1.3 Work and Shop Organization
1.4 Effective Work Methods and Work-Place Layout
1.5 The Shop Committee
1.6 Understanding Worker Incentives
1.7 Training Problem

Stage 2. *Direct Responsibilities of the Supervisor*
Lesson
2.0 Introduction
2.1 Training Procedures and Tools
2.2 Job Training
2.3 Maintaining Open Communications
2.4 Maintaining a Safe Shop
2.5 Setting up Work Controls
2.6 Setting up Cost Controls
2.7 Handling Personnel Problems

Stage 3. *Cooperative Responsibilities of the Supervisor*
Lesson
3.0 Introduction
3.1 Dealing with Workers as Individuals
3.2 Personnel Coordination
3.3 Coordination with Off-the-Job Training
3.4 The Employee Development Program
3.5 Voluntary Training Program
3.6 Activities of Employee Relations
3.7 Maintaining Morale

Stage 4. *The Supervisor as Manager*
Lesson
4.0 Introduction
4.1 Worker Attitudes
4.2 Scientific Management and Industrial Organization
4.3 Understanding and Explaining Policy
4.4 Delegating Work
4.5 Using Staff Specialists
4.6 Office Organization and Reporting
4.7 The Trainer

THE LESSON PLAN

Lesson plans are developed to provide training for the accomplishment of the steps of a job training outline. Lessons are organized according to the emphasis to be placed on any step, that is, the degree of the skills required, or the time required to learn the skills. Parts of different steps of a job training outline may be combined into courses to be taught in a classroom, as is done in the teaching of blueprints for various steps of a job breakdown; or the simpler tasks may be combined into lessons for the training of helpers on the job.

The lesson plan outlines the specific activities to be undertaken during a particular period of work. Its preparation must take into account such matters as the scheduling of study and practice periods, variation in background of the trainees who are to be grouped according to prior training, availability of instruction materials and training aids, the size of training areas and classrooms, and a host of local conditions affecting the training. *For each lesson, specific objectives are defined; estimated time allotments for topics are indicated; and standards are prescribed for the areas to be covered.* The lesson plan specifies the methods of instruction and of evaluation of trainee progress.

Inexperienced instructors and trainers can increase the effectiveness of their work by outlining fairly completely everything that will be a part of the lesson, including illustrative stories, suggestions and hints of ways to apply the training, descriptions of set-up and operation of training aids, references to readings, questions to ask in order to stimulate discussion, and the ways in which the lesson is to be presented to the group of trainees.

Each lesson plan should have a quiz or test. An instructor can use such a test as a standard of performance for the lesson, to provide the questions either for discussion or for correction after the test has been administered to the trainee group. Even minor quizzes should be written out in advance.

If the lesson plan is well organized, the instructor should have no difficulty in progressing through a series of steps toward an objective which has been defined as the purpose of the lesson. A form for preparation of the lesson plan, in which information necessary to the lesson is indicated, is shown in Fig. X.

It will be noted on this form that *the lesson plan is organized according to a definite pattern: the introduction, the body, and the summary.* The introduction consists of an over-view of the lesson. This over-view has the following aims:

1. To acquaint the trainee with the objectives of the lesson.
2. To place the lesson in its proper setting in relation to the other lessons.
3. To "sell" the lesson as worthy of study.
4. To present the outline of the material to be covered in the lesson, emphasizing in advance the principles and key points to be covered; and to indicate the methods by which mastery is to be attained.
5. To announce the assignments for study and the reasons for them; to specify standards of knowledge and proficiency; and to indicate the testing and check-out procedure to be employed.

Over-views are usually presented by the lecture method, but the information concerning objectives, assignments, outline of material to be covered, and the standards of attainment should be duplicated and distributed to the trainees.

The body or major portion of each lesson should be planned, first, to present a stimulating exploration of the new material. This should link what has occurred in previous lessons, or what the trainees already know, with what will be given. The exploration of the material ordinarily starts with a discussion based on the over-view and on the instructor's remarks concerning the relations between the lessons. It aims to prepare the trainees for the new materials and to relate the new to what they already know. In order to find out what the trainee knows at the start, providing this has not been accomplished in grouping them, it is desirable to use tests of prerequisite material for the lesson. These may parallel forms of previous lesson-end tests.

The development concerns the learning of the new material. *The way in which the new material will be presented must be predetermined.* The details of lecture, explanation, discussion, recitation, demonstration, instructional films, etc. are prepared in advance. The trainees should have been informed to read or study the basic test materials or collateral readings. Special attention should be given at this point in the lesson to technical terms, rules, formulae, etc.

The summary of the lesson should include some method for deter-

FIG. X. LESSON PLAN

Phase of Training *Lesson Title*

Objective (outcome):

Scope of lesson:

References (or handouts):

Training aids or devices:

Outline of Lesson

Introduction—Body—Summary	*Method of Presentation*
I. Introduction: over-view (including objectives and outcomes)	
II. Body: exploration and development	
III. Summary: evaluation and review	

mining the extent to which the training is being absorbed. Evaluation of progress may be employed whenever it is feasible, either during the development or as part of the summary. Care should be taken to avoid making the recitation an evaluation session. Evaluation may be accomplished by giving a test after the development has been completed, or the instructor may close his development with a review in preparation for a test.

An effective summary may consist of a discussion based on test papers corrected in the classroom. This procedure results in longer retention. *Placing the summary after the test drives home the point that the purpose of learning is not merely to pass a test.* Then, the instructor can base his review or summary on those test questions missed by a considerable number of the trainees. Finally, *the sum-*

mary should relate the present lesson to future lessons, and particularly to the next lesson to be covered.

Scheduling Training

The scheduling of the training, the assignment of hours, the provision of the necessary equipment, the maintenance of proper records, the housing of classrooms, and the provision of space for job-site training all affect the success of a program. The method of payment and seniority credit for time spent in training will determine the attitude of trainees. *Neglect of such details can result in failure of an otherwise excellent training program.*

SCHEDULING ACCORDING TO NEEDS

Trainees are assembled in groups according to the needs indicated for their training as shown on their individual records. Such a procedure, of course, presupposes that a training program is available to provide for these needs, including the proper content. A training program, or stage of a program, might be established in clerical, mechanical, or supervisory techniques to develop individual skills, or these needs might be met by courses in a basic subject such as mathematics. The training might be provided in a course in which the trainees volunteer for training on their own time; or it might be provided in a required course, given on company time, either off the job or on the job. Necessarily, any program must have a syllabus with lesson plans, facilities, and trained instructors before it can begin.

A new employee on any job might be scheduled in orientation training to acquaint him with the plant and its facilities. This training might be full time for a few days, and it would be on company time. If untrained in any skill, the employee would be scheduled for pre-job training, perhaps in a vestibule school or institute for apprenticeship training run by the industry or a group of local industries. Placed on the job, this new recruit might be scheduled for job training under direct supervision or assigned to special training in a job-site training unit. *After being prepared for work on a job, the employee's development continues as job needs set the goals for his training.*

Job training is progressive and continuous as the worker advances up the ladder toward top management. Much of specialized job training in industrial companies is scheduled in the evenings. The

company may operate a school with courses in languages, mathematics, cost accounting, economics, and so on, for volunteer groups of employees. Scholarships may be provided in technical schools and universities for those showing potential for further development. Correspondence courses or instruction in almost any field may be authorized for those who wish to study a special subject. A rotation system of training in the company may be scheduled for management development.

Such a company training program as has been described here requires an effective record procedure, a plan for selection and payment of trainees, and a schedule for training and allocation of facilities.

ALLOCATING FACILITIES

The allocation of space and facilities must be coordinated with the scheduling of training. The availability of space and facilities will determine much of the scheduling. The location of training will depend upon the kind of training, the use of special devices, and the physical set-up: the need for space, chairs, etc.

All facilities should be arranged to encourage learning, providing space, for example, away from distractions, with comfortable ventilation, accessible to work place, and so on. Where the company provides proper facilities, this indicates to the trainee the importance of his training, and also stimulates learning. He feels that management is back of the training if money is spent on providing him with the best facilities. Training in any skill requires adequate facilities and space in which to work.

THE TRAINING GROUP

Assuming the assembling of trainees with comparable background or similar experience, how many people can be given effective training at one time? This depends, of course, upon how much trainee participation is desired, or how much practice or laboratory instruction must be given.

If the training is conducted on a conference basis, as is usual in advanced training of managers and supervisors, *an ideal training group for one conference leader might be eight to twelve,* but not more than twenty. In training through lectures, where there is little discussion except in the answering of questions, thirty to thirty-five

trainees can be effectively grouped together. In uninterrupted lecturing, where there is an adequate public address system for amplification of the speaker's voice, as many as two thousand have been assembled in one audience for effective training. Of course, when TV is developed as a mass medium of industrial training, the size of the group is unimportant since the trainees are not assembled in one location.

Available equipment, e.g., typewriters, crank shafts, and boxes used in the instruction, will often be a limiting influence on the size of training groups. In apprenticeship training, vestibule training, and training in clerical and mechanical skills, where such aids are necessary and where a great deal of individual counsel and assistance is necessary, the trainer may not have more than five trainees under his direction to advantage. Ten or twelve would represent a top figure for job-site or laboratory training.

TRAINING PERIODS

Learning must be properly spaced for the most economical results. This implies that the meetings of any training group might be held with good results as infrequently as once every two weeks, particularly where the training is by the conference method. Probably weekly meetings provide the optimum conditions.

There must be an opportunity for the trainee to digest the instruction where principles and theories are involved. One hour a day for eight days of training in a specific skill is far better than eight hours in one day. One session daily for instruction in a skill appears optimum. Where full time is given over to training, as in apprenticeship or vestibule training, different courses should be scheduled throughout the hours of the day.

There is, of course, the other side to such scheduling. *The interval between sessions must not be too long,* so that lapses of memory remove any possibility of coordinating the different lessons of the syllabus or program.

Learning takes place best when the trainee is not tired, as he is likely to be after a hard day's work at the bench, or in supervising production, or in attending managerial conferences. Training sessions must be scheduled so as to conflict as little as possible with work schedules, and here arises a conflict which must be solved by

compromise. For example, it would not be desirable to schedule training sessions for supervisors at the beginning or at the end of a shift, but it should be possible to find an hour during the day that is light in supervisory work when the training session can be held each week or every two weeks. If training sessions are held in the evening, they should be scheduled long after the conclusion of the day's work to give the trainee an opportunity for a meal and perhaps some rest or recreation before coming to class.

There is no ideal length of a class period. Fatigue research shows that a worker rests about ten minutes for every hour he is engaged in light industrial or clerical work. Thus, *if the class period is longer than one hour, a break of possibly ten minutes should be taken in the middle of the session.* These breaks are enjoyed by trainees as "bull" sessions, often on the subject of the training. Possibly there is more training during these breaks than in any other unit of equal time of the session.

There are many influences upon the desirable length of a class session. They include the age of the trainees, their interest and motivation, and the procedures of training which provide incentives or create boredom. A conference or laboratory session may run well up to three hours with satisfactory results, although two hours is considered optimum. Uninterrupted lectures should not be longer than forty or fifty minutes for the best retention and note taking.

THE INSTRUCTOR'S SCHEDULE

Scheduling will be important. A more successful program will result when the instructor or trainer gives adequate time to the organization, preparation, and presentation of the content of the training. Of course, as has been said frequently, if the trainee does not want to learn, he won't; and, of course, if the needs for training felt by the individual are not met, then little training will occur.

How long should an instructor be in the classroom? The maximum teaching load for class work should not be more than one-half of his work day, approximately four hours. *Teaching requires at least as much time for preparation as is spent in the classroom.* Teaching is physically and emotionally taxing. The teacher works at a fever pace, whether delivering a lecture or leading a conference.

The special job trainer, who is usually an experienced operator

with expressed aptitude for teaching, does not require as much time for preparation as does the conference leader and lecturer. He may supervise skills training for a full shift in the same manner as he would supervise actual operations.

An instructor's main task is to prepare for the training. When the syllabus is ready, the facilities and aids provided, the trainees selected, and the schedule arranged, he should be ready to give the training his full attention. There should be no "playing it by ear" in training. There are rough spots in the syllabus to be improved as the training progresses; training aids need to be given a trial in advance of their use; and lectures need to be improved with greater detail or more "boiling down." *The instructor is never free from his problem of stimulating and encouraging learning.*

Measuring Progress in Training

The practical value of measuring individual progress in training rather than merely estimating it is becoming recognized in industry. It should be as acceptable as is measurement in other branches of management.

AMOUNT OF PRODUCTION

Where the trainee is in training for production, his success or failure is indicated in the production records. The amount of production or the waste in production by trainees can be compared with that of permanent employees performing the same work. This applies in the clerical as well as in the mechanical occupations. Also, production time required for particular operations or tasks may be used for this comparison.

PRODUCTION STANDARDS

Where production standards have been set, the effect of training can be measured in terms of the percent of achievement of the standard made by a trainee. This achievement of a production standard can be related to the period of training already completed. Comparing the progress of individual trainees in relation to this standard identifies the superior trainees. At some time in the training, the slower learners should be dropped back into their old jobs or discharged and the training speeded up for the superior trainees.

TRAINING INDICES

There are various important general indicators which should be used in representing the value of training to management. The amount of *turnover,* of *absenteeism,* number of *suggestions,* kind of *complaints,* number of *infirmary visits,* etc. may be computed for trained and untrained workers, or before and after the installation of a program of training in a factory or shop. *Such measures provide an indirect indication of effectiveness of training,* although they will also be affected by other influences such as pay, factory location, and supervision.

TRADE TESTS

Trade tests or job-standards tests are particularly helpful for the supervisor in establishing the effectiveness of training in the clerical and mechanical skills. A test for measurement and precision fitting in an auto reconditioning shop, which is illustrative of a job-standards test, is shown in Fig. XI.

Any supervisor can prepare such a job-standards test based on his knowledge of the purposes of various operations in his shop and the standards required for the skillful operations. Section A of this job-standards test is designed to aid the supervisor in evaluating the trainee's level of skill development in the use of the micrometer. Section B is a demonstration test of the precision fitting required on the job. The examiner "mikes" all work and scores the items on the basis of "satisfactory" or "unsatisfactory." The score of an individual divided by the total possible score indicates the percentage of the standard achieved by the student.

TESTS OF MANAGERIAL AND SUPERVISORY PERFORMANCE

Measurement is made of supervisory and managerial training, where knowledge of such matters as company policy, work organization, and union contracts is desired. Such tests can be constructed by training personnel. Where supervisory training is concerned with problems of employee relations in which company policy provides the answer, a *straightforward factual test will measure knowledge of company policy.* Or problems in which the company policy offers the solution may be presented for the manager or supervisors to provide the correct answers.

FIG. XI. TEST OF MEASUREMENT AND PRECISION FITTING

Section A. *Measurement*

1. Use 1″ and 2″ mike performing the following:
   a. Clean all surfaces of the mike and check points of standard
   b. Check mike with 1″ standard
   c. Check mike with 2″ standard
   d. Adjust mike as necessary

2. Mike 6 objects to .0025

Round objects	Bearing insert (ball mike)
a.	d. .....
b.	e. .....
c.	f. .....

3. Mike crankshaft and differentiate between the following:
   a. Standard shaft
   b. .010
   c. .020
   d. .040

4. Set up and check run-out of a crankshaft with .001 allowable.

Section B. *Precision Fitting*

1. Select from four pairs of main bearing inserts the correct size measured by a mike and fit for following:
   a. bearing crush, using plat and .0015 shim at 10 pounds torque
   b. check bearing clearance to .0015 using either gauge or plastigauge
   c. repeat for connecting rod
   d. use torque wrench to specified foot pounds to tighten mains and rods

It does not seem desirable to depend on answers to a questionnaire asking such questions as, "Did you find the information provided useful in your work?" when evaluating the training of managers and supervisors. Of course, *it is not easy to measure supervisory behavior in human relations directly on the job. But it is possible to measure knowledge of the best ways of solving human relations problems by tests* in the same way as it is possible to test safety and production information.

Here are a few examples of the kind of questions that will measure the effectiveness of managerial and supervisory training as related to knowledge of policy.

The shop committee
a. operates without authority upon any question.
b. operates where a consensus of opinion of the committee is favorable.
c. is a propaganda agency of management.
d. has full authority on all matters of personnel, training, and other problems of industrial relations.
e. is an advisory body for the manager of the shop.

For this question, "b" would be acceptable in some shops, as all "authorities" of the shop are on the committee and the shop operates in a democratic manner, but according to policy, "e" is correct.

Managers should know their labor contract. Here are examples from a true-false test used in testing knowledge following a course on labor contract.

a. Learners' base rates are applied only on "set up and operated" jobs described in the "Incentive Job Evaluation Manual."
b. An employee working on an irregularly scheduled work week is eligible for premium pay for the sixth day of work during his work week.

Whether these statements are right or wrong depends, of course, on the contract. It is interesting to find that in some industries higher scores will usually be made on such a test by shop stewards than by supervisors in the same shop.

Another multiple-choice question, this time on human relations, follows:

The best supervisor to work for is one who
a. allows you to handle your section as you see fit.
b. gives you close supervision and offers you helpful advice.
c. allows you to decide when you want to ask him for advice.
d. frequently inquires how the job is going.
e. judges you by the results of your work.

The best supervisors choose "c" as might be expected.

Questions such as these reveal whether managers and supervisors have achieved an increased understanding through training on com-

pany policy and methods of supervision. *It is not necessary to accept a training program on faith if such methods of evaluation are used. Without such measurements, there is no way of knowing whether training is worth what it costs, or whether it is worth anything, or whether or not a different method of training might be more effective.*

Keeping Training Records

Training records are maintained in a manner similar to production records, turnover records, or absentee records. There is involved in keeping training records an accounting of time spent, of the number of syllabi or programs, of attendance, of numbers of persons trained, and of individual performance. The records of individual performance are maintained on the individual trainee record illustrated in Chapter 3. From such records, the number trained for various jobs with an acceptable level of performance, as determined by job tests, can be computed. Also, different job tasks or skills (called training steps) for which training is completed can be computed to establish how many workers in a shop can perform certain skilled tasks.

REPORTING TRAINING ACCOMPLISHMENT

The only records of training that should be kept, of course, are those for which there is some use. A story is told of an army officer, bored with his assignment to a post and pestered with flies, who instigated for his amusement a "fly count" report of his station. He sent this in regularly to GHQ. Eventually he was transferred to greener pastures. Months later he received a personal call from his replacement who was terribly upset over the demands of GHQ for the "fly count" report. He wanted to know how the count was made and he feared a reprimand if the report was not submitted. Once a reporting system is established, it is likely to become fixed procedure. *Any reporting system for training should be adapted to the needs of the program.*

It is difficult for the training director or management generally to evaluate the training being performed in various units, departments, or plants of a company. *Number of hours is not a satisfactory measure of training accomplished,* but it is frequently used as the

only available statistic for comparative purposes. *It omits any value placed on the quality of the training.*

The formula for computing training based on hours of training follows:

$$T = \frac{C\ (\text{number of classes}) \times H\ (\text{number of hours of class}) \times P\ (\text{number of persons in class})}{E\ (\text{number of employees})}$$

T is interpreted as the per capita man-hours of training. To provide the necessary information for the use of this formula, an instructor or trainer needs only to keep the hours of attendance on training programs.

It is possible to provide for a control of quality of training in the use of this formula. Where standards of accomplishment such as tests or check points in the training are used, only hours of training need be included in the report of a unit where performance standards have been achieved.

ESTIMATING COST OF TRAINING

The above formula may be used to estimate the cost of training for a unit by making the following adjustment:

Training Cost = T × Trainee Personnel Costs (for training time)

If training costs are more than 12.5 per cent of total personnel costs, they would seem to be excessive unless a new product is being introduced or there has been great turnover. This formula, of course, does not include the cost of the actual instruction itself, that is, of instructor time, facilities, and space. It estimates only the cost for trainee time.

MOTIVATING TRAINEES THROUGH RECORDS

Recognition for successfully completing company training, through an award, a diploma, or a certificate, is common practice in industry. It provides a strong incentive for it gives the trainee some concrete evidence of the successful completion of a difficult task. Any system to recognize performance in training requires that records be kept of individual progress and attendance. The system of recognition employed as an incentive for training will vary with the kind

of training. For example, it is not customary to give performance certificates in courses where standards of performance are not applicable, as in supervisory or managerial training. Instead in these cases certificates are often given where there has been 80 per cent or better attendance. It is also customary to add to the certificates, whenever skill training is involved, the grades received from tests or check-outs.

9. *The Organization of Training*

THERE are different types of training. The types being used are defined in terms of the kind of programs which are set up to fill the needs of employees for development. For example, job training is concerned with the accomplishment of the duties of the job, whether it be production or managerial. Job-related training deals with the special knowledges and skills which contribute to greater efficiency in performance of the job duties. Some companies regard most of the job-related training as the responsibility of the employee and offer it on a voluntary basis, to be taken as the employee feels that he needs it, and on his own time, the company bearing the cost of the instruction. Much specialized training is offered by industrial concerns in this manner, thereby allowing the employee to work out his own development under his own steam.

MAIN TYPES OF TRAINING

An over-all distinction made in job training is whether it shall be performed on the job or off the job. *About 75 per cent of all industrial training is performed on the job.* Off-the-job training is usually considered, at least for production jobs, as preparation for on-the-job training. Of course, in such areas as supervision and management, much of the training must be conducted off the job.

ON-THE-JOB TRAINING

On-the-job training is performed by specially selected job trainers, experienced operators, or foremen and line executives. Probably most American industrial companies of any size have an organized on-the-job training program supervised by a specialist. This training is confined to the needs of the job. Some on-the-job training is performed by representatives of machine manufacturers while installing new machinery. The usual practice in small industry is for the super-

visors to offer any necessary training on the job. Large industries may employ job trainers. Occasionally a job-site training unit is set up near the production unit for training in various difficult tasks of a production job. Possibly one-third of all on-the-job training in American industry is of this kind. In such cases workers are released for an hour or so a day for this special training. Job-site training releases machinery for productive use which might otherwise be tied up for training purposes.

When properly supervised, on-the-job training is regarded as the most practical method for production workers. From the point of view of achieving training for the whole job as soon as possible, however, time may be wasted in on-the-job training. The trainee repeats the simpler operations many more times than are necessary for adequate learning. As shown in the job breakdowns, the majority of the tasks or steps of a production job are relatively simple, and can be learned in a short period. A study of all operations in eighty-eight companies, representing thirty-one different industries, illustrates this point:

22 per cent	required	½ month training
33 per cent	"	½ to 2 months training
17 per cent	"	3 to 9 months training
16 per cent	"	10 months to 2 years training
8 per cent	"	2 to 4 years training
4 per cent	"	4 or more years training

The answer to this, of course, is that most workers in clerical and mechanical jobs do not need to perform all of the operations of a whole job in order to be productive. On-the-job training can make them productive in performing the simpler tasks; the more complicated tasks can be performed by more experienced workers. *Thus the trainee learns only what is required of him on the job, and as other more complex skills are required they can be provided through job-site training.*

OFF-THE-JOB TRAINING

On-the-job training presupposes preparation or training sufficient to put a worker on the job with whatever operations and use of tools and machinery are involved. The essential purpose of off-the-job training is to prepare the trainee for on-the-job training, or for

placement on the job ready to perform productive work, either because training on the job is too costly, too dangerous, too time consuming, or impossible for other reasons. *In training for such positions as manager or supervisor, it is desirable to conduct most training off the job so that status may be preserved.*

In introducing new workers to the plant it is wise to familiarize them with plant operations and policy before they are placed on the job. A vestibule school may be set up for this purpose where raw recruits must be trained rapidly for production, or where the supply of workers prepared for on-the-job training by various apprenticeship systems, such as trade schools, is inadequate.

Off-the-job training, while involving only about 25 per cent of the total training effort in American industry, is extensively organized in large industrial companies. There may be a centralized company school which has a curriculum comparable to a technical school or college. Internships or scholarships may be offered by the company at engineering schools, universities, and summer schools for post-graduate training. Apprenticeship training may be delegated by the company to local technical or trade schools which are supported by one or more of such companies. *The goal of off-the-job training is to organize the facilities for training so that the flow of men to work is accomplished with maximum preparation for direct placement onto the job.*

Areas of Training

The essential purpose of training is to place an effective worker on the job and to increase his potential for work on higher level jobs. The growth in size and complexity of industrial companies, the introduction of scientific management, and the specialization of work organization have increased the difficulty of this task. The problem is met through an organization of training into various areas. These areas are classified for purposes of description, as follows:

1. Orientation Training
2. Job Skills Training
3. Human Relations Training
4. Technical and Professional Training
5. Managerial and Supervisory Training
6. General Education

1. ORIENTATION TRAINING

The new employee is oriented to provide him with a satisfactory adjustment to everything that is involved in employee-company relations. Such an orientation, or induction, or indoctrination program should provide a knowledge of everything involving the safety and health of the new employee, all rules and regulations concerning industrial relations and personnel practices, and the authority and responsibility assigned to the worker in the company organization.

Orientation is a continuous process aiming at the adjustment of all employees to new and changing situations. It aims to impart the facts of company rules and policy, *to create attitudes* of confidence in the company, *pride* in its product, *respect* for company personnel, and *to provide information* about needs of skill development, quality production, and work organization.

Early orientation programs in industry were concerned primarily with company rules and policy, and such knowledge of the job site as the supervisors could provide to a new employee just reporting for duty. As industry has come to realize that *the major problems in fitting employees into the company are those of attitude* rather than lack of job skill, greater stress has been placed upon gaining mutual respect and confidence and in establishing cooperation in the development of production.

Traditionally, orientation has been handled by most industries in a formal class for new employees. Orientation, defined as a continuous process of adjustment of employees, should be a function of the personnel or industrial relations office where counsel on all kinds of problems of employee relations can be provided. *Three key individuals stand out in the orientation of new employees, the first-line supervisor, or foreman, the personnel counselor, and the training specialist.* They are in a strategic position in creating and maintaining attitudes of understanding in employee relations. Generally speaking, supervisors do not regard this as a major function for which they will be held accountable in the same way that they are held accountable for production. Orientation training should lead them to do so.

Handbooks and employee magazines are excellent tools for orientation training. A handbook should be a reference book of facts. It is sometimes regarded as a means of propaganda, and then it probably does more harm than good in orientation. The handbook, like

the magazine, must be written at the level of the reader, with as many illustrations and examples as possible. Only then will it be read completely and not just ignored.

Orientation for supervisors should help to familiarize them with changes in company policy, the plans and procedures that affect their job. This requires training in company organization and history, management philosophy, economics, quality control, projected product development, personnel policies, staff and service functions, control and maintenance, and other important materials. Such orientation in advance of new developments will check rumors and gossip gained from the local grapevine, newspapers, and union stewards. With such training the foreman is in a position to inform his subordinates of the facts in the case. Friction developing from misunderstandings between units or between line and staff departments can be eliminated through the explanation of new procedures in advance of their introduction. This is a proper function of orientation training for supervisors. As supervisors are made to feel that they are "in the know," they are in a better position to convey a "sense of belonging" to those they supervise.

When orientation training functions to its fullest extent in fulfilling the needs for information at all levels of the company personnel, it contributes in large measure toward arresting turnover, absenteeism, and unjustified job dissatisfaction. Orientation training opens the channels of communication in a way no other source can.

2. JOB SKILLS TRAINING

a. *Apprenticeship training* is a carryover from the craft organization of the middle ages where youngsters were bound to master craftsmen to learn the mysteries of a trade. Possibly about 5 per cent of training in industry today is apprenticeship training. *Apprenticeship training differs from other skills training primarily in that it trains in a total job, where acquiring the knowledge and skills of the trade requires a fairly long period.* In such trades as high-class engraving and stone and marble cutting most training today is performed by the apprenticeship method. In contrast, the shoe, pottery, furniture, and canning industries train by other methods.

Most apprenticeships last for four years and combine shop practice with classroom training. This is true in such trades as toolmaker, machinist, plumber, draftsman, and electrician. Apprenticeship

training may be delegated in part or in whole by the company to a vocational school. Also, the trainee may go to a vocational school "on his own."

b. *Vestibule training,* as a part of job skill training, *has the goal of teaching the novice one or more semi-skilled operations so that he can reach a point of productive efficiency quickly.* The training in the vestibule school of a company is on a more elementary level than that of apprenticeship. Such training may range from only a few days to several months. It deals with tasks or steps in a job breakdown, whereas apprenticeship training deals with a whole job. It is particularly useful in training new workers in special operations where jobs have been simplified into limited steps; also in refresher training in the specialties of a job.

Vestibule schools duplicate the facilities of production. In a sense the job-site training unit is a small vestibule school. The advantages of the vestibule school are several: The trainer has the trainees under full-time supervision; training in the knowledges and skills which are common requirements of a number of jobs can be combined, and the trainees can be grouped according to needs though assigned from different production units; during slack periods of work employees can be trained in specialties, anticipating a future need in production. Then, the school has under its control all of the facilities of training. Tools and machines cannot be withdrawn from training purposes according to the ideas of supervisors whose primary concern is production.

c. *On-the-job training for job skills has become increasingly popular during the last twenty-five years.* Much of the apprenticeship training of the early history of industry was on the job, where the trainee was expected to lay out the tools for the artisan and to pick up what skills he could by assisting the artisan in the operations of the job. He was at the mercy of the journeyman, who was often not too anxious to impart his trade secrets to someone else. Thus on-the-job training was slow and ineffective and consisted largely of having the apprentice do just the dirty work.

On-the-job training today is a highly developed procedure. A job breakdown is prepared, and training steps are laid out systematically from the simpler to the more complex operations (see Chapter 3). *The trainee can become a production worker in a short time through on-the-job training procedures.* Any one of the steps in the job

training outline may become a production specialty. Training for production is the goal of on-the-job training. With the improved techniques that have gone into on-the-job training during the last twenty-five years, the job trainer has a clearly defined procedure for accomplishing this goal.

3. HUMAN RELATIONS TRAINING

The objective of human relations training is to acquaint all levels of employment, and particularly those concerned with the supervision of people, with the principles of human behavior, and to help them use these principles in day-to-day contact and communication.

Human relations training enters into *all* programs of training. The development of the proper attitudes toward human relations is one of the goals of orientation training. It is a major unit in managerial training and one often emphasized in supervisory training programs. The trainee in skills training must want to learn. This is basically a matter of good human relations between the company and the worker, with the trainer in between. A smoothly functioning organization is one in which human relations are relatively satisfactory to all concerned.

The methods used in training to achieve good human relations which appear to be most successful are of the participation variety (see Chapter 7). Lectures, motion pictures, and demonstrations successfully present the ways of dealing with people so that knowledge is gained of what is good and proper in behavior. Discussions of cases help to clarify point of view. But it is necessary to practice ways of not offending while actually disciplining a subordinate for excessive waste or "soldiering" on the job. One's habits are so deep seated that to change them requires considerable practice before one can respond in a moment of excitement with the new and better way of handling a human relations problem.

Much human relations training is by means of role playing, or some adaptation of the laboratory method of participation in human relations practices. The trainees gain experience in dealing with people through taking a part, or dramatizing a common industrial situation, as in a play; then they view the results, as recorded, for their own and others' criticism. Such training must be repeated over and over again to achieve the desired improvement. Hence the method is time consuming, but well worth the effort. The goal is to

practice the live human relations situations of the manager's or supervisor's workaday world.

4. TECHNICAL AND PROFESSIONAL TRAINING

Employee and managerial development programs are concerned primarily with technical and professional training, although all training contributes to this development. The problem of these programs is to select those who have the potential for advancement and to provide the proper stimulation for growth.

Technical training differs from professional training in the degree and scope of the specialization. *Technical training is a part of professional training. A professional man has mastered a number of techniques, but he also has the training to direct their use and to give them meaning* in relation to some purpose or policy of the company. A time study man, a draftsman, an employment interviewer, a bookkeeper, a laboratory man and an inspector are thought of as technically trained men, whereas an industrial engineer, a training specialist, a wage and salary analyst, a research chemist, an accountant, and a corporation lawyer are thought of as professionals. Professional training requires at least four years of college education whereas the technician may be trained in six months or more of time.

Technical training is carried on in the company school where various technical courses may be offered. Few company schools are equipped to offer many courses contributing to professional training. *In most cases, a professional is trained outside of the plant* and if he is to receive his basic education at company expense he is given a scholarship with pay to complete his professional training at some university.

Cooperative training is set up by many companies with local universities in which special classes are arranged exclusively for the company employees, either to be offered at the plant or at the university. Courses are arranged to meet company needs for technical and professional training. The training of professional students is usually directed toward the acquisition of an academic degree or certificate and the university may accept credit for such courses where they are approved as a part of a university program of study. The technician, however, is more interested in the training to im-

prove his performance on the job and no credit is sought in many of the technical offerings of cooperative university training.

Both technical and professional training should be coordinated with practice. Professional on-the-job training is recommended, and it is usual procedure for professionals in research units. For training in certain professions, e.g., in industrial engineering, a rotation system of assignment in several different departments or units may be found desirable to give the trainee a broader background of experience.

5. MANAGERIAL AND SUPERVISORY TRAINING

The function of those who manage is to coordinate the activities of all concerned with production, to the end that work is accomplished effectively and economically. Managerial development programs have for their purpose the development of personnel to carry on this function at different levels of the organization. Professionals are, of course, managers of such staff departments as engineering and research.

Management skills generally consist of knowledge and technique involved in organization planning, time study, cost control, job control, quality control, training, communications, and so on. The supervisor at the higher levels of company organization must know the principles involved in these activities. *There is little difference today in the training of supervisors at the various levels of management except in the degree to which understanding of technical and social problems must be attained.* Basic training for managers and supervisors has to do with the principles of scientific management: organizing, planning, directing, and controlling.

Today, the foreman or the supervisor who is in a large industry no longer hires and fires, sets the rates for his men, disciplines workers, operates quality control, determines the methods of work, trains his apprentices according to journeyman ideas, performs maintenance, etc., at will, as the owner of a small plant did fifty years ago. Tremendous changes have taken place in the control of industrial operations since then. *The supervisor does these things now with the help and advice of specialists in scientific management.*

This is the picture developing in industry in the management and supervision of work. Recruitment and selection, except for final decision, is assigned to the personnel department; layoffs and disci-

pline—with recommendations by the foremen—are assigned to employee relations; wage and salary rates are established by job evaluation; quality control, or at least the establishing of criteria for such control, has been assigned to an inspection department; work organization is handled by the industrial engineer and psychologist; maintenance is assigned to a specialized department dealing with all equipment; now even the training of workers is a specialized job; and so on throughout all of the activities that were once under direct control of the foreman.

The coordination of all of these activities, now performed by specialists, has become a function of the manager or supervisor. This requires of him different talents in supervision both over materials and over people. This is the reason for present-day emphasis upon supervisory and managerial development. The foreman of a production unit must know the laws with respect to matters of wages, hours of work, overtime, layoffs, absenteeism; he must know a variety of labor regulations and rules imposed by contract with unions. He must interpret them for management. He is management for his unit. A decision by him must be based upon the law, company policy, or union contract. *Foremanship training is in large measure management training.*

The first-line supervisor of today, and also the manager of a department, must develop understanding with his men. He must interpret the rules to them; he must do it with good human relations, as an older man dealing with a younger and less experienced one. He remains the leader of his unit, but he looks to the experts in personnel, in rate setting, in cost accounting, in discipline, and so on, for help in staging his project. To accomplish this, he must know how the facts are obtained in the various specialized areas—in order to answer the ever-present question of "why" from his men. He must be able to explain rules, regulations, and procedures wherever they affect his people.

Managers and supervisors must be continuously informed of changes in company policies, plans, and procedures that affect their job; this is the goal of orientation training. They must be acquainted with and practice the best methods of human relations, discarding their own prejudices concerning the authoritative position of management, and endeavor to handle objectively the everyday problems of all work involving human relations. This is the function of hu-

man relations training. Skills training for managers and supervisors relates, of course, to the specialty in which they manage or supervise: for example, machine maintenance or accounting or economics or banking or industrial chemistry. This has already been discussed under the area of technical and professional training. *Each manager or supervisor must qualify as a technician in one or more areas according to the needs of his job.*

Company training in managerial skills is most frequently carried on by the conference method. Readings are assigned and principles, methods, and procedures of operating a company are discussed in formal group training. Lecture courses in managerial skills may be offered in the company school or professional courses in management may be taken at local universities. The cooperative plan may be followed in managerial as in professional and technical training.

On-the-job training is a necessary adjunct to managerial skills training, since supervisors must prepare control charts and graphs for their own units, and arrange them so that they present intelligently to a group of managers such problems as amounts and sources of waste, training time, labor turnover, research variables, and customer complaints. They must set up systems for recording and analyzing such data. They may learn a great deal about these procedures from demonstration lectures, conferences, and illustrated books. When such subjects as merit rating, up-grading, and job evaluation are discussed, for practical application on the job there should be some form of laboratory exercise. Potential managers and supervisors may be assigned for this purpose to work with men experienced in such techniques. Rotation may be used as a method to train supervisors in various operations of the entire organization.

Managerial and supervisory jobs are basically the same, regardless of the kind of business or industry. *They differ only in amount of authority and responsibility* from the lowest to the highest level of the organization. *Each supervisor has some planning, organizing, developing, directing, and controlling functions.* Differences are recognized in the training program according to level in the organization. The training may be organized into pre-supervisory training, supervisory training, and executive training. *Human relations training is emphasized throughout.* Orientation training is necessary for all. Appropriate emphasis on training in technical skills is made according to needs. The major difference in training at the different

managerial levels lies in the stress upon understanding of the principles of scientific management which the managers at higher levels of organization must know in order to carry on their functions of organization and planning.

6. GENERAL EDUCATION

General education provides the basis for understanding of all of the problems of a modern industry. It is an area of industrial training which cannot be ignored in large companies in planning for employee and managerial development. Industry and business have become a way of life. They are a part of the social structure of society. *Many companies now recognize the social role they play in the community.* The goal of general education for industrial personnel is to develop understanding in social activities.

A variety of courses are offered in the company schools of large industries for purposes of general education. In fact, some companies provide a course in any subject where there are enough registrants to make the offering of the course worth while. The course may be in ancient history, anthropology, or Sanscrit. This is done on the theory that *any education that benefits the employee will, in the long run, benefit the company.*

Courses may be offered in popular chemistry or physics, algebra, the metric system, Spanish, current events, and practical psychology. Many employees, men and women whose formal education ended in the public schools, are anxious to understand what is going on in the world as it is taught in a liberal arts college. This appeal to the desires of every employee, based on his thirst for information about the world around him and his proper place in it, can be met by the company training school.

General educational programs may be developed purely for recreational interests. They may include such subjects as social etiquette, public speaking, contract bridge, choral singing, and sports. The purpose behind such offerings, made at company expense, is the all 'round development of a man, from which the company and society will benefit. It is believed that this approach of educating the whole man by stimulating his interests and increasing his knowledge will result in a better citizen and a more productive employee.

Companies are offering general educational courses through the facilities of local schools and colleges. They include such courses in

the curriculum of the company school. In a large company, the school may take on the appearance of a modern university.

Industrial Organization for Training

There is a tendency to make things in the training organization appear complicated where they are relatively simple. An essential fact emerges in all industrial training: *training is the responsibility of the line organization.* The staff training department is established to provide services to the line organization.

STAFF DEPARTMENT FUNCTIONS

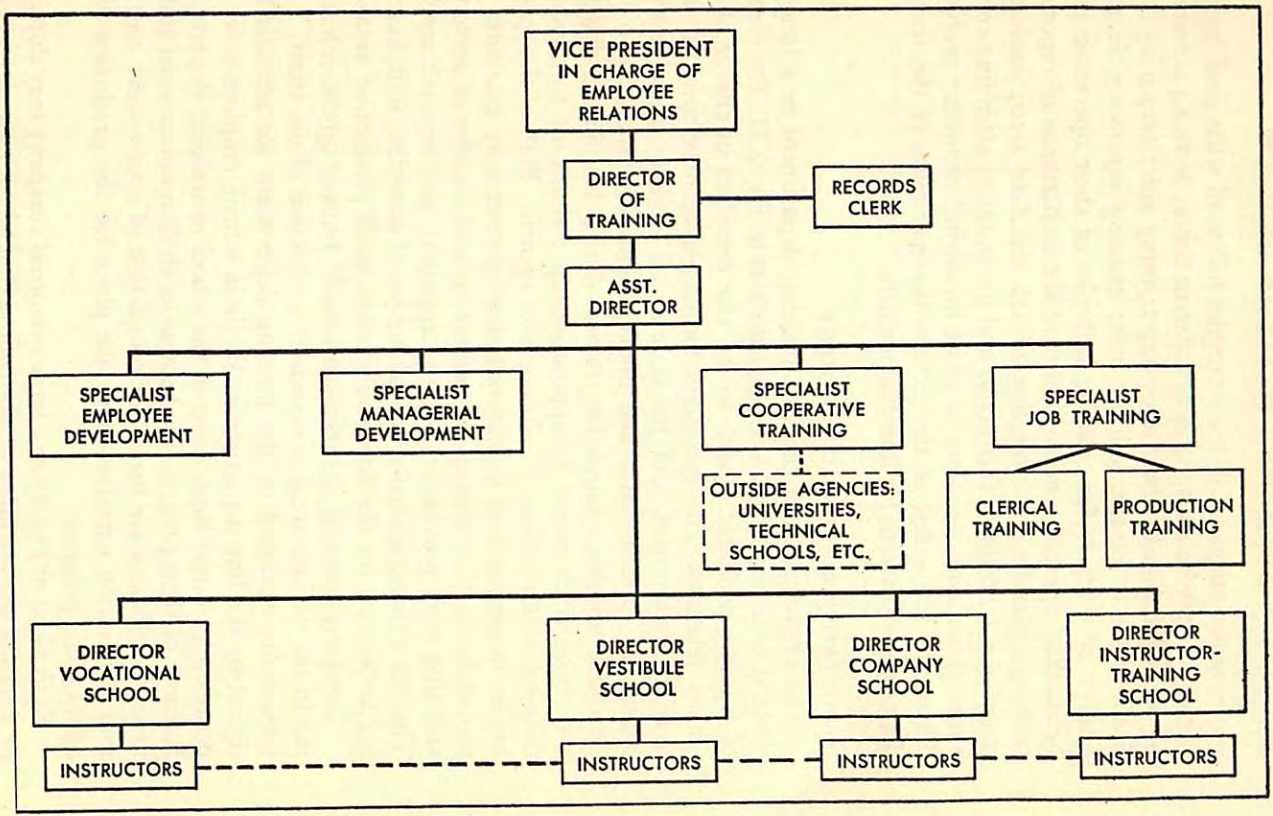
Any large industrial company usually has a well equipped training department at the staff level. It is the function of this staff department to plan, to develop, and to control the technical aspects of the training program of the company. Staff personnel serve as consultants to the line organization. They perform surveys to establish training needs; they assist in the preparation of training outlines, materials, and aids. They provide the procedures for the evaluation of training and the keeping of records. They advise line organization on methods, facilities, and administrative procedures of training. They develop instructors and trainers for assignment to line training jobs.

The instructors assigned to training receive their authority for training from line management. Official communications from them are always through the line organization to the staff training department. However, a *continuous informal contact is usually maintained on all technical matters between line and staff training personnel.* This is the way training operates in all large industrial companies.

Staff training departments in large industrial companies administer various off-the-job facilities. The training department may run a company school for technical training, or even for training at the professional level. The training department arranges for cooperative training with universities and for the assignment of scholarships for university training. They may operate one or more vestibule schools for the rapid training of novices in the clerical and mechanical trades. These activities, of course, are provided only if they fill training needs of the line organization.

The staff training department of any large industrial company

FIG. XII. ORGANIZATION OF A STAFF TRAINING DEPARTMENT



serves many purposes. A few examples follow of what staff training personnel may be engaged in at different times: *training supervisors to make job breakdowns; designing training aids; preparing specifications* for a job-site training unit; *assisting supervisors in preparation of budgets* for training activities of their operating units; *persuading operating management* of the importance of reports on training; planning *construction of job standard tests; evaluating training aids; training instructors* and job trainers; *attending conferences of training directors* to assist in solving company problems. These are but a few of the services the specialists of the training department perform for line management.

ORGANIZATION OF STAFF DEPARTMENT

The organization of the staff training department in a large industrial company might look like the chart in Fig. XII. The director of training probably reports to the vice president in charge of employee relations. The specialists for employee development, managerial development, and job training all work in an advisory or consulting capacity with line management. The specialist for cooperative training controls the trainees during the periods that they are assigned elsewhere to apprenticeship training or to advanced training in universities or other outside agencies. Both of the specialists in employee and managerial development may establish personnel accounting systems for promotion and transfer of personnel, and they may provide counseling, appraisal, and research services. The job training specialist has the big job of providing skills in training know-how for the line management in all production areas.

Company training departments usually provide off-the-job training in the various areas as shown at the bottom of the chart. These schools are operated by the training department for personnel assigned by the line departments. While in school, employees are students under direct supervision of the school or training department. Records of their progress are kept as in civilian educational institutions. Certificates are issued for completion of course work and formal graduation exercises may take place for the graduates of an educational program.

Each plant or factory in a large industrial company may duplicate in part the organization of the company staff training department. The company and vocational schools would probably be centrally

located and be operated by the central training department. But division staff training departments might operate vestibule schools and job-site training units in many factories or locations, for the purpose of rapid training of novices in the clerical and mechanical skills. Arrangements for cooperative training with universities and for the assignment of scholarships usually are handled by the central staff department of a large company. But any plant or factory unit or affiliate of a company would probably have staff specialists in employee development, managerial development, and job training.

Both the central and the division staff training departments of a large industry have the responsibility for the development of plans and procedures of training. But they do not have the responsibility for the actual training except as the trainees are assigned by operating units to the various schools run by these departments.

Team Work Among Specialists

Managers of operating departments rightly feel that they should decide what will be done in the training of their personnel. This is as it should be. Line management has the responsibility for operations and industrial training has the goal of improving operations.

THE OPERATING TEAM OF SPECIALISTS

Progressive companies have a team of specialists to assist operating management. These specialists may be fitted into the company organization either on the staff of the operating departments, as with a mechanical engineer, or as a member of a staff department of the company, as with the job evaluation man or the cost accountant. In the former instance the specialist reports directly to the operating head. In the latter, the staff department furnishes services to the operating head. In both cases responsibility for the work rests with the operations manager.

The training specialist is a member of this team of operating specialists. In many companies, there are staff training men and operating training men; the former are concerned with the over-all problem of company training and the latter with its administration in the operating units. Always, any decision as to whether or not men will be trained rests with the operating head.

This team of operating specialists, whether reporting to staff departments or directly to operating managers, may be thought of as

additional hands of the operating manager, in planning, developing, control, and maintenance of productive capacity. These specialists do things which the old-time manager did himself, only better. For example, in many companies there is a specialist in quality control who carries on a continuous statistical check on the quality of production, there is a mechanical engineer who is concerned with economic maintenance of machinery, a time study man who studies and recommends the rates for various items of production, a cost accountant who analyzes the cost of production of different projects, and so on. There would be an extensive list of operating specialists if we included all who have been found profitable in various industries—for example, research men, employee relations specialists, safety engineers, and industrial engineers.

The training man works closely with a number of these specialists forming teams for job development and for employee development. Job development has to do with improving the job as a production unit. Employee development has to do with improving the employee to perform a job or to advance into future jobs. The whole process is often referred to as manpower utilization.

THE JOB DEVELOPMENT TEAM

The team of specialists primarily concerned with job development usually consists of the industrial engineer, the safety engineer, the salary and wage specialists, the personnel man, and the training specialist. These people perform services in organizing the work which the old-line supervisor or manager could do in the early days of industrial management. But now production demands are such that *no one man can perform all of the tasks of work organization.* The operating manager or supervisor can no longer be a jack-of-all-trades in production.

The personnel member of this team is primarily concerned with establishing realistic specifications for hiring. He has to work out with the training man the level of skill at which employees can be recruited and how much training will be required before the new employee can be placed on the job. The labor market and what it costs to produce the product at an established quality will enter into this decision.

The salary and wage specialist studies any job to evaluate it in terms of the company wage structure. In this, bargaining with the

union may be involved. Job evaluation usually includes, as one of its factors for consideration, the training difficulty involved in the operations of the job. This information is supplied by the training man.

The essential contribution of the training specialist to job development, before training is undertaken, is made in cooperation with the industrial engineer in establishing the organization for the work of a production unit. No one specialist can perform all of the tasks of work organization. The industrial engineer studies a shop or factory from the standpoint of output demands, just as the automotive engineer studies the requirements upon an engine. From this he establishes the work load. He lists the operations necessary to accomplish this load, establishing how many of each are necessary. He combines them into jobs. At this point *the training man can be of vital assistance by indicating the training time required for each operation.* In this way necessary job simplification can be accomplished, or specialization if there are extensive demands upon any one operation. All jobs, then, are combined by the industrial engineer into an efficient work flow. Work places can then be laid out for the most efficient utilization of space and effort on the part of the operators.

This organization of work in office, shop, or factory has been going on gradually over the years in most companies, always with the goal of improvement of the working process. Methods men study the job to improve working procedures or work place layout. The training specialist studies the job from his point of view of improving skills. He sets up job-related or job-site training whenever deficiencies are found in present operations or new operations are to be introduced.

THE EMPLOYEE DEVELOPMENT TEAM

Employee development starts with the recruitment of new employees, and ideally ends with their retirement. No one should ever be hired to be fired, for this is a waste of company money. It is just as much a loss as is the purchase of the wrong materials.

The personnel man has studied the job to establish its specifications for hiring and to select the people requisitioned by operations. He reviews and recommends for promotion based on these "job specs," as they are called. Final approval of all hiring and all pro-

motion is in the hands of the operating manager. The personnel man is his assistant in employee development.

The training specialist is the key individual in making the employee development team a success. Once the employee is hired, it is the specialist's task to develop him, for example, from loader to president if possible. The job is the starting point in all training: the manager's, the typist's or the mechanic's.

Social Responsibility of Training

Whether in the job skills area, or in managerial training, and particularly in general education, the need to develop human beings has caused the leaders in the training profession to realize that *a great social responsibility is involved in training.* Training is viewed not only as a means of providing an industrial company with greater productivity but as a way to develop a better society.

Material change is affecting training in almost every job. Automation in industry is now producing earth-shaking new conditions. *Training is the means provided for an employee to adjust to his ever-changing life work.* Each worker, each manager must keep up with material culture or drop behind in modern industrialization.

Every material change forces a social change to which there must be an employee adjustment. Training is needed to provide for *changing attitudes to meet these social changes* as they take place. This is where the responsibility of the training department becomes acute!

The company training program is a conveyor of social change, of providing for employee adjustments which contribute to re-forming society. The company bears a responsibility in this re-forming process. How well it meets this responsibility rests largely on the shoulders of the personnel who are planning the company training program.

10. *The Training Profession*

THE goal of education is to make a man self-sufficient and the goal of training is to make him self-sufficient in work. The trainer, the instructor, the teacher, has the task of guiding others in becoming self-sufficient. This entails vast responsibilities, responsibilities toward human beings which go far beyond those of other vocations.

An instructor or trainer is regarded as unethical who teaches others what will harm them, what will make them less effective as human beings, what will lead them into trouble, or cause them to have accidents, or make them unhappy. He has broken faith when he misleads or misguides a person who looks to him for assistance. Those who teach should ponder their great responsibility.

Knowledge is a tool which may destroy. The following is inscribed on a tombstone in Essex, England, dated 1440:

> When pictures look alive with movements free
> When ships like fishes swim beneath the sea
> When men outstripping birds shall scan the sky
> Then half the world deep drenched in blood shall lie.

Now that the first three predictions of this age-old "revelation" have come true, the way to avoid the last is to direct man's new knowledge into productive rather than socially harmful channels. He who chooses the profession of industrial training bears a share of this responsibility to mankind.

SETTING THE STAGE

Sounder professional development among training people is gradually eliminating some of the less accurate ideas of the past. But *many misconceptions have crept into the attitudes and beliefs of the training profession,* as happens in the emergence of any professional group. These ideas range from the belief that anyone can train

others to do anything they can do themselves to conceptions of trainees as mechanical men. Let's examine the facts.

WHO SHOULD DO THE TRAINING?

It is often said that the skilled journeyman, the speed typist, the successful supervisor, is the person to see when needing a good job teacher. A great many managers and supervisors believe this today, as do occasional members of the training profession. Does one who knows how to do a job always know how to teach or to train others? This does not seem to be the case. The expert may have forgotten *how* he learned even if he knows *what* he learned.

This was dramatically illustrated in the recent statements made by a famous Arctic explorer. He refused to train his men on how to prevent frostbite. He felt that he was so well trained that he was no longer aware of, and could not communicate, the processes by which he learned to protect himself from extreme temperatures. He insisted on a person trained in training others to do this for him.

Often a supervisor, when transferred to another unit where he has little or no skill in the crafts, finds that he can do a better job of supervision than he did when he supervised workers in skills in which his performance was equal to the best craftsman. This is an analogy; but everyone has seen a craftsman, confident that he can train others in his craft, who bewilders and discourages his trainees with directions and then jeers at them for their awkwardness. Finally he ends up by doing the work himself because it is easier, and his training is reduced to yelling at the employees when they do not hand him the right tool.

Another mistake made by journeymen in training is to permit the trainee to practice a skill when he does not know the right moves, and then correcting him only when he does something drastically wrong. The trainee often is allowed to practice the wrong way sufficiently long without correction until what he must now unlearn is more difficult than new learning. This is particularly true in the hit-or-miss methods of supervisory training.

A *good teacher thinks as the trainee thinks.* He points out each step of the learning, what it is that the trainee must accomplish—for example, where the hand should be on the hammer handle, where the light should be in reading the micrometer—when to explain and when not to confuse, and when to let the trainee do it

alone. To become a craftsman requires considerable training in the skills of the craft. *To become a trainer in that craft requires considerable training in how to train,* because training is itself another skill. *Learning how to train must be given the same attention and painstaking effort that goes into the development of any skilled performance.*

The belief that a skilled person is ipso facto a good trainer has led many managers into trouble. Not all people who are highly qualified in their work want to be trainers. This is *the first test: Does he like to train others?* It is sometimes better for a trainer to be less than expert, for then he will retain the need for self-improvement. Generally speaking, *it is best to select instructors and trainers for their experience in helping others*—teaching, guiding, and counseling—with the supervisory or trade skills given secondary consideration.

This principle is well recognized in training athletes, but it is not as well recognized in industry. It is not expected that the successful coach will be the top performer. Likewise the successful teacher of music may often be an obscure person, known only to other musicians. The army learned this principle the hard way in the last war when it found that top aviators or top noncoms did not make the best instructors. An instructor might be any person who is interested in people, in their development, and who studies ways by which operations can be learned easier, faster, and better.

AVOIDING IMPRACTICAL GOALS

Some training people have become extreme visionaries in human relations. They behave like missionaries, promising almost impossible results from training. They seem to have an impractical ideal in front of them which they strive unrealistically to attain. The manager or supervisor that they hope to develop could be called a god without too big a stretch of the imagination: one who is always objective, one who never loses his temper, one who is courteous and ever available to discuss the problems of others, one who knows the privates lives of his subordinates, but never intrudes and always understands what is troubling them; all of this, and sometimes more! In addition, he must maintain costs and get the work out! These are not uncommon misconceptions found in the training profession.

Surely the training specialist hopes that what is going on in his

training of others will make some difference in the way the trainees will behave in the future. When a supervisor goes back to his office or shop after a training session, he is under varied pressures of working relations. *The effects of his training may fade into oblivion when he returns to the work scene. This is the reality a training specialist must face as he develops his objectives.*

The manager or supervisor or worker is under pressures both from without and from within. Pressures from without may be similar at all levels of supervision. They include, along with getting the work out, all the problems that arise when people are at work together, such as living with company policy, according to rules laid down for safety, transportation, and housing, and accomplishing the work in accordance with the union contract. These problems put pressures on everyone. How they are met will be determined in large measure by the pressures from within the person.

EXPERIENCE IS OFTEN A POOR TEACHER

One of the most persistent assumptions about training is the belief that learning from experience is a simple, effective process. From childhood on we have all heard this.

All would agree that what a manager or supervisor learns from experience is likely to be important to him. However, the surprising thing is that *the same experiences teach different people quite different things.* They can teach the wrong as well as the right lessons. *The "school of hard knocks" makes both good and bad managers or supervisors.*

In talking to supervisors, one will find that personal experience has taught them many surprising things. For example, some supervisors of women will say: "Women are more easily upset by unimportant things than men"; or a gang boss will say: "You have to let laborers know who is boss to have their respect"; or an old first-line supervisor will say: "It's not what you know but who you know that counts in getting ahead." Another will say: "You can't train people; they either have common sense or they don't, and no training program will give it to them."

Such beliefs are not unfounded and *they can be traced to the experiences of the believer. But they are often incorrect generalizations.* If applied too rigidly they may get a supervisor into trouble, or

more important, they will prevent the supervisor from learning new lessons from fresh experiences.

Once such beliefs are built up, they persist, and *every new experience has a way of seeming to confirm them.* For those who believe the world is hostile, every experience makes it so.

All of us select from our experiences the points that support our beliefs. *On many occasions experiences are used to confirm, not to correct, our own prejudgments.*

Learning from experience is not the simple process it is often assumed to be. It is not the trainee's ignorance that is the greatest difficulty in training; but it is what he is sure he knows (which really isn't so) that causes the trouble. The greatest task in training is to *get the trainees to unlearn those particular beliefs which are not true.*

This brings us to the main point concerning the misconceptions of the trainer. There is great confusion when an instructor teaches impractical idealisms to trainees who are convinced of the truth of their own false beliefs. No training outcome of any value will result, as is illustrated in an actual example from supervisory training in the discussion of loyalty. The conference leader asked the group of supervisors, "How about loyalty?" A supervisor said, "Good, you have to have it." The conference leader said: "Is it ever bad?" The answer he expected was, "No, not if it is directed toward the company." But he did not get this answer. One of the supervisors in the group said: "When the company gives you a raw deal, you can't be loyal." So, the conference leader became hard-boiled and said, "Well, then you'd quit." The supervisor hedged and said, "Well, I don't know," seeking an out. Then, the conference leader rushed in to close the subject as best he could by saying to the group what he hoped a supervisor would say: "Here we have an emotion that is good if properly directed. To whom do we have to be loyal? First to the company—to all executives and to all workers."

Trainers cannot tell adult human beings how they should behave and what their beliefs should be. Why? Because people learn by themselves from their own experiences.

It is not possible to change these past experiences but *people can be given an opportunity to reexamine and reevaluate their own experiences.* Teachers can help people to recognize the reasons why they feel and believe as they do. They can help them to ask better

questions of their experience. The church fathers spent a great deal of time trying to answer the question, "How many angels can dance on the head of a pin?" Unlike the church fathers the good trainer asks questions for which answers can be obtained. *An instructor or a trainer can help people to recognize the feelings that experience gives them. He can show them how to ask better questions* in explanation of their experiences. *He can help them to become better observers* of their own experience. *He cannot tell them how they should behave.*

ESTABLISHING REALISTIC GOALS

Unrealistic goals often are accepted by training men as practical or necessary because of the demands of management. The training specialists recognize that the operating man is boss and that they must do as production management wants, particularly if they cannot convert responsible authority to more realistic approaches. These goals frequently are based on conceptions of labor as a commodity bought and sold in the market place. Realistic training goals come neither from the minds of idealists nor from the biased point of view of unenlightened self-interest. *They come from a balancing of motives, from a compromise between what management wants in immediate production and what the trainee wants in self-development.*

Let us take an illustration from the published remarks of William Gomberg, an industrial engineer in the employ of the International Ladies Garment Workers. He describes a situation where a supervisor needed two of three qualified girls to work on Sunday. All three girls had dates, one with other girls, the second with a boy to whom she was engaged, and the third with a new man, whom she hoped to bring home to the folks as a conquest. None wished to work on Sunday. The supervisor called all of the girls in the shop together to discuss which two of the three girls should work overtime. The girls felt that a date with other girls was not a real date and an engaged girl could alter her date, so it was agreed that the girl with the new conquest had priority. Mr. Gomberg stated that there should be no implied assumption that the girls' dates after working hours are any less important than the employer's production problem. If the girls are not willing to work after regular hours, that is their privilege. That is the difference between a real demo-

cratic solution and a play-acting democracy. The girls had no obligation to solve the employer's production problem.

Thomas Jefferson spoke of a democracy as a functioning compromise. So, *in training, the company goal for increased production must be brought together with the worker's need for individual development.*

The job of the training specialist is to help people become better managers, better supervisors, better mechanics, better clerks, and better people. *Industrial trainers are concerned with the problems of people:* people wanting to know, people wanting to improve, people wanting to be a part of something, people wanting more, and people just wanting. The training specialist's job is to fit benefits to these "wantings," benefits gained through training, in which accomplishment accrues to the company.

Industrial training personnel are in a position to understand both the company needs for training and individual desires for development. It is their task to achieve a joining of these purposes. *An instructor or trainer cannot eliminate conflict of motives, but he can achieve a realistic compromise* for the mutual benefit of all.

Qualifications for the Training Profession

The training specialist has emerged as a professional very recently in the history of industry, and in large measure this has taken place as a result of World War II. During this war a specialist in training was in great demand both in the military and in industry, because so many new and varied ways to do things faster and better had to be learned by millions of people. In his brief history as a professional worker in industry, the training specialist has learned the importance of study and experience both with the job structure of industry and with the psychological make-up of the worker.

As a person, the industrial training specialist ranges from an artisan of little formal education, guiding the on-the-job trainee, to the Ph. D. who is adapting the professional knowledge of education to the needs of an industrial company. Their qualifications will differ according to the demands of their jobs.

There are, however, certain essential qualifications for all training specialists, whether employed to teach a simple industrial task in a job-site training unit or to manage a large staff training department. These are the things that make training a profession.

To rephrase an old statement, "Trainers are born, not made," we realize again that this is only a partial truth. We know that *teachers and trainers are made when there is the will to learn how to teach and to train.* But not all persons can be successful in teaching and training, and *there are wide individual differences in ability to teach others.* Interests, incentives, and general background are pertinent factors in the development of industrial training personnel.

Above all, *the industrial instructor* or trainer must learn a truism from all teaching. He *must not be set in his ways.* He must be ever developing. He *must be flexible in thinking, as if he were growing with those he is helping to grow.* On this rests his right to teach and train others.

EXPERIENCE

Experience requirements will vary for the industrial trainer or instructor. But it is generally accepted that *industrial experience is desirable if not necessary for all those concerned with training.* A teacher cannot be taken directly from the college classroom and be expected to function adequately anywhere in industrial training, not even if he is just teaching a course in mathematics or English. There must be a certain amount of industrial orientation to establish acceptable attitudes.

It is important for the instructor, or trainer, or conference leader of any industrial group to have had some common experiences of the group. It is desirable for the trainer to know how managers and supervisors think about their problems and how they solve them. As implied above, *it is knowledge of the attitudes and beliefs,* gained through supervisory experience, *which will help the instructor* to bridge the gap between the company demands and the individual needs.

The most essential item of experience for industrial training, however, is to know the occupations, and how they can be broken down into elements or steps in learning. This is a technical requirement of the training specialists. It can be gained in various ways, e.g., as a job analyst, as a time study man, as an employment interviewer, or as a vocational counselor. Any experience that has broadened one's knowledge of occupational skills, their simplification, their relations, the time required for their learning, their difficulty, and their social

status, is essential experience on which the training specialist may build his skills.

EDUCATION

Training jobs always will vary in their formal educational requirements. It is a safe rule, however, that *the formal education of the industrial trainer or instructor should be at least equivalent to that of the people who are in training.* Greater educational demands will, of course, be placed on the trainers of managers and executives. Those who are the planners of training programs or who direct staff training departments should be highly educated men in the formal sense, for they should know what science and education can contribute to industrial training.

All training personnel should be adept at both spoken and written language. Often, the training specialist will need to lecture before groups of managers and supervisors on subjects where new content is presented for discussion. They will be required to organize courses of training in written form and to abstract books for outside readings. All this must be done at a higher rate of speed than is required for training in most occupations.

Training personnel need to be perennial students of people and the social structure in which they live. What they lack in formal education they need to secure through study and reading in the fields of anthropology, economics, education, psychology, sociology—anything concerned with man, how he lives and develops. It is, of course, essential that the trainer keep abreast of recent developments in his own profession by reading widely in the principles and techniques of training.

PERSONALITY

Anyone who is to teach should have a demonstrated interest in teaching and give evidence of enthusiasm and patience in training others. Above all, *an instructor or trainer must like his job.* One may do mechanical work where there is no interest, or fun, or desire, in performing the work. But it is doubtful if even this work can be accomplished without error where one is completely uninterested in the results. *Teaching or training, on the other hand, to be successful requires a personal relationship in which the trainee definitely feels that he himself and what he does are important to the trainer.* They

are important because the teacher or the trainer is interested in him and his success.

The successful trainer has cultivated a personality that is acceptable to others. Others will accept suggestions from him. He is encouraging, optimistic, and enthusiastic about what they are trying to learn and what they want to be. This is the foremost qualification of the teacher.

One should review carefully the personality qualifications of a person who is being selected to train others. *Such an individual must be adaptable to changing ideas;* he must be *flexible in discussion and cooperative in human relations;* he must be *a keen observer of human problems and helpful in seeking their solution.* Yet he must maintain in his own mind the purpose for which he is working and have clearly before him the goals of training. Most important, *he must be aware of his own beliefs and attitudes that may block his understanding of those he trains.* He must keep an open mind, eagerly searching for better ways to do his job.

The Job Breakdown of a Training Specialist

The job breakdown of various training specialists will differ, of course, according to different training jobs. There is, however, a job breakdown which applies all across the board in training jobs. It might be called a core job breakdown, describing what all training specialists, instructors, conference leaders, trainers, and teachers must do in setting up an industrial training program.

The major steps of this job breakdown for the training specialist as they apply to all industrial training are shown in Fig. XIII. These steps begin with the initial review of the needs for training through observation and discussion with production personnel, thereby establishing the areas, or vocations, or shops where training is required. The initial review with management may establish that supervisory training is the starting point or that job training is the starting point or that certain orientation training is the first essential in the training program.

Questions of what training is necessary and of who shall be trained must be answered before any training plans can be made. There is a lot to be done before the training program can be prepared and trainees selected and introduced.

This job breakdown ends with the evaluation of the training. In-

FIG. XIII. JOB BREAKDOWN OF A TRAINING SPECIALIST

Steps	*Key Points*
1. Discover areas of needed training	Consult with production heads; sell training needs
2. Determine the skills of jobs in which training is needed	Include tolerances required and measures of learning difficulty
3. Discover individual worker deficiencies or needs for improvement of skills	Have operations personnel test worker performance in skills
4. Establish training program	Prepare individual trainee records; assemble trainees in courses according to training needs
5. Construct courses with content and training aids necessary to the training	Check content with steps 1, 2, and 3; select appropriate method of training
6. Schedule training of workers in courses	Provide facilities: e.g., rooms, aids, transportation
7. Training of trainers (incl. self-training)	Consult about qualifications: experience, education, personality
8. Evaluate training	Use job standards and trade tests; maintain employee development records

dividual performance evaluation may be accomplished through job tests. The opinions of production supervisors may be sought after the trainees have returned to the job, or in the case of part-time training, their opinion may be given while the training is in process. The opinions of trainees or recent graduates from the program should be systematically collected. All of this helps in improving any training that is under way or in planning future training. Procedures that can indicate the practical value of what is taught will not only help to improve the program but will also go a long way in justifying its existence or any needed expansion.

Records of individual trainee accomplishment are necessary to any training program. They lend prestige to the training. They provide the basis for reporting to management. Above all else, they furnish accumulative records of employee development for use in assignment and promotion.

Professional Perspective

"Our earth is degenerate in these latter days; bribery and corruption are common; children no longer obey their parents; every man wants to write a book; and the end of the world is evidently approaching." This statement was copied from an Assyrian tablet on which it was carved 4700 years ago. It is apparent that in those early times teachers were already discouraged in their accomplishments.

Industrial training is a new profession and we should not expect too much from it too soon. Professional standards, professional ethics, and professional skills are in large measure yet to be defined and imbedded in the attitudes of training people. There is no need for discouragement; there is so little known and so much ahead in industrial training. A comparison of industrial training with what has been accomplished in formal education during the last fifty years should be enlightening to the training specialist in setting the goals of his profession.

It can't be done

Getting outside of one's job helps to give one realistic perspectives. The goals of industrial training can be such as to change the entire picture of industrialization. Just as material invention has changed and is changing industry, so human attitudes have and will create changes.

Let's look at a few things of which it was said, "It can't be done" by the many, and which the few who had perspective did. These are all things that are commonplace today.

The first successful cast-iron plow invented in the United States in 1797 was rejected by New Jersey farmers under the theory that cast iron poisoned the land and stimulated the growth of weeds.

An eloquent divine in the United States declared that the introduction of the railroad would require the building of many insane asylums,

as people would be driven mad with terror at the sight of locomotives rushing across the country.

In Germany it was proved by experts that, if trains went at the frightful speed of fifteen miles an hour, blood would spurt from the travelers' noses and the passengers would suffocate going through tunnels.

Commodore Vanderbilt dismissed Westinghouse and its new air brakes for trains with the remark that he had no time to waste on fools.

Those who loaned Robert Fulton money for his steamboat project stipulated that their names be withheld for fear of ridicule were it known they supported anything so "foolhardy."

In 1881, when the New York YWCA announced typing lessons for women, vigorous protests were made on the grounds that the female constitution would break down under the strain.

Men insisted that iron ships would not float, that they would damage more easily than wooden ships when grounding, that it would be difficult to preserve the iron bottoms from rust, and that iron would deflect the compass.

Joshua Coopersmith was arrested in Boston for trying to sell stock in the telephone: "All well-informed people know that it is impossible to transmit the human voice over a wire."

Chauncey M. Depew confessed that he warned his nephew not to invest $5000 in Ford stocks because "nothing has come along to beat the horse."

In 1907, when DeForest put the radio tube in workable form, he was unable to sell his patent and let it lapse rather than pay $25 for its renewal.

In 1890 serious consideration was given by politicians to closing the Patent Office because it was considered that everything new had been thought of already.

Just a cursory review of the attitudes expressed here illustrates how secure one can be in ignorance. The horizon of the training profession is broad, but is undefined as if one looked "through a glass darkly." No one today should say of training, no matter where it is considered, or for what purpose, that it can't be done.

THE LAG IN TRAINING

What the training specialist needs from industrial management, above all else, is an understanding of the difficulty of the problems of training, an awareness that a human being is not a piece of raw material or a machine to be molded at will, and a knowledge that time

is necessary to get results. Training gathers momentum. The results come slowly at first, particularly in the handling of men. But once rolling, the results pile on top of themselves until it seems that all people in an organization are in training. Training specialists need understanding and cooperation in removing the obstacles to effective training. It might be well to review with operating management some of these obstacles to training.

PEOPLE WANT TO ADVANCE IN THEIR OWN WAY

Each individual sets his own goals for his development. Here is an illustration.

Hank was a native worker in the company butcher shop in one of the foreign enterprises of a large American concern. Hank had advanced to the journeyman level. But he went to school every night for four and a half years. He took everything that was offered by the company school. One day Hank came into the training office and asked for a job as a trainer. He was told in a humorous vein that the company did not need anyone butchered. He said quietly, "Oh, I can teach anything: English, mathematics, typing, shorthand, bookkeeping, certain trades, anything, almost, that you want." He was a journeyman butcher. Would you have believed him? But to be fair he was sent to the school office with the request that he be given an examination in various subjects. The school sent him back with a note, "There is no use in examining him, he has passed everything in the school. His record is attached."

Then he was asked, "Why do you want to qualify as a trainer? It won't be long before you will be the supervisor of the company butcher shop and that pays really good dough. You only have to work eight hours a day now and you can do the work almost with your eyes closed. If you are a trainer, you will get less pay; you will work long hours; you will teach evenings; you will have to guide other people slowly through things you know well; they won't show any appreciation of your help; in fact, they may resent your helping them." His answer was, "Oh, that's all right. I want to be a teacher."

Why? Because in his country a teacher had higher social status than a butcher. He became a trainer, and a good one, and probably married the girl who wouldn't marry him when he was a butcher.

Such are the things that make individuals willing to learn and also create the problems and the adventures in training. *Each individual is different. As a training specialist, one can do a great deal toward helping people want to learn by understanding their individual goals and hopes for the future.*

PSYCHOLOGICAL BLINDNESS

Another obstacle is psychological blindness. *The trainee often cannot solve a problem because his set is against it.* He just doesn't see it that way and *it is not stubbornness.* A famous experimenter used mathematical problems to demonstrate this, giving them to mathematicians. The first few problems could all be solved easily by the same formula. This set the mathematicians in the way to perform the task. The next problems could all be solved by this same formula, but it took a great deal of time to work through to the solution. Another formula could be used which would solve these problems easily. But all were done the hard way by these mathematicians because they had been set to do them in that way. They had what is called psychological blindness. They knew the easy way, but never used it because they were habituated in the hard way. The people a trainer meets may be just as blocked from doing things the easy way as these mathematicians were.

HABITUAL BEHAVIOR

So it is with supervisors in learning better ways to deal with people. They may have knowledge of how to handle people so that there can be a smooth-running, cooperative organization. But the bad ways of dealing with people, in which they have been habituated, come out before they think, under the stress of a human problem. This is one of the most usual causes of lag in the training of managers and supervisors. *Changing behavior and attitudes is far more difficult than imparting knowledge.*

To make this point absolutely clear let us ask ourselves, "Do I first put on my shoes or my shirt when I get up in the morning? My right shoe or my left shoe?" We cannot tell, can we? There is a reason: Nearly all of our behavior is automatic. We have learned a certain definite sequence and we hold to it! If this were not so, we would be worn out before breakfast. Habit comes to our rescue and

takes over most of what we do, fortunately. But to change those sequences and habits is more difficult than to make them. This is why there may be a lag before training takes hold.

MANAGERIAL ATTITUDE

Lag in training can be increased or decreased by the attitude taken toward it by management. If management gives training wholehearted support in all ways, everyone else is likely to do so. But if skepticism is shown by various managers toward the efforts of the trainers, perhaps in a few jesting remarks about "those new-fangled ideas," then others in more lowly positions will follow suit. There are more derogatory terms in the dictionary than there are encouraging words. People seem to take pleasure in using them.

TEACHING ATTITUDE

The instructor's attitude toward the trainee will affect his learning in an astonishing manner. We all know our children do badly under a teacher who is not interested in them. Sometimes a person learns on his own without a teacher. But he must know what he seeks. A trainer should be a guide and inspirer in training. *The attitudes of the teacher can increase or decrease the natural lag in all training.*

IT TAKES TIME TO TRAIN

The real effects of training will come after several years. It takes hours and hours of practice for a typist to get his speed up to thirty words per minute. But it takes months and perhaps years for him to learn to fit into an office organization. With continuous training he might develop into office manager and perhaps be prepared for a position as vice president in charge of finance.

So with the first-line supervisor. It has taken days and months of practice to acquire the skills of his trade. The development into a top-flight supervisor will be gradual over the years, as he is promoted up the line, providing he has adequate guidance in making these steps. It is the trainer's purpose to give him this assistance. But *the long-term effects of training have to be recognized* in planning such a program. Patience is a special virtue in the Bible of the training specialist.

A Sound Professional Philosophy

A sound philosophy for the training profession will be based on faith that the job can be done. It will be based on faith in the flexibility and adaptability of human beings to grow and benefit from training to perform, in the future, what would be regarded today as impossible industrial tasks; on faith in the ability of the training specialist to grow so that he may develop the means whereby this training is made possible; on faith that industrial management may be enlightened as to the status necessary for the profession. With this philosophy it will be possible to train the people who can operate the expanding machinery of industry.

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INDEX