

HOW TO DEAL WITH RESISTANCE TO CHANGE IN INDUSTRY

by

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INTRODUCTION

"One thing that is new is the prevalence of newness, the changing scale and scope of change itself, so that the world alters as we walk on it, so that the years of a man's life measure not some small growth or rearrangement or moderation of what he learned in childhood but a great upheaval."

(J. R. Oppenheimer)

One of the most baffling and recalcitrant of the problems which business executives face is employee resistance to change. Such resistance, as explained by Lawrence (1950), may take a number of forms--persistent reduction in output, increase in the number of "quits" and requests for transfer, chronic quarrels, sullen hostility, wildcat or slowdown strikes, and, of course, the expression of pseudological reasons why the change will not work. Even the more petty forms of this resistance can be troublesome. All too often when executives encounter resistance to change, they "explain" it by quoting the cliché that "people resist change" and never look further. Yet changes must continually occur in industry. This applies with particular force to the all-important "little" changes that constantly take place--changes in work methods in routine office procedures, in the location of a machine or a desk, in personnel assignments and job titles. No one of these changes makes the headlines, but in total they account for much of our increase in productivity. They are not the spectacular once-in-a-lifetime technological revolutions that involve mass layoffs or the obsolescence of traditional skills, but they are vital to business progress.

Does it follow, therefore, that business management is forever saddled with the onerous jobs of "forcing" change down the throats of resistant people? The answer, of course, is no. People do not resist technical

change as such, and most of the resistance which does occur is unnecessary.

The key to the problem is to understand the true nature of resistance. Mostly, what employees usually resist is not technical change but social change--the change in their human relationships that generally accompanies technical change.

PERSONAL FACTORS

People differ in what they expect from their jobs and what they value as important. Some individuals are so frustrated by life in general that they report their jobs highly dissatisfying, although no change in their work would really make much difference in how they felt about it. But they are the exception and not the rule.

To be interesting and challenging, the demands of the job should match the abilities of the jobholder. If the demands are too great the worker will be frustrated by his failure to succeed; if demands are too light he will be bored by the lack of stimulation.

Motivation to work will depend strongly on the extent the individual worker is clear about his objectives in working. He is likely to be influenced by his own level of aspiration, and when faced with goallessness, negative goals or conflicts in goals he will seek flight or fight, alternatives to adaptive or productive action.

It will be useful to pause here to see how employees differ in what they find rewarding about change in their work environment. Whether the changed environment is rewarding and satisfying will depend on the particular worker's age, status, attitude and job satisfaction, morale, anxiety, sex and ability.

Age

The kinds of changes that have been taking place in industry on a large scale--for example, the increasing proportion of clerical work, the displacement of some traditional jobs by automatic equipment, and the rise of whole new industries generally favor the younger person who has no old skill

to unlearn. An older man with a lifetime investment in skills that he fears could become obsolete at any time tends, understandably, to view any kind of change with misgiving.

In some industries a reasonable proportion of the more skilled jobs may involve either considerable physical strength or high-speed working. Additional opportunities for training for these jobs may not be freely extended to the workers over forty years of age.

Heron and Cunningham (1962) studied "the experience of younger and older men in a works reorganization" involving 209 men. Although few men left the factory during the period of reorganization--probably not more than usual--the proportion of those who were aged forty or more who left was high. Second, there was evidence that in this reorganization men over forty went to the lower grade jobs in relatively greater numbers than did their younger workmates. In this connection it was also found that few of those over forty received training whereas a majority of those who were less than forty received training. The question then is what can be learned from the above study?

There is a possibility that those responsible for decisions "naturally" preferred younger men when the more skilled jobs, requiring the most training, were under consideration. If this preference was exercised because it was known that an older man often takes longer to learn than a younger man, then at least it can be said that perhaps such a view is correct. But if the preference was based on tacit acceptance of the cliché "old dogs can't learn new tricks," then it had no such foundation. The fact is that older men can learn new tasks, but they may require special training and they may take longer.

This is not to say that training alone would solve all the problems. The point, however, is that a complete neglect or even a half hearted attempt to look after the adjustment of the workers over forty years of age may result in employees' dissatisfaction and eventual loss of interest in their work.

Good managements never knowingly waste men or materials, and try to strike a fair balance between considerations of humanity and of economic necessity. There is one hard-headed reason for giving thought to the problems of production planning and of training which must be solved if better use is to be made of that population of the working force which is "over forty"; it can be seen as good investment. Men over forty years of age are generally regarded highly by managers and supervisors, who speak of them as "more conscientious, loyal, co-operative, tolerant, better timekeepers" (Heron and Chown, 1961). They certainly stay longer in the firm than do their (sometimes) quicker learning younger workmates. The saving in labor turnover costs and gains in reliability would, in all probability, more than pay for whatever additional costs were involved in special or longer training, or in process or job modifications.

Status

An important influence as explained by Gellerman (1963) on the employee's attitude toward change is, in a sense, "political." New operating methods can change the status relationship within a department or at least create the possibility that old status relationships can be challenged. If, for example, an employee was the key man in a particular operation that is to be superseded, he would have a stake in preserving his favored position.

Whether he opposes the change or accedes to it will depend, to a large extent, on whether he thinks he can continue to be a key man in the new operation. On the other hand, if an employee does not have a particularly influential position under the existing system, he will have little to lose under the newer one. Accordingly the non-status employee is likely to support a change if it promises to put him in a stronger position and to be neutral toward it if it seems unlikely to affect him directly.

Attitude and Job Satisfaction

Reid (1964) points out that it is this human factor that is so often overlooked when a new system is being planned and installed. On paper, a new system may look foolproof. Employee A does this, Employee B does that, Employee C follows up, Employee D takes it from there, and the nice, shiny product comes out here.

But what happens when this tidy blueprint for change must be transplanted into flesh-and-blood reality? Employee A finds himself unable to adjust to the new ways of doing things. He honestly believes that the way he has been doing his job for the past ten years is the best way--not because he has analyzed it objectively, but because he has become so comfortably adjusted to the inefficiencies of the old method that he is no longer even aware that they exist.

Employee B has lost his bearings. He does not know what his job means any more. All the familiar landmarks of his old job have suddenly disappeared, leaving him helplessly adrift on a strange sea. He may do his best to swim back to shore--meaning get back to the obsolete system.

Employee C has been obliged to work overtime for ten straight days

during the changeover. Sheer fatigue is affecting his attitude toward the new system--and it is also affecting his efficiency.

Employee D is a sociable, outgoing man. In his old job he enjoyed working closely with other people. Now things have changed--his new job puts him off in a corner by himself where he hardly sees anybody all day. He resents this isolation, and the many errors he is making at his new tasks are unconscious expressions of this resentment.

These are very real attitudes. But before the supervisor can deal with the worries and discontent of his employees, he must be aware of them. This is not as simple as it sounds, because many employees will express such feelings obliquely rather than directly. It is up to the supervisor to be something of a Sherlock Holmes--he must be able to spot and interpret the clues that reveal the employees' real attitudes about the changeover.

Since these problems involve people, they have no sure-fire solutions.

There are some effective ways to help employees accept a new system and adjust to it with minimum disruption and distress. The most important is the one which we all have heard so much about; that is, show your own confidence and develop the confidence of others in whatever you propose others to do. This may be effective for employee A. Explanation of the meaning of his task may help employee B. Give employee C some rest. Redesign the job so that the employees are physically closer for employee D.

It is a human characteristic to time and again try to do things the old and familiar way. Employees likewise are tempted to return to their old ways of doing things. Sometimes, a little loophole in a newly changed system is taken up by the employees as a sign sufficient enough to start grapevine talk that the new system will never work. Small errors by

employees, either in design or manufacturing methods, are generally overlooked. Defects like these should get the management's utmost attention and must not be considered as having a self-correcting built-in mechanism. They must be given management's full consideration so that a correction can be made before it is too late.

Whenever any change is planned to increase productivity its effect on one crucial element, job satisfaction, must be thoroughly investigated before such a change is introduced.

Some studies (Gadel, 1953; Ross and Zander, 1957; Stagner et al., 1952) have approached job satisfaction by combining variables relating to favorable work attitudes into factors. Although there is not a complete agreement in studies made as to what precisely are the factors which really count as a source of job satisfaction, there seems to be a strong tendency to include the following factors:

1. Working conditions
2. The work group
3. Supervision
4. Pay and other benefits
5. The company.

Basically, then, job satisfaction emerges as an individual favorable attitude towards the five factors.

Metzner and Mann (1963) and Ross (1957) have indicated how job dissatisfaction leads to worker grievances, absenteeism and turnover. Hence, when wants are not met on the job (where recent changes have been brought about) a person attempts to satisfy his wants by leaving the unsatisfying environment either temporarily or permanently.

In the opinion of the author of this report a high degree of anticipated job dissatisfaction exists among the majority of Southeast Asian students, many of whom stay in the United States or in some European countries after the completion of their education abroad.

During discussions with many foreign students, one may easily pick up the sources of trouble:

1. Low pay scales for technically qualified people
2. The autocratic supervision on the jobs offered to them.

Since the newly developing nations, more than any other nations, require the services of these young men, it would perhaps be worth while for management in those nations to take positive steps to remove some of the job dissatisfaction factors which ultimately are holding back the progress of those nations.

Morale

Stagner and Ross (1952) define morale in terms of an individual-group relationship. The point that they have emphasized is what Applewhite (1965) uses in differentiating between job satisfaction and morale. Individuals possess job satisfaction and groups possess morale. It is important for a manager, supervisor or leader to differentiate between the two concepts.

If, in a newly changed environment, individual aspirations are met, the worker may seek further satisfaction in cooperating with a group of his fellow workers. The group, then, develops certain expectations (in this case with changed situations) and becomes motivated to reach some goal.

Let us now examine the difference between the concepts of job satisfaction and morale from a practical point of view.

Katzell (1958) writes, "Morale is a condition of congruent motivation among members of a group resulting in relatively high levels of energy expenditure."

From the studies mentioned above as well as from Guine's (1958) study, the author of this report agrees with the conclusion reached by Applewhite that an important difference between job satisfaction and morale is the effects each one causes. If a newly changed environment results in increased grievances, turnover and absenteeism, then it is safe to predict that a low morale exists in the group. More important, however, may be low morale's relation to productivity. Medalia and Miller (1955), in their study of air force personnel reported instances where high morale leads to higher productivity. Certainly from our day to day observations we can confidently say that there is more than a chance relationship between morale and productivity. If now we apply the acceptable definition of morale to the relationship of low morale and productivity we will thus conclude that this higher productivity shall result only when the group goal is higher productivity, and higher productivity will result only under the condition of a group goal of high productivity.

It will again be equivalent to saying that the underdeveloped nations must not create an atmosphere where one or only a few qualified individuals can get job satisfaction; real progress can be made only where a vast majority of work groups develop a positive morale.

Certainly, one prerequisite for such a morale to exist is the creation of environments where most of the individuals have job satisfaction.

Anxiety

An element of anxiety is generally associated with a completely new environment as well as with a change from a reasonably static pattern of life. A good everyday example in a student's life, particularly a foreign student studying in the U.S.A., is the element of anxiety connected with the frequent examinations in a short term of four to five months. Quizzes, tests, etc. are deviations from the daily lectures and preparation which a foreign student becomes used to in his home country. No doubt the degree of anxiety differs from one individual to another.

The results of a study done by Hanes and Flippo (1963) are that even fatigue may be a function of the personality of the person. Highly anxious people, though of substantially equal height and weight, protest that they are completely "worn out" long before those who are much less anxious.

This fatigue is as real and important to them as that resulting from complete muscular exhaustion. The major value of this study, according to Hanes and Flippo, may lie in the placement and supervision field. Certain individuals are afraid of working with certain kinds of tools, not because they are dangerous or harmful to their physical being but due to inner personality traits and the degree of adaptability to change. This is not to say that all high anxiety individuals will oppose any and all kinds of changes introduced in the work environment. Once again, techniques employed, timing and the means of introducing these changes play a vital role in their acceptance by individuals or groups. If the change is such that continuous production must be maintained, their study suggests that a test of anxiety might be added to the usual tests of physiological fitness to determine suitability of the individuals and groups to such a change.

Sex

In Western countries where women work side by side with men, many jobs are classified as either meant for men or women. Women are a very important segment of the labor force; long ago this was recognized by Western industrialists and at present this idea is slowly creeping into the Eastern countries. Irrespective of the two cultures, there is the challenge of greater magnitude for management in those industries which employ both the male and the female. Due to certain biological, environmental and even cultural differences between the sexes, a female grows up in an atmosphere which entitles her to different treatment than a male.

In 1964, however, an equal opportunity law was passed in the United States requiring employees not to be refused a job purely on the basis of sex difference, unless some strong and valid reason can be demonstrated by the employer.

Although this change is a step toward eliminating the discrimination, it does however overlook many problems that are enveloped in its implementation. Certainly we are aware of many things that can be measured to a great degree of accuracy and the results proven accordingly. There are, however, a number of intangibles which exist but no accurate and perfect instruments have yet been found to measure them. Things like feelings of a person, attitude, desire, love, hate, etc. are all intangibles which cannot be mathematically measured by a would be employer and thus demonstrate to the government or public as a "cause" for refusal to hire a particular sex for a certain type of job.

For instance, let us imagine a factory which employs both male and female. At present light assembly production work is done by females

because it involves finger dexterity rather than use of muscular strength. Male employees, on the other hand, do heavier work such as punch press operations, material handling, etc. and are paid on an average about fifty to seventy-five cents an hour more.

For the sake of argument let us also imagine that all or few female employees decide to enter into the jobs presently done by males. Naturally many complications can arise. First, will there be no resistance offered by male employees? We must not forget that in many families in the United States there is more than one bread winner and in certain families even a male has a difficulty in finding a job. Second, are we ready to hand over a physically demanding job to women employees who may in the long run be physically harmed and therefore lodge a suit against the company? Another problem will be can men and women be treated similarly and equally on jobs as is done while they are students in schools and colleges? How about the problem of labor turnover on some heavy jobs which may require regular attendance twelve months in a year?

The ideas expressed by the author in the above paragraphs however should not indicate that he is against any infiltrations by members of different sexes on each others job. The main purpose is to bring home the effects of such a change on oftenly overlooked intangible factors. The change somehow must take into consideration these important but hidden persuaders called intangibles upon which the ultimate success and smooth running of any organization employing men and women may depend.

Ability

Bass (1965) points out that the intelligence, skill and education of an

employee should not be much less than the requirements of the job, or inability to perform the job tasks will lead to the employee's dissatisfaction as well as to that of those who depend on him and who are responsible for his efficiency. On the other hand, an employee may be too intelligent, too skilled, or have too much education for his new assignment, in which case he will become dissatisfied because his new assignment is below his level of aspiration and fails to challenge his abilities sufficiently.

During times of labor surplus, firms are tempted to hire applicants with more talent than needed for the job. Unless provision is made for rapid advancement in salary and position of such capable applicants, high turnover rates are likely, particularly if the labor surplus disappears and job opportunities become plentiful again. Hence, when changes are introduced in the work environment, the employee's abilities must be taken into consideration.

HUMAN ENGINEERING--A DESIGN PHILOSOPHY

Just what is human engineering? It is the application of the knowledge of biological and social sciences to the design of any equipment (Woodson and Conover, 1964).

Basically, the idea is not a new one to the industrial engineer. He is fully aware that the efforts of Taylor and the Gilbreths were the first major attempts to increase machine productivity by improving the work habits of the operator. In fact, in this approach man was to adjust to the machine. Human engineering has reversed this procedure; the machine has become the variable. This is equivalent to saying why not design equipment to secure optimum operation in terms of human capabilities, limitations, and variability?

Woodson and Conover explain that the application of human-engineering principles in the design of things which are to be used by people is not an exact science. Rather, it is a philosophy or an approach to problems of designing and constructing things which people are expected to use--so that the user will be more efficient and less likely to make mistakes in the use of the article. In addition, it is an effort to make such articles more convenient, more comfortable, less confusing, and, in the end, less exasperating or fatiguing to the user.

Everything Is Designed for People

This categorical statement is sometimes questioned: therefore it is important to understand why we must accept it to develop a sound "human-engineering philosophy." If one were to analyze each and every object designed or constructed (in an objective manner, that is), he could not

escape the fact that everything is designed for people.

A passenger airplane was designed to transport people, not because we like to design wings and tail sections. A lead pencil was designed because people needed a writing tool with readily erasable marks--not because we like to design little sticks of wood with lead in them and rubber on one end. A complex computer is not built merely for the pleasure the computer gets from running at great speeds. A ballistic missile is not designed just because we like to see amazingly complex hardware sitting on the launching pads.

All of these things were and are designed and constructed to extend man's capability in some way and are therefore built for man! That is, we start with the man and provide what accessories he needs to carry out or reach a prescribed objective.

The Starting Point

It is immediately apparent that the place to introduce human engineering is at the beginning of a program designed to bring any change rather than after completion of the technical design of the job. This is true for equipment, the layout of the area and the development of necessary training programs, following a complete task analysis.

The Role of a Human Engineer

Heron and Cunningham (1962) write that if everyone concerned is conscious in advance about the greater physical effort imposed on the middle-aged operators in a high-speed working condition, this usually has not led to further thought about ways in which these physical demands could be

reduced by variations in work area layouts, or by the use of different methods of material handling.

In today's rapidly changing industries management cannot afford to let the senior workers lose interest in their work.

One thing that a human engineer learns is to regard both man and machine as part of an overall design. Instead of selecting the man for the machine or designing the machine around the man, each component is planned for the system and the objective which is to be achieved.

How can this "complementary" approach be utilized today by those who are responsible for introducing changes? Lavender (1961) depicts the approach followed at the Electronics and Ordnance Division of AVCO. Most human engineering groups follow similar procedures. He states it verbally, as follows:

1. Become thoroughly acquainted with the system that is to be introduced.

2. Make preliminary list of human tasks and requirements utilized by the system. This includes the tentative assignment of functions to one or more men, i.e., assignment which will result in economy of operation, optimal communications, work flow, and size of team.

3. Decide which of the tasks, if any, had best be performed by machine.

4. Decide and list the step-by-step procedures to be followed with an organizational and/or flow diagram. Furthermore, all functions should be checked against a time-line analysis to insure against overloading; design and manning must be directed where the demands are the greatest.

5. Decide whether the equipment design is compatible with man's requirements, capabilities, and limitations; if not, redesign may be required, within cost allowances.

6. Develop a training program, based upon personnel requirements derived from a task and time analysis.

7. Plan the layout of the various equipment to achieve

optimum work and communication flow. This includes the delineation of usable work area, i.e., on the basis of accessibility and sensory capabilities; and further delineation of the specific work area based upon primary, simultaneous and sequential functions.

Such a procedure will cause various questions to arise, the answers to which will further develop an optimum man-machine relationship. For example:

1. Does the equipment design give the operator the information he requires in order to perform his various tasks?

2. Are space, weight, and bodily dimensions and human capabilities compatible?

3. In general, is the man being utilized so as to contribute most effectively to the achievement of the system's mission?

4. Are redesign, training requirements, training equipment, and related human-oriented factors compatible with cost and schedule requirements?

Thus a genuine human engineering approach demands the evaluation of an environment from the operator's point of view without ignoring the technical feasibility of a system as a whole. Besides, a human engineer's interest and exposure to the field of psychology can be a great tool for him to use properly in understanding a resistance to change whenever and wherever it develops.

Fatigue and Boredom

Many new changes introduced in work environment require operators to repeat certain steps over and over again.

Man gets fatigued or bored if he must do the same thing for a long

time, and his performance deteriorates accordingly. The principal effect of fatigue and boredom in work situations is to reduce motivation--willingness to do one's best. Except where extreme exertion is involved, fatigue ordinarily does not impair the ability to perform. It is also natural that with fatigue or boredom a person's attention wanders, and the likelihood of making mistakes or having serious accidents increases. Some of the important conditions contributing to fatigue and boredom are as follows (Morgan and Chapanis, 1963):

a. Periods of duty that are too long. The optimum cycle of work and rest depends on the kind of work, but, for tasks involving careful attention without much physical exertion, cycles of 40 or 50 minutes of work alternated with 8 or 10 minutes of rest are best. In general, total work periods should not be longer than 4 hours with 1 hour of rest.

b. Repetitive tasks. Simple tasks that must be done over and over again are boring. Where possible, provision should be made for some variation in the tasks to be performed.

c. Cramped and unchangeable positions. People become fatigued and bored when they must work in the same position for a long period. When possible, provision should be made for the person to sit or stand at his own position or, in lieu of that, to shift into a variety of positions.

Job Contrast Between the Old and the New

Most changes are eventually put into effect, and it then becomes necessary for everyone concerned to adjust to his new role. And this is not easy. New methods inevitably place at least a temporary strain on the individual's abilities and his tolerance for the new social role he is

required to play in his company. Gellerman (1963) reports that when an employee finds that his job has become difficult (which is not unusual in the case of men who work with equipment that has been redesigned with new technological features) his feelings of competence may decrease. And, if he is not able to surmount the difficulties of his new circumstances, he will probably have production problems. He may try to ignore them, but other people will not and his reputation as a craftsman will suffer. He will, in effect, find himself no longer quite so well qualified for his job as he used to be, and therefore he will be to some extent deprived of whatever interest he previously had when he was master of his work.

On the other hand, if the change has made his job less challenging (which happens when jobs requiring judgment or skill are split into smaller, repetitive operations for the sake of mass production), he will probably find that his job absorbs only a part of his energy and interest. He will be tempted to day dream and to socialize with nearby employees. He may regard this change as a rather welcome relief from the burdens of full-time work, or he may feel superfluous and therefore vulnerable.

In short, the main factor that determines whether a newly changed job will be welcomed or resented is the contrast with the interest and challenge provided by the previous job. If the change places an individual in a role that requires a higher degree of capability than the one possessed by an employee, he may feel dissatisfied and eventually lose interest in the job. However, if the position offers him the full scope he needs, but not more than he can handle, he may even seem to blossom with new assurance and increased energy.

MANAGERIAL FACTORS

Man is not always a rational animal but managers often make decisions and act as if he were. Men are not moved alone by logic but also by fear, envy, stress, resentment, a lofty purpose, rational reasoning, an abstract criterion of justice and a host of other emotional elements and behavioral-influencing factors. As, with the help of social scientists, we learn more about the importance of psychological forces in the working environment, the question becomes: What can we do together for the betterment of the individual that in turn will improve business effectiveness for the advantage of all (Ferguson, 1966).

Ferguson then points out that, in the successive advances made in improving system efficiency and output, future competitive advantages will probably lie with those managers who are best able to provide means for more fully utilizing the potential abilities of all their employees.

Whenever men compete, the difference between the winner and the also-rans is almost always quite small. In a series of situations, it is not how much an individual or an enterprise wins by in a particular instance, but the number of successive wins, regardless of the margin. That necessary margin is likely to be provided by a knowledge of how to build effective, comprehensive working relationships and better utilize latent abilities of associates.

Explore What, Why and How of the Resistance

Management in general will do better to look at it this way: When resistance to change does appear, it should not be thought of as something to be overcome. Instead, it can best be thought of as a useful red flag--a

signal that something is going wrong. Lawrence (1950) writes that signs of resistance in a social organization are useful in the same way that pain is useful to the body as a signal that some bodily functions are getting out of adjustment.

The resistance, like the pain, does not tell what is wrong but only that something is wrong. And it makes no more sense to try to overcome such resistance than it does to take a pain killer without diagnosing the bodily ailment. Therefore, when resistance appears, it is time to listen carefully to find out what the trouble is.

It may happen that the problem is some technical imperfection in the change that can be readily corrected or it may turn out that the change is threatening some established social setup for doing work. Whether the trouble is easy or difficult to correct, management will at least know what it is dealing with.

The Prime Role of a Staff Specialist

The staff specialist must earn the cooperation of the line supervisor to bring about a smooth change.

As worded, this principle, according to Juran (1964), puts the staff specialist in the role of an advocate of change and the line supervisor in the role of a member of the culture faced with absorbing a change. However, the principles (as enlisted below) are regarded as applying universally, irrespective of who is the advocate of change and which is the culture threatened; e.g., the labor union advocating change is faced with a cultural pattern of industrial managers.

1. The staff specialists who propose change must understand that the premises on which they base their proposals are

merely products of the culture in which the expert happened to be reared. They are not necessarily universal truths.

A foreman retires and there is need to appoint a new foreman. The superintendent offers the job to a qualified workman and is shocked when the promotion is declined. In the same way, a scientist may prefer the laboratory to the directorship; a professor may prefer the classroom to the deanship. It is stupid to accuse such men of "no ambition" because they elect to follow a way of life which is preferable to them.

2. The culture of the line supervisor serves him well by providing him with precedent, practices, and explanations. These things, however unenlightened, have the advantage of predictability and thus assure, to some degree, peace of mind. The more the staff specialist recognizes the real values this culture has for the line supervisor (instead of disparaging it as "ignorance," "stubbornness," "too old to learn," etc.) the better will he be able to prepare his case.

An accountant prepared a financial report to improve control of the inventory of copper rod. The rolling-mill superintendent never read the report. Instead, he continued to rely on two stripes painted on the wall of the storage shed. Years ago he had given the foreman orders to keep the pile of stored rod high enough to cover the lower stripe, but not so high as to cover the upper one. By this method he was able to review the inventory situation at a glance on his daily trip through the shop. The system had never failed, and the varying price of copper had never bothered him. Had the accountant translated his report into suggested changes in the height of the paint stripes, he might have got somewhere.

3. The staff specialist should examine his proposals from the viewpoint of the line supervisor, since that is what the latter is bound to do anyhow.

A manufacturing engineer, under pressure to reduce manufacturing costs, concluded, after studying competitors' products, that his own company's

specifications were needlessly tight and thus not competitive. He then proposed to the manufacturing vice-president that a joint study be undertaken by the manufacturing, sales and engineering departments to confirm or deny this conclusion. Despite the engineer's evidence, the manufacturing vice-president rejected the idea because the manufacturing performance was currently under fire from the president. The manufacturing vice-president felt that before he could make such a proposal (which could be constructed as muddying the water), he would first have to solve some of the more purely manufacturing trouble.

4. The staff specialist must avoid the temptation to deal with a localized problem through a sweeping master plan which goes far beyond immediate needs. If he urges the sweeping plan, he risks rejection of the entire proposal, including the solution to the localized problem as well.

A procedures analyst was assigned the job of preparing a plan for delegating approval of purchase orders. The company was ready for such a plan, and the analyst put together a good one. However, he succumbed to the temptation of extending it to cover the delegation of authority for approval of capital expenditure projects also. The climate was not right for securing action on the latter. As a result, his plan for purchase orders lost out too.

5. Unless the line supervisor is genuinely convinced that the change should be made, he is likely to return to his old ways rather than endure the tensions of frustrations brought about by the change.

A staff quality-control engineer succeeded in convening a meeting of company executives to hear him out. He put on an entertaining, convincing display, using pinball machinery, charts, etc., and aroused a highly favorable reaction among the executives. The plant superintendent honestly did not understand what the engineer was driving at. However, he was unwilling

to get in the way of anything which had so favorably impressed the top management. The engineer went to work but, swept away by his own enthusiasm, he spent his energies devising numerous charts which had little relation to the actual problems faced by the shop. The shop faced many real quality troubles which required diagnosis and solution through a variety of remedies. The engineer had only one remedy and was trying to apply it to all the company's troubles. Within two years, the charts had fallen into disuse. All that was left was widespread confusion and irritation in the shop.

Staff Men Should Overcome Self-preoccupation

All too frequently people come across staff specialists who bring to their work certain blind spots that get them into trouble when they initiate a change with operating people. One such blind spot is "self-preoccupation." The staff man gets so engrossed in the technology of the change he is interested in promoting that he becomes wholly oblivious to different kinds of things that may be bothering people. Lawrence (1950) provides a fine example of this habit of certain staff specialists.

In one situation the staff people introduced, with the best of intentions, a technological change which inadvertently deprived a number of skilled operators of much of the satisfaction that they were finding in their work. Among other things, the change meant that, whereas formerly the output of each operator had been placed beside his work position where it could be viewed and appreciated by him and by others, it was now being carried away immediately from the work position. The workmen did not like this.

The sad part of it was that there was no compelling cost or technical reason why the output could not be placed beside the work position as it had been formerly. But the staff people who had introduced the change were so literal minded about their ideas that when they heard complaints on the changes from the operators, they could not comprehend what the trouble was. Instead, they began repeating all the logical arguments why the change made sense from the cost standpoint. The final result here was a chronic restriction of output and persistent hostility on the part of the operators.

Obviously, in this situation the staff specialists involved did not take into account the social aspects of the change they were introducing. For different reasons they were so preoccupied with the technical aspects of the change that they literally could not see or understand what all the fuss was about.

We may sometimes wish that the validity of the technical aspect of the change were the sole determinant of its acceptability. But the fact remains that the social aspect is what determines the presence or absence of resistance. Just as ignoring this fact is the sure way to trouble, so taking advantage of it can lead to positive results.

Time and over again it has been demonstrated in our own life that the social arrangements that at times seem so bothersome are essential for the performance of work. Without a network of established social relationships, a factory would be populated with a collection of people who had no idea of how to work with one another in an organized fashion. By working with this network instead of against it, management's staff representatives can give new technological ideas a better chance of acceptance.

Let the Employees Learn First

Training takes time--but there are two ways in which it can also save time. First, a good trainer often takes less time than a poor one because he concentrates on the essentials and uses methods which speed up employee learning. Second, efficient training methods insure not only that the employees will learn faster but that they will learn more thoroughly and will be able to reach top performance on their new task sooner.

Hall (1964) lists six important ways in which we can both increase the speed of the employees' learning and improve its quality as well:

1. Don't just give the employees information--tell them what they are going to do with it.

A supervisor sometimes focuses his employees' whole attention on knowledge, rather than on the use of the knowledge. Knowledge is essential, but in a work situation it is only a means to an end: getting the job done.

This hindrance to learning can be overcome by avoiding long periods where the employees are only learning facts without learning how to apply them on the job.

2. Use the "active participation" approach.

Besides doing the job himself there are other ways in which the employee can participate actively in the learning process. Here is how to stimulate such participation:

When giving information or instructions, allow time for discussion. Encourage questions and discuss how the information can be applied.

When a change is made in departmental operations, discuss with the workers why the change is necessary, what effect it will have, and so on.

Rather than merely telling that the employees have some weakness on

the job, try to lead them to discover the fact for themselves. Don't let learners become merely passive listeners. Get them to talk by asking such questions as "Why would you do it that way?" "What will happen if you do this?" "How does this action jibe with our policy?" In short, encourage learners to raise questions, to feel free to express their ideas.

3. Break the job down into digestible parts.

Too often we overestimate the amount that people can master or grasp at one time. Mental indigestion sets in, and as a result they cannot assimilate at all.

The employee usually is not in a position himself to break down the mass of what is to be learned into appropriately sized "meals." This is primarily the supervisor's job, and it requires advance planning. Often he can break the new job down into its various parts, listing the duties and operations. These details can then be presented to the workers in a logical learning order, directing attention to the easiest and most necessary ones first.

4. Help the employee see what is especially important.

In any complex skill or body of knowledge, some parts are much more important than others. If those parts are mastered, the rest fall into place relatively easily. The supervisor can help them learn more quickly by emphasizing what is important.

5. Help the employee understand the meaning of what he is learning.

It is not enough to help people learn what to do and how to do it. It is just as important to help them learn why they do it. Employees can apply a policy, regulation, or rule to specific instances with intelligence only if they know the reasons underlying the policy. They can adapt a procedure

to changed circumstances only if they understand the purpose of the procedure.

It is particularly important for a supervisor or management to give reasons when he is changing or correcting a piece of work done by workers. Unless the employees know the reasons for the changes, they cannot profit from the correction or changes and will continue to make the same mistakes.

6. Build the employees' confidence in their ability to learn the job successfully.

If the employees are to put forth the effort needed to learn or adapt to the changed circumstances as quickly as possible, they must feel a certain confidence that they can succeed. Here are some ways in which the supervisor or management can bolster their confidence:

The supervisor or management can be particularly generous in giving recognition for any progress the employees make. Praise is too often reserved for outstanding accomplishment when it is needed most by employees who are struggling to master a new skill. Praise for progress is one of the strongest incentives for further improvement. The supervisor can demonstrate that he is confident the employees will succeed.

He can make it clear that he expects the employees to make mistakes while they are learning. Success inspires greater effort to achieve even more success. As the workers improve in skills, they will raise their standards of performance. In short, giving the workers confidence is one more way to speed up their learning.

Make Use of Operator's Know-How

Staff people must recognize that the production foreman and the

production operator are, in their own way, specialists themselves--specialists in actual experience with production problems. Many staff specialists, according to Lawrence (1950), fail to appreciate that even though they themselves may have the superior knowledge of the technology of the production process involved, the foreman or the operators may have a more practical understanding of how to get daily production out of a group of men and machines.

The experience of the operating people frequently equips them to be of real help to staff specialists on at least two accounts: (1) The operating people are often able to spot practical production difficulties in the ideas of the specialists and iron out those difficulties before it is too late. (2) The operating people are often able to take advantage of their intimate acquaintance with the existing social arrangements for getting work done. The staff experts can then go to work on ways to avoid the trouble area without materially affecting the technical worth of the change.

Management Must Develop Leadership Abilities

Current objectives as well as newly introduced changes are achieved by organizations because sound decisions are put into effect by qualified leaders. The most valued man in an organization today is one who can lead others under existing day-to-day conditions. In fact, such leadership is of even greater value than modern new machinery or an extensive organization (Prentice, 1961).

In the same article, Prentice quotes the study, "Importance of Good Executive Leadership," done by the editor of Dun's Review and writes that the true leader in management not only must have intellectual ability and

a thorough knowledge of the tools and technical skills of his profession. He also must be able to organize, to administer, and to get things done through people. He must above all else have certain personal qualities that make other people eager to follow him.

According to Prentice, such a leader is like a director of an orchestra who thoroughly knows about his instruments and above all inspires the musicians to create great music. He then examines the important secrets of success of such a conductor and relates them to our industrial leadership.

(1) Obvious enough in this context, but not always remembered, is the fact that the men must have the requisite skills and training for their roles. Hence a really good leader will see that all his men are well trained and ready to take over their respective assignments when the time for such a change comes.

(2) A psychological setting must be established for the common task. Just as the conductor must establish agreement about promptness at rehearsals, talking or smoking between numbers, new versus old music, and a dozen other things that might otherwise come between him and his colleagues in their common aim, so every good leader will have rules or customs which are clearly understood and easily followed. If the changed environment will require even a slight change in some already established pattern, he will make it his duty that everyone is well informed about such a change.

(3) Most important of all, the musicians must share satisfaction with their leader in the production of music of a certain quality. Similarly a good leader in industry will see to it so far as possible that workers under him do achieve a sense of accomplishment and fulfillment from the present task as well as from any planned change in the future.

Work with the Recognized Leadership of the Culture

A dramatic example was the decision of the American government to conduct the military occupation of Japan by retaining the Emperor in nominal authority. The long-standing tradition of obedience to the Emperor was in this way utilized to make effective the orders of the occupation forces.

Applied to industrial situations, this recommendation says, in effect, only the members of the culture understand the habits of the culture. Sometimes industry has misused this by pitting members of the culture against each other, i.e., the pace setters of the efficiency experts. But where a respected member of the culture has been genuinely convinced on going ahead with the change, he can be of great aid to the proponents.

The leadership of the culture is sometimes referred to as the "informal organization." It goes farther than this. The man who is to present the proposals to the culture should also be acceptable to them. Otherwise, his personal make-up may hinder rather than help the contact between the cultures.

Work Through Established Informal Organizations

Eric Trist and his associates as quoted by Schien (1965) did extensive studies of the effects on coal miners of a technological change involving the installation of mechanical coal-cutting equipment and conveyors. The old system involved small groups ranging in size from two to eight men who worked as a highly interdependent team, usually in isolation from other similar teams. The team generally consisted of one skilled worker, his mate, and several laborers who removed the coal in "tubs." Each team had a small section of the coal-face and was responsible for the cutting, loading, and

removal of the coal from its section. Teams were highly autonomous; members were picked by the team leader on the basis of mutual compatibility, and long-term relationships were established among members, relationships which included taking care of a team member's family if he was hurt or killed. Because of the anxieties aroused by working underground and in the dark, and because of the actual dangers involved in mining, strong emotional bonds formed among team members.

Conflict and competition between teams were common and various sorts of bribery and graft were involved in getting good sections of the coal-face to work and in acquiring enough "tubs" to be able to take out more coal than other teams. Although fights both underground and in the community were common, they apparently served as a useful outlet for the aggressions which resulted from the highly frustrating aspects of the work itself. The competition was accepted as part of life and did not disturb the basic social system of the community and the mine.

Because of the variable thickness of the coal seams in the British mines, it became desirable from an engineering point of view to install mechanical equipment for cutting and removing coal. The kind of worker group needed for this type of operation differed sharply from what was needed for the method already in use. The organization had to shift from small teams to large groups resembling small factory departments. These new groups consisted of 40 to 50 men under a single supervisor. Where previously the traditional groupings had been small teams and a total community, now an intermediate-size social system had to fulfill the various needs of the workers.

This intermediate-size system created great social difficulties because

the men were generally spread out as wide as 200 yards, in a tunnel two yards wide and one yard high, and they were divided into three shifts. The task required such a high degree of coordination among the shifts and among the men within a shift, that an inefficiently done job anywhere along the line reduces the output of the entire group sharply. Particularly sensitive was the relationship between those men who had to prepare the face by drilling and blasting the coal loose and those men who then removed it onto the mechanical conveyor. The new small groups which emerged around common tasks were differentiated in terms of the kind of work and the kind of prestige they enjoyed in the total community. Thus, not only were communications between shifts undermined by the new method, but the new small-group organization was also similarly undermined by the differential prestige associated with the different work.

Besides the emotional strains which resulted from the disruption of group relationships with the advent of highly differentiated, rigidly sequenced, mechanical mass production methods came other problems having to do with the amount and quality of the work itself. Because the workers were so spread out, no effective supervision was possible. Because of the inherent dangers in the work situation and the inherent difficulties of the work itself (without opportunities to release tension in close emotional relationships), the productivity of men tended to suffer. A norm of low productivity tended to arise as the only way to cope with the various difficulties encountered. Psychologically, the consequences were a loss of "meaning," an increasing sense of "anomie" (of being unrelated to others and to society), and a sense of passivity and indifference.

The important lesson in this example is that a technological change

dictated by rational engineering considerations disrupted the social organization of the workers to such an extent that the new mechanical system could not work efficiently. The new formal organization was physically arranged in such a way that it was impossible for the men to form a meaningful informal organization which could meet their emotional needs. Only as the coal-mining industry, with the help of social scientists, began to redesign the formal organization as well as the organization of work was it possible to begin to overcome some of the difficulties created.

In today's dynamic world it has become highly evident that informal associations and groups are to be found in almost any organizational circumstances and that these profoundly affect the degree of acceptability of a change in a work environment, level of output as well as the quality of the work done.

Plan Ahead for Manpower Requirement

Bekker (1959) points out that the growing speed of technical innovation makes forward planning more essential than in the past. Plans should include, among other things, estimates of manpower requirements, particularly when in recent years there has been much talk of resistance by labor and management to technological changes, and there is a growing appreciation of the need to preserve sound human relations during the change, and especially to inform and consult workers in advance.

Resistance to change may be difficult to combat if it is based on the belief that layoffs cannot be avoided. Ways of avoiding layoffs need much more study than has been undertaken so far. No tactical approach, however wise, is likely to win the consent and willing cooperation of those whose

jobs are threatened. But a sharp clash of interest over layoffs can often be avoided if problems of manpower are considered, as an integral part of forward planning, well in advance of expected crises.

The planning of manpower is based on several factors. Prediction of future technical developments within a firm or industry, taking account of economic factors; an assessment of the skills required to operate new technical processes; information on possible sources of manpower; and a long-term plan of training which will enable the demand for and supply of manpower to be reasonably balanced. Forward planning is necessary because it is becoming increasingly difficult to adjust supply and demand over a short term. Skilled labor is scarce. The higher the skill, the longer the period of training and the greater the time-lag between the recognition and the satisfaction of need. On the other hand, where labor is suddenly made surplus, it may be difficult to reabsorb. On both accounts new methods and technologies emphasize the need to look ahead if demand and supply are to be kept in balance and, most important of all, if critical rough spots are to be avoided as much as possible in introducing a change.

One potential result of planning for manpower, according to Bekker, is that training requirements can be stated well in advance. They are likely to involve training on the job for semi-skilled labor, the creation of deeper technical understanding among craftsmen, and the provision of more highly trained managers and technologists.

Properly Motivate the Employees

Bellows (1960) calls ability a necessary but insufficient condition for improvement of performance and further says that motivation might be related

to ability in two possible ways:

1) Performance = ability + motivation, or

2) Performance = ability x motivation

His explanation for the two hypotheses is as follows: The first hypothesis, that ability plus motivation yields high-grade performance--at golf or bridge or chess or in managing people, selling, creating and inventing--does not hold up very well when viewed objectively and analytically. It is a false hypothesis because it does not work. Some people have a high potential for golf or bridge or management, but would not be good performers because they do not care for these activities. In business or industry, a worker (or executive) who is uninterested in performance, who is "negatively induced," will perform in a mediocre manner regardless of his ability or potential. We would not expect him to achieve par. From the first hypothesis we would expect that when ability is "100" and motivation is zero, then performance would be at 100. This, of course, is not true. When ability is "100" and motivation is zero, performance or output is simply nothing, e.g., the person who does not care to play golf.

When we come to examine the second hypothesis we find that, if ability is "100" and motivation is zero, performance is also zero: $100 \times 0 = 0$. This seems to fit the facts as we observe them in situations in which we seek to improve performance.

What Bellows has said in the several paragraphs above strongly suggests that training must place special emphasis on motivation as a necessary and crucial factor in the performance formula. If we are to improve performance through any sort of change, the situation must provide for motivation.

Management Should Seek Employees' Active Participation

Goodwin (1950) defines Modern Work Simplification as a step in which everyone participates in the improvement process, each to the extent of his ability. This is done in an atmosphere of friendliness, teamwork, understanding, sincerity, mutual confidence and respect. Fears and inhibitions are minimized. Opportunity, satisfaction and recognition exist at all levels. People are taught to use the tools compatible with their level of activity. They also learn to recognize the need and request service from those with other capabilities. The expert and specialist take on a new role of supplying answers to requests for assistance as opposed to trying to sell their services. This then is the organized use of common sense to find and apply better ways of doing anything.

We shall demonstrate the truth of Goodwin's definition of work simplification by relating the famous study done at the Harwood plant (Coch and French, 1948). This study primarily involved three groups.

Group I was a "control group" in which the management did not allow any one of the members to participate in the change. Group II was allowed to participate in the change through "able representatives" of this group. Group III was allowed "total participation" in designing a change. Group II and Group III were called Experimental Groups I and II.

The three groups were roughly matched with respect to: (1) the efficiency of a group before transfer; (2) the degree of change involved in the transfer; (3) the amount of "we-feeling" observed in the groups.

The results of the experiment were as follows:

1. The control group improved little beyond their early efficiency ratings. Resistance developed almost immediately after the change occurred.

A marked expression of aggression against management occurred, such as conflict with the methods engineer, expression of hostility against the supervisor and deliberate restriction of production. There were 17 percent quits in the first forty days. Grievances were filed about the piece rate, but when the rate was checked, it was found to be a little "loose."

2. Experimental Group I (participation through representatives) showed an unusually good relearning curve. The attitude was cooperative and permissive. They worked well with the methods engineer, the training staff, and the supervisor. There were no quits. There was only one act of aggression against the supervisor recorded in the first forty days.

3. Experimental Group II (total participation group) recovered faster than Experimental Group I. They worked well with their supervisors and no indications of aggression were observed from these groups. There were no quits.

In this experiment, the control group made no progress after transfer for a period of thirty-two days. At the end of this period the group was broken up and the individuals were reassigned to new jobs scattered throughout the factory. Two and a half months after their dispersal, the thirteen remaining members of the original control group were again brought together as a group for a second experiment.

This second experiment consisted of transferring the control group to a new job, using the total participation technique in meetings which were similar to those held with Experimental Group II. The new job was a pressing one of comparable difficulty to the new job in the first experiment.

The results of the second experiment were in sharp contrast to the first. With the total participation technique, the same control group now

recovered rapidly to their previous efficiency rating, and, like the other groups under this treatment, continued on beyond it to a new high level of production. There was no aggression or turnover in the group for 10 days after change, a marked modification of their previous behavior after transfer.

Thus it is possible for management to modify greatly or to remove completely group resistance to changes in methods of work. This change can be accomplished by the use of group meetings in which management effectively communicates the need for change and stimulates group participation in planning the changes.

Work Groups May Retard or Accelerate Production

Konz and Redding (1965) conclude that decision-makers are influenced both by the "facts" and by the social pressure operating on the individual, even in situations where a person does not realize he is under pressure. Social pressure can either increase or degrade the quality of the decision. Management should recognize that social pressure is an important element in decision-making and design situations so that social pressure tends to improve the quality of the decision.

A group standard can exert extremely strong forces on an individual member of a small subgroup. That these forces can have a powerful effect on production is indicated in the production record of one presser during a period of forty days (Coch and French, 1948).

In the group	
Days	Production per day
1-3	46
4-6	52
7-9	53
10-12	56
Production per day	
Scapegoating begins	
13-16	55
17-20	48
Becomes a single worker	
21-24	83
25-28	92
29-32	92
33-36	91
37-40	92

For the first twenty days she was working in a group of other pressers who were producing at the rate of about 50 units per hour. Starting on the thirteenth day, when she reached standard production and exceeded the production of other members, she became the scapegoat of the group. During this time her production decreased toward the level of the remaining members of the group. After twenty days the group had to be broken up and all the other members were transferred to other jobs, leaving only the scapegoat operator. With the removal of the group, the group standard was no longer operative; and the production of the one remaining operator shot up from a level of about 45 to 96 units per hour in a period of four days. Her

production stabilized at a level of about 92 and stayed there for the remainder of the twenty days.

Thus it is clear that the motivational forces induced in the individual by a strong subgroup may be more powerful than those induced by management.

Establish Temporary Job Standard

Establishing temporary job standards, according to Reid (1964), is another way to make it easier for employees to cope with a changeover. When employees don't know what amount of output is expected of them under a new system, they have no way of pacing themselves. Let us say management expects each employee to turn out 100 units a day at first. Management should let them know this, so they don't stop when they finish 60, or develop ulcers because they can't hit 300.

Hence in talking to employees, one of the management's key goals should be to give meaning to unfamiliar assignments.

It Takes Time To Learn New Things

Many a management have yet to learn this truth that, even after the plans for a change have been carefully made, it takes time to put the change successfully into production use (Lawrence, 1950). Time is necessary even though there may be no resistance to the change itself. The operators must develop the skill needed to use new methods and new equipment efficiently; there are always bugs to be taken out of a new method or piece of equipment even with the best of engineering. When a staff man begins to lose his patience with the amount of time these steps take, the people he is working with will begin to feel that he is pushing them; this amounts to a change in

their customary work relationships, and resistance will start building up where there was none before.

The situation is aggravated if the staff man mistakenly accuses the operators of resisting the idea of the change, for there are few things that irritate people more than to be blamed for resisting change when actually they are doing their best to learn a difficult new procedure.

Timing

It has long been said that there is a right time to do everything. Hardwick (1961) quotes Shakespeare, who immortalized this bit of ancient wisdom in a famous verse:

There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and miseries.

To draw this beautiful gem of human expression and sentiment into a discussion of something as mundane and practical as administration may border on the profane. And yet it must be done, for nowhere else is the philosophy of timing--a matter of incalculable significance to good administration--so aptly set forth.

There is a right time to introduce change. It is the point at which receptivity for the step will be highest (or opposition, the lowest). The strategic administrator, always interested in the best possible results, will try to gauge his actions accordingly. In other words, he will endeavor to time them.

Probably no more difficult task exists in the field of administration than right timing. Time is in several ways a factor in dealing with the acceptability of change. Several of the recommendations of the anthropologist

relate to the time dimension (Juran, 1964).

- (a) Provide sufficient time for the mental changes to take place.

This vital rule is violated often and needlessly. There are numerous ways of applying it. For example, in suggesting changes, propose distant effective dates to allow time for all to become familiar with the idea before being subject to the change itself. If a proposed change is rejected, let some time pass before bringing the subject up again.

The importance of time as an ingredient of change is well known to the chemist, the politician, and many others. The industrial staff man needs to grasp this principle firmly.

- (b) Start small and keep it fluid.

To protect both the staff and line man, the unexpected should be provided for. Change should be introduced slowly and gradually, so that, if necessary, the original plan may be modified as experience dictates.

Industry uses this principle extensively. The pilot plant, the test town, the trial period are all means of trying out on a small scale, and of learning at little risk, before taking the big plunge.

- (c) No surprises.

It is the unexpected change--the one that defies explanation--which breeds chaos, and drives the individual to find a way to relieve his tension.

- (d) Choose the right time.

The "right" time is influenced by the number of changes

already in progress (there is a limit to the digestive capacity); by the record of prior successes or failures; by the rhythm of good or bad feeling between the cultures involved. The planning should specifically consider the timing.

Adaptability to Change Suggests Democratic Institutions

Slater and Bennis (1964) write that there are signs that the business community in the United States is increasingly becoming aware of this principle. Executives and even entire management staffs have been sent to participate in human relations and organizational laboratories to learn skills and attitudes which ten years ago would have been denounced as anarchic and revolutionary. The great reason for this is the continued innovations. Changes are much more rapid than the knowledge that one person can accumulate early in his lifetime by acquiring a college degree and feel that is all he wants to know.

The most familiar variety of such change to the inhabitants of the modern world is technological innovation. This has been reported by Slater and Bennis in the words of J. Robert Oppenheimer:

One thing that is new is the prevalence of newness, the changing scale and scope of change itself, so that the world alters as we walk on it, so that the years of a man's life measure not some small growth or rearrangement or moderation of what he learned in childhood but a great upheaval.

But if change has now become a permanent thing with which all of us in business or elsewhere must make arrangement to live, the biggest question then becomes the adaptability to change as a means of survival.

Finally, summarizing their views, Slater and Bennis point out that the organization and communication research at the Massachusetts Institute of

Technology reveals quite dramatically what type of organization is best suited for which kind of environment.

Specifically:

For simple tasks under static conditions, an autocratic centralized structure, such as has characterized most industrial organizations in the past, is quicker, neater, and more efficient.

But, for adaptability to changing conditions, for "rapid acceptance of a new idea," for "flexibility in dealing with novel problems, generally high morale and loyalty . . . the more democratic or decentralized type seems to work better." One of the reasons for this is that the centralized decision-maker is apt to discard an idea on the grounds that he is too busy or the idea too impractical.

SUMMARY AND CONCLUSION

There is little doubt about the fact that the practice of management in harnessing human energy and converting the opportunities provided by nature into useful forms for modern society has been remarkably successful.

There are, however, a number of indications of difficulties that managers have in adapting to changes in technology, complexity, growth, and changing environmental conditions. In addition, there are many relevant questions that progressive managements ask themselves:

Can we increase the rate of innovation and receptiveness to change within the organization?

Can we learn how to adapt to changes--both anticipated and unanticipated?

Can we do better than we are doing?

The author in this report has approached the problem of adaptability to change from three angles. His first approach is from the individual point of view, that is, how a person (an individual) looks at a change in his environment. An employee will view any change as to what and how it affects his age, status, attitude and job satisfaction, morale, anxiety, sex and ability.

The second and third approaches, namely the human engineering approach to a system design and the managerial practices adopted in an organization, are not directly in the control of an operator but certainly play the greatest role in influencing him indirectly to accept the change and work for the betterment of a society as a whole.

The human engineering approach to a system design can simply be stated as follows:

It is a mating of "man and machine" by adopting one another's capabilities in such a way that a well-balanced, harmonious system is the result. Man does not become a slave to a machine. In short, an optimum work system is designed whereby the operator retains the pride of using his God-given senses to the best of his ability.

Managerial practices, however, control the brain in the body system of an organization. It is here where final decisions are made as to what steps should be taken to introduce the change. This then becomes the origin point of everything. It therefore is the point where the power lies as to what, when and how a change should be brought about which ultimately decides whether or not the new environment, technology or a system will be accepted or rejected.

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REFERENCES

- Applewhite, P. B.
 "Job satisfaction and industrial morale," Journal of Industrial Engineering, Vol. XVI, No. 3, pp. 198-200. May-June 1965.
- Bass, Bernard M.
Organizational Psychology, Boston: Allyn and Bacon, Inc., p. 124. 1965.
- Bekker, A. J.
 "Automation: its impact on management," Advanced Management, Vol. 24, No. 12, pp. 20-24. December 1959.
- Bellows, R.
 "The challenge to tomorrow's executive," Advanced Management, Vol. 25, No. 4, pp. 6-10. April 1960.
- Coch, L. and J. R. P. French, Jr.
 "Overcoming resistance to change," Human Relations, Vol. 1, No. 4, pp. 512-532. 1948.
- Ferguson, L. L.
 "How social science research can help management," California Management Review, Vol. VIII, No. 4, pp. 9-10. Summer 1966.
- Gadel, Marguerite S.
 "Productivity and satisfaction of full- and part-time female employees," Personnel Psychology, Vol. 6, pp. 327-342. 1953.
- Gellerman, S. W.
 "What is behind employee attitude toward change?" Supervisory Management, Vol. 8, pp. 4-8. October 1963.
- Goodwin, H. F.
 "Everyone participate in work simplification," Advanced Management, Vol. 24, No. 12, pp. 12-15. December 1959.
- Guion, Robert M.
 "Industrial morale (a symposium): the problem of terminology," Personnel Psychology, Vol. 10-11, p. 59. 1958.
- Hall, M.
 "Six ways to speed employee learning," Supervisory Management, Vol. 9, pp. 18-21. November 1964.
- Hanes, B. and B. E. Flipppo.
 "Anxiety and work output," Journal of Industrial Engineering, Vol. XIV, No. 5, pp. 244-248. September-October 1963.

- Hardwick, C. T. and B. F. Landuyt.
Administrative Strategy, New York: Simmons-Broadman Publishing Corp.,
 p. 254. 1961.
- Heron, A. and C. M. Cunningham.
 "The experience of younger and older men in a works reorganization,"
Occupational Psychology, Vol. 36, Nos. 1 and 2, pp. 10-14. January and
 April 1962.
- Heron, A. and S. Chown.
 "Aging and semi-skilled," Medical Research Council Memorandum, No. 40.
 London: Her Majesty's Stationery Office. 1961.
- Juran, J. M.
Managerial Breakthrough, McGraw-Hill, p. 152. 1964.
- Katzell, Raymond A.
 "Measurement of morale," Personnel Psychology, Vol. 11, pp. 71-78.
 1958.
- Konz, S. and S. Redding.
 "The effect of social pressure on decision-making," Journal of Industrial Engineering, Vol. XVI, No. 6, p. 384. November-December 1965.
- Lavender, J. H.
 "The relationship of human engineering to industrial engineering concepts," Journal of Industrial Engineering, Vol. XII, No. 1. January-February 1961.
- Lawrence, P. R.
 "How to deal with resistance to change," Human Relations for Management,
 E. C. Bursk, ed., Harper and Brothers, pp. 343-360. 1950.
- Medalia, Nahun Z. and Delbert C. Miller.
 "Human relations leadership and the association of morale and efficiency in work groups," Social Forces, pp. 330; 348-352. 1955.
- Metzner, Helen and Floyd Mann.
 "Employee attitudes and absences," Personnel Psychology, Vol. 6, pp. 467-485. 1953.
- Morgan, Cook, Chapanis, and Lund.
Human Engineering: Guide to Equipment Design, McGraw-Hill, p. 31.
 1963.
- Prentice, W. C. H.
 "Understanding leadership," Harvard Business Review, Vol. 39, p. 148.
 September-October 1961.
- Reid, P. C.
 "How to survive a system change," Supervisory Management, Vol. 9, pp. 4-8. April 1964.

Ross, Ian C. and Alvin Zander.

"Need satisfaction and employee turnover," Personnel Psychology, Vol. 10, pp. 327-338. 1957.

Schien, E. H.

Organizational Psychology, Prentice-Hall, 1965.

Slater, P. E. and W. G. Bennis.

"Democracy is inevitable," Harvard Business Review, pp. 51-59. March-April 1964.

Stagner, Ross, D. R. Flebbe and E. V. Wood.

"Working on the railroad: a study of job satisfaction," Personnel Psychology, Vol. 5, pp. 293-306. 1952.

Woodson, W. E. and D. W. Conover.

Human Engineering: Guide for Equipment Design, Los Angeles: University of California Press, Berkeley, pp. 1-1 to 1-3; also 1-23. 1964.

HOW TO DEAL WITH A RESISTANCE TO CHANGE IN INDUSTRY

by

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One of the biggest problems faced by management is the employee resistance to technical, organizational changes brought about in work environment. These changes have become an important part of survival in business life.

From the literature reviewed by the author the resistance in industry mostly develops because these changes are introduced haphazardly, suddenly and without much planning. Not much analysis precedes the decision to introduce new equipment or replace the old.

Employees do not resist technical change if it does not threaten the social, cultural setup on the job and does take into account the individual's capabilities and limitations. Fortunately a proper human engineering approach can be a source of great help in dealing with the operator's capabilities and limitations.

However, a successful approach requires much more than developing an adequate man-machine system. Personal factors such as age, attitude, morale, fatigue, anxiety as well as managerial factors of preplanning, proper timing, employees' training, etc., play a key role in the final acceptance or rejection of a change.

