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THREE STUDIES IN MANAGEMENT

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THREE STUDIES IN MANAGEMENT

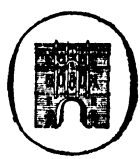
by

JEROME F. SCOTT

and

R. P. LYNTON

British Institute of Management



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PREFACE

THIS book falls into two main parts. Part I consists of three field studies of industrial organizations. One is a colliery employing about 1,400 men; the second is a village factory studied from its beginnings; the third is a large hosiery factory. The studies attempt to describe in detail the ways in which the people in each unit achieve the organization, leadership and co-operation necessary to the efficient discharge of their industrial functions. Elsewhere[1] we have explored in some detail the nature of those functions. The present volume is concerned largely with the study of the managerial skills which go into the running of industry.

Part II explores some significant differences and similarities which emerge from comparing the three studies. In this sense, Part II is an attempt to make useful generalized statements about the skills of management. But the facts themselves, and particularly the most obvious, often forgotten, facts are the most important matter; many are needed, and many more will be needed, before generalization can be very extensive.

In addition to brief notes on methods of research in each study, there is a much fuller and more general statement in an appendix. There are also some suggestions for further reading. Besides indexing names and subjects, we have provided a separate index to examples used in the book.

We very much wish that we could name all those to whom we are so grateful for divers kinds of assistance, direct and indirect. For reasons of confidence, it is impossible to name those who helped most, the managers and others with whom we collaborated in the study of their organizations. As for others who helped, it seems too invidious to try and name a few out of the many. We would like to mention one, however: Mrs. D. Bryans, who

[1] *Community and Technology*, UNESCO, 1952.

assisted most ably and kindly with the manifold tasks of seeing the manuscript finally to the printer and then through proofs and indices.

J. F. S.
R. P. L.

British Institute of Management,
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INTRODUCTORY

CHAPTER I

STUDYING MANAGEMENT SKILLS

MANAGERS can describe their skill in human relations in two ways. One way is to say that a manager must be tactful. In the true sense of the word tact—'intuitive perception of what is fitting, especially of the right thing to do or say, adroitness in dealing with persons or circumstances' (*Concise Oxford Dictionary*)—tact is certainly sound, and the person who is naturally tactful possesses an essential quality of leadership. But 'intuitive perception' sometimes fails, and then the admonition 'be tactful' is not enough. The girl in the war factory who complained of being 'welfared to death' has become a classic example of the inadequacy of someone's perception of what was fitting to do. What had been tactful in other situations was clearly not so in her particular instance.

The other way of approaching the task of management is to assume that each situation for action contains new elements. Previous experience is then not enough. The particular facts of the new situation need to be specially studied. In this way the study of management becomes something more than learning traditional practices, for it is concerned with present needs. In so far as the causes of events are discovered, it becomes possible systematically to predict; and that is science.

In the profuse flowering of the established sciences it is easy to forget that they have their roots in the original determination of some men to study the obvious. A large part of present-day physics, for instance, stems from Newton's dogged study of the obvious fact that an unsupported object falls to the ground. It remains to be seen whether the uniformities in management situations will ever be as numerous as in the physical sciences, or even as in medical science. What is certain is that we shall never know the answer to this until a sufficient number of people insist on studying the obvious fact that some groups and some leaders are more productive and healthier-minded than others.

Study begins with the patient, pedestrian description of the obvious, such as that an apple falls to the ground. Speculation, tested by experiment, as to how the obvious comes about, is accompanied by more observation and description. Perhaps one of Newton's early profitable speculations was that the apple falls in a straight line towards the centre of the earth. When the important facts can be distinguished from the trivial, then there may be scope for more systematic experiment. Similarly, social science begins with the study and description of the facts *as they are*. It is a fundamental mistake to think of this as 'applying science to management'. Rather is it a process of first seeking the science *in* management.

The studies in the present volume represent that sort of activity. If at times they seem to dwell on the obvious, it is in the search for new meanings. Before we could discover the sources of wind we had first to see that it was the wind that bends the trees. Much management action is akin to behaving as though the trees blow the wind. For example, attempts are often made to stop a strike (prevent the tree from bending) before asking whether it is cause or effect. Again, it may be more useful first to study the normal—why most people do not strike—than the abnormal. In our studies we shall be more concerned with the normal condition of co-operation, rather than with the abnormal failure of co-operation. No grandiose claims are made for the significance of the studies or for the hypotheses which, derived from this and previous research, are set out in later chapters. But some light may be shed on the processes of co-operative endeavour.

Rapid Change, Specialization and Growth

The systematic study of management is in its infancy. But by drawing on the various social sciences it is able to proceed on a fairly substantial basis of fundamental knowledge. For instance we know (within the bounds of certainty that limit any scientific hypothesis)

that man is a social animal;
that he lives, plays and works mainly with others;
that the groups that are formed in these activities have ties and characteristics of their own;
that it is largely the influence of these groups which forms the habits and morals of the individuals who comprise the groups;

that strong social pressures contrive to keep the individual in line with his group's standards;

that these groups are *systems*, in the sense that a change introduced into the group by pressure from outside has one of two results: the group resists in order to maintain its present balance or, if the change is absorbed, numerous readjustments take place throughout the system in the attempt to achieve a new balance.

These seeded hypotheses, simple as they are to state, provide in practical use a considerable basis for the interpretation of human relations in industry.

If that is so, why then is so much explanation and action in administration problematical, why so many of the results disappointing, why the evident gaps between what is known and what is done? One answer would be that people's capacity for 'intuitive perception of what is fitting' in any situation has declined. That is arguable. Another answer might be that conditions in modern society do not favour intuitive perception or that they make it inadequate. The word tact is derived from the Latin *tactus*, 'touch'. At least four major characteristics of modern society make it increasingly difficult for managers to keep in touch.

The first characteristic is the great speed with which change is aking place. Inside industry, technological changes alter jobs, work ırrangements and the physical environment. Outside industry, there are new products to consume, higher standards of life, greater possibilities for mobility, new opportunities. Rapid change means that managers and workers need to adjust themselves continuously to new conditions, to people with different backgrounds and to unfamiliar environments, and that an increasing number of influences bear on any situation.

The second characteristic of modern society is the segmentation of a person's activities. An individual tends increasingly to be worker, member of a family, citizen, scholar, and hobby enthusiast each at a different time of the day, in a different institution, and in association with a different set of people. This at once multiplies both the need and the difficulties of adjustment. It also threatens that the different situations to which people have to adjust may make conflicting demands; the different facets of life may no longer be compatible.

The third characteristic is a product of the first and second. A

multitude of increasingly specialized, largely unrelated institutions cater for people's various needs—factories, schools, places of entertainment, government—and, as specialized institutions, they have grown greatly in size. Often they are so big that they unbalance and disrupt communities and, along with them, much of the complex of influences which foster co-operation and educate for responsibility. All life is a balance: unbalance in a community becomes both an effect and a cause of the community's sickness.

The fourth characteristic is a product of rapid change, specialization and growth, all three. They create ambiguity of status. No longer is there a governing class who think, feel and act alike, and share the same ethical codes and the unquestioning confidence of the community. Almost everyone is a potential leader; the process of selection is broad and uncertain. Anyone may be discontented with his rôle in the community; many are uncertain as to what their rôle actually is. New specialists are slow to be accepted. In rapidly growing organizations, individuals may exaggerate their formal status because they can be sure of no real standing in the social groups which make up the organization.

These conditions are new and need attention. Where social and technical conditions still change slowly and industrial units are small and are a real part of the community, managers can still arrive by fixed routes, and adequate administrative skill can still be acquired in the traditional way: namely by imitation and supervised experience, and through gradually getting the 'feel' of a place and a situation. Under the new conditions, on the other hand, when managers are unsure of their standing and have to deal with rapid social and technical changes and increasingly complicated processes in organizations increasingly large and possibly foreign to the community, old methods of acquiring administrative skills are inadequate. This is the position in large parts of British industry. It is usual for people's backgrounds to vary so that they have less in common, and cannot take so much for granted. Their contacts with each other outside work are slight. Managers have less scope for learning of problems at first-hand. Yet they are greatly pressed to provide solutions. Mistakes are more costly, rules of thumb often quite inadequate. If they are relied on exclusively, action is apt to be chancy and the physical and mental strain on managers becomes very great.

That the same kinds of contradictions and conflicts are to be found in family life, education, and government as in industry is an im-

portant fact. It suggests that the workplace and the community outside are both parts of a larger whole. The problems of one are therefore mirrored, not compensated for, in the other. It follows that high standards of living, advanced education, or ample sports fields and clubhouses are not always the answer to problems in the workshop; also that industry must contribute to the solution of general problems.

The interaction between the workplace and the community outside helps to explain why, in industry as elsewhere, life is 'just one thing after another'. If things are going well they tend to get better: high output tends to go together with technical development, with co-operation inside the workshop and with the community outside, and with securing staff who are keen to keep it high. Conversely, if things are going badly they tend to get worse: low output tends to accompany resistance to technical change, lack of co-operation, and a reputation outside the works which hinders recruitment. These features reinforce each other and it is difficult to change from one cumulative process to the other.

For all these reasons old skills need to be supplemented. There is room for new guides to the collection and assessment of facts, and for more systematic study and communication of management skills. Implicit skills need to be made explicit; much of what is taken for granted needs to be examined, for it may no longer apply.

Systematic Training for Skilled Trades—An Analogy

The essence of this introduction can be summed up in the form of an example. Until recently it was maintained that some of the most highly skilled trades could be carried out only by people 'born' for them. Glass blowing and coal getting are examples. There was no occasion to doubt this as long as there were enough 'born' craftsmen.

When sufficiency gave way to serious shortage some organizations decided to study the skills called for. This proved most difficult. Observation alone did not lead to understanding. Also, experienced workers were found to be unable to describe their skill. More difficulties arose from the very attempt to run counter to established ideas and practices.

Analyses of superficial technical and physiological requirements were an inadequate basis for training. Some organizations secured the help of specialists. To the technical components were added

analyses of movements and of emotional and environmental factors in learning and consistently doing the job.

Skills were broken down into parts that could be learned one at a time and integrated later, exercises and devices were developed, psychological and sociological factors were taken into account. The important facts were separated from the unimportant so that the training scheme as eventually operated, tested and improved was designed to teach the essential aspects. These constitute the essential framework, and within it there is considerable variation in practice from worker to worker.

For many trades the number of suitable workers has thus greatly increased. Ideas and practices have changed. Some skills that were once acquired—and inadequately—by spending two years watching an experienced worker can now be taught in ten weeks of systematic training. Not only has systematic training been well integrated and established in many organizations; it has become possible to communicate their experience to other organizations and to use it to refine and elaborate general theories of training.[1]

Three Management Case Studies

The three studies which follow are the early result of activity in the field of management analogous to that described in the previous section.

The colliery study is an attempt to analyse some of the normal processes of organizational life that are 'taken for granted': methods of communication and control, the development of effective relationships, maintenance of flexibility. Novel forces of rapid change and specialization now press for alterations in these processes. Because these forces have only recently been felt, relatively little fundamental readjustment has yet taken place.

'Minetown', the second study, is focused on a fundamental readjustment, viz. the introduction of factory employment into an old mining village. It will tell how the factory has been fully integrated into the community, and how unskilled women have been taught a delicate skill and are producing more than their counterparts in advanced industrial communities.

The third organization studied stands almost in contrast to the colliery. At the Acorn Hosiery Company drastic changes of organiza-

[1] One organization's experience in establishing systematic training is described in the third case study, pp. 116–46.

tion and methods have become routine. The community is typical of modern industrial civilization in its instability and relative absence of tradition. The study illustrates management methods which are keyed to organizational life in a rapidly changing environment.

The three studies are deliberately placed in that order in the ensuing chapters: they begin with the old industrial order, end with the new. Hence, though each study stands on its own, the three together represent a sequence of development which itself tells the story of the evolution of management problems and management methods. The colliery study is different in kind from the other two in that it describes the natural processes of co-operation and thus provides, as it were, a starting point for Minetown and Acorn, just as the study of medicine begins with anatomy and physiology. Minetown and Acorn, together with the last chapter of the Burncoal study, are chronicles of the adaptation, the conscious adaptation, of these processes to more rapidly changing conditions.

Each study contains a brief statement of the ways in which it was carried out, and is illustrated by numerous detailed examples. Each study has been cleared with the organization it describes; however, names of firms and individuals are fictitious. The ways of doing research, and presenting it, are more fully described in an appendix. The reader is entitled to such exposition because otherwise he might well wonder if the studies are no more than arbitrarily selected, indiscriminately presented and personally interpreted collections of facts. The appendix will lead him to decide, we hope, that a cohesive and constructive way of thinking underlies the entire process.

PART ONE

THREE CASE STUDIES

CHAPTER II

BURNCOAL COLLIERY

Maintaining Flexibility of Communication and Control in the Changing Circumstances of an Old Industry

I. INTRODUCTION

The Project

MAKING management skills communicable and more efficient begins with defining and describing present management methods and the intuitive skills which guide them. An efficient colliery is a useful subject for such study, for four reasons:

First, it shows the management process in a strong light, for in a colliery problems are encountered in exaggerated form. Distance, darkness and difficult physical conditions tax communication and give the word 'control' a vivid meaning. The fact that problems of organization, communication, control and discipline are common to all forms of co-operative effort, gives the study of colliery management the same sort of special value that the study of individuals adjusting to extreme conditions has for a doctor.

Second, great age and isolation have lent to the traditions of mining the clarity and strength that characterized most traditions prior to the Industrial Revolution.

Third, the relationship between community and colliery has historically been very close, reflecting strongly the normal interaction of work and home life.

Fourth, coal mining has recently come under great and varied pressure. The problems of adjustment highlight both the strengths and the weaknesses of traditional management methods.

The Scottish colliery here called Burncoal was chosen as an organization efficient and profitable under demanding conditions—not a 'hot-house plant' which produces fruit in its favourable atmosphere but would fail in a more severe environment. Both the physical

and the social conditions at Burncoal call for high managerial skill.

The colliery is financially sound; and efficient in terms of output per man-shift and other available indices—strikes, absenteeism, labour turnover, wages and accident rates compared with other collieries in its district. This managerial efficiency is obtained with a ratio of management personnel to total number employed that is very low in comparison with many other industries.

Methods of Research

Before studying Burncoal Colliery, it was essential to spend considerable time in a number of other collieries. For, whereas previous experience had provided the researchers with ready guides to observation and evaluation of factory situations, they had little knowledge of mining; and such few observational reports of the processes of life and management in collieries as were available were only of limited help. In order to describe Burncoal faithfully, therefore, the researchers had first to develop their standards and learn what to look for in other coal mines.

Thus over a period of two years the research officers established contact at all levels of the National Coal Board, in universities, and in the National Union of Mineworkers. During the first months of field work interim reports on observations, both oral and written, were discussed at these various levels. Burncoal Colliery was then chosen for the present case study. After the field work, draft reports were discussed and revised with the manager and agent of Burncoal, the local professor of mining, area and divisional officers and then (official agreement to the report having been obtained at all levels up to and including division) with others both in the mining industry and outside it.

As presented below, the study of Burncoal Colliery incorporates many observations based on the collieries previously studied. Sometimes we reach out to these other collieries for confirmation of an observation at Burncoal; sometimes we use them to portray general characteristics of mining communities in Scotland, or in Britain as a whole, as distinguished from specific aspects of Burncoal. Once or twice it has been necessary to substitute a general observation for one on Burncoal alone in order to protect individuals from identification, e.g. a particular specialist. Finally, the relative incapacity of mining people to make the reasons for their procedures and relationships explicit required that we confirm apparent facts by observations

in a number of collieries, where in other research it would be possible to elucidate by intensive interviews. In an industry where skills and relationships are developed and transmitted by tradition and apprenticeship, solicited explanations are often incomplete or misleading.

Indeed, both that kind of factor and the physical conditions inhibited the use of extended interviews. The most reliable and workable field procedure combined observation and intermittent interviewing, and interviewing served largely to complete pictures of observed situations. Most of the research officer's time was spent in just being with an official or a group of officials or men. One day, perhaps, he would spend with the manager, going where the manager went, sitting in on his discussions and interviews, accompanying him underground. Another day he might spend with an official, maybe an official who had discussed an interesting situation with the manager the day before, following up a situation that the research officer felt would provide helpful material for the study. And so on.

Industrial Background

Coal mining had very early beginnings in Great Britain, extending at least as far back as the thirteenth century. Between 1530 and 1700 output increased fourteen times, and three times again in the eighteenth century; so that a very substantial development occurred before the industrial revolution. Though mining was very primitive for centuries, shafts were sunk comparatively early, and by 1700 over half the colliers in the country worked in mines employing over 100 men. In a substantial sense the collier of the twentieth century had been developed by the eighteenth. In the nineteenth century output increased twenty-three times, and it was not long after 1900 that the peak output was reached (1913). The first nation-wide coal strike occurred in 1912.

Over this long period, and until very recently, the miner was isolated—physically and socially. There was not a national union until 1942. The almost universal situation was that a village was built, or grew, at a pit, and all the colliers in that mine lived in the village. It was a specialized, self-contained social unit, this colliery-and-village, and the sons of one generation of miners became the miners of the next generation.

The system was essentially feudal, the local landowner being very

frequently the local coal entrepreneur. However, coal mining also became one of the earliest capitalist industries, owing to the large investment required to sink a deep mine before it produced anything. Often this large investment was a gamble. It happened, for instance, that a shaft was sunk at great cost, only to reach unexpected water. More than one company went bankrupt in this way. The alternative was to make more exploratory borings: but this, too, required a great initial outlay of capital.

The feudal system, the nature of the work and some of the unfortunate practices of early mine owners conspired to give the miner a degraded position in the national community. This exaggerated the effects of the physical isolation, so that altogether mining became a very isolated and distinct industry. Even to-day it is widely thought of as in quite a separate category, distinct from the rest of the industry. This distinctness—plus the miner's sense of pride in his work and the historical unemployment in the industry—is still reflected in many attitudes. For instance, a new miner, even after eighteen months of training and even after he has begun to work at the face (*the* job of mining), may still be referred to in the pit as 'the trainee'. Old miners will swear that no man can acquire a safe 'pit sense' in less than five years and doubt that such a sense could be acquired by one who did not begin his underground career before his twenties. Such examples reflect the strong sense of tradition and the age of the industry.

Summary. Section 2 shows how the greatest problem, the constant need, in coal mining is for flexibility. The essence of the management process in a colliery is to maintain flexibility of men, equipment, supervision, stocks, under extremely restricting and rapidly changing physical and social conditions.

Section 3 describes the traditional sources of this flexibility, and, Section 4, the relationships and forms of communication that utilized those traditional sources in the management process. Burncoal Colliery itself showed a remarkable economy of managerial organization. To supervise, under widely varying conditions, over 1,400 men spread over thirty miles of underground workings, difficult of access, dark and dangerous, less than half as many management personnel were employed as in a typical factory of 1,400 men. The pivot of the organization was the manager, who, employing largely personal and informal methods, was able to maintain close contact

with every aspect of the colliery's operations. He did this mainly by giving constant attention to keeping his relationships with his junior officials strong and flexible.

The concept of organization to some extent accounted for the economy of managerial staff at the colliery. The general principle was that line officials and men were used wherever possible. Specialists were employed only where the line officers could not do the job, and conditions in particular situations determined the division of labour. Duplication of officials and men, and problems of co-ordination, were thus at a minimum. Rather than division of labour by function, the rule—in so far as regulations, the law and union rules permitted —was: supervision divided geographically, specialists only where necessary, compromise for economy.

Considering the physical conditions, Burncoal Colliery was outstanding as an instance of effective personal control of an organization of nearly 1,500. This aspect was all the more interesting considering that any manager was there for only a few years. While the personal control resulted in remarkable economies of paper work and of administrative staff, it had the defect of limiting the amount of time that the manager and agent had for thinking and planning.

Section 5 shows how comparatively recent developments have seriously restricted, indeed sometimes rendered obsolete, the traditional methods of management which counted heavily on teamwork and responsible co-operation. For recent developments, national and local, economic, political and social, have seriously curtailed the sense of community in and around the colliery. At the same time, physical conditions, in Burncoal as in most other British collieries, have also increased the difficulties of 'winning' coal.

Finally, Section 6 describes some attempts to adapt mine management to its new environment of rapid social and physical change together with some of the new problems raised by the attempts themselves.

2. THE NEED FOR FLEXIBILITY

The Nature of Mining

Mining requires constant flexibility. In other industries the physical environment of work can be kept relatively fixed. A coal mine, on the other hand, could be likened to a factory covering several square miles, constantly enlarging, with the machinery and conveyor

system moved every day, and the staff never knowing when, as it were, a bomb might fall on some part of it.

All this would not matter so much if there were no limits to the available space, time, materials, skill, finance, organization. In fact, the limits are narrow. Sometimes they reinforce each other, as when the coal seams of poorer quality are the most costly to mine. Or the limitation of one factor of production can be offset by greater use of other factors: for instance, given time and skill, a steel washer, out of stock at the pithead, can be made in the engineering shop and transported to the coal face. Again, the organization may be sufficiently flexible to deal promptly with a breakdown one day, whereas, faced simultaneously with a number of exigencies, it is quite unable to cope with a similar breakdown on another day. In short, both pressure and flexibility refer to a specific situation in its totality. No more can be done here than to indicate the main areas of pressure and, in the next section, the main ways in which mine management cope with these pressures.

Dirt, dust, danger, damp and darkness—'the five d's'—condition what is significantly described as 'winning' coal. Physical conditions of work are far more variable in a coal mine than in most other types of productive unit. Nothing—neither men and machinery nor geology and air—is static or fixed. The coal faces shift as the coal is extracted. One face may run into an unexpected geological fault with the result that output is reduced and the men clamour for a reassessment of task. In another section the coal becomes harder. A substantial head of water makes a third practically unworkable pending the installation of a pump. A fall of coal buries tubs and tools, and perhaps men, and completely nullifies the scheme of operations. Gas is detected. Moisture, warmth, weight of roof and other unfavourable natural conditions cause timber to decay, steel girders to snap, rails to shift, and generally make roadways and plant difficult to maintain. There are frequent delays and breakdowns. A jerk in the haulage dislodges a coupling, and half a dozen tubs race down a slope and smash at the next turn. A haulage rope comes off the return wheel and jams tight in its waterlogged case. Moisture short-circuits an electrical installation. The nails holding a piece of canvas to a strip of mouldy wood drop off, and the proper circuit of ventilation is broken. Occurrences like these are so common that they hardly arouse comment; they have an air of inevitability about them.

For instance, on a Monday morning the haulage serving one half

of the pit breaks down and calls for serious repair. (In fact, it was stopped for over six hours.) An observer remarks that this is a nice way to start the week off. The undermanager completely fails to detect his meaning. 'Yes,' he says, 'it is good, isn't it? Being Monday, the pit is full of empty tubs and we can keep the men (at the face) going for a while.' He is less concerned with the breakdown than with the good fortune that it has come when it did. Wednesday a man dies of heart failure in the pit, and the men take the day off—in accordance with the custom in some pits. On Friday a tub slips and catches in the shaft while the cage is being hoisted, causing considerable damage. Again, the manager remarks on his luck at its happening that week: the men have lost their bonus shift payment by taking Wednesday off; therefore, although his week's production is low, his costs also are less than they might have been (for the 'bonus shift' is an extra shift's wages paid a man unless by his own choice he works less than five days in the week).

Distance, darkness and limited space make movements of men and materials unusually difficult and expensive. In some pits the journey from pit-head to the coalface takes an hour and a half. From one coalface to another it is often longer, so that it is of little use to try during the shift to reallocate men, tools or tubs once they have been put to work. Considerations of safety and space limit the types, size and weight of machines that can be used underground; there is usually inadequate headroom, for instance, for cranes. Considerations of safety and hard usage have affected design so that equipment is heavier and more bulky and (also for other reasons) more limited than similar equipment for use above ground. Different conditions require different types of a machine; for instance, it may be necessary to use various makes of coal-cutters in one pit. This means either more investment in spare motors or less flexibility, because when the coal-cutter motor is removed for overhauling it must be replaced with a spare.

Official regulations govern in great detail the design and use of equipment, ventilation, methods of securing roofs, and action to be taken in the event of certain dangers and accidents. Safety regulations specify such details of operation, for instance, as the maximum number of shots to be fired per day by each shot-firer in a certain kind of district of a certain size. Inspectors make occasional routine, unannounced visits as well as visits immediately following reportable accidents. Where considerations of safety are involved, there is

practically no room for flexibility on the part of management: safety regulations must be followed almost without question and virtually to the letter of the law. Such regulations, taken together with other limiting factors such as the shortage of manpower, and absenteeism, constitute substantial additional limitations on flexibility.

Problems of Communication and Control

Problems of communication and control within these rigid limits become exceptionally difficult. The physical problem of communication alone is extremely vexing. Most communications must pass through several individuals and over great distances. In much the same sense as the entire pit may be held up by a mechanical breakdown at one point, efficient communication depends on a proven and adaptable line of relationships. Anybody may be used as a messenger. Communication must also be 'self-starting', since scheduled, formal devices of communication would not begin to suffice where activities are so numerous and varied. Oral communication predominates by far. Frequently the memories of one or two individuals have to serve even for important information regarding workings, e.g. how water entered in the workings and how it was stopped. Sometimes there is disagreement on such points. Even large machinery may apparently get 'lost'. In one colliery, it was rumoured that a complete haulage was still in position from many years ago in what was now a place filled with stone and dirt; in another colliery a 20-inch conveyor structure apparently 'disappeared'. To one who has been underground, it is only surprising that such things do not happen more often.

Like communication, control is a unique problem in a colliery. It is difficult to lay down standards for checking and evaluating results: different ways of doing a job may be equally efficient and one man's choice as good as another's. There must be a great deal of latitude, and control depends ultimately on relationships, on morale, on the strength of tradition, rather than on devices of check and measurement.

For instance, the amount of non-combustible material—'dirt'—coming up the pit can only be controlled up to a point; from then on, the 'dirt' must be removed on the picking tables and in the washery. But the proportion of dirt sent up the pit could be considerably lower. It depends on the attitude of the men and of the officials. Apart from substantially increasing the number of officials

—and it would not be as simple as that, for the men's reactions to the increase might tend to defeat its purpose—the manager has no way of attacking such a problem except by appealing to the men and by seeking generally to improve morale.

In other words, given the unique and intransigent physical circumstances of coal mining, the process becomes uniquely dependent on flexibility of applied resources—of men, machines, transport and management.

3. TRADITIONAL SOURCES OF FLEXIBILITY

Traditionally the chief sources of flexibility in mining have lain in the management and men in the community. As the National Coal Board's 1948 Report put it in describing the manager's job, 'geology and history have given each colliery its individuality, calling for qualities of adaptability, resourcefulness and initiative' (p. 104), and the same applies to some extent to each miner and to the social environment of both managers and miners.

It is assumed that everybody will help cope with the frequent and unexpected variations in mining. In the event of a mechanical breakdown, for instance, anybody available will automatically lend a hand. Often it is brawn that is mainly required, and even an inexperienced visitor can be useful. The experience of working together is immediately evident; there is usually no question of waiting for a recognized superior before proceeding with salvaging what tubs remain in a usable condition after a smash and putting them back on the rails or with executing the innumerable small repairs to roof supports and mechanical equipment of all kinds. If an official is present he automatically assumes charge, whatever his level, and the same can happen with the appropriate functional specialist. Formal spheres of responsibility and lines of authority tend to be forgotten in the face of the emergency. Many of the repairs are sound. Others cannot be more than make-do, to be superseded by more adequate repairs as soon as materials, tools or skill can be secured and used with little interruption of output. Where excessive difficulties and discomforts result, *ad hoc* additions to wages will usually keep production going until, for instance, a pump can be installed or protective clothing provided. Only when a working place is held to be unsafe are the men withdrawn.

Mining Men

Supervisors, Specialists and Manager. The responsibility for offsetting variations in his section rests immediately on the deputy, the first-line supervisor. He allocates his men to their work, marks down and often assesses extra work for payment, and helps them in any way necessary. Higher officials and specialists, such as engineers and electricians, are used to interrupting their routine to deal with exigencies in their sections and shifts, or indeed anywhere in the pit. They often return to the pits in the evening to have a word with the back-shift and night-shift officials, and they are liable to be called out any time of the day or night. Officials, engineers and winding-men virtually have a seven-day week.

Every day the officials spend some, often considerable time discussing breakdowns and repairs, requirements for the next shift and future plans. Major questions are often left to be discussed in some comfort and at length in the evenings or over week-ends. Some managers may also use the week-end to catch up on regular office work and any other matters which have had to be left undone during the week.

Miners. Resilience and adaptability are among the strongest traditions of the miners. They have always stressed toughness and manliness, reflecting the need to adjust to a tough and manly job. Men may be seen working with bandaged fingers in wet workings or working blithely under an inadequately supported roof. It is not because they are not interested in first-aid and safety; they are interested, as first-aid classes, for instance, show; but injuries that others might consider worth a doctor's attention are routine to the miner. For instance, a man may come up the pit with his mouth covered with blood. A junior official in the cage with him casually asks how he got that way. 'A fall of stone,' is the reply, 'but I forgot and left my teeth at home this morning, so I'm lucky.' 'You'll be all right,' says the official, no more.

Miners may be moved about between sections, to start a new section, to team up with somebody on another shift, to take the place of an absentee, to help until a certain difficulty has been overcome. The trade union has agreed that this must be so. Miners do small repairs in the course of their normal work, and when a breakdown occurs nearby they give a hand. When they are paid by results, earnings are liable to fluctuate according to the bargain struck with

management, hold-ups in output, special wage concessions and work at overtime rates.

Although in setting a day's 'task' some allowance is made for interruptions, not all delays can be made good during the shift, and it is not unusual for miners to work overtime without notice in order to complete the day's job. Thus facemen are asked to stay on till the face is stripped or until the next shift comes on to take their place, and the men working the haulage and essential ancillary services have to stay on accordingly. Repairs, maintenance and new installations are concentrated into shifts, when they do not interrupt production, or are left for the week-ends, or the annual week's holiday. The union agrees that a man should work a 'reasonable' amount of overtime. Occasionally this requirement interferes with private plans.

The Community

The community surrounding a colliery adjusts itself to the needs of the pit as transmitted mainly by the miners themselves. That is, it tends to support the customs and relations at work. Miners' wives are well known for the interest they take in their husbands' activities and relationships at the colliery; they have many insecurities unburdened on them which they interpret in common-sense terms with an eye on long-term relationships within and without the pit. But there is a limit to the extent to which the community can be made to conform to the needs of the colliery. Attempts to synchronize holidays as between collieries for instance, led to grave objection and to considerable absenteeism where holidays ceased to coincide with such local events as fairs and race meetings which customarily determined local holidays.

Conversely special arrangements are customarily made, e.g. in working hours, so that miners can perform duties in the community and attend such events as weddings, funerals and club meetings. Welfare Institute[1] activities, union meetings, local government, ambulance classes, dramatics, etc., have always played a large part in the miner's life. The colliery manager is traditionally also a community leader, and sees his duties as a village 'patriarch' as an essential part of his duties as manager.

[1] The Welfare Institute is the local miners' club set up by the Miners' Welfare Commission. It usually comprises a library, a bowling green and other recreational facilities and is largely financed by a national assessment on each ton of coal.

Organizational Structure

The management structure of the colliery is simple and small considering the complexity and diversity of its problems and the distances and conditions involved in mining. It is very dynamic and variable, impossible to chart accurately. In each district of Burncoal Colliery the 'back-shift' (afternoon shift) and day-shift change over every so often, so that the advantages of the day-shift and the disadvantages of the back-shift are shared evenly among the men.

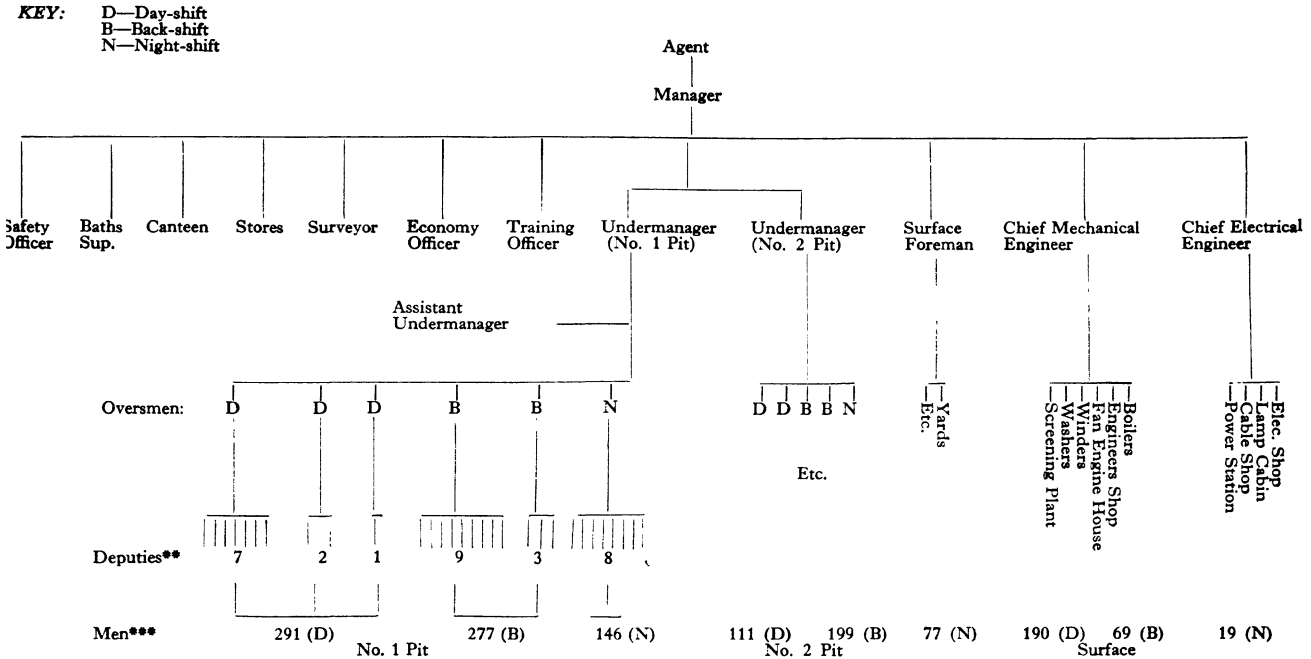
The chart which follows sketches the formal structure. The chart necessarily fails to portray the dynamic and varying aspects of the organization, not to mention the informal relationships. These will be discussed later. The only reason for including the chart here is to give the reader a rough idea of the formal organization at one point in time.

The agent. The only higher official to be mentioned at some length in this study is the agent, the colliery manager's most immediate supervisor. He may be likened to a flotilla commander. Like a flotilla, his group of collieries—Burncoal is one in a group of four—is a distinct unit; and each colliery, again, is like each ship in a flotilla, a distinct and separate unit with the manager as captain.

In conjunction with the manager and the Area Planning Department, the agent sets the course, for instance by specifying in what directions development work (i.e. preparations for future extractions of coal) will take place. Keeping a check on the efficiency of the colliery is another important function of the agent. He gets records (daily and weekly) of the colliery's accidents, wastage, absenteeism, production, consumption of roof supports (weekly), manshifts worked, sectional wages costs (weekly), face advance measurements (linear records of coal extraction), etc. These and similar details are expanded to a detailed monthly record of total cost, which in turn leads to a monthly profit and loss statement. In addition to routine records, he gets special reports and measures, for instance to help determine whether Saturday working is justified despite high absenteeism, reports on dust and air conditions in different sections of the colliery. The agent approves the manager's requisitions for supplies —and sees that he gets them—and examines capital expenditure. He may inquire several times a day as to how things are going and may actually see the manager once or more a day.

The division of function between manager and agent is one of the

ORGANIZATION CHART*



BURNCOAL COLLIERY

* Approximate. This chart makes no attempt to show informal gradations of status.

** Regulations limiting the number of shots that one man may fire in a shift, make it in some circumstances better to use a 28*s.*-a-shift fireman (using him for both shot-firing and supervision) than a 23*s.*-a-shift shot-firer.

*** Figures for men show number actually present at work on 23rd February, 1950. Total 'strength' of the pit is about 1,440.

chief sources of flexibility in colliery management. Often the agent gives detailed attention to long-term problems; e.g. he may spend much time on improving the efficiency of the fan which provides air circulation in the pit, discussing the matter with the colliery engineer and electrician and with higher level specialists. At the week-end he may actively direct a major operation like re-routing the pit ventilation.

He must be present at meetings to settle differences with the union as to rates, perhaps coaching the manager in facts and strategy. He may attend the joint consultative meetings and take an active lead in discussion. On some occasions he may hold special meetings with the colliery union representatives, for instance, to negotiate an agreement for limiting the areas of the pit in which the men take a day off when a man dies underground.

In all these matters the agent is the link between the colliery and the higher levels of management. The manager is almost completely absorbed in running his colliery. The agent is one who is close to the colliery and intimate with its problems, yet can stand back now and then and look at it as through the eyes of higher-level policy-makers.

The manager. The manager may be captain of a ship, but he is also chief cook and bottle-washer. Like the captain of a ship he is ultimately and legally responsible for a large, distinct unit closely dependent on nature. He is always on call in emergency. His work is not limited to eight hours a day. Many managers regularly return to the colliery in the evening to see how things are going—after having worked from 6.30 or 7.0 in the morning till 5.0 in the afternoon. Like the captain again he is in intimate touch with all the varied aspects of his unit; so that if he is not actually cook and bottle-washer, he at least knows the cook's job forwards and backwards.

He interviews job applicants, weighing each one up to determine whether he will work well and fit in with his men; hurries the men down the pit if they dawdle on the surface at 6.30 in the morning; takes charge in underground crises and supervises emergency repairs; forever keeps an eye out in his wanderings for mistakes, slackness, danger signs, men off their jobs, development prospects; checks on the checking of his functional specialists; deals with the union delegate over rate and other grievances; negotiates new wage contracts for new coal faces or altered conditions; acts as chairman of the joint consultative and other committees; spends most of a morning going through the wage books with a fine-tooth

comb (this provides him with many clues to wasted skills and unnecessary costs underground and demands a detailed knowledge, as does the rest of his job, of the vast and complex underground workings, of the surface arrangements and of several hundred men). A detonator is missing; he must institute a thorough search, lest it turn up in some householder's coal and perhaps explode. An assistant bath attendant is not needed full time; he is found some other work for two days a week on the surface. Overtime work is necessary in one part of the pit; the manager spends some time trying to find the most suitable people to offer this work to.

A boy comes in late in the morning: he has slept in, missed the day-shift and wishes permission to make it up by working the back-shift (2.30 p.m.). The manager must act carefully: he must beware of offending others. 'What's your name, lad?' he asks. 'Where do you live?' 'Your father works here, doesn't he?' 'How long have you been here?' 'Who do you work for?' The manager sums up the case in his mind: it is a worthy boy; his father has been a good worker in the pit for years, and is liked and respected by his comrades; leniency in this case, he concludes, will not offend others or create any dangerous precedents.

He sees, as he walks by, that the men in one part of the pit are getting careless about removing steel props before letting the roof fall, and remonstrates with one of the men. . . . Five men are coming to work in his pit from the other side of the country; these men will require some time to get accepted by his men. Shall he break them up putting each with a group of his men; or shall he keep them together? He gives the matter considerable thought. One manager breaks them up, on the grounds that they plot trouble as a group and will not get acquainted with his men if they stay together. Another manager keeps them together, on the grounds that they may foment trouble if separated and will be lonely without their mates.

In some ways the manager of Burncoal Colliery is more of a key figure than the works director of a factory of comparable size. In a given day he may have contact with men from the level of a picking boy up to area production manager or higher; he may deal with problems of all sizes and implications, from planning new development work involving sizeable capital outlays to ringing up the bus company to make sure the buses will pick up men on Saturday (alternate Saturdays are worked, and the men have a claim to their pay if the bus does not call for them on schedule).

A single day's events, then, may comprise early morning discussions in the officials' baths with his junior officials (at 7 a.m., so as to see the night-shift officials going and the day-shift officials coming); a tour around part of the surface facilities to sign various report books and see how things are going; a visit with the agent, perhaps over breakfast; a tour underground (three hours); back to his desk in time for the stream of men waiting to see him before they go underground on the back-shift, or after they come up from the day-shift (this may include everything from dealing with an unruly boy who has been making trouble—and dealing with his father—to receiving a deputation from the men). Interspersed all the time will be interviews with various officials whom he calls in or who come in about something; with the agent, in person, or by 'phone, with other miscellaneous callers. Occasionally he may snatch a moment to study his development plans. At about 2.0 or 2.30 various area specialists and representatives of colliery equipment and machinery manufacturers may drift in, and at 3.0 or so the undermanagers and oversmen come in to discuss the day's problems and results. At times in the afternoon his office may resemble a small railway station, with groups of two or three chatting in various parts of the room whilst waiting to speak with the manager. Usually at about 5.0 or 5.30 a break comes, so he leaves while he can, usually dealing with one or two officials between office and car.

In addition, the manager of Burncoal Colliery must serve, usually as chairman, on several colliery committees—the joint consultative committee, the canteen committee, and various *ad hoc* committees—and he and the agent must perform many duties outside the colliery, such as calling on officials and men when they are sick or there is death in the family, visiting the village school-master on community matters, acting as master of ceremonies at various social functions, even going to meetings of both political parties during an election campaign to show their willingness to listen to both sides.

Many matters will come to the manager simply because mining problems are so infinitely variable. Nothing ever happens the same way twice, and major issues with new aspects come up constantly. Technical operations must constantly be varied to suit conditions; experts still disagree on the best methods for performing some operations that have been routine, e.g. packing.[1] Mining, full as it is of customs and traditions, thus presents infinite scope and need for

[1] Filling spaces with rock to support the roof where the coal has been mined.

ingenuity and improvisation. A decision, particularly in such matters as planning roadways, etc., can save or lose thousands of pounds.

Other officials. The analogy between colliery and ship holds right down through the ranks of supervision. As the organization chart indicated, the undermanagers are in charge of two large underground areas. These areas are divided into two districts, each usually under the charge of an oversman. In Burncoal's No. 1 Pit, for instance, there were six oversmen (see organization chart) at the time when the chart was made; three on the day-shift, two on the back-shift and one on the night-shift. They covered three districts. The day-shift was the main shift, i.e. the coal-getting shift. On the other two shifts, in which the coal faces were prepared for the day-shift, there were fewer men and therefore fewer oversmen and firemen.

The deputies, for which the chart shows the number on each shift in each district, are primarily responsible for safety precautions. But they also exercise a certain amount of supervision, and in that sense are the lowest level of management. There is still another level of supervision—the 'leading-man'—a member of a team of workers who is designated to take charge. He is strictly a working leader and is sometimes recompensed by a slightly larger share of the group's 'pool' of earnings. Leading men are used on teams making roadways, repair teams, and other jobs requiring small groups working alone.

The functional specialists can mostly be identified by their titles. For instance, the economy officer is a junior official, with a staff of three or four men, whose job is checking and controlling the consumption of supports of steel and wood. These are used in large quantities, are expensive and easily lost, in short, an item which in a large pit justifies the full-time attention of an official.

The functional specialists have only a secondary and limited authority over the men; that is, they have their authority through the line officials. In addition to their responsibility to the manager, they report to corresponding area specialists.

Summary. The traditional sources of essential flexibility in mining must be, and have traditionally been, found in mining men, in the support and teamwork which they give to each other, in their deep-seated habits of co-operation, in the forms and processes of organization and management which they have evolved by trial-and-error over centuries. In these respects, this chapter, and the one following,

epitomize in concrete form the 'natural' evolved ways of working together that characterized human industry until the nineteenth century, when the pace of developments began to demand quicker and more drastic adaptation, at the same time as social disruptions began their inroads on established patterns of co-operation.

4. COMMUNICATION AND CONTROL

The problems of mining coal call for an attitude towards communication and control that sees all behaviour in the colliery as tied together. We gave briefly some typical illustrations in the second section of this study. The topical problem of absenteeism is a good illustration of these inter-relationships; a detailed description of its relation to multiple colliery and community factors will provide the necessary realistic setting for a discussion of methods of communication and control.

Absenteeism as an example. Absenteeism has a long history in mining. In the past, it was often forced by lack of work, and supported by the custom miners had of spending some time each year in other work, such as agriculture. With the present demand for output and shortage of workers, it is nearly always on the miner's initiative.

The ramifications of absenteeism are legion. For instance, absenteeism sometimes entails shutting down an entire long-wall face for a day with a loss of 500 tons of coal or even more, because a 'strip' must be entirely removed in the coal-getting shift before the conveyor pans can be shifted, the coal undercut and shot-fired and the packs extended, preparatory to the next coal-getting shift. The manager can counter-balance some absenteeism by getting some men to change work-places and others to work overtime. But the former is something that a miner traditionally has the right to be difficult about; and the latter often results in absenteeism the next day and is expensive as well. When these expedients are not enough, the face must be shut down. The final difficulty is that absenteeism is unpredictable.

Some men are simply better attenders then others, but absenteeism is also related to a number of general factors:

One is physical conditions in the pit. They are often extremely tedious. In this category would come also the problems of mechanization and consequent reduction of craftsmanship.

Status and income are another factor. The *élite* of miners, i.e. the workers at the face who actually get the coal, are usually paid by piece-rates, earn most and are the worst absentees. In one respect it is simply that they earn more and therefore can afford to buy more leisure. Also they work very hard and need rests.

Taxes and the general economic situation seem to have a bearing on absenteeism. Income tax, is a definite 'dis-centive', other things being equal; absenteeism usually means a reduction or even a rebate in a miner's tax. Moreover, the five-day week agreement, under which he is paid a 'bonus shift' if he works five days, frequently encourages him to prefer two absences in a week to one. Purchase taxes have a special deterrent effect on the miner's desire for money, because his living standards are relatively fixed, and he can postpone purchases of articles to which he is not accustomed. These factors are closely related to the matter of living habits.

The miner is very much a creature of habit. It is sometimes suggested that he depends on habit to make him work at all. At any rate habit is, or has been, a strong factor in his life. His habits of living are relatively inelastic. In part this is due to fear: he is afraid of developing a standard of living that he may not be able to maintain when he falls on hard times. There is also strong community pressure not to deviate much from the general pattern. The miner gives a certain amount to his wife for household expenses, and often uses the rest for smokes, drink and gambling, and some savings—or he gives his pay to her, and she makes the allocation. At any rate, until the mid-1930's he was not particularly tempted to buy durable goods, or to better his material standard of living. The change which began then was nipped in the bud by war and its shortages. Perhaps the movement for material improvement will gain momentum as there are again things to buy and particularly as housing improves. On the other hand, the introduction of factory employment for women in some mining communities has opened a new source of income.

Some of the habits and customs of mining communities have semi-superstitious bases. For instance, a miner may one morning have a 'premonition' that danger lurks in the pit, and therefore will not go to work. Or he may not be feeling actually sick, but will stay home if he is not '100 per cent. fit'. Much of this is due to the many dangers in the pit. For instance, by going to work when he is feeling 'off' he endangers other lives as well as his own. Or he may not work on the day before holiday week: an accident might occur that last

day. This feeling might be partially justified by the unusual atmosphere which prevails before a holiday, carelessness becoming a special danger. Likewise, he is frequently absent the first day after a holiday. Again, possible deterioration in pit conditions during the inactive period of the holiday would to some extent justify his wariness.

In addition to these factors there is the important fact that forced absenteeism has been very common for a long time. Even three or four centuries ago it was common for a miner to work but 150 days a year, or even fewer. He has bitter personal memories of waiting for work in the pit bottom and then being disappointed.

All these factors combine into one important point: because of tradition, force of circumstances in the old days, superstition and custom, absenteeism is very much the 'done' thing, and is a likely first expression of any dissatisfaction or disequilibrium. It might almost be said that each day it is an open question whether the miner will go to work or not—so easily are the delicately-balanced scales tipped in favour of absence. Even such a matter as not having an alarm clock can in the circumstances be a very considerable factor—especially as in some communities the miner has a superstition about going to work if he wakes up late!

In studies of absenteeism during the war, striking general differences were found in absence rates between communities. The differences seemed to be related to two factors, viz. the human situation within the factory and the underlying attitude of the workers as a community towards absenteeism. Thus in one large industrial city where 3 or 4 per cent. was a normal absence rate, the general social pressure was against absenteeism: other matters such as transportation difficulties or 'feeling off colour' had to be quite strong to offset this normal tendency to be present at work. In another city, where indeed the work was lighter and the physical conditions better, the normal absence rate was 10 per cent. or higher, and absenteeism was socially accepted: in this city the 'natural' response to difficulties was to stay away from work. In other words, the underlying attitude of the community towards absence strongly conditions the operation of all other factors; it either exaggerates their effects in particular instances or tends strongly to offset them. Community feeling is thus the most important single 'cause' of absenteeism; but that is an inaccurate way of putting it. Actually, it is not a *cause* as such, but acts in conjunction with other factors—

as is the case in all human situations. Its great importance, particularly in the coal industry, lies in the fact that it is a broad underlying thing that works through, and is often hidden by, the more immediate or direct factors. In mining, absenteeism is in fact socially accepted by the community.

Finally, in an industry where the worker prizes his independence and does not mind arguing with a supervisor (and he may be right, even on technical points), and where absence is a customary form of expression, it is only natural that a man should absent himself from time to time as a way of expressing his independence.

In circumstances as complex as these, to ask for the 'reason' for an absence or to think of 'controlling' absenteeism is unrealistic and may be misleading. One can at best try to learn about and alter some of the factors which lead to absenteeism. Of these the most important are the informal relationships which support standards of behaviour in the colliery and surrounding community. In that sense, communication and control simply reflect relationships; and communication and control can only be improved through improving relationships.

Informal Relationships

Informal relationships amongst the men. Miners divide themselves into roughly three groups. Facemen are the real 'colliers'. The statistics include among face-workers all workers within a certain distance of the coalface, but socially the term refers in the main to the men who get the coal, plus some others, e.g. repairmen, who are skilled and experienced. Next in status come other workers below ground, mainly employed in haulage work, the 'drawers' and 'hauliers'. Permanent workers on the surface, finally, are regarded as almost of a different kind.

Wage differentials traditionally match the broad differences in status in what seems to be a money-conscious community. At home the miner promises his child of seven a shilling for doing a little job in the house, or bargains with him one food ration for another. Perhaps this is indicative of a people who pride themselves on their independence and wish continuously to confirm it.

Within the three broad status groups there are jobs reserved for specific groups of workers. At sorting tables on the surface, there seems to be old men, disabled men and trainees. Old men also do many odd jobs, particularly repair and maintenance work. Special jobs which require the attention of individual workers and are diffi-

cult to supervise are given to people with good records. It is accepted that men are employed as long as they can be fitted in, and that temporarily disabled men will go back to their old jobs upon return.

Traditionally family groupings play an important part in the work arrangement. Though it applies less and less owing to the reluctance of young workers to go down the pit—or their parents' reluctance to let them go down the pit—traditions concerning positions at work for members of a family are still strong. It still happens sometimes that the son is trained by the father, and that brothers and relations work together. Until recently at least, the position of the father largely determined the kind of work his son got. If the father was a face-worker, his son went on the face early. If the father was an on-cost worker, it was not so easy for the son to get face-work. Indeed he did not feel strongly about getting face-work, for this would upset his status and his standard of living. This almost feudal system has perpetuated itself through generations.

Teamwork is the essence of mining. The miner, an individualist, prefers to work in small teams. Members supervise each other. Many teams have worked together for years, on brushing, repair work, etc. Men who get to be known as the best team-workers are appointed leading-men of small teams of between three and eight men put on special jobs. Similarly certain men make the best training supervisors, and the training officer tries to team up recruits with them. But this is not always easy because for men paid by results supervising trainees often entails loss of earnings. In the days of contractors—a system (now discontinued because of abuses) by which one man, the contractor, took responsibility for a group of men, guaranteed their output and received a lump sum out of which he paid the men's wages—the contractor's unit was very much a team, with boundaries well marked in every way, geographically, financially, and in terms of the jobs involved.

The importance of teamwork was emphasized in the Reid Report. It contrasted the room and pillar system, which employs small teams, with the longwall face and observed that even when the room and pillar system was fully mechanized 'the workers are attracted by the greater variety of the work, and the greater skill required in its performance, once they have become accustomed to the new technique; and the small size of the groups encourages a team spirit'. (Reid Report, p. 40). Experiment with smaller teams now in progress at

Bolsover Colliery in Yorkshire seems to confirm this observation.[1]

Informal relationships between manager and miners. The relationship between manager and men is decisively influenced by the similarity of their backgrounds. The normal situation in Scotland is that both

[1] The room and pillar system is based on driving roadways forward into the coal, taking out the coal as the road is pushed forward, thus

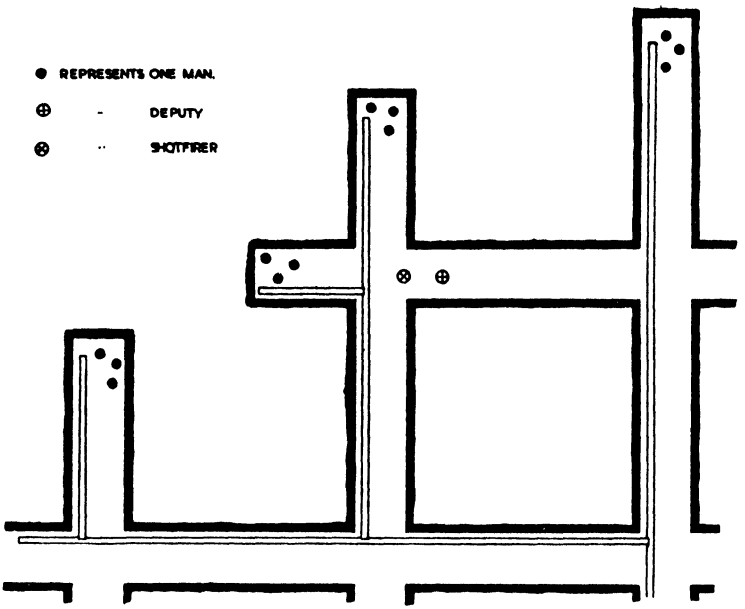


DIAGRAM SHOWING SMALL TEAMS IN 'ROOM AND PILLAR' METHOD OF WORK.

In a working space having the width of the roadway, the team of miners will obviously be small. The longwall face—it may be several hundred yards long—employs upwards of fifty to seventy men. Coal is removed from the long face, and 'packs' are built opposite the face to support the roof as the face advances, thus:

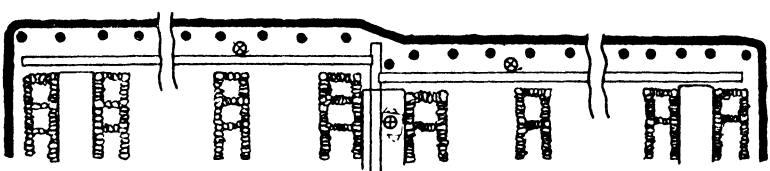


DIAGRAM SHOWING DISPOSITION OF MEN ON A 'LONGWALL' COAL FACE.

Behind the 'packs', the roof is allowed to collapse, in order to take the main weight off the working face.

have learnt, lived and breathed mining all their lives, and little else. Even at social functions their chief topic of conversation is mining. The manager and the agent of Burncoal Colliery were once working miners. They began work at the age of fourteen, and slowly worked their way up, by working at a colliery all day and studying at night. The great similarity of backgrounds may explain why managers emphasize their status at the same time as, often very consciously, they conform with the standards of the mining community.

Even in Burncoal, which employs 1,400 men, the manager knows many of the men. At meetings of the joint consultative committee he may show detailed knowledge of the situation of various applicants for houses and of their families and connections. He thinks of his problems in terms of *what* men he has and needs fully as much as in terms of how *many*, a distinction that is often lost sight of in manpower targets. He lays great stress on knowing his men, and a chat about a man's personal matters often produces a situation in which work problems can be discussed as well.

Nevertheless the distinction in status of manager and men remains; indeed it is strongly nurtured. Thus when a retiring president of the National Association of Colliery Managers emphasized in his valedictory address that, old-fashioned or not, he believed that good discipline is not achieved by a manager being addressed by his Christian name, the meeting acclaimed his remarks with special show of feeling. In some instances this relationship between manager and men is definitely arm's-length, but generally managers are more concerned about keeping the distinction in the abstract than in practice. It seems always to exist in some degree.

Informal relationships between managers and officials. Even with his officials the manager's 'separateness' is noticeable again, like a captain's. Everybody is aware of it. It is epitomized and maintained by, for example, the use of 'mister' in addressing the manager. Managers have customs, ways of life and a status in the community of their own. But managers and officials are bound together by great interest in the work. They work long hours and odd hours, and they like to talk about their work. They may complain, but they show their loyalty to their job in many ways. This is very apparent, for instance, in discussions which take place in the manager's office after the day-shift officials have seen the men off, conferred with their colleagues on the next shift, bathed and come in to discuss the day's problems. It is clear also that these discussions

'combine business with pleasure'. They are informal and usually looked forward to by all.

Routine discussions between manager and junior officials help to keep flexible and strong what must of necessity be flexible and strong relationships. For instance, the conditions and variations of mining make it essential that officials can 'by-pass' one another without raising vexed problems of status and formality. The manager himself is a frequent breaker of the 'chain of command'; as a matter of course he takes direct charge of situations in the pit when he is underground. Traditionally when a manager transferred to another colliery he might take with him a number of officials with whom he had developed strong working relationships. At one mine, for instance, the manager had worked elsewhere together with a senior oversman, the head electrician, the head engineer and another oversman. In no case were managers and officials close personal friends; but they had become very much accustomed to working together.

In mining it is particularly clear that officials must have much freedom in performing their duties. Improvisation is constantly required. The manager must constantly restrain unnecessary and wasteful improvisation without going so far as to kill essential initiative. With little to choose often between ways of doing a job the manager is wise to err if anywhere on the side of latitude and to humour a cantankerous official who has high social and technical qualities.

The relationships between the manager of Burncoal Colliery and his junior officials and functional specialists are complex and full of apparent inconsistencies. In line with traditions of the industry in Scotland, there are certain patterns of interaction between manager and junior officials which might appear to some outsiders to be quite dictatorial on the manager's part, and subservient on the officials' part. Yet the relationship is really that of man to man, not man to servant. For instance, at an afternoon meeting of junior officials, an oversman showed some negligence and ignorance concerning a stoppage of the conveyor which held up part of the pit. The manager thereupon subjected him to the apparent humiliation of a cross-questioning on elementary facts about his job in front of his fellow-oversmen—finding him unable to give the length of one of his conveyor belts and asking the other oversmen the lengths of their conveyors to show him how negligent he was. But at next day's meeting the manager talked with him in a perfectly usual way and even took some special note of him in small ways, such as saying, 'And now

last but not least you, Jim . . .' when that oversman's turn came to report the day's events.

In fact, the officials at Burncoal Colliery have an exceptional amount of responsibility and authority. For instance, though elsewhere it is quite common for the manager to ask for reports by telephone or even to return to the pit in the evening after dinner to see how things are going, the manager of Burncoal Colliery confines such contact to emergency. He requires his officials to keep written records of the day's events in pocket note-books, and these he looks at regularly—usually first thing in the morning, sitting on a bench in the officials' baths. The officials' baths are in this and in other ways a centre for the frequent contacts which effective relationships require.

Two functional specialists in particular, have important functions *vis-à-vis* the manager at Burncoal Colliery, of which no hint is given by their titles: the safety officer and the training officer. Their office connects with the manager's office, and he has a buzzer by which to summon them. Many of their duties are in the nature of personal assistant to the manager. The safety officer in particular, a considerably younger man than the manager and a counter-poise to him in personality, acts as a close aide; for instance, he accompanies the manager on his underground trips.

The surveyor at Burncoal Colliery is a student who is working for a university degree and a first-class certificate. He is thus rather distinctly differentiated from the other officials—a relationship which is however modified by the fact that his father is a winding engineman (an important job) and an old employee at the colliery. The surveyor's work, which consists almost entirely of such service-functions as mapping, and collecting air samples, does not need to be as closely integrated with that of the junior officials as some other specialists must be.

Relationships amongst junior officials. Within the simple formal hierarchy of officials, there is a more complex informal system of distinction. An oversman on the coal-producing shift, for instance, has a higher status than an oversman of the preparation shifts. It would be a promotion for a deputy on the night-shift to be moved to the day-shift. It seems accepted that old officials, who pass from the coal-getting shift to another shift, are transferred as it were to the backwaters: they are making room for younger people on the day-shift who have got to make their way to higher management. Traditionally, informal differences of status have been reflected in differences

in pay. Perhaps because there are frequent temporary appointments of officials (for instance, when substitutes are required during holidays) and partly because the manager seems to be able to demote officials if he does not feel that they are satisfactory, the gap between the lower officials and the men is not large.

The most striking general feature of the relationships among junior officials at Burncoal Colliery is the very flexible division of functions between them. It is easy to forget both how necessary this is and what an achievement it represents. Generations of experience and tradition have gone into working out the kinds of relationships which enable the thin film of management structure, covering several acres of surface facilities and several dozen miles of underground workings, to accommodate itself to continuously changing needs. For instance, an oversman or deputy begins his work-day by conferring with his opposite number on the previous shift and with his superior. He assesses the situation on the way to his dispersal point underground. Then he must distribute whatever men present themselves for work according to his judgment of the needs of the situation. Somehow teams have to be manned up and concentrated on the more urgent jobs. Some men may be absent; one or more deputies are absent and the oversman must appoint temporary deputies. In addition to their loyalty to the job all officials need to and do possess a strong sense of individual responsibility.

Communication

Means of communication: through junior officials. The manager is first and foremost dependent on his junior officials for keeping him informed of the work situation and for transmitting his orders into action. To some extent this applies to all industries, but in the colliery the dependence is unique. At least the factory manager can do frequent tours of his works, covering the entire building in anything over half an hour, and thus provide himself with certain assurances of varying degrees of reliability. For the manager of Burncoal Colliery, with over thirty miles of difficult and dark roadways, this is quite impossible: he is lucky if he can see even the major parts every fortnight.

Yet even in the much easier conditions of other industries, foremen sometimes so censor and temper the information they pass upwards that higher levels of management have as a result a quite inaccurate picture of the factory. If the manager of a factory of 1,500

is in this sense at the mercy of his junior officials, the colliery manager is much more so. He can do spot-checks, he can visit trouble spots. But for routine knowledge of what is going on underground he depends absolutely on what his junior officials tell him, plus whatever he can add by his own ingenuity and intuition.

The manager is almost continuously in close touch with one junior official or another, often by telephone or in person. This is easy in the case of officials whose work is wholly or mainly on the surface. Contact with underground officials is partly premeditated. They are customarily or as specially arranged near an underground telephone at certain times of the shift; but this cannot be very often. The manager can also meet them underground. But conferences with officials have to take place mostly above ground, before or after the shift, in the baths or in the office. They are regular; and they are formal to the extent that the manager may call on each official to report in turn.

Often the manager must choose between getting information directly and immediately, or getting it a little later through the officials. The former tends to weaken the initiative of his officials in reporting. By the latter he trains them in their rôle of important links in the chain of communication. He therefore sacrifices the individual piece of information for the sake of promoting the smooth and continuous operation of his regular lines of communication. If but one official falls down on the job of keeping the manager advised of events, it can increase very substantially the manager's burden.

Mining is a particularly clear, indeed an extreme, example of the fact, brief to state but of overwhelming importance, that effective communication depends on effective relationships. Tradition is of great importance here: the sense of discipline and loyalty which exists among junior officials—very much like that in the Army—probably grew out of the crucial position filled by the officials and the rigid process of selection. A healthy sense of independence prevails amongst junior officials who have made the grade. An undermanager who regularly returned to the colliery after supper put the paradoxical nature of authority and control in a nutshell: 'If the manager told me I *had* to come back in the evenings, I'd kick up a row.'

Other means of communication. In addition to his officials, the manager traditionally has had five other means of communication: (1) through deputations of workers, (2) through the union representatives, (3) through personal contacts with individuals below and

above ground, (4) through social contacts in the village and in miscellaneous activities and (5) through meeting with the men *en masse*. A sixth, which is really a component of most of his other contacts, might be called intuition: it consists largely of knowing his men and pit so well that he can sometimes *sense* a situation. The manager of Burncoal Colliery is very keenly and discriminatingly alert to subtle changes in situations. This is the basis for hunches which are followed up by investigations. He is always alert to indications, on the surface, of underground activity. For instance, in the middle of concentrated thought and conversation he may glance out of the window and notice that the 'creeper' (which moves tubs on the surface) has stopped, and immediately send someone out to establish the reason. The winding gear is a good indicator, for it must be in almost constant operation to draw a normal day's output; the longer it is stopped, the greater is the irredeemable loss of output. Or by following up a hunch suggested by a slight oddity on the pay sheets, the manager unravels a situation which calls for disciplining a worker and reorganizing supervision.

The manager of Burncoal Colliery uses all means of communication except addressing the men as a body. Deputations of workers usually come to present a grievance on which no satisfaction has been obtained. A deputation can be one step in a series of representations which, failing of satisfaction at successive levels, may go right up to the umpire at divisional level. The manager usually considers a deputation symptomatically; i.e. he listens to the deputation and assesses it very much in terms of the personalities and relationships involved. After a deputation he may say, for instance, 'What Smith really meant was . . .' or, 'The real purpose behind that deputation was such and such. . . .' He may listen to the full story and assure the men of his attention to the matter. Or he may try to reason the matter out. Or, where the case is clearly without basis and the men are obviously not pressing the case on its merits, he may, after attempting without success to settle it, encourage them to take it up to the next higher stage. An instance of the last occurred when a deputation came into the manager's office to press the case of an oncost worker who had refused to take a different job from his regular one, was sent up the pit and then claimed his pay for the day. (It had been necessary to shift him in the usual course of distributing the day's jobs in light of the day's absenteeism.) The deputation pressed their case, the manager was equally sure of his ground; the case

therefore went to a pit meeting between higher union representatives and management.

The deputation is an established form of communication in the industry. It represents a customary method of dealing with grievances when they have not been settled by other means, the last resort before taking matters up to higher levels. The number of deputations may be therefore an inverse index of the effectiveness of routine relationships at a colliery; like all such indices, it is of use only in the light of local relationships.

The main contacts with union representatives occur over grievances and over negotiating contracts for particular jobs and conditions. In the area where Burncoal is situated, they are more in the nature of a battle of wits than of real communication—more significant as reflecting than as developing relationships.

Participation and leadership in community affairs is rated as of first importance. The manager of Burncoal Colliery takes part in village 'concerts'—usually as chairman; attends the various competitions—swimming, bagpipes, etc.—for which the district has some fame; maintains regular contact with the school-master; is an elder of the church and a friend and supporter of the parson; attends political meetings; is a heavy contributor to and a leader of local charities; and bowls at the local club. These contacts are particularly important not only because they reflect his interest in the community life of his employees and his sense of responsibility, but also for another reason: the reserve between manager and miner at the colliery is such that there must be other contacts away from the colliery in order to make for a balanced relationship. The community and the colliery together are the field for personal contact. The wisdom of tradition has contrived community responsibilities for the manager and agent which bind pit and community, men and manager. There was probably more contact in the days when pit and community were a more isolated, integrated unit than there is now.

Control

Communication is the process of knowing and understanding the behaviour and feelings of others. Control is the process of modifying behaviour and feelings to promote the aims of the organization as a whole. Every communication has some effect as a control, if only indirectly; for instance, the very act of reporting an incident may, by giving him an opportunity to 'think out loud', help a junior officer

or workman to see more clearly the relation of that incident to the total situation. Again, a statement or order may have an effect, for control, quite different from that which was intended. By arousing fear or hostility it may, indeed, have precisely the opposite effect. As with communication, therefore, control depends very largely on the soundness of relationships, and it is through the careful, persistent maintaining of these relationships that the manager and his junior officials chiefly exercise control. Hence what has been said about the connection between communication and general relationships applies also to control.

In addition, certain specific, formal devices are employed at Burncoal Colliery. One of these devices is training. The traditions of mining emphasize training. Its technical importance is obvious enough. Not so obvious, perhaps, is the importance of training for control. Miners do not consider a man trained until he has developed not only the necessary mechanical skills but also the capacity to sense what behaviour a situation demands and to act accordingly. This sense of the 'authority of the situation' is still strongly preserved in mining.

In addition to the daily inculcation of this kind of training by his fellow-workers, the trainee receives special attention from his training supervisor, who is a miner given special responsibilities for one or two trainees, and chosen as much for his capacity to teach a sense of responsibility as for his technical skill. (In olden days, the 'training supervisor'—though not so called—of a new boy was usually his father.) The pit training officer makes a point of maintaining frequent contact with the trainees, and he too emphasizes this responsibility.

The manager's office is a focal point or funnel of communication in Burncoal. When the manager is in his office, information gravitates to him. He has one of the two or three telephones at the colliery with outside connections. He contrives to be in when officials are most likely to be above ground; if he is elsewhere in the colliery an effective bush telegraph keeps track of his whereabouts. Tied to this practice of keeping himself readily accessible is his unique status: his say only is accepted in many situations and decisions may be deferred until he is available.

Three classes of concrete and explicit devices of control are employed: (1) piece-rate systems, (2) inspections, and (3) reports.

Piece-rate systems, based on yardage, tonnage, or cubic footage, are used widely in paying the actual coal-getters, and represent to some

extent a substitute for personal supervision. But their complications and the bargaining over new rates for changed conditions and workings consume substantial amounts of managerial time.

Inspection is the commonest control device. It takes up much of the time of the manager, undermanagers and other officials, the training officer, the safety officer, the economy officer, H.M. Inspector of Mines and men representing the union (inspecting for safety) and others. It includes a variety of activities. The manager and all officials except a few deputies, spend a large part of the time underground on the move, inspecting mining operations, development work and safety. It is constantly necessary to remind the men that they are endangering their lives. All officials make it their business, as part of the process of moving from one place to another, to keep an eye out for bad supports of roof and such like. When they spot one, they mark it with white chalk so that it will receive attention.

Inspection is partly unplanned. Officials take every opportunity they have to inspect a place, so difficult may it be to revisit a spot. They carry very little information on paper; but every roadway has a name and all locations are readily identified in conversation.

Filled coal cars coming up the pit are spot-weighed by a colliery employee and checked by the check weighman who represents and is paid by the strippers on the coalfaces. Technically, checking of weights is now largely unnecessary, but the presence and the routine function of the check weighman reassures the men, and it would be very difficult to dispense with him. In other cases, too, inspection sometimes looks like pure routine. Yet, these inspections constantly remind people of their duties and responsibilities, and help to reinforce relationships.

Reports, or at least written records, are used in many places in the colliery. Various stores records are kept. There are records of machines, showing when they were overhauled, etc., and records of safety lamps. The manager keeps maps and charts showing the location and output of workings. Daily logs are kept by engine-room men, weighmen, deputies, and others. Most have been collected for many years. Others—notably the deputies' daily logs of safety conditions—are required by the safety regulations. In addition, the manager has his officials keep daily diaries of events and developments. Another form of report in common use is the practice of officials to mark their initials and the date on a girder or support

when they visit a section. This temporary 'record' can be referred to in case of accident or dispute.

Practically all these records are subject to inspection at one time or another. One of the manager's routines is inspecting and signing report books while visiting workplaces on the surface to see how things are going. Some of the weekly reports are signed on a certain day because 'that is the tradition in this area'. The manager regularly reads the daily logs which his officials keep in their pocket notebooks.

Almost pure chore is the daily routine of signing the deputies' safety reports. Copies of these are posted at the pit-head for the men to inspect as well. The reports themselves seldom convey useful managerial information: they are couched in such stock phrases as 'satisfactory'. (Unsatisfactory conditions are corrected, and reported as corrected.) A deputy will fill up his report in almost identical manner each day. Nevertheless, these reports, with their tradition and their status in the scheme of things safety-wise, again remind men of their responsibilities and reassure them of the attention that is paid to conditions.

As direct forms of communication and control, the reports are of limited use. The manager well recognizes this. He develops communication through healthy relationships, and he exercises control through these relationships, augmented by intermittent checks, to test the completeness and accuracy of the knowledge he is given. Prodding a pack to see that it is solid and not just a shell is such a check, as indeed are all his trips underground. A halt in the pit-head creeper indicates a temporary stoppage and provides a check on the report that the oversman later gives of the stoppage.

Another important control device is the manager's weekly review of the pay sheets. By knowing his pit, his officials and his men thoroughly, the manager can early spot trends on the pay sheets. If his junior officials put skilled men on unskilled jobs, high-paid men on jobs that should not pay so well, pay too much extra for bad working conditions, etc., the manager can note it. The pay sheet is thus one of his most important tools for checking other forms of waste. It is virtually infallible, since the men themselves notify the manager of any deficiency between agreed and actual pay. (On pay day, the queue of men to see the manager at 2 o'clock is extra long.) It is a traditional 'target' for undermanagers to pass a weekly pay sheet without being questioned by the manager on any item.

Summary. The colliery shows communication (the meeting of

minds) and control (the co-ordination of action) in their essence. Where another kind of organization has the means to circumvent deficiencies of co-operation or to recover most of its failures, the colliery is uniquely dependent on routine understanding between men for co-ordination and on a universal self-discipline for the avoidance of catastrophe. A properly functioning colliery, therefore, shows the great potentialities of what Mayo called the spontaneous co-operative capacity of men to co-ordinate their activities even with the help of very few mechanical aids to communication.

5. NEW OBSTACLES TO FLEXIBILITY

A variety of factors increasingly restrict the flexibility of colliery operations. They have become important in recent decades and affect all four essential aspects: physical and technological conditions, the community, labour relations and management.

Physical and Technological Conditions

Burncoal Colliery has extended to a point where it has over thirty miles of underground roadways and eleven miles of conveyor belting on fifty conveyors. The distance between the pit-bottom and the farthest coalface worked is over three miles. (A new shaft is being sunk to alleviate this situation.) The coal seams have got thinner and contain layers of non-combustible material, which reduces efficiency greatly: for instance, about 30 per cent. 'dirt' (i.e. non-combustible material) was coming up the pit with the coal recently in spite of perpetual efforts to prevent it. The colliers require much more effort and time to sort out the coal from the dirt; effort and time is wasted again in bringing the remaining dirt to the surface, sorting it and disposing of it. Over 1,400 men are employed to obtain a daily output of about 1,500 tons of saleable coal; over fifty pumps, twenty coalcutting machines and about 1,500 kilowatts of power. (The colliery village consumes about 60 kilowatts.)

The chief feature of the present productivity of Burncoal Colliery is not that it is greater than, say, twenty or thirty years ago but that it is about the same despite the serious deterioration in conditions. Only by extensive mechanization and improved management has it been possible to maintain profitability.

Paying extra for difficult conditions is costly because the very conditions for which extra pay is given—e.g. water, dust, 'dirt'—are usually the most unprofitable. As the colliery works out its seams, it is forced to work more of these unprofitable ones and pay higher wages. Here again, changes in physical and geological conditions directly decrease flexibility.

The Report of the Technical Advisory Committee on Coal Mining (commonly known as the Reid Committee) has pointed out the varying effects that machines can have on the spirit of the men. The mechanical loader, for instance, 'brings with it the very important advantage that it is operated by a small team of skilled men. Wherever these machines have been installed they have almost universally been welcomed by the men, and it has been found that the spirit and regularity of attendance of teams operating loading machines are much better than prevail in large groups of men filling out the coal on longwall faces. The interest in the work, and the scope which it provides for skill and initiative have certainly a bearing upon this phenomenon, and the indirect benefits obtained, while difficult to measure, are nonetheless real.' (Reid Report, p. 51.)

Some other machines have not been so successful. In addition to their specialized nature which itself limits flexibility and mobility, machines have often aroused fears of unemployment. Even more serious, mechanization has led to the disruption of small teams.

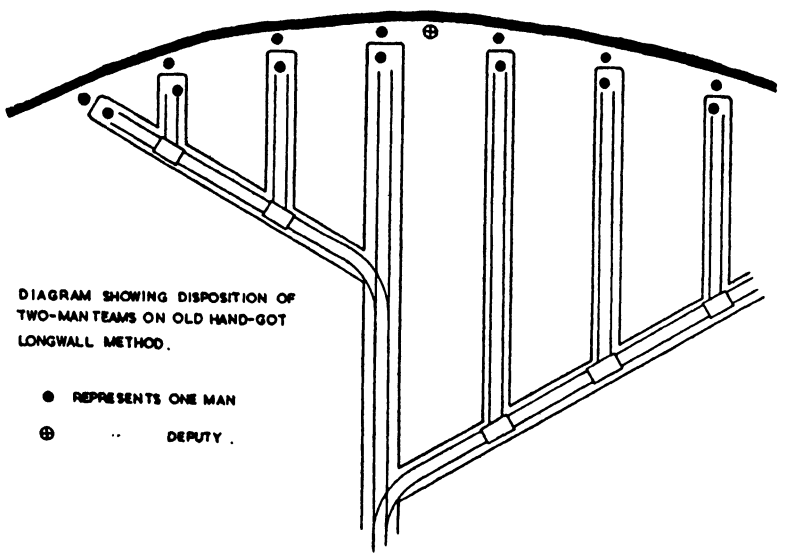
The Reid Report gives an example: 'It is often very difficult to follow technical history while it is in the making. Before the system of longwall mining, coal had been got by small self-reliant teams of men, able and accustomed to perform all the operations required in their working places for keeping themselves secure and for getting the coal. With the introduction of machine mining larger teams were a necessary corollary. Where payment remained on a piecework basis, the wage was often pooled over these larger groups of men, so that the personal efforts of the individual made less and less difference to the total earnings of the pool.

'When conveyor faces were first started, and the co-operation of the miners was secured, there was a novelty about the project which caused interest and keenness, both among the officials and the men. As more and more faces were mechanized, interest and keenness waned. What was new became routine, and hence arose the phenomenon, frequently remarked upon by mining engineers, that the first mechanized face was often the best face they ever had. It gradu-

ally came home to the miner that, though he was spared on these faces the severe physical toil of hand-getting he was still involved in considerable effort with little scope for the exercise of the skill he had acquired through the old system.

'Although the adverse effect of this change in the individual status of the miner was, and largely has been, confined to the coal-getter, it is he who has always been recognized as representing the miner's calling. Any lowering of his status, therefore, tends to react unfavourably on the workers throughout the mine. Unfortunately it was not appreciated that machine mining was resulting in an impairment of his status, and that the effect of this upon his outlook and behaviour would be likely to reduce the advantages in productivity expected from the change of method.'

A longwall coal face in the days before mechanization and large teams may be visualized thus:



The man and boy performed all the operations in their section. They prepared their work-place, did the shot-firing, won the coal and transported it from the section to the main haulage. In other words, a definite section of the face was *their* work-place. Results and earnings depended on their own efforts.

Under mechanized methods, the entire face is one unit. Operations

are specialized: under-cutting, shot-firing, conveyor-pan shifting, packing, machine maintenance and coal-getting are separate jobs done by different men on three different shifts. As the longwall face must advance evenly along its whole length the scope for individual effort by coal-getters is reduced. It is reduced further by uncontrollable breakdowns and by inefficiency on the part of others, many of them away working on other shifts or in other parts of the pit. Wages come out of a pool made up by the efforts of all the seventy or more coal-getters on the face. The old system encouraged careful work. In the new system there is no certainty that a man will reap where he has sown. He may be transferred to the place of an absentee, for if all faces cannot be fully manned, work must be concentrated on stripping fewer faces fully rather than more faces partially: longwall machine mining (except in some cases, where pneumatic picks are used instead of coal-cutting machines) depends on a rigid cycle of operations in cutting, stripping and advancing the mechanical means by which the coal is conveyed away from the face. If any one operation is not completed within the shift, the whole twenty-four (occasionally forty-eight-hour) cycle is upset and a day's output from the face is wholly or partly lost. This specialization by shifts itself reduces flexibility. The effort to make it up by shifting miners deprives them of their own 'place' and of a strong incentive to keep the working 'neat and tight'.

Modern methods of transporting coal to the surface have also made mining operations less flexible. There is virtually no room in a mine for storing coal: the coal is immediately sent on its way to the surface and counted as output. Therefore, breakdowns in transport tend to be reflected almost immediately in final output. The connection is rigid because there are no spare coal faces[1] which might be worked by miners thrown temporarily out of work by breakdown, nor alternative transport.

Modern methods of mining have further accentuated all these effects by concentrating haulage in such a way that one conveyor belt carries coal from several faces. Thus:

[1] Idle faces deteriorate geologically. They have to be specially prepared for working.

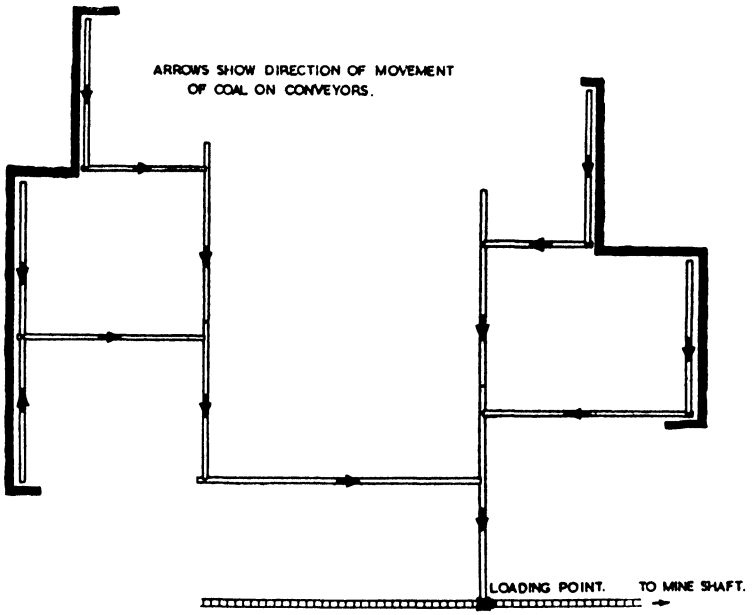


DIAGRAM SHOWING, IN SIMPLIFIED OUTLINE, CONVERGENCE OF CONVEYOR SYSTEMS ON TO CENTRAL HAULAGE.

A breakdown of that conveyor immediately stops all haulage from the coalfaces, and, since coal cannot be stored, the actual process of coal-getting at the faces has to stop also.

Costs are also more rigid. Mechanization means higher overhead costs, already very high in mining. Every idle machine is a charge against profits. Stores of machines are therefore small. It is all the more necessary therefore to avoid breakdowns, for instance by using machinery carefully and under restricted conditions. This, too, is a reduction of flexibility.

Community Conditions

Unlike many collieries, Burncoal Colliery has from its beginning recruited men from a wide area. In June 1950 only 20 per cent. came from the colliery village. The rest came from towns and villages scattered over at least five distinct districts. It was partly because so many men travelled to the pit by bus that the former colliery owners installed pit-head baths on their own initiative and at their own expense about twenty years ago. (Normally baths were installed by the Miners' Welfare Commission.)

In the cosmopolitan atmosphere of Burncoal Colliery the lack of social cohesion is often sorely felt, and it is necessary to attempt to counterbalance it in the work situation. The problem is particularly important because Burncoal is located in an uncommonly individualistic community known for its 'clannishness' and its highly developed social activities, and for the tendency of miners there to 'kick up their heels' and go on strike at the slightest provocation. The town which is its centre, with a population of 16,000, boasts five church choirs, a miners' male voice and a women's choir, a musical association and two junior choirs, a pipe band of European fame, three silver bands, a prize-winning swimming team, drama and film festivals, an indigenous football team, a Highland show and various welfare activities. The incidence of strikes in its neighbourhood suggests that it likes to be in the lead in that respect also.

The situation is exacerbated by two more factors. The first is that many districts from which Burncoal Colliery employees travel are centres of labour trouble. As a result, the possibilities of trouble at Burncoal Colliery are multiplied several times. The second factor is that several collieries in the area have been or will be shut down because they are no longer economic to operate, and this is another source of irritation. The difficulties encountered in persuading men to leave the district reflect their strong sense of community and perhaps also the important fact that this sense is less and less supported by common activities and institutions and general social cohesion.

Motor transport has broken down the physical isolation of mining communities. New employment offers new opportunities to sons and daughters. New housing, pit-head baths, canteens and the like have substantially changed the day's work and the status of miners' wives. Because their duties have lessened, some have even taken on paid work, which further alters the relationship between them and their husbands. National trends have decreased the number of opportunities for responsible work in community affairs. The delegation of more authority to the national union has narrowed the scope of the local branches. Football and racing, the cinema and visits to the city have to some extent replaced traditional activities. The homogeneity of the community itself has been disturbed by the transfer of miners from redundant to developing areas, and by the recruiting of Poles, European voluntary workers and others to the industry.

'Little' changes, too, may be noted, for instance, efforts to get miners to end the custom of taking a day off when a man dies in the

pit.[1] In some instances, this custom has been replaced by the practice of contributing to a fund for the widow, thus to some extent filling the social vacuum left by discontinuance of the old custom. In other cases, the vacuum has been left to be filled by other satisfactions, some salutary, some not.

All these changes together have, among other things, made the managers' and officials' task of knowing individual miners and their personal backgrounds much more difficult. Considering the importance of personal contacts at a colliery, the added load on managers and officials is important. The manager alone has much direct contact with the men, ranging from occasions when he goes into the baths to hurry the men down the pit to his talks with individual men underground and in his office. Though junior officials have some powers to change men's jobs and alter their pay, the colliery manager is very much his own personnel officer. These contacts are important; but they place a great strain on the skill and memory of the manager. He must marshall and size up the facts and relationships in each case, and must remember later to ask or inform junior officials about matters that come to him in this way. For a manager who can master such detail, personal contacts are a useful tool. Such is the case at Burncoal Colliery. But it is not readily and widely adaptable to other situations.

Labour Relations

Labour relations in mining have always been somewhat bitter. Partly this may be due to physical conditions. Also because the supply of coal and of miners for long exceeded the demand, miners were not well paid, and the miner even when employed could not work every day of the week; his life was one not of feast and famine but of subsistence and famine.

Out of long bitterness there early grew the class struggle—Nef spoke of the miners' social isolation as 'a new gulf between classes'—from which sprang the miners' unions: the Petition of Durham and Northumberland miners (1662), the Tyneside strikes of 1765 and 1810, a union in Ayrshire (1824), Tony Hepburn's union (1831), the National Association of Miners (1841), followed by a long strike as early as 1844.

Recent history is also bitter. A miner who is now fifty-five years

[1] Under an agreement between the union and the N.C.B. (1950), this custom has largely been officially abrogated.

old will have been through three major strikes (1912, 1921, and 1926), and suffered intermittent or complete unemployment in his thirties—the most important years of his working life. Naturally he feared that the extension of mechanization in the 1930's would mean more unemployment. A quite unexpected shock came when his response to the demands for increased output in the first war years (September 1939 to June 1940) was followed by another period of unemployment in some parts of the country, and the call-up. The isolation, if not even the hostility has been maintained unintentionally since by some government actions and public attitudes—e.g. special ministerial controls, applied to mining only; exemption of miners from conscription to the armed forces; the famous Bevin boys; post-war publicity in the newspapers alternately stressing the importance of mining to the national economy and criticizing the industry's inefficiency; suggestions of compulsory and foreign labour in the mines.

In many ways more has happened to mining in the last generation than in whole centuries before. Still underlying it all is the fact that the industry is told on all sides of its importance to the national economy at the same time as it is constantly reminded that the seller's market in coal may presently disappear. Out of the bitterness of the past, miners have developed a deep suspicion of 'cheap coal'. To them cheap coal meant low wages, and mechanization meant cheap coal. Every exhortation to greater efficiency keeps fresh this fear of cheap coal, unemployment and poverty.

As a result custom has become rigid. Where change has clearly conflicted with custom, custom has often won. As the Reid Report pointed out: 'The miner preferred to preserve his traditional methods of work and the customs with which he had grown up, unsuitable though they sometimes were to the changing circumstances of the time' (p. 4).

For instance: 'Mechanization, though seldom encountering active resistance, was not generally received by the men with enthusiasm, no doubt in the fear that more machines meant fewer men at a time when unemployment was widespread; and, where machinery was installed, its potential savings seem largely to have been dissipated by a quiet but effective determination that the number of men discharged should be kept as low as possible. This must have been a contributory cause of the overstaffing in many of the operations at or about the coalface. In addition to this, they have steadfastly re-

quired the observance of old customs and traditions which are inappropriate to the conditions of mechanized mining and thus have put a brake upon the modernization of the Industry' (Reid Report p. 4).

Even new benefits like pit-head baths and canteens were slow to be accepted. In one colliery attempts to introduce an extremely cheap laundry service for pit clothes were abandoned because the miners and their wives were not in favour of it.

The unions[1] are now stronger than ever, but with the increasing number of matters settled at higher levels, loyalties to local and national institutions are confused. In many cases the tie between the local branch and the national organization of the union has been weakened. For instance, whereas in previous years one of the main functions of local union officials was to lead strikes, they are now duty-bound to deplore strikes. This places them in a dilemma, for they depend on support from the rank and file and the community. The difficulty is reflected also by the very poor attendance at ordinary local union meetings; fifteen men out of a membership of 1,000 is not unusual, and an assiduous minority can control union affairs.

All these factors—the increased mobility of miners, the reduced homogeneity of colliery and village, the continued sense of distrust and fear, the confused union situation—have led to increasingly rigid labour relations. Hours and rates of pay are largely governed by general regulations. Regular hours of work are limited by law, and overtime must be paid extra. Rates of pay are increasingly agreed between the unions and the National Coal Board away from the colliery. Wages must be made up to the agreed national minima if the miner's earnings fall short. Payment by results at the coalface, it has been agreed, is to yield at least thirty shillings per shift. If a miner is moved to other work he must be paid at least the minimum wage laid down for his usual task. The minimum wages of different classes of workers differ substantially: the minimum for face-workers for instance is over £2 per week higher than the minimum for haulage workers. This limits the value of inter-change of workers and hence restricts movement. Because of payment by results at the coalface the gap is usually in fact wider than £2 and movement more re-

[1] Of which there are four in Scotland: The National Union of Mineworkers (representing miners), The National Association of Colliery Oversmen, Deputies and Shotfirers, The Scottish Colliery Enginemen, Boilermen and Tradesmen's Association (representing specialists), The British Association of Colliery Management (representing management ranks from oversmen up).

stricted. Rates of payment by results tend more and more to be embodied in written local agreements and are then difficult to alter. There is a similar tendency to define ever more closely the physical conditions which entitle the miner to additions to his basic wages, such as payment for working in water, for getting and separating dirt, and for drawing tubs to and from the coalface more than a defined distance from the mechanical haulage. Higher management constantly press for fewer and smaller payments, and it is increasingly difficult for the manager to give special pay for special services.

Before minimum wages were introduced it was possible to turn a man back if he arrived at the colliery and was not needed. When, for instance, there had been a fall of roof, some men would be taken on for repairing, and the rest had to wait unpaid until the fall was cleared and secured. Then the production of only one shift and the wages of only a few men might be lost. Now because of the three-shift cycle of operations, a day's output may be lost and all men reporting for work are entitled to a guaranteed wage.

Length and organization of training are governed in detail by official regulation, and there are routine visits by ministerial training inspectors. Each trainee has to spend specified periods of time at school, in formal training elsewhere, and at the different types of work in the mine. In the mine, he is supervised by a specially chosen miner. The trainee does not get full pay until he has learnt all major jobs. He is therefore particularly anxious to complete his training, whatever other demands are made on the pit. Trainees who have completed their training and wish to go to the coalface, and experienced colliers newly arrived from other pits, are placed on the waiting list which, by joint agreement between the union and the management, must be rigidly followed when promoting men to the coalface. Thus the job of training men is a burden and decreases flexibility, while its potential results often go unrealized.

The shortage of miners, absenteeism, strict procedures for handling disputes and the greater relative strength of the men and the union in general (however equitable the change) are additional factors which have reduced flexibility. The new situation conflicts with the ancient tradition of strict discipline based partly on the ruggedness of the industry, partly on uncompromising demands of safety and partly also on a balance of power which made it possible for management to be very strict. Now the balance has shifted, and there are instances of men going on strike to support a miner dismissed for

having cigarettes in the pit or for contravening other safety regulations. The reasons for a strike are complex but it is significant of a trend that such a dismissal can be the occasion for striking. The same applies to tardiness in getting down the pit for work (which is often a subject of discussion at joint consultative meetings) and such matters as men appealing against the docking of pay for refusing to do a different job for one day.

It is a general trend, tied up with national factors as well as with others relating to the coal industry alone and to a particular colliery and community. In part it is probably something of a reaction from the days when traditions and status in the industry were so strong that disciplinary prerogatives went virtually unquestioned. Now they are all indiscriminately questioned and there is formal procedure for doing so. At pit level the man with the grievance discusses it first with his oversman, then with the undermanager, finally with the manager, in the company and with the assistance of his union delegate if he so wishes. If the matter is not settled then, it is discussed at a special meeting at the pit which includes the union agent (a full-time employee of the union, one of whose main functions is the arguing of such cases) and probably the N.C.B. agent. If not settled there, it is referred to the divisional disputes committee, whence it may go to an arbiter. In this way the top policies of the trade union and of the Coal Board affect the handling of disputes at higher levels and, indirectly, at the colliery; and this in turn, affects the general discipline of the colliery.

Other problems of the system for appeals of unsettled grievances are (*a*) the lapse of time involved in the process of appeal, and (*b*) the problem of getting agreement on the facts at several removes from their source. For example, four machine-men, two on each side of a roadway, had six places to cut—two on one side and four on the other. One of the men was absent, the two on the one side were therefore instructed to cut their two places and then help the single man on the other side cut his four. They refused to do so. In the appeal of the case they claimed that the deputy had not given the order so that they correctly understood it. Was this, or was it not, so in fact? Given the facts, the appeal can, potentially, result in justice—but it depends on the establishment of the true facts of the situation; it cannot, however authoritative a body it may be, conjure them up. The men, irritated by the delay, tend to take matters in their own hands.

Who has the final say in a dismissal is a question of first importance for the morale of the organization. Formally the manager had it. Now the power of dismissal is very severely restricted by the threat of strike. There is also formal provision for appeal to an umpire against the dismissal (to be made in writing, within seven days of the dismissal). In arguing before the umpire the manager is sometimes required to 'prove his case'. The practical threat of strike and the formal machinery of appeal reinforce each other to give further protection against dismissal. While an appeal is pending or a strike is threatened, the dismissed man may continue at his job, which reduces the manager's prestige as well as his powers of dismissal.

In so far, then, as the morale of the colliery is raised by the certainty that no man can be dismissed unjustly, the present arrangements for appeal against dismissals raise morale and increase efficiency. In so far as morale is depressed by the almost complete absence of the power of dismissal, efficiency and flexibility are decreased.

Specialization of Personnel

Specialization, which is due largely to new mechanical methods and labour conditions, decreases flexibility in two ways: (1) it limits the tasks that any one miner or official can perform and (2) it introduces a new kind of relationship into the traditional organization of men and management in mining. Although the miner is usually trained in all aspects of mining, his permanent tasks now tend to be limited. At the mechanized coalface he cuts coal, or he fills the coal and puts up roof supports, or he shifts pans and builds packs. He rarely has continuous experience of all three. Deputies and such functional specialists as shot-firers, repairers, maintenance men, and engineers, have been allocated functions that were formerly within the miner's normal task. This entails new limitations on the types of work, e.g. helping to repair breakdowns, to which miners can be sent.

There has been specialization also in management, as we have seen. It is not rigid. No hard and fast lines are drawn between functions or between executive and advisory relationships. In many ways line officials are advisory to the manager, so wide and frequent is his routine contact all the way down to the men themselves, and so often is his decision necessary before an issue is settled. On the other hand,

such staff specialists as the chief electrical and mechanical engineers have for many purposes as much executive authority as line officials. In fact, the practical status and authority of an official depend chiefly on three things: the methods of the manager and his relationships with junior officials and men; the tradition of the particular position which a junior official holds; and the nature of the personal relationships which develop between him and others in the colliery.

But relationships between line officials and functional specialists (and between specialists and men) are not as settled as those between the line officials. The technical specialists generally have not as high a status as line officials. Technical people are not as a rule at the daily meetings of pit officials, although engineering and electrical methods are often brought up for attention. Manager and miner are used to getting advice from line officials. The authoritative relationship is old, the advisory relatively new. It is usual, therefore, for the undermanager or an oversman to give technical advice.

The specialists are responsible direct to the manager, and their formal relationship with the pit is through the undermanager. In actual practice specialists have considerable direct contact with oversmen and firemen. But specialist staff in a district are subject to the authority of the responsible line official in that district. Usually specialists arrange their own communication between shifts. In one colliery the engineers relied on the production officials for their communication between shifts. This was not satisfactory, partly because the instructions left were incomplete. The oversmen would put down something like 'continue job', but only when the specialist on the next shift got to the job did he find that he needed further materials and tools, and perhaps men, before he could get on with it.

Many specialists are apprehensive lest their functions be infringed by line officials. Partly as a result of this, partly also because they see the specialists 'around' and feel they might as well 'give those people some work to do', many production officials no longer take as wide responsibilities as they used to. In this uncertain relationship situations can arise in which the manager tells a specialist to get after the production people to see to a job—a reversal of the more usual situation.

The confusion is particularly evident in maintenance work. Some maintenance is the responsibility of production officials even when it requires men full-time (e.g. pumps). Some is carried out by specia-

lists. The general rule at Burncoal Colliery is that line employees are used wherever possible. Only when a job exceeds their competence are specialists employed. Occasionally line employees team up temporarily with engineers or electricians. But the confused relationship sometimes leads to ambiguity. For instance, the haulage at one pit had a serious breakdown and it was found that it had not been oiled, and further that the ten-gallon oil drums, situated in each section, had been away for a week for filling. There was some debate as to whose responsibility this was. Some years ago there would have been no question. Now it might be the line official's or the specialist's. The employment of specialists has naturally followed advances in mechanization and other changes, but their relationships remain to be worked out. Until they are, the use of specialists may sometimes reduce flexibility rather than increase it.

Increased Pressure on Management

The basic uncertainties of mining have to be met somehow. As specialization and other changes have reduced the flexibility of men, machines and mining operations, the burden of adapting to ever-changing conditions has fallen increasingly heavily on the manager and the line officials. For instance, security gained by the men (e.g. security of employment, a minimum wage, and greater freedom to be absent or to strike without fear of dire consequences) has under these conditions entailed greater insecurity for management.

The manifestations of this are not new, they are simply increasing. Combined with the longer-standing pressures, they constitute a real threat to continuing flexibility and efficiency. For instance, feats like working three consecutive shifts in an emergency are expected and are seldom specially acknowledged. Officials work fully extended as a matter of routine and may be away from home so much that family life is impaired. Some pressure is transferred upwards, to the agent, and to higher officials; and some results in impaired relationships in the pit and in the community. This situation contains the seeds of more serious developments: for in good relationships in the pit, at home, and in the community generally, manager and officials find some security. They find more in their traditions of loyalty and hard work and in their record of success on a hard road. But these too may be wasting assets: as officials and their wives get about more and acquire wider interests, they may no longer feel like eating,

sleeping and breathing mining. In this sense the mining industry may be living on capital, just as it was some decades ago when it used up much goodwill on the part of the miner.

With the further uncertainties connected with nationalization and with the increasingly active interest of outsiders in mining communities, insecurity may already be a very serious problem at the colliery. This is particularly likely to be so in the case of the manager. He is as liable to accident and the other uncertainties of pit life as any mining man and has the uncertainties of management in addition. He does not know what exigencies he will be expected to deal with. He only knows that things cannot possibly go smoothly for any considerable length of time, and feels that the means at his disposal are less adequate while the pressure on him is greater than before.

His frequent emphasis on the need for discipline in the pit probably reflects the extent to which he is dependent on flexibility on the part of his men; and his frequent reiteration of the current lack of discipline may reflect the extent to which the men have gained security at his cost. Their guaranteed wage means that the manager must occasionally make their earnings up to the minima, thus raising costs, and often makes the employment of old and slightly disabled people unprofitable. Higher wages and the shortage of miners, higher absenteeism, less desire to work overtime and less possibility of dismissing an unsatisfactory worker, all make the manager's job more difficult. Absenteeism is supported by high compensation benefits for accidents and unemployment. Compulsory payment for delay due to breakdowns makes delays more expensive and the men less eager to help in ending them. Yet these very same men may now discuss the manager's shortcomings in the fortnightly meetings of the Colliery Consultative Committee.

Finally, the manager is aware that his employer has a monopoly of the only industry in which he is qualified to work. His own responsibilities and the responsibilities of higher officials are still shifting, and he finds it difficult to conclude from the inadequate and contradictory indications where he will fit into the new organization.

The manager of Burncoal Colliery, like most managers in Scotland, had come up the hard way, starting work at the pit at fourteen, going to evening classes up to six times a week, taking his certificates and acquiring responsibility as he went along. To become manager meant to have arrived: he had crossed the most important dividing line in mining. Managers' salaries often no longer show this: a face

worker may make up to £15 a week—almost as much as a manager of a small colliery; undermanagers' salaries have recently been raised to very near the managers'. Managers of some smaller pits have received increases in pay in order to maintain a gap between their salaries and those of their subordinates.

But socially the dividing line is clear enough, as we have seen. Most managers sided with the owners in the big strikes of the 'twenties, or at any rate had a sufficient interest in the pit to help guard its safety, and this is remembered by many men. Some managers seem to have had a very difficult time indeed, and they in turn recall, even to-day, marching through the villages after working at the pit, with police escort, and heckled and despised by the workers and their families, and sometimes even fighting them. There is an impression that a man cannot become a good manager in the place of his birth, because people knew him there as a boy with all his failings and because he is on too personal a footing with people who are afterwards his subordinates. But the manager who comes from outside is often not completely accepted by the community and this is an extra strain in what is in any case often a rather isolated post.

The agent can, by wisdom and understanding, substantially alleviate this loneliness. For the manager—and for the pit—it is most important that he have someone whose presence will constantly reassure him that he is not entirely alone. The agent's chief importance probably lies in this. An experienced man chosen for his capacity for taking responsibility (and, in the case of Burncoal Colliery, familiar with the colliery by reason of having once been its manager), he is someone with whom the manager can discuss his problems freely. This relationship takes on increased significance in view of the new insecurities felt by the manager. Probably it is the most important relationship in the colliery. At Burncoal Colliery the pairing is fortunate. The agent and manager are in some respects of complementary natures, and this makes for increased effectiveness as a team and efficiency of management in the colliery.

Summary. As so often happens, it was not until obstacles suddenly —comparatively suddenly—presented themselves, that the balance and complexity of the relationships making for co-operation and flexibility in mining became apparent. The difficulties of recent decades have, by interaction and ramification, permeated and altered the entire basis of colliery management. The manager's implicit

assumptions about his men and officials are no longer quite true, his traditions and habits of action no longer adequate to a new reality, his colliery itself no longer an entirely cohesive unit—in these circumstances the manager must bring his methods to light and re-examine them, alter and add—develop new methods to meet changed conditions.

6. RECENT CHANGES

New Attempts to Adapt Communication and Control

In the face of increased pressure on management, some action has been taken nationally to keep communication and control in collieries effective. Some steps have created problems in turn, for instance by introducing new rigidities and problems of status. The machinery for arbitration is an example (cf. p. 56). But some such machinery was undoubtedly necessary to avoid a complete disruption of the management-miner relationship—and communication—at some collieries. In the dilemmas of an institution which is going through a period of drastic rearrangement of traditional relationships, innovations are always likely to be mixed blessings. This likelihood is further increased if, as is often the case in the coal industry, new methods and devices are imposed uniformly from above. They are bound to clash with many accepted relationships in a particular pit and community. The introduction of formal joint consultation by law has had this result in part. But again from a national point of view, some such law was perhaps inevitable.

In discussing the effects of new attempts to improve communication, therefore, it is necessary to bear two general points in mind: (*a*) that some of these attempts have been necessitated by drastic failures of communication in parts of the industry, and (*b*) that because most of these attempts have been applied from without rather than within the colliery, they were bound to create problems of adjustment for the colliery. It is difficult to assess their potentialities; we shall only attempt here to describe the steps taken as they relate to Burncoal Colliery. They will be discussed under five headings: training and promotion; improvements in the formal qualifications and formal status of some ranks of pit management; introduction of new functional specialists; introduction of formal joint consultation; and increased emphasis on 'human relations' in management.

Training and promotion. One of the most vivid effects of previously 'living on capital' has been the departure of many miners and the failure of traditional sources to replace them. As a result, great efforts have been made to recruit workers from other walks of life in addition to offering miners' sons new inducements to go into mining.

As might be expected in a traditionally tightly-knit community, the miners have been slow to accept additions to their ranks of other than their own kind. Bevin Boys, European Volunteer Workers and Poles have been accepted only slowly and then not completely. A newcomer must be a strong man to go through the social initiation into mining and simultaneously get used to the arduous physical conditions. Wastage among recruits is high, and by a weeding-out process a kind of closed shop (in the social sense) is maintained among the miners.

Considerable attention is now given to induction, training and promotion. Training centres have been set up, where the recruit, boy or man, receives instruction in the general and theoretical aspects of mining. At the pit he works under close supervision at various jobs above and, later, below ground. All this is usually the special responsibility of a full-time training officer.

Most miners begin on surface work. The traditional ladder of promotion is as follows: underground on-cost work (e.g. haulage), coal-getting, shot-firing, deputy's certificate (qualifying a man for a deputy's job), deputy, oversman, second-class certificate, under-manager, first-class certificate, manager. Now a young man can go through a combined course of study and practical experience leading to a university degree and first-class certificate at twenty-three years and upwards. The N.C.B. subsidizes the course. A greater number of officials and men, of course, still attend evening and one-a-week day classes, for which they are given time off from the pit, than attend university. But under the 'Ladder Plan', any entrant can proceed to the examination for Ordinary and Higher National Certificates which may carry partial exemption from the statutory examinations for second- and first-class managers' certificates. Vacancies in higher posts are advertised throught the Division, and selection is made by panel. These improvements are due to nationalization, for in the days of private ownership a company was loath to train an official who might then be attracted to another pit. On the other hand, nationalization may in some instances limit a manager's or agent's feeling of freedom to go elsewhere if he is dissatisfied in his present position.

Two important determinants of the effectiveness of training and promotion schemes are (*a*) the relative pay scales and status of different jobs, and (*b*) mining tradition regarding such matters as status and expectations of promotion. Not all junior officials will become or wish to become managers. Tradition, status and custom have for long played an important part in helping junior officials to find satisfaction in their particular niches—much as in the Army—while at the same time demanding the highest standards of devotion and hard work. We have already noted that this may not continue to be so, a conclusion which is borne out by increasing difficulty in recruiting officials.

Improvements in the formal qualifications and formal status of some ranks of supervision. Steps have been taken to improve the status of the deputy. As wages for miners rose, fewer and fewer of the better men and, what is most important, fewer of the natural leaders amongst the men applied for employment as deputies. It became imperative to raise the pay of deputies. Now it is substantially improved. Even so, it is often still not clear where the deputy's main sympathies lie, with the management or with the men. The N.C.B. regards deputies definitely as officials, but many still belong to the miners' union. At one pit, there was a discussion between junior and higher officials on whether the deputies should work a seven-and-a-half or an eight-hour day; and whether they should always be required to come out in an emergency. The discussion showed how unreal this matter really was, how inevitable that they would work longer in order to meet colleagues from other shifts and higher officials. The deputies also acknowledged that they would of course have to stay behind if there were what they called 'a real emergency'. The matter was finally shelved with the comment that all these exceptions were all right so long as they did not become 'habitual'. But the mere fact that such a discussion took place, showed how ambiguous the status of deputy is.

Oversmen, the next highest officials, have had their pay raised recently, and also have other marks of status: e.g. the oversman is salaried and is entitled to a longer paid holiday, sick leave with pay, the use of officials' baths. He is definitely of greater account than the deputy, even though the deputy's pay, including overtime, may be as high as the oversman's salary. But in view of its importance, the position of the oversman demands close scrutiny. Some mining men suggest that he will eventually be displaced by deputies with

special qualities and training. On the other hand, an examination for oversmen is being introduced with standards considerably higher than those of the present Deputy's Certificate. There is much ambiguity and more study is required, for an oversman may be responsible, under the manager, for the production of £100,000 worth or more of coal a year, and his quality, feelings, and prestige are matters for serious consideration.

Introduction of new functional specialists. An increasing number of functional specialists are employed at the pit. But, in the complexities and difficulties of mining, the introduction of a new specialist always raises complicated problems, not only of the physical division of labour but also of status and communication. The problem of dividing the repair or overhaul of a coal-cutting machine between an electrical and mechanical engineer may serve as example. The time required to get from workshops at the pit-head to the face where the machine is situated is very considerable, but to keep two specialists in readiness at the face is very wasteful. The general tendency therefore is for the electrical engineer—who has more skill of mechanical engineering than the mechanical engineer has of electrical—to do it all, but the problem is by no means solved everywhere. At Burncoal Colliery the manager places electricians who can also do some mechanical engineering at the coalfaces, and other electricians on the haulages, at the pit-bottom and on the surface, where there are, for instance, specialists in lamp maintenance. In short, the manager tries to match needs and capacities. He is helped very much by effective, informal relationships between the officials which enable the parties to develop informal working arrangements. If relationships were weak or antagonistic, duties and responsibilities would be constantly in dispute. The manager's main job is first of all to encourage team spirit. If team spirit is absent no specification of duties can operate smoothly and efficiently.

Training is one of the formal specialities which have not yet been fully integrated. At present the wise training officer, knowing that officials have difficulty on Saturday mornings in placing trainees properly, will 'keep out of their way' then to avoid upsets. Sometimes he is put on a tough personal problem (i.e. the buck is passed to him) which by the tradition of colliery organization is for the line managers to cope with.

The difficulty of the training officer illustrates a basic dilemma of introducing specialists. He has no direct authority and is not sup-

posed to interfere with production. Yet it is felt that to be adequate he must be experienced in production and must, indeed, have been accepted as a real fellow-member by mining men. With such a background, a background in which the traditional relationships are authoritative, not advisory, the new training officer must suddenly reorientate this approach based on years of habit and experience. In addition he must stand up to the insecurities of his status and cope with resistance or indifference on the part of line officials and employees.

Problems of the relationship between production people and specialists continually find concrete expression in the question: shall production stop or be altered in this instance to accommodate what are thought of as specialist needs, e.g. machine maintenance, or providing training facilities? Very often in mining it is an either-or proposition, for it is difficult to duplicate equipment or workings underground; so that this general problem, like others, is there thrown into sharp relief. The weight of tradition and practice is on the side of making the specialist secondary, of making him accommodate his requirements to the needs of production, of feeling generally that the specialist is really more interested in his particular speciality than in keeping the coal coming up the pit.

At Burncoal Colliery the specialists have more standing than is usually the case, and co-operation between them is better. The original owners of the colliery always insisted on fully qualified electrical and mechanical engineers and thus gave those functions a good start in status. Co-operation between specialists depends partly on this, and partly also on time and on the manager's and previous manager's choice of men for the jobs. All officials and specialists at Burncoal Colliery have worked there in one capacity or another for many years, and have thus developed a capacity for teamwork. No one manager could build such relationships from scratch in a year or in five years, but the manager's leadership is continuously required to ensure that what difficulties there are do not snow-ball into complete inefficiency. For even at Burncoal Colliery, relationships between specialists and line officials are far from settled. The arrangements there represent one approach, satisfactory but by no means perfect.

Introduction of formal joint consultation. Formal joint consultation at collieries is required by the law under which the National Coal Board was set up. Imposed from above, it has naturally on occasion clashed with established relationships and led to expressions of scorn

and some real difficulties. It is felt by some, for instance, that joint consultation cannot produce useful suggestions for increasing efficiency because 'the men have always assumed that management thought of every possible way of raising profits'. It is not at all unheard of for a man to suggest new methods in the course of informal discussion with an official down the pit. But there is a different atmosphere when representatives of workers meet representatives of management in formal session and this may alter the case. The situation varies in different relationships.

The consultative committee at the colliery consists, on the management side, of the manager, the undermanager, and two or three others (including the surface foreman and a representative of the functional specialists) and, on the workers' side, of a roughly equal number representing two or three grades underground and the surface workers. Until recently, the workers on the consultative committee were elected by the men as employees, not as union members. Even then the members of the committee were almost invariably men who were active in the union. Now members were elected by the unions. The following subjects were discussed at a typical meeting: output, absenteeism and housing—regular subjects, dirt in the coal, lateness, moving the training face (a matter for discussion because the men now at the face to be taken over for this purpose do not want to leave it), and the question of working extra Saturdays.

Dirty coal provides an example of the way in which the committee deals with a specific problem. It had been a pressing problem at Burncoal Colliery for some time. Deputies, oversmen and undermanagers had done what they could about it, but felt that the men still did not fully realize its seriousness. It was therefore brought up in the committee. After discussion, two workers on the committee were appointed to visit the faces (being temporarily released from their regular duties for this purpose) and to report back to the committee. At this meeting they expressed the belief that there was a growing awareness of the problem on the part of the men.

The subject of lateness was brought up by the manager. Lateness had been increasing recently and, only the day before, the manager had himself gone into the baths to hurry stragglers down the pit. The manager felt obliged at this meeting to say that future offenders would be turned back at the pit-head. (In the past late-comers were not allowed down the pit at all; in some collieries this applies still.)

Joint consultation holds promise as a means of regularizing, formalizing, making more convenient and perhaps giving more prestige to, the consultation which goes on constantly in the colliery. It also provides a more satisfactory method of dealing with such matters as lateness than do posters on the notice board (in this case a notice was put up as well). It was begun at Burncoal Colliery before nationalization. Even so, it is still finding its place. This is no simple matter. Joint consultation will be integrated only when the attitudes and habits of all concerned lead the committee to deal with important problems and when the committee commands general respect. The manager, though he claims to be somewhat sceptical, is trying to make it work. For instance, the method exemplified by the appointment of two members to study the problem of dirty coal had been used before and had been, in his opinion, of no help. But he continues to try because, in his words, 'if management doesn't go forward, it will go backwards'.

The matter of lateness had also been put before the committee before with good effect—for a time. The danger in this instance lies in the use of the committee as a disciplinary tool. If it is to be a responsible body, it should not be spared such problems. But two problems present themselves. The joint consultative committee is advisory; it cannot decide policy in the sense that a board of directors decides policy. Can it therefore be expected to assume any responsibility in matters of discipline? This query is reflected in many of the difficulties of the committee. The second problem grows out of union-management relationships: can the committee work as a team as long as its members represent two 'sides' which are traditionally opposed? Out of these two difficulties rises much of the feeling of ineffectuality sometimes expressed by members of the committee.

Perhaps the most difficult aspect of integrating formal joint consultation in the colliery is that of integrating it with the countless other forms of communication. It can by no means replace them. The danger that it will be thought to do so is at least as great as that it will be given insufficient authority. Burncoal Colliery has not yet been able to sort this problem out. At present many matters that the committee deals with seem to some of its members to be petty. But even so there may be good reason to discuss them if they have not yet been satisfactorily answered. The committee's position is ambiguous at present, but time may work out for it a function and status that will make it a major force in the colliery.

The committee certainly serves as an additional opportunity for explaining management decisions, and for the men to explain their decisions. Thus, for instance, management may decide that a good block of coal, now being worked only partially, had better be saved until such time as men and equipment are available to extract it intensively and more efficiently. The problem is to put this to the men who very strongly dislike leaving a good face. The opportunity for explanation provided by the joint consultative meetings is an important addition to the other means of communicating the reasons for the decision.

Increased emphasis on 'human relations' in management. It is often suggested that the manager to-day does not know his men the way his predecessors did, or that he is not as attentive to 'human relations' as in former days. The opposite is also put forward: that the older 'school' of colliery management paid no heed to 'human relations'. Both of these comments miss the point. The facts seem to be that the manager has about as much knowledge of his men now, perhaps more than before; but also that much more knowledge is needed now to understand them. The manager of old could take more for granted. Again, the manager to-day is probably much more attentive to 'human relations' than in times past. But he needs to be because the situations he must deal with are considerably more complicated, alter more rapidly and are coloured by factors outside the local community. Moreover, it is a greater struggle to keep abreast of the men's personal situations to-day because there is so much else to do—more machines and regulations for the manager to deal with, more difficult and remote workings—and because the turnover of the men is greater.

It is still usual for a manager of a colliery employing 500 to know every one of his men personally and to know the wage of each man. But 'human relations' is a great deal more than knowing men's first names or carrying wage figures in the head. It consists in acting in complex situations in terms of individuals and groups as they really are, in such a way that relationships develop which make continued communication and co-operation possible. In other words, 'human relations' means considering the implications of a course of action for the total situation in the colliery.

The instance, some pages back, of the boy who had slept in and wanted to work on the back-shift was a case in point: the manager gave the greatest care and thought to the boy's standing in the com-

munity and consequent ramifications of his decision, and then decided to let him work. By way of another example, at a meeting of the joint consultative committee, the agent and manager, acting under instructions asked the men to agree to work some extra Saturdays to improve output. Before they would agree to commit their fellows, the men wanted to know how many Saturdays this meant. Without hesitation, the manager and agent guaranteed that it would be no more than three extra Saturdays though they had had no definite word themselves. In the one case, the case of the boy who slept in, the manager was considering the repercussions of a seemingly small matter in a complex community. In the other instance, a failure to take a decision there and then might have seriously hindered future co-operation. These are examples of the actual practice of 'human relations' in concrete situations.

Conclusion

The response of an organization to new conditions depends on its capacity to maintain its 'wholeness' or integrity. Where integrity is lost, conflict results. Where it is maintained, adaptation is effective. Analogy with the individual person may be appropriate; 'integrity of response' of the individual—that is, complex adjustment of intellect, emotions, habits and body—is the essential condition of successful adaptation to change.

The function of communication and control in an organization, as in the human body, is the maintenance of this integrity of response. Without effective communication the group, like the individual, may find itself at cross-purposes with itself. Rigidity of response in any one element may lead to conflict with other elements in the organization and therefore to rigidity in all elements.

A balanced relationship among the elements of an organization where change is constantly taking place presupposes the maintenance of spontaneous co-operation. The formal direction of all action would put an impossible burden on managerial capacity, just as the laboured conscious thinking out of each movement of one's body would lead to utter frustration. The habit of spontaneous co-operation is deep-seated in all men. Deprived of its normal routine constructive objects, this habit will either atrophy or find expression in co-operation for resistance or destruction. The first job of management, therefore, is the maintenance of spontaneous co-operation; and effective communication both makes for and depends on the

capacity to sense and utilize men's needs for responsible daily participation in small stable groups.

The coal industry provides striking illustration of these facts. It has been noted by penetrating observers that the men of the industry show a remarkable discipline combined with remarkable lack of discipline. This is another way of saying that, given opportunities for responsible participation in small stable groups, miners are capable of carrying out one of the most dangerous, difficult and changeable of all industrial tasks. Deprived of opportunities for such participation, they can be most stubborn and recalcitrant. Despite a very great improvement in the economic position of the miners, despite nationalization and the no-strike pledge, unofficial strikes and high absenteeism—two expressions of recalcitrance—are common in the industry if not indeed characteristic of it.

A recapitulation of the traditional bases of teamwork amongst miners, and how these bases have atrophied or been destroyed, is illuminating:

First, the traditional unity of pit and community has been undermined. This relationship used to be close-knit and comparatively undisturbed by outsiders. Now there are European voluntary workers, Bevin Boys, new recruits from other industries; at many pits miners are drawn daily from afar or permanently from other parts of the country as a result of closing uneconomic pits; and all this is in addition to the general trend away from the isolation of individual communities. This aspect is especially important at Burncoal Colliery, which lies in a particularly individualistic community, slow to assimilate outsiders.

Second, there were the specific community activities—local government, charity, etc.—which were focal points of responsible participation and teamwork. These are being removed rapidly to higher levels of government and to paid public servants.

Third, there were union affairs. Nationalization of the mines, national collective bargaining, the wage-freeze, etc., have substantially reduced the functions of the local branch of the union. Thus the local branch union is stripped of many important official functions which could be focal points for responsible and satisfying cooperative endeavour.

Fourth, there was the community leadership provided by executives who have since been shifted to other communities as a result of nationalization and reorganization. Few figures are available on this

point, but observation of the moves and a knowledge of the importance of the industry's executives in community affairs gives force to the suggestion. If the best leaders are chosen for central posts, their communities are bound to feel the loss.

Fifth, there was the contracting system. This was subject to serious abuse, so serious that it was discontinued under pressure from the union. But the essence of the system was teamwork, with the aims, scopes and members of each team very clearly specified and differentiated.

Sixth, there was the method of work in general. Teamwork pervaded it—the teaming of son with father, of cousin with cousin, teaming up to do jobs which were clearly distinct from other jobs, and which were done from beginning to end by the one team. Now there are long longwall faces involving dozens of men; work is done in three cycles, each cycle by a different lot of men; specialization by function, both required by the new techniques and encouraged and enforced by union practices, replaces specialization by social location. A man's pay depends no longer on the efforts of his small team, but on a team of as many as fifty or more—on the whole pit for that matter, for a stoppage in one place may hold up the entire colliery. Mechanization in some ways displaces or reduces the importance of men, and restricts the opportunities for teamwork and modifies its results.

All these factors have limited and impaired the miners' opportunities for spontaneous constructive co-operation. Yet their habits of teamwork are deep-seated, their habits of mutual assistance are as strong as their individualism and they will unite at the slightest danger. Deprived of traditional opportunities for teamwork, they will team up in resistance—to outsiders, to innovations, to mechanization—or in open hostility, expressed, for instance, in the form of strikes. The kind of response will depend on the skill of management in sensing and utilizing men's needs for responsible daily participation in small stable groups.

The pressures of geological and mechanical considerations have often seemed to conflict with these human-social pressures, and the conflict has seriously limited the effectiveness of new methods. The answer is neither simple nor specific; it is to be found only in detailed examination of all aspects of the functioning of a particular colliery or collieries. To that end a relatively effective modern colliery has been described in this study.

British Institute of Management, 1950.

CHAPTER III

MINETOWN

Introducing Factory Employment into a Small Community

1. INTRODUCTION

The Project

INDUSTRY has tended to concentrate—in the coalfields, in ports, in areas within easy reach of markets. Auxiliary services and organizations and civic life have concentrated likewise, making distinct industrial areas. Now many reasons for concentrating have disappeared, and the shortage of workers in industrial areas is an added incentive to industry to disperse.

This study is concerned with the establishment in mid-1948, of a small branch factory for the finishing of hosiery in a northern mining village—Minetown we will call it. For this purpose the parent firm secured the services of an industrial consultant with experience in this field—Mr. Taylor. At his suggestion a research officer from the British Institute of Management joined him to record what happened.

Methods of Research

The research worker's rôle in Minetown was that of Mr. Taylor's colleague—a fellow-consultant. This provided continuous opportunities to study the factory and its relations with the community without great disturbance.

The methods of research varied with the situation and yielded varying amounts of immediately useful data. The research worker carried out much of the testing and interviewing of applicants, and the selection and grouping of trainees was based largely on the results. Much of the data gathered about the community was also of immediate use, as a barometer of the community's feelings towards the newcomers and the project, and in indicating relationships, customs and habits which could be taken into account in the factory.

The same applied to the analysis of trainee records combined with other research data. Qualitative and quantitative recording was adequate for drawing valid comparisons between working groups and for evolving better criteria for deciding the best lengths of the different stages of training.

Some experiments could be carried out. Occasionally they were carefully planned. At other times experiments took place unexpectedly: for often a situation had been adequately recorded before and after for the change to be treated as an experiment, on the basis of which new methods could be usefully compared with old, and some permanent adjustments made.

Industrial Background

English hosiery production is traditionally associated with Leicester and the Midlands. It depends on an adequate supply of women workers. For many years this supply renewed itself in the old areas with complete regularity: whatever the turnover of workers, whatever the additional demands of the industry, a sufficient number of women always came forward to work in the factories. The late war changed this position permanently. Women were required to enter the Armed Forces or employment of more immediate importance to the national effort. When the emergency had passed, and the hosiery industry tried to re-establish itself and meet pressing export demands, it found that many women would not return to their former occupations, and that there would not be nearly enough recruits to fill the vacancies.

The shortage was particularly acute in the case of a finishing operation in the production of hose called linking (or, occasionally, looping). The linking machine consists of a revolving dial at the edge of which are arranged points radiating outwards. The operative's task consists in loading the hose on to the points of the dial: the same row of stitches must be followed all round the toe and no stitch must be missed or split. The machine then cuts off all stitches above those on the dial and 'links' (or sews) together, point by point, each pair of stitches. The result is a smooth grafted finish across the toe of the sock or stocking.

Linking is difficult in many ways. It is unusually fine work: fine seamless hose, for instance, has up to forty-four needles to an inch. Payment is by the piece and the speed of working is normally high: for fine hose it is three or four dozen pairs per hour; with coarser hose

it is correspondingly higher. The traditional training is long and the risk of complete failure high. For a period varying from eighteen months to two years the recruit is normally expected to sit beside a skilled operative and pick up the job as best she may. Only a small number, variously estimated at one to three in ten, usually survive this ordeal. The impression exists that these are 'born linkers'. Partly through the strain of trying to 'pick up' this difficult job, partly through inadequate lighting, linking has acquired the reputation of ruining the girls' eyesight. 'Linking stare' is the occupational disease; so much so that opticians have tended to recommend glasses as soon as linkers disclosed their occupation, and some firms, as protection against eye defects rather than as an aid to vision, have run benevolent schemes to assist their workers in getting glasses. Finally there is the impression that linking, even when considered as a task, is not really worth while. Dexterity rather than skill seems to underly it. Linking is, after all, a repetitive job with a work cycle of half a minute or less, and one, moreover, in which it is not easy to have personal relations during work periods with any but the workers immediately on either side.

As a result linking is among the most highly paid jobs for women in the industry and has great prestige attached to it. But after the war an ever increasing proportion of linkers in the traditional areas were elderly and married women of whom many worked part-time; absenteeism and labour turnover were high; and in many firms recruitment did not keep pace even with wastage.

Some firms decided to face these problems in areas in which there was little paid employment for women, for instance in agricultural or mining communities, even though this entailed dislocation and expense, and additional problems. The general experience was that workers could normally be procured and that they tended to be reliable; but that they were slow in learning the jobs, did not reach the same standards of output as the workers in the traditional areas, and behaved in ways that were often puzzling to the incoming management.

Summary. Section 2 describes the community of Minetown, the problems which the company had to face in entering this small community, and the difficulties inherent in the particular work to be done. Management planned to proceed along lines indicated by previous experience, but to work out the detail in relation to the

particular circumstances of Minetown. The methods were aimed at making the factory an integral part of the community.

Section 3 traces developments during the eight months following the opening of the factory: how contact was made with the community and workers were recruited, how they were trained and developed into proficient and responsible workers, how the participation was secured of the workers in the factory and of the community in general.

Section 4 indicates progress at the end of eight months and again two years later. It was most satisfactory. Some comparisons are drawn between the methods used in introducing factory employment into Minetown and those generally used elsewhere.

2. PROBLEMS AND PROPOSED METHODS AT MINETOWN

Minetown, a mining community of about 6,500 people, was chosen in 1947 as a suitable place to establish a branch factory. For upwards of a thousand women of working age there were hardly eighty paid jobs in the local shops, the pit canteens and the one little garment factory. Another fifty were at work elsewhere, forty of them in cotton mills an hour's bus ride away. As in other mining villages, a steady trickle of girls left their birthplace to work elsewhere. But for the most part the girls stayed to help at home, to get married young and in turn to bring up large families.

Local employers had gained an immediate advantage by the scarcity of paid work for women. They were used to having ten applications or more for each job. Standards of wages and working conditions were low, and occasional abuses remained undetected because the workers were not prepared to lose their jobs as a result of raising a protest. £1 or 30*s*. was considered adequate remuneration for full-time employment in a shop. A twelve-hour day, seven-day week, fifty-one-week a year job as general maid and bar attendant was yielding 30*s*. a week to a girl of twenty living out. Many girls were used to start working at 10*s*. a week, and employees of the little garment factory were frowned upon for talking or singing at work.

Management-worker relations were naturally patterned on those prevailing at the pits where 1,300 of the 1,700 employed men worked. Most of the other men were employed on the prosperous dairy and sheep farms, some of which jutted right into the built-up area. Other

crafts had practically died out, leaving a clear split between the mining and farming folk. Even the building industry employed only a dozen people, and those were engaged on house repairs; house building was carried out by large contractors who brought their own workers week by week from outside.

Built in the immediate vicinity of the various pit-heads, both past and present, the different blocks of houses were up to two and a half miles apart. Many of the 1,500 houses were old. Some sixty had been condemned; a further 520 had been declared to be unfit according to modern standards of habitation. Over one-fifth were overcrowded. In the worst housing area people were living, on the average, at five persons per room (if the kitchen counted, per two rooms); cases were encountered of seven persons to one room. When the mines were nationalized, the majority of the existing houses, including virtually all those that needed to be replaced, became the charge of the National Coal Board; some brought in just 1*s.* 11*d.* per week for rates and rent combined. Mining subsidence or the danger of it was the main factor that prevented the built-up areas from being joined up and, but for an agreement with the previous coal companies, would have prevented any new building.

The opportunities for spending money, particularly on furniture and other durable consumer goods for the home, were thus limited, yet over a period of years the earnings of the miners had greatly increased and goods had become scarcer. With local coal-mining also an expanding industry there was no pressing need to look anxiously abroad for new industries, or to worry greatly about new ideas and new methods. In fact the community had the reputation of placidly accepting such few newcomers as arrived from elsewhere in the north to stay (mainly in connection with mine management), and of being wary of people from the south, some of whom had in years back set up and then closed again enterprises of various sorts. There was little impetus to change.

In different forms and under various guises these and the more intricate problems of job and community appeared on numerous occasions during the project. There were indications of them even before the first trainee started in the factory. There was only the word of a suspect outsider that the job could be done at all and was in fact being done in places only forty or so miles away; why then, for instance, had Minetown been chosen to try this admittedly difficult job? Again, in a community as cut off from other hosiery districts as

Minetown, no criteria existed to denote likely success or failure in applying for the job, or, later, in doing it. The first applicants could not weigh their qualities, however fictitiously, against those possessed by girls whom they knew, and who had been accepted or rejected for work, nor their likes and dislikes against those of girls who had taken to or rejected the job later.

Management's Plans

Some plans for dealing with these problems existed in rough outline before Mr. Taylor set foot in Minetown. They were based on recent experience of similar tasks, on the accumulated knowledge of selection techniques and the lately evolved training scheme for linkers, and on conditions of work fixed by national agreement between hosiery employers and trade unions.

Mainly on the assumption that the most useful part of a linker's working life ended with marriage, he intended to recruit single girls, preferably between the ages of sixteen and twenty. Each applicant was to take part in an interview which was to determine whether she was a 'good type' and, in particular, whether she was likely to get on well with other people. Her eyes were to be tested; and her finger dexterity, perception and general intelligence were to be assessed with the aid of three selection tests.

The scheme for the systematic training of linking had been worked out some years back.[1] The main principles were: getting the trainee used to the job and what it consisted of, as analysed on the basis of an experienced worker's performance; developing her sense of touch, vision, flexibility and sensitivity by means of various exercises with and without training devices; building up her knowledge of the job, and her accuracy in performing it; and, with increased confidence, inducing her to acquire greater speed and stamina.

On the understanding that the trainees' rate of progress was influenced greatly by group attitudes, and that these could be fostered, individual and group targets were among the techniques to be used. The workers were to be fully consulted on all points.

Wages and hours of work accorded with the national agreement and not with the district agreement which provided for a rate of pay substantially above the rate applied in the Midlands in order to enable the local workers to earn an adequate wage even though their output

[1] Cf. next study: Acorn Hosiery Company. Effecting Change in a Large Established Organization, pp. 116 *et seq.*

was much lower than that obtained in the south (Section III, p. 109). It was largely due to the district secretary of the trade union, who had first-hand knowledge of the methods and the conditions of work in the Midlands, and believed that, given proper means, the same rate of output could be attained in the north, that the national rate was applied in Minetown from the very first. Weekly wages during training varied from 30*s.* for fifteen-year-old school-leavers, to 45*s.* for the over-eighteens. Eventually they were expected to be between £4 and £5. The working day was nine hours, the working week five days. In both wages and hours the factory was going to compare very favourably with other local employment. Physical conditions too, were to be modelled on conditions in the Midlands; in some respects they were, even in the temporary premises, to be superior. Fluorescent lighting, scientifically arranged, was going to provide adequate illumination for linking. Thermostatically controlled heating and ventilation was to be installed, since Minetown was liable to have very cold winters, so cold that mining was considered by some a sheltered occupation. The workplace was to be bright and comfortable, and standards of cleanliness high, and tea was going to be served twice a day. It was intended to minimize hostility on the part of other employers to these innovations by not engaging, at least initially, any girl already in local employment, and to do everything possible to secure the positive interest and co-operation of the community for the project. Of greatest importance in this endeavour were the decisions to do all training locally and to transfer the management of the factory to local people at an early date.

3. METHODS OF MANAGEMENT

Given the decision to train people locally, recruitment had to await the finding and fitting up of premises for hosiery production. Early in 1948 the choice fell on the former firemen's recreation hut, a narrow wooden building with good natural light and of sufficient size to accommodate up to thirty trainees. Many villagers thought it unsuitable, even for temporary premises. Local craftsmen were engaged to put it in a state of good repair, to install machinery and services, and to do the redecoration. The villagers, mainly through the agency of the craftsmen at work in the hut, kept in touch with all details, and through rumours conjectured more.

Recruitment and Selection

The formal motions of recruitment were gone through in the second week in May. The local Labour Exchange (located in the burgh some five miles away) was approached. Small posters, to the effect that female workers were required in the new hosiery factory, went up in shop windows and public bars. These formal methods seemed to have no obvious effect. It might have appeared that the Labour Exchange manager had been right after all when he warned that only a handful of women would be available for work in the new factory.

The next few days were spent making informal contacts. There were visits to local councillors, the vicar, and the solicitor. Through the activities in connection with getting things ready at the factory contact was also made with many other people. By one or other of them the existence of an active girls' club was discovered, and contact was made with the club leader, the schoolmasters and the local Press reporter. A meeting was held with a group of club members and another with a class of school-leavers. These opportunities were used to get to know about the community and to get known by them.

On the third day, as a result of an article in the local paper published that morning, the first applicant appeared. A group of seven girls from the club applied the following day. There then began a regular stream of applicants—sisters or friends of those who had already been at the factory, people who had been given the latest news about the factory by the craftsmen still engaged in fitting it up or by the life assurance agent, or had picked it up in shops and on street corners as they went about their business. One girl was so dissatisfied with her current employment that she took the whole day off merely to apply. There were sixty-three applicants during the first month. In addition, a few people applied for part-time work but had to be informed that it was not, at the moment at any rate, possible to cater for them. The flow was greatly reduced in subsequent months, but never ceased, not even when there were no more vacancies and little prospect of obtaining employment before the opening of the permanent factory, months, perhaps years in the future. As the school year drew to its close, facilities were obtained to make personal contact with twenty-four school-leavers, that is all except four who had decided not to seek paid work or who had fixed themselves up with other employment.

Except for the school-leavers who were seen at their two schools, applicants were asked to call at the factory, even before it was in operation. This ensured that they would immediately get some idea of where they would work. Some applicants were interviewed and tested during their first visit, others, later on all, were asked to call at a convenient time.

Tests and interview. Applicants for work were generally very anxious when they arrived to be interviewed and tested. Some of their anxiety was no doubt based on the fears familiar to applicants for work anywhere: they were naturally uneasy about their prospective entry into employment or, at any rate, into new employment. They were anxious about their chances of success on tests which, despite even full explanation, were bound to remain mysterious and full of unknown possibilities. On the actual job they wished hard for success, to satisfy themselves and the people at home; and they were anxious to remain within their circles of friends.

In Minetown there were additional grounds for anxiety. There was the very newness of industrial employment in the community. It was work of a type at which nobody had been known to succeed. Applicants had, at any rate initially, no guide at all as to what made for success. They were conscious only of a few obvious factors: for instance, they had learnt somehow that smooth fingers and good nails were an asset and that good eyesight was required. Girls who lacked confidence in the adequacy of their fingers and nails came into the factory holding their hands behind their backs, or wearing thick gloves—in summer—in the hope that the blemishes would remain undetected. In short, for one reason or another, the emotional tension of most girls was unusually high, in some cases very high.

The selection tests yielded no useful results as long as the tension persisted. Several applicants, whose eyes were perfectly good, affirmed repeatedly and forcibly in the initial stages of the eye test that they could see nothing at all. Others, with rough fingers and bitten nails, found difficulty in handling the pins used in the dexterity test, and some got seriously upset. Applicants who had left school some years back and had had little occasion to use pencil and paper since, were flustered when it came to the test where these were essential. In the case of the form board test, which required pieces of wood of various shapes to be fitted quickly into spaces to match, a number of candidates got so rattled by initial lack of success, that they failed altogether to complete what was essentially a very simple task.

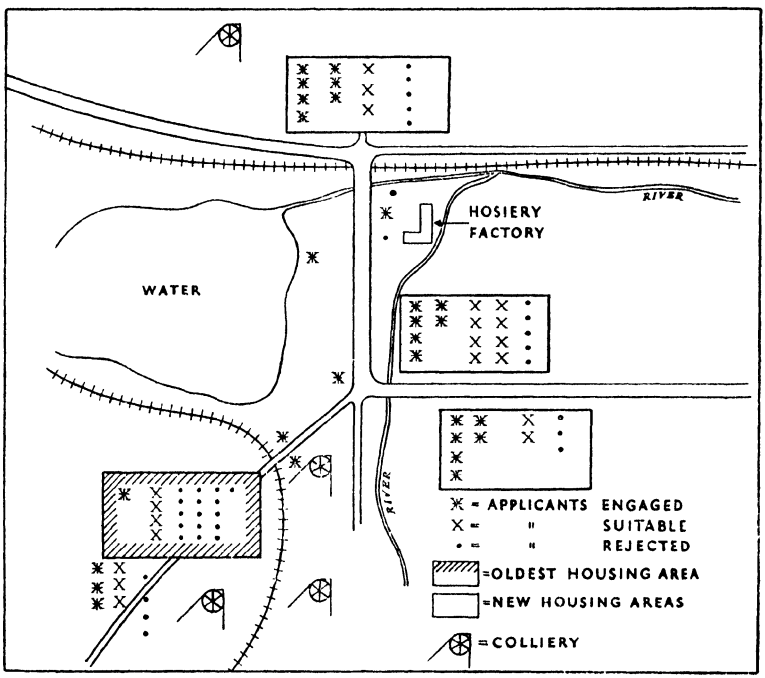
There was the young girl who spent several minutes trying, with pathetic stubbornness, to force a moonshaped piece into a square hole and a star into a rectangle provided the most extreme instance. Her strain could be attributed mainly to home circumstances: her father was dead; her mother had left her children largely to look after themselves. Not yet out of school, this girl had attached herself to a girl who was her senior by three years and had 'a way with the boys'. She was her hero. She tried to imitate her in everything. She succeeded only in accompanying her everywhere and in losing contact with her own elder sister and the rest of the family. By the time she came to be tested she seemed almost resigned to permanent insecurity. She needed success very badly and it was by no means certain that she had not all the qualities required. But her tests were so bad that she merely smiled resignedly at the end of the session, quite certain that here was just one more case of miserable failure.

The whole selection procedure was geared to removing the tensions of the applicants. The girls were, as far as possible not kept waiting. If some delay was inevitable, they were encouraged to look over the factory, to study photographs of girls at work in other factories, and to raise queries. A great deal of explanation was volunteered about the tests. The tests were arranged so that the eye test which did not demand much of the girl came first, and that next came the dexterity test on which nobody could fail to attain some success and on which it was possible to allow short practice.

Unguided interviewing was used to elicit information about the applicant's family background, her previous employment and earnings, her reasons for wishing to work at the factory, and her social relationships with girls already in the factory. The object was to get the girl talking about herself and to note not only the contents of what she said and the omissions, but also the sequence in which the statements emerged, and the importance attached to them. To have the interview as a distinct part of the procedure, as was tried initially, seemed only to add to the tension, and after the first day of selecting applicants the interview was therefore interwoven with the rest of the procedure. Nothing seemed to reduce the general tension of the applicant quicker than that she should be made to feel free and be encouraged to talk freely from the very first. By chatting with the applicant as the occasion arose—in between tests, during the eye test, and while getting tests ready for her to do—two major objects were pursued at once: tension relaxed, thus rendering test results

credible; and information was accumulated about the applicant. The applicant left greatly reassured about the humanity of management and the fairness of their methods, and the interviewer secured a wealth of information about the girl and her immediate environment, and also about the community in general.

Selection results. About one half of the applicants were held to be suitable for employment at the factory. They came almost exclusively from the newer housing areas. These had tended to attract, at any rate before the big post-war housing schemes had been begun, the kind of families who were prepared to pay substantially higher rents for more space and cleanliness, and for pleasant-looking surroundings. (Cf. Map.)



Minetown. Residence and performance at selection of first eighty-two applicants for work.

Of the twenty girls who had applied from the district where housing was worst, only one secured employment in the factory, and she made the slowest progress. Not one girl came from a farm. The

farming community's only applicant had been sent by her mother and stated bluntly that she liked working on a farm very much and did not want a factory job. She was also unsuitable otherwise.

All but one of the criteria on which the choice of workers was based were occasionally ignored. The exceptions proved the rules. They were caused mainly by the need to secure workers who would one day be instructresses, inspectors and, perhaps, supervisors. Two applicants were taken out of local employment, one because she was 'too good to be missed' and because the domestic work which she was doing was very unsuitable. The other was a widow of forty-two; she was taken on, though her capacity for the work was rather low, because she might develop into a supervisor. Very great keenness to come, though for no evident reason, combined with adequate capacity for linking and the possible makings of another supervisor secured employment for a married woman of twenty-two. And a girl of twenty-three, in urgent need of paid work, but with a test score that rendered success at linking or mending unlikely, was engaged, upon the consideration that her capacity would certainly be adequate for sorting work, a job on which it would be wrong to employ a girl with greater capacity.

The only principle that was applied relentlessly was that the applicant could be expected to make a socially desirable member of the factory community. If she could not be so regarded she was rejected, however adequate otherwise, at any rate provisionally—until such time as the factory had developed a strong and healthy atmosphere of its own. The relationship between factory and community was so close that it seemed doubly important not to run the risk of employing what the community regarded as 'bad types'. One of the girls rejected on this ground shared with two others the distinction of scoring highest in the tests. She was the 'hero' of the lonely young girl mentioned earlier. In comparison with the other girls she was strikingly well dressed; her hands were fine and well tended and bore stains of heavy smoking. Obviously used to getting 'her own way with the boys', she paid little attention to any girl except her admiring follower.

It was possible to learn not merely whether a girl was liked, tolerated, or disliked by the others, but also whether she herself had any preference for working next to one person rather than another. On the basis of this knowledge, account could be taken in the organization of the factory of the existing social pattern of Minetown, and it

was possible to a large extent to make the existing informal structure extend into the factory.

For example, six of the first ten girls engaged for work were members of the girls' club. Of the first twenty-nine trainees, seven lived in one short street and six in another. One linker, two menders (of knitting and linking faults), and the woman who swept up and made the tea were closely related. There were also two pairs of sisters. In four cases close friends worked next to one another. All the other pairs not only knew and, at worst, did not mind each other, but were as nearly as possible of similar age and capacity.

An immediate advantage of this arrangement was that the new employees did not have to enter a totally unfamiliar situation. This was all the more important on a job like linking which, especially during training, was liable to lead to a great deal of tension.

Training

The first steps. In the absence in the north of a linker able to help train the first groups of girls, an experienced linker to act as instructress had to be sent from the parent factory. In her mid-twenties, she had herself only learned linking since the late war. She had not received any formal training; the job had just grown on her and she liked it. She took also to systematic training and was intelligent and cheerful in performing her tasks. By fortunate coincidence she had served in the A.T.S. together with the sister of one of the new employees. This greatly eased her entry into the community and she became very much part of it.

She was guided by a detailed programme of training. The first task was to show the girls what linking consisted of and then to help them to do the job. There were photographs, diagrams and demonstrations, and practices on training devices. By a series of exercises the trainee improved her capacity for fine visual discrimination and for working at eye level, and learnt to co-ordinate the movements of hands and eyes. By practising 'linking' on static dials the girl got familiar with the whole task—her posture in relation to the machine, the height of the seat, the level of the eyes and arms in relation to the dial, the positioning of wrists, hands and fingers in relation to the fabric and the machine—before having to work on moving parts and worry about faults.

Eye exercises were an important part of the training. Usually they were incorporated in more general exercises, but one exercise at

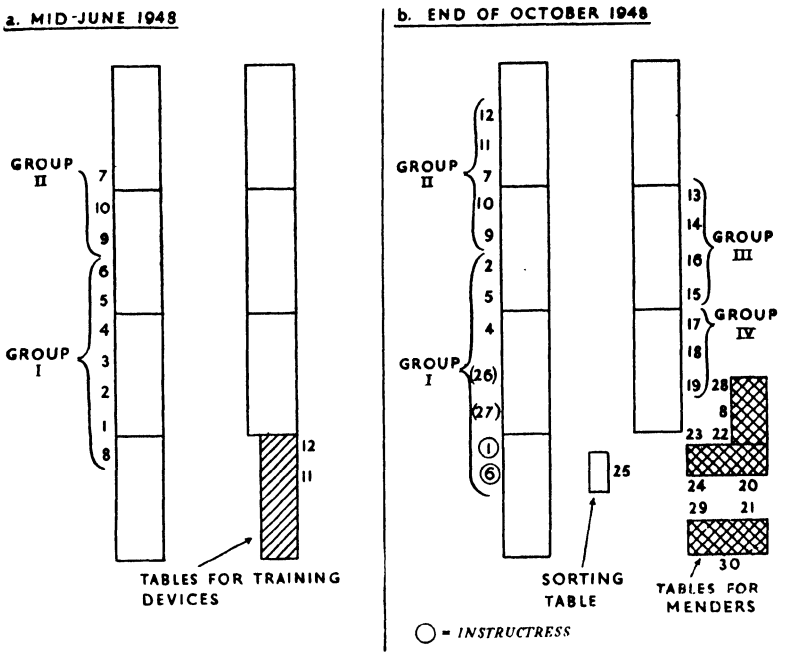
least was specifically designed for eye training. Every few hours the group of trainees were given graph paper. Across the room the instructress held up a series of cards, each bearing a number from 1 to 9, which the trainees were required to plot. The exercise involved long and short vision alternately in fairly rapid succession. As a by-product, it made the girls familiar with graph paper, to be used extensively for record purposes as soon as they were placed on machines. In the case of other exercises and practices, eye training was a deliberate by-product. Thus there were several dials, each designed for a different gauge fabric: girls progressed from the coarsest to the finest fabric, and their eyes got used to seeing progressively finer stitches without strain.

During the second and third weeks of training the girls spent an increasing proportion of their time on machines. For purposes of training, the job was broken up into six parts, and these they practised more and more. They also linked whole socks.

The major problems at this stage were the need to provide flexibility in the training scheme to accommodate differences between the girls and to prevent boredom. The problems, as also the methods of dealing with them, were interrelated. The available training programme was only used as a guide, chiefly for determining the sequence of stages. Each trainee had her own programme for each day, worked out each morning jointly by the instructress and herself. It was possible therefore to take account of her special weaknesses. Thus while one trainee was to concentrate on part 3, another might be practising part 6, and yet another the whole cycle of movements. Working out the programme also provided an occasion for the girl to raise any points of difficulty, and for the instructress to form an opinion on whether the course was progressing too rapidly for the trainee with limited capacity or for some perhaps personal reason. Sometimes circumstances conspired to make the trainees feel strongly that they wanted to do the same as other girls in reality more advanced than they.

For instance, one day early on two girls found themselves isolated at the training bench in one corner while the others had moved on to machines on the other side of the hall. They clamoured to be allowed to go on to machines too, and their wishes were conceded even though their training on devices had not been quite completed. On a later occasion Group II wished to try for a bonus at the same time as Group I and were allowed to do so. On both occasions the

changes were beneficial in terms of output. More often such alternations proved premature; which having had their way, the girls readily recognized and accepted.



Factory layout (trainees numbered in order of starting).

The trainees had been taken on in pairs and initially worked in pairs. Once their daily programme had been agreed—and it was expected that this was done on the previous evening or within one hour of starting work in the morning—the partners largely looked after each other. This had the effect of providing each with plenty of rest (but not with periods of doing nothing). It also very considerably lightened the burden of work on the instructress.

Changes in activity were frequent and targets were set for each activity. During the initial days each girl changed her activities at least once every half-hour. Over a dozen different devices and exercises were incorporated in the first week's programme, and periods of work alternated with periods of rest. Variety had to be a little reduced when the trainee worked at her machine. Initially she could practise the six different parts as well as the whole job. But these

parts were by no means all equally difficult, and before long, it was usually only one part which needed separate practice. It would have been worse than useless to insist on the continued practice of parts which the trainee was able to perform at fair speed, merely in order to retain an outworn variety. In fact, once the girls were able to perform the whole task, they almost uniformly pressed to be allowed to cease altogether practising parts, just as once on the machines, they had grown increasingly impatient of working on devices.

Targets were set for all tasks included in the girl's daily programme from the very first day. This was not done to attain immediate speed: speed was, initially, a secondary consideration. The targets were based, like the choice of activities, on the trainee's previous performance and a joint estimate of what improvement she might make during the day. They were deliberately designed not to strain her. At the same time, targets kept the girls 'on their toes' and gave them something to achieve even prior to linking a single sock. Partners timed each other off a large clock hung at the end of the hut—which exercised the eye muscles at the same time. Only a minimum of timing was asked of them. Above this they were free to vary the amount of control, and there were wide variations in the amount of timing done by different pairs of trainees. The timed performances recorded by each girl in a personal file guided her and the instructress in setting out the programme for the following day.

From the day a trainee started work on a machine, her best performances were daily recorded on a personal graph on the wall. These graphs were there for all to see, and each trainee obtained satisfaction not only from perceiving how she was managing to reduce the time spent over various parts of the task and over the whole cycle, but also from comparing her performance with the performances of her partner, her other neighbour, and the rest of her group. The position of the graphs on the walls reflected the seating arrangements and grouping of the trainees, and conduced to the growth of the notion of group performance.

Transition to production. The main object, once the trainee was able to link one sock at fair speed, was to build up her stamina so that she could maintain and increase that speed over progressively longer periods. Targets and records related increasingly therefore to specified periods each day, called 'runs', during which the girl was required to link as many socks as she could. At first, timed 'runs' did

not exceed five ten-minute periods during the whole day. As time went on, the frequency of these periods was increased and, more important, they were lengthened to twenty, thirty minutes a time, then to an hour, two hours, and four hours, until eventually the whole working day was covered.

As in the case of parts, a variety of runs were on the programme each day. Single socks also continued to be timed, and total output was recorded daily. Wholly for the sake of variety, the girls timed how fast they could finish a dozen pairs of socks. This was virtually the same as a thirty-minute (later a twenty-minute) run. But it seemed a different achievement and sounded quite different. In the case of the time runs, the number of socks linked increased; in the case of the timed dozens, the number of socks was fixed, and there was a progressive reduction in the time taken per dozen.

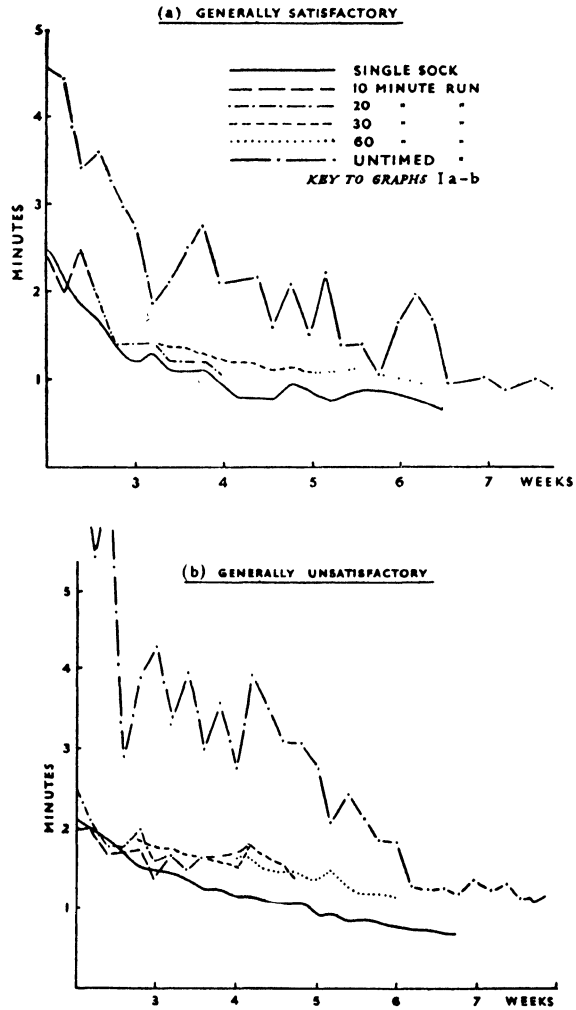
A girl's total output attained a new importance when she went 'on her own time', that is when her earnings as piece-worker exceeded her training wage, and her wage packet began to show the connection between output and earnings. Since the training wage differentiated between age, the girls began to 'pay for themselves' at different periods. As the trainee got near the stage when she would be on her own time, the rate of output required for the change-over was marked on her graph. This usually led to an extra spurt in output. Proper timing was probably essential to attain this result; for instance, discouragement and subsequent apathy would probably have followed upon marking the data at too early a stage. It happened that the two last trainees were so young and progressed so rapidly that they were on their own time before the usual data had been inserted on their graphs. They were flustered when they learnt of this. Their output fell and remained low for several days. (As one of their neighbours explained, 'they suddenly felt out of their depth'.)

Three times during training each girl had the opportunity to earn special bonuses through attaining certain targets. Linking one sock in a specified time once every day for a week was the first bonus target. Later targets related to an hour's run and to total output.

In addition, all achievements continued to be recorded and were of the greatest value for adjusting the training scheme to the particular needs of each girl; especially for deciding on the proper time for introducing ever longer runs and, finally, for ending this stage of the training (Graph I).

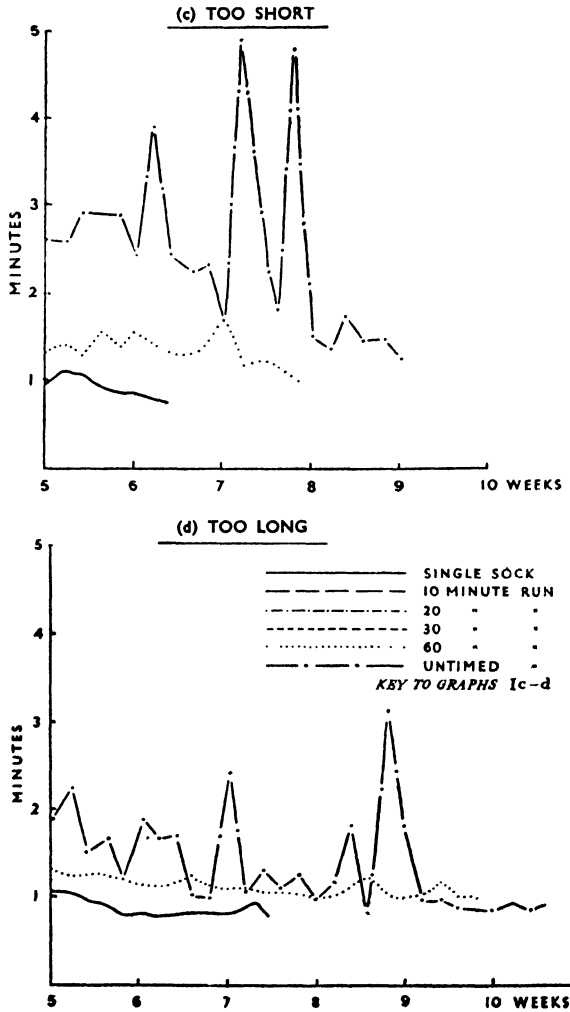
The 'good' training graph had four distinct characteristics:

1. The time taken to link one sock was not merely reduced, but fairly steadily reduced, from day to day; this applied equally to any length of run, and, to a lesser extent, to the time per sock during periods when the operative was not timed.



Graph I. Learning curves (slightly simplified).

2. The different lengths of runs merged into one another; by the time twenty-minute runs started the operative was able to link about twice as many socks in twenty minutes as in ten; and similarly, with the introduction of half-hour runs.
3. At any time the variations in the speed of working broadly conformed to the differences in the length of runs.



4. The speeds attained on runs of different lengths did not differ greatly.

Training under this particular type of control was stopped altogether when the rate of working during those hours when the girl was not being timed came near to the speed she attained when timed. Where the control was ended before this was so, the girl could usually not maintain the speed throughout the day. Where the indication was ignored, the trainee's capacity ceased to improve, and she showed signs of becoming an irritated and dissatisfied worker.

The changeover from training under control by means of periodic timing, to building up without this aid, brought only one new feature: henceforth the girl had to give her exclusive attention to total output. For instance, a girl could no longer make up for her failure to hit her output target for the day, by success in increasing her speed on an hour's 'run'. So far, the rate of output when the girl was not being timed had mostly reflected any temperamental vicissitudes, and had often differed sharply from the rate of output when she was timed. Thus long periods of 'timed' work tended to be followed by periods of slow working. When control by timing ceased, each girl took over, as it were, the allocation of her efforts over the whole day. The immediate result was a decline in the day-to-day variations of output.

Working Groups and Later Placement

Initially the girls had worked in pairs. How much some of them had depended on their partners had become clear when a girl had been absent: almost invariably her partner blamed the girl's absence for her own poor performance. But once on machines, the partners had tended to become less dependent on each other and to develop close relationships with the few other girls who had started training at about the same time.

The standing of these intimate groups was deliberately confirmed by many methods. Informal chats were held with each group whenever there was something to discuss, and always on Friday evenings when the girls cleaned down their machines. The graphs of group members were kept side by side on the wall and were headed by a graph showing the daily output of the whole group and the average per girl. Regularly every morning and every evening the girls crowded around the graphs of their groups. This provided occasion for lively and at times heated discussion, particularly when one girl

had failed by a considerable margin to reach her target. Ostracism by a group could reach extreme forms. One group was so exasperated with the continued and seemingly unjustifiable failure of one member to reach her target that they recommended that she should be sacked.

When, with the passage of time, the slight differences in the lengths of training of group members had ceased to be of importance, daily output targets were fixed for the whole group. The procedure was much the same as with individual targets: the group's previous performance was the primary consideration. Next came their estimate of what they would be able to do. Both were essential to fixing a useful target. No difficulty at all was experienced in their dividing the group target according to the previous achievements of individual members: it never seemed to occur to the girls that it might be divided some other way, say evenly. A difference of several dozen between the targets of members of the same group was quite usual. On one early occasion the most advanced member was expected to contribute over 50 per cent. more than her slowest mate.

Attempts were made also to make the working groups the bases for bonus targets. According to the letter of the training scheme, girls of the same group would be trying for their bonuses at slightly different times, according to the precise date on which they started training. As this proved to be upsetting, it was decided to average out of the differences in the length of their training and to let the whole group try for the bonus together.

A later bonus presented a more complicated problem. To girls in the first group it was given individually and for a certain standard of output maintained every day over a fortnight. This had major disadvantages:

1. The girl who, for some reason, failed to reach the target on any one day was needlessly discouraged: and if that day was early on in the fortnight, it might stop her trying to do better; and
2. The bonus would not affect the girl who habitually reached the target.

Three changes were therefore made:

(*a*) The whole group tried for the bonus at the same time;

(*b*) the average performance of the group counted, so that the higher output of a better member could continue to be of importance to attaining the bonus for the whole group; and

(*c*) the required standard was held to be reached if the performance of the group over the whole fortnight averaged out at the target output per day, so that failure on any one day did not put the group out of the running for the bonus. (The bonus of the individual girl could easily be safeguarded against failure on the part of the group as a whole, so that the faster workers risked nothing while the slower workers were encouraged to make their maximum contribution.)

Lasting large differences in individual standards of performances were incompatible with the health of the working groups, and the membership of some groups had to be changed accordingly.

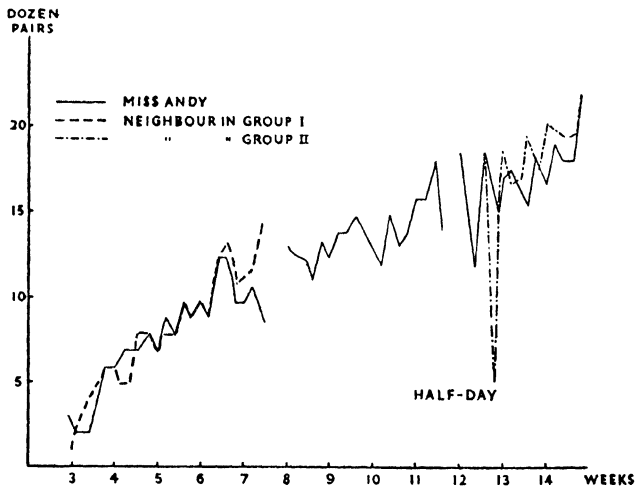
The case where one group recommended the sacking of one member has already been mentioned. The girl came of a poor family, living four to a room. Her mother's reputation in the community was not good—for which at times her daughter was made to suffer. Her stepfather seemed not to like her. Her halfbrothers and sisters, whom she had to mind during the frequent absences of her mother, were much younger than she. She had had neither time nor pocket-money comparable to other girls of seventeen. Everything had tended to make her lonely in this small community. Her reaction to this situation had confirmed the tendency. Always requiring social recognition but not gifted with charm or attainment, she was easily despondent and, by being abrupt for no apparent reason, liable to deter people who were, perhaps all too consciously, well disposed towards her.

She had been among the first four girls to be taken on. This had been an achievement in her eyes as well as in those of the family and the community. It was also likely to reduce her material handicap. She had started well, with a cheerful, socially successful girl whom she regarded as a friend. Unfortunately for Miss Andy, her partner, after making very rapid progress, had been chosen as an instructress. This required her to be away from her machine for varying periods of time, and her production varied accordingly. On the other side of Miss Andy sat a girl of sixteen, a single child rather weak, spoilt and variable.

Miss Andy had thus lacked a real partner. She had tried to work in with the next but one girl; but that girl had shown herself capable of high productivity despite high spirits, a combination in which Miss Andy had not succeeded. Miss Andy's production had ceased

to improve. She had fallen out with her partner. Whilst all the others had improved in cleanliness and general appearance, she had remained as before. Probably to attract attention she had acquired the habit of frequently coming late, and she probably got some satisfaction out of the attention that was being given to her case by management and fellow-workers alike: if she could not be the best, she might try to be the worst.

She had succeeded generally in alienating the goodwill of the others by the time that they asked that she should be dismissed.

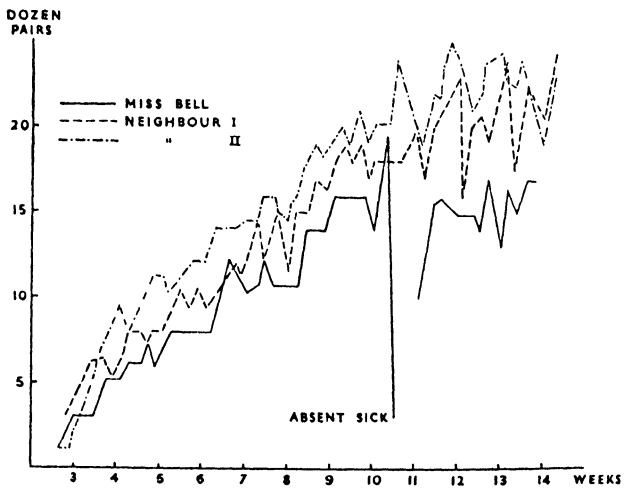


Graph II. Miss Andy: daily output compared with output of neighbouring trainees.

Instead she was shifted to the end of the group, to work, on the one side, with a girl who was very much better than she and did not take any notice of her and, on the other, with girls of the second group, with whom she, from then on, tried to keep up. (Graph II.)

The second case was the frail, spoilt girl who had worked next to Miss Andy in her first position. That she was able to do the job admitted of no doubt; but she did not feel like applying herself consistently to it. She played about a great deal, and her influence on her friend on the next machine was not good. Within a fortnight of her starting, moving her had to be considered. But her progress was good, even if not brilliant; her output was never far from that of her friend's, though the evenness of her progress, frequently with iden-

tical output for several successive days, contrasted with the sharp fluctuations normal in the output of the other girls and indicated that she might well have done better. Eventually she fell ill and was away for three days. A doctor told her that she was not strong enough and should wear glasses (though in fact she was one of the girls who had worn glasses when they had first come to the factory but had put them aside after some days' training). She never again got anywhere near the rate of output of the other members of her group, and she handed in her notice a fortnight later. (Graph III.)



Graph III. Miss Bell: daily output compared with output of neighbouring trainees.

Mrs. Field's was altogether a different story. She was a lady of forty-two, the widow of a mining engineer who had some six years before been killed in a pit. Though not born into the community, she was well liked by it. Her husband's death had forced her to obtain paid work, and when the factory had started she had been working as cleaner at the nearby school for a weekly wage of 25*s*. The pension had brought her income up to 35*s*. She had been taken on, although only moderately suitable, in the hope that she might develop into a supervisor. Immediately, her wage during training was 45*s*. per week. She had started off well enough, partnered by the married woman of twenty-one. But unfortunately she had got wind of the idea that she was going to be a supervisor. The assurance given to all the girls,

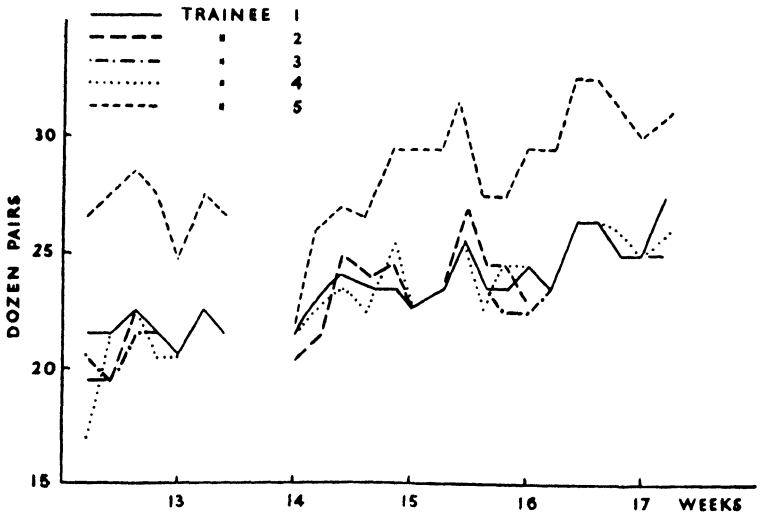
that no supervisor had yet been chosen and that this avenue of promotion was open to all, had not altogether dispelled her impression: for one thing, after all, she was much older than the others, and there must have been some reason for taking her on.

The difference in age had soon told. As soon as her partner had progressed a little faster than she, Mrs. Field had become discouraged. And the success of the sixteen- and seventeen-year-olds had deepened her anxiety. Her preoccupation with her own shortcomings had further retarded her progress, and when the time came for her and her partner to be put permanently on machines, it was clear that it would be unwise, for her no less than for the others, to place her right among a rapidly progressing group of young girls. So on the suggestion that she required a lower bench, she was given a machine at the end of the line, next to a girl who was so much further advanced than she that she would not be tempted to draw comparisons. This relieved the tension but not permanently. She could not fail to learn of the others' progress: she was being overtaken by trainee after trainee of more recent standing. She expressed the fear that she could not see the stitches, that she was being paid for doing nothing. The tension increased, despite continued reassurance, and her production suffered.

One day she was given to understand that there would be another job, mending, and that her experience of linking would be very useful. When the time came, she was moved over, doing, first, inspection, at which she was not very successful, and then mending. There the pattern threatened to repeat itself. She did well initially, but fell behind as soon as she was overtaken by someone younger than she. But this time there were these differences: first, one mend was not as closely comparable to another as one linking job to another, so that there was always some room for doubt when she compared her performance with that of the others; and secondly, menders had the chance to blame, rightly or wrongly, the linkers for poor linking. Mrs. Field took to doing this. As a result she ceased to be obsessive about her own shortcomings and became a steady and useful worker. All through she was well liked by the other girls. They often helped her, and she was chosen later by the menders to be their representative in formal consultation with management.

With groups consisting of members of roughly similar competence, individual rates of output often corresponded very closely. For instance, four members of Group II produced almost identical

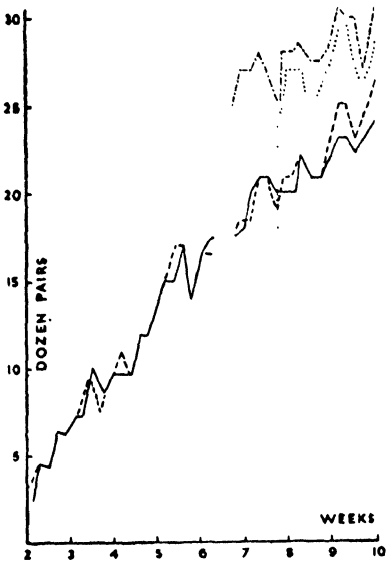
amounts each day for a succession of four weeks. The fifth girl built up unnaturally fast and exceeded her neighbour's output regularly by at least one-fifth. Fortunately it so happened that her machine was the last of a long row so that she did not seriously disturb the others. If that had not been so she might have had to be moved. (Graph IV.)



Graph IV. Group of trainees: daily output over five weeks, according to seating.

The last two linkers to be trained while this study was in progress remained entirely dependent on one another for an unnaturally long period. To get them out of a draught from the door they had been placed between the two local instructresses and the rest of Group I. They stayed in that position even when the cause of their discomfort had been removed, for two reasons: first, the rest of Group I ceased thereby to be seriously upset by the comings and goings and the irregular production of the instructresses; and, second, the newcomers were permanently under sound supervision without causing the instructresses to leave their machines. Their progress was very rapid. The existence of very much more experienced operatives seemed to ensure that they themselves progressed together. Only when the newer trainees came near to the rates of output of the more

experienced girls did their close partnership end. They then merged into the wider group. (Graph V.)



Graph V. Pair of new trainees placed among advanced group. Daily output, compared over three weeks with output of neighbouring trainees.

Participation

Evolving factory standards of performance. Many instances of joint management-worker activity have already been mentioned: immediate working companions were selected in agreement with the girls; individual and group targets were fixed jointly; any special questions or difficulties were resolved together. In fact, joint decisions were reached continuously. If the value of a training device was in question, it was 'talked over' with the instructress and some trainees. Faulty workmanship was jointly discussed and corrected. The girls advised on the allocation of difficult work. When a reluctance to be timed for 'runs' indicated that the trainees were becoming rather more dependent on the instructress from the south than seemed sound, the problem was frankly discussed with them to immediate good effect.

The changeover to local instructresses provided many occasions

of joint effort. They were chosen, with the agreement of all, after only six weeks in the factory. One was a young vivacious girl, well liked, who had been the first applicant for work. The other was twenty-five years old, nervous when she came and saddled with a marked feeling of inferiority. She lived in an old two-roomed cottage that was flooded regularly three times every year. Her parents had died in rapid succession soon after she had returned from service in the A.T.S. Her brother had one eye, was deaf, but was at work. She herself had been working as a domestic at 25*s.* a week. She scored highest in the tests, and had been taken on. She had not been immediately successful, felt that she would never be able to do the job, and blamed her eyes. One day she had been told her test scores. Her output had doubled that afternoon. She had overcome occasional setbacks, gained confidence, and exerted a good influence on her group.

Each instructress gave only a part of her time to instructing, spending the rest of the time on building up her own performance. This dual rôle involved difficult questions of pay: the girls immediately lost piece-work earnings, and they inevitably failed to build up speed on the job as fast as they would have done if they had spent all their time at it. The matter was settled jointly, on the basis of average earnings of selected girls and a small addition. And later, when there was a decline in the amount of training to be done, ways and means were jointly devised to reintroduce the girls as full members of their group.

Initially, too, the instructresses were not able to describe the job better than 'well, some days they just slide on, some days they just don't'. In order to improve on this and give them much needed confidence, one evening was spent with them in studying the aims and methods of training.

Consultation was altogether informal until it was found inadequate in one instance. On that occasion, a bonus target was settled without the girls' agreement. The target was ineffective except in arousing feelings of discouragement and disgust. The girls protested that it was too high and received sceptically an explanation of the calculation that had preceded it. When they were patiently persuaded to try it, they did considerably better than what was required of them.

The time seemed to have come for some more formal arrangement. A suggestion to this effect was received well by the girls, and three representatives were elected by secret ballot; the two instructresses and Mrs. Field. A meeting was held with them at least every Friday

morning so that points brought up could be discussed the same afternoon at the weekly informal chats with each working group. There was strong pressure to continue to have the informal talks because the girls were not sure whether their representatives reported back to them at all adequately.

There were no formal agenda for the Friday morning meetings but the main points discussed were noted after each meeting. For the first five meetings they were:

1. the quality of the supplies of unfinished socks: the setting of targets with a view to extending timing to the full day; the price of the tea served twice daily; amendments to the training course; the proposal to have a parents' visit; the background to Miss Andy's difficulties, showing, for example, in lagging output and occasional latecoming;
2. the allocation of coloured socks between the different trainees;
3. the persistent lag in output on Fridays;
4. the girls' reluctance to do coloured socks; a rumour about closing down; a comparison of Minetown and the community in which the parent factory was situated, in terms of employment and industries;
5. the quality of the supplies of unfinished socks; the future supply position; the demands on the trainees of the training programme.

Though initially the girls had merely followed instructions, when left to their own devices they came to show a great deal of initiative and settled matters by informal and largely automatic arrangement among themselves. They often helped each other and were each others' best supervisors.

The working groups were consistently curious about each others' rate of progress. As long as there were only ten or twelve girls at the factory their curiosity had been automatically satisfied. Later the output of each group was recorded daily on a large graph near the factory door, next to the output figures for the whole factory. The comparisons provoked lively argument and seemed further to promote output. Each of the later trainees had the average progress of all previous girls recorded on her graph. By way of experiment this was omitted in the case of a group of seven girls. When their rate of progress had lagged consistently for some days they were given comparative data; there was an immediate upward turn until it topped the average.

Nobody wanted to lag behind, and it was possible to judge from

the behaviour of a group whether they had fallen behind. When a trainee who had experienced some difficulties early on began to feel that she had overcome them, she was encouraged to talk about her success to any other girl in similar difficulties. To an ever increasing extent even detailed explanations of working methods to new trainees were left to the local instructresses.

On the condition that she would maintain her rate of progress, a girl was occasionally allowed for some reason to come late or leave early. In every case where a girl was absent for less than an hour her output during the day was higher than for the day immediately before or after. When two neighbouring girls wished to exchange positions they were allowed to do so. When their output declined they were merely reminded that they might have to revert to their former positions if output did not improve. Thereupon output did increase.

The girls quickly developed a sense of responsibility. For instance, it became the accepted thing to work on if difficulties had not been overcome to the girls' satisfaction during the day, or, if they considered their rate of progress too slow. There was much latitude for singing and other signs of exuberance.

During the first few weeks the great keenness to work overtime could be attributed to the novelty of the venture. But it never ceased to be common usage to be in the factory at least ten minutes before and after time, and to start work early and finish late. Yet there was no work clock for clocking on or off and regular signing on was discontinued, each operation took less than a minute to complete so that there was no difficulty about leaving the work at any time, and there was no payment for additional output to trainees not yet on their own time. This continual unofficial overtime work imposed extra strain on management and seemed also undesirable in itself. But an attempt to keep to scheduled working hours by keeping the factory shut until five minutes before time for starting and shutting it five minutes after time for finishing failed completely. Its only result was that a crowd of girls waited, sometimes in pouring rain, for the factory to open, and it seemed more humane to discard the idea. Many of the girls often stayed on until the manager left in the evenings, which was, since he had to catch a local bus, half an hour after time; they looked forward to the mornings when the manager had to arrive early to check in work that had come up from the Midlands and to send back the finished socks; and, having

some difficulty in understanding why it should be illegal for management to allow them to work through tea breaks, they continually tried to do so. The pressure for extending working time was particularly heavy when work had been held up for some reason during the day, or when a girl happened to have come some minutes late in the morning and insisted on making up time—which seemed to be only right.

After the factory has been in operation for two and a half months the two instructresses, one other girl and the permanent manager were taken on a week-end's visit to the parent factory. They might have been rather discouraged by the rate of output there, which still averaged, at that stage, some two-thirds higher than their own. Instead, they decided that they could do just as well in a few months' time and better soon after. They saw several reasons why they should: they had been trained properly, while the workers in the south had not—this was evident from the great divergencies between the individual southern linkers' movements, when compared with the broad similarity of movements of girls in the Minetown factory (whatever small variations were introduced by each girl into the basically uniform pattern of movements); working conditions in the north were at least as good as in the Midlands; and the towns in the south seemed to have more disadvantages than attractions. When the girls returned they set about constructing a graph by which they could measure their performance week by week against their ambition.

Mr. Taylor left with his colleague at the end of October. It had been part of his task to try and find a suitable manager, and within three weeks from the start of the factory several applicants had been seen. Two were inhabitants of Minetown, which was regarded as an important qualification. The one selected a week later had been a motor mechanic in the Armed Forces during the war and had come back to look after the vans and deliver meat for the local Co-operative Society. He had no managerial experience, but was well known and liked in the community, and altogether seemed a good candidate. He started working alongside Mr. Taylor five weeks after the opening. After October he was left in sole charge.

Relations with the community. Officially the community had welcomed the idea of having a factory established in its midst. Unofficially too, people thought it was probably 'a good thing'. But the main attitude encountered during at least the initial three months

was one of reserve. The community was resolved to wait and see, and to judge the newcomers by their actions.

In order to be able to enlist the help of as many people as possible immediately, the newcomers tried to allay and, where possible, to remove all apprehensions, sectional as well as general. The formal means for doing this were limited: there were occasional contacts with the local Council for some specific purpose, such as for a discussion of possible sites for the permanent factory, or a formal visit by the Council to the temporary premises. But there were no speeches nor other regular publicity. Reliance was placed on the numerous and widespread contacts with the community which arose in the normal course of the work, to provide continuous opportunities to reassure people about the purposes of management and associate them with the project.

Thus one shopkeeper who was anxious not to lose her assistant to the new factory was told of the intention to recruit only girls not already at work, and another that he stood to gain along with the other shopkeepers from the increased trade that was bound to follow new employment. A leading lady parishioner who was apprehensive that the introduction of employment for women would disrupt family life felt easier when she was told that the factory would employ single girls, many of whom had so far to travel long distances to work, or gone away for good, with much more serious effects on family life. The manager of the Co-operative Society was visited and his agreement obtained before one of his staff was recruited (as the future manager of the factory). The husband of the married woman who had applied for work and was suitable possibly to become a supervisor, was consulted before she was taken on.

There was a parents' day during which the factory, by then already humming with activity, was open to all who cared to come; many came. School-leavers, and their parents, were encouraged to see for themselves at any time the conditions under which they would work if they cared to apply and if they were accepted. Frequently other people came, by quite informal arrangement, and brought friends to see the output graphs, the training devices, the general methods; often they suggested that these things should be in operation elsewhere. Management laid great stress throughout on the intention to make the factory a local enterprise, with a local manager and local instructresses and supervisors, and a permanent accession to the community.

Much valuable help was immediately secured. In innumerable ways local people helped to get the factory started and to prevent management from making mistakes, some possibly serious, through sheer ignorance of local facts. They suggested suitable premises. They knew the best way of contacting possible applicants through local clubs, schools and churches. They had the addresses of the most reliable local craftsmen and suppliers whose help was required for erecting machinery and getting the place fixed up for work. They advised against the choice of the site suggested by the local authority for the permanent factory, because only they pointed out that the stream which looked so low and slow would flood the site practically every winter. They were not aware of the value of this help to the newcomers, and the offer of payment for what was to them elementary knowledge to have and common courtesy to give would only have aroused suspicion of the newcomers' motive.

This circumspect procedure, though immediately successful, entailed early contact with more fundamental problems of integrating the factory into the community. Different sections of Minetown—and they were many—had different ideas about the most desirable future of the community and of the factory's place in it. Management's attempts to allay all apprehensions and to stimulate cooperation from all sections were thus variously interpreted and must often have appeared contradictory and suspect. For instance local people often took for agreement with their particular points of view the patience with which the newcomers listened to them, and read their own views into managerial actions.

For instance, while shopkeepers were left with the impression that their girls would not be taken from them, supporters of Labour were pleased to note that the new factory was bound to raise standards of employment in the area. A solicitor had every cause to be satisfied with the newcomers' attention to his statements about the inexperience of the new Council, the dangers of bureaucracy, and the benefits of his party's administration; yet the Labour Councillors were assured that no obstacle would be placed in the way of the appropriate union who wished to recruit the factory employees, and they were also generally aware that it was politically beneficial for the factory to come in during their tenure of office.

Again, it was not possible immediately to stick fast to the guiding lines of managerial policy. Since it was impossible to find a suitable local instructress, the first instructress had to be brought up from the

south. A married woman was engaged with the idea that she might develop into a supervisor. The only suitable applicant for the post of manager was already in local employment; and he was, of course, accepted. These deviations and inconsistencies, real or imagined, were bound to keep alive many suspicions.

The early uncertainties showed themselves in the factory in many ways. Even slight changes in procedure brought out the girls' distrust; and this was kept alive by a suspicious community. Shortly after training was started, for instance, the day to which pay was made up each week, had for the convenience of the parent factory to be changed from Wednesday to Tuesday. This meant that at the following pay day the girls were paid for four working days instead of for the normal five. Though considerable trouble was taken to explain the reasons for this change, it aroused interest for several weeks. The girls were highly sceptical and wondered, for instance, why they did not get an extra day's pay the week after. The cost of tea was a sore point for two-and-a-half months before it was aired. In most local employment it was not usual to serve tea, but at a cotton mill twenty miles away where some of the girls had worked, tea had cost them 2d. per week. Here they were being charged 1d. per cup.

Occasionally there were rumours, some based on misinterpretations of fact, some without factual basis. The most blatant example was the rumour which circulated about three months after the factory had started—when the girls were showing already that they would be able to do the job well—to the effect that the factory was about to close down and the girls would shortly be paid off.

Throughout the initial three months of the factory's start Minetown was preoccupied with testing out the newcomers. The newcomers for their part were trying to get to know the patterns of hopes and fears of the community and the best ways of fitting into them. They took great care not to favour, or even appear to favour, any one person or group of persons so much as to confirm the apprehensions of the others and consequently lose their goodwill and help. They attempted to maintain a rough balance in the contacts with the community. Where there was no choice of persons who could be asked to give some particular help, this endeavour usually presented no serious problem; for these were usually occasions when professional help was required, and all that needed to be done was to consult Mr. Smith, not as Mr. Smith, the fireman in the mine and Labour politician, but as Mr. Smith, the local Councillor; or to ask the help of

Mr. Jones, not as a friend, but as the electrician, or the postmaster, or bank manager, or owner of the site that seemed interesting for the permanent factory. Problems arose where there was a choice; and there the choice was made deliberately so as to preserve the balance. For instance, if the factory was open to anyone not directly connected with its employees, or its operation, it was open to all. The same attitude dominated purely social contacts: they too, were widely spread and well balanced.

The result was that the relationship between the consultant and the community remained somewhat impersonal. This was shown up very strongly just once when, one evening in the factory, a local Councillor was talking together with a friend. Some people peeped curiously through the door. Thereupon the Councillor and his friend made their way rapidly outside, saying, by way of explanation, that they did not like to be seen in the factory.

As the factory got under way, a number of suspicions faded away without attaining any precision, one was confirmed and resulted in some opposition, and others assumed definite forms and were dealt with as they arose. By mid-summer it had been possible to show in several instances that the assurances given were valid. There had been, for instance, no large-scale exodus of girls from the shops and, though the summer school term had ended, other employees had found that all the school-leavers they wanted were available for work. The girls in the factory had started a holidays savings fund with the local bank. While a number of shopkeepers had had to raise wages and to spend money on improvements in physical conditions of work, the factory girls' earnings were beginning to find their way into the shops, and there were clear prospects of the trickle growing more substantial soon. So Minetown was on the whole satisfied and even pleased. The girls themselves, once the factory had got away with a fair start, had ceased to be merely the channels through which the community's suspicions could be unloaded on the factory, and had become also the main channels for promoting the cause of the factory in the community.

The increasingly secure relationship between the factory and the community showed itself, for instance, in reduced resistance to changes at work, in the absence of further rumours, and in the spontaneity with which help was offered for present or future exigencies. On one occasion the community had the opportunity to take the part of the new factory against a local employer. As the owner also of a

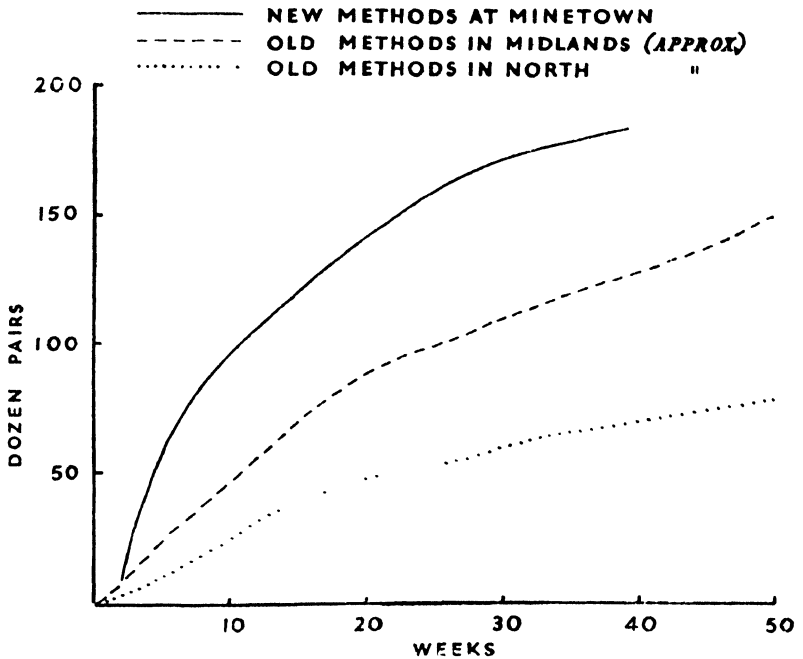
shop this employer stood to gain. But as the owner of the small garment factory he had to raise wages in the factory, install fluorescent lighting, and build a new brick staircase—changes which his son, in charge of the workshop, had recommended repeatedly ever since he had returned from the Forces. The nationalization of the gas industry had just deprived the father of a directorship and of the main reason for continuing to run his workshop on gas. Perhaps most important, he lacked social recognition. He would have liked the newcomers to take to him. Instead they had never progressed beyond the initial non-committal attitude. The bubble burst when the foundations began to be laid for an extension to the hosiery factory. On some pretext about land ownership he told the local builder to stop work. The community was quite openly indignant about this interference.

From August onwards, an increasing number of people went out of their way to express their appreciation of what had been done, an approval which often took the form of attempts to make social contacts with the newcomers. The factory began to be regarded as a permanent anchor for social relationships and was accepted as a new sectional interest in the community.

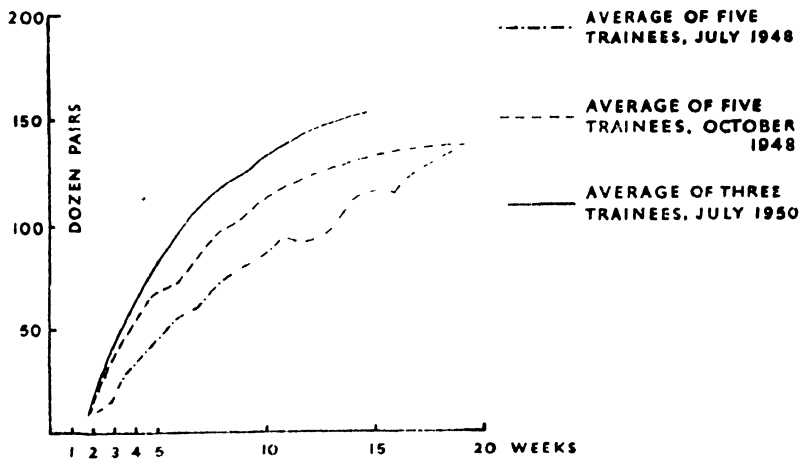
4. SOME RESULTS AND COMPARATIVE DATA

At the end of October 1948, that is five months after the start of the factory, twenty-one linkers were at work. Another eight girls were employed on inspection and on mending faults in knitting and linking. Recruitment had been temporarily suspended so as not to get out of step with the production programme, which had originally allowed for the employment of about fifty girls at this date. Though some of the girls had been in the factory only ten weeks, the average output per linker was over 100 dozen pairs per week (Graph VI), and each group of trainees was at least maintaining and usually improving on the standard of performance of the previous group (Graph VII). The most advanced trainees were linking 150 dozen pairs per week, which compared with the average output of 180 dozen attained by experienced operatives in the Midlands and of 90 to 100 dozen attained by experienced linkers elsewhere in the north.

Only one girl had left. Absenteeism was less than 1 per cent., and was more than counterbalanced by a consistent desire to work over-



Graph VI. Average output per trainee. Comparison of old and new methods of training.



Graph VII. Training and build-up. Comparison of output of trainees who started training July 1948, October 1948 and July 1950.

time. No eyesight problem had emerged; indeed, the three recruits who had worn glasses on starting at the factory had put them aside soon after. By that time too, a manager, recruited locally, was in complete charge of the factory, and all further training was carried out by two local girls.

Comparative Methods of Management

The methods of management employed to start hosiery production in Minetown differed in some respects from those employed in similar projects elsewhere. A few differences may be pin-pointed here.

Training. Many systematic training programmes provide first, that the parts into which the job has been broken down for training, be practised singly until an experienced worker's speed is attained; and, second, that these parts then be practised in pairs of threes with the same objective, before the trainee turns to doing the job as a whole.

Neither principle was applied in this case. Most trainees failed to get any better after practising a single part for a time. They were therefore allowed to proceed to the next stage even though they had not attained an experienced worker's speed. Nor was synthesizing parts in pairs and so on always tried. Often, before long, the only alternative to practising a part was doing the whole job. Experience indicated that partial synthesis could have two major disadvantages: first, there was no sense of achievement in practising parts—indeed in the practice of the later parts of a job much preparatory effort was wasted; and, second, the systematic failure to complete the whole job led to breaks in the pattern of movements which tended to become a hindrance to later progress.

Range and continuity. In a number of post-war projects entailing the setting up of factories to employ women in communities in which there had been little paid employment for them, production started well enough but failed to advance past the level at which the workers could earn £3 to £3 10*s.* per week. This has usually been explained in terms of the personal characteristics of country folk and of their lack of opportunities to spend money and consequent absence of will to earn it. In some cases it has been assumed that this position would change after some years, and that the venture could only then begin to be profitable.

At Minetown it was assumed that any great reliance on the financial incentive would lead to a similar result. There seemed to be even

more reason than usual to widen the range of methods by which the workers might be stimulated to improve their performance. The range of means specifically designed to do this and in operation by October 1948 included, in addition to payment by the piece, individual, group and factory targets; individual and group performances marked on individual, group and factory graphs; periodic individual and group bonus paid for agreed performances during training; and the insertion of the graphs of individual trainees and groups of trainees of the average levels of performance attained over the same period by previous trainees.

Such specific methods were (only) a part of total environment conducive to high performance, and made it possible to vary the stimulants and the emphasis on them from time to time during the period of training and build-up. For instance, when there were indications that the girls approached a level of output at which they would earn £3 to £3 10*s*., the group's attention was drawn to targets and graphs and to comparisons of the performances of different working groups. There was no production lag at the level which elsewhere was regarded as all that could be achieved during the initial years.

The operation at all stages of training of a range of stimulants also made it possible to introduce new methods and cease the application of old without ever having to affect a substantial change in the working environment all at once. The value of the broad continuity of methods and of slow change was indicated by the disturbance caused in two groups of early trainees who had unexpectedly to change from linking undyed to linking coloured socks, compared with the absence of difficulties on the part of later trainees who started working on batches of coloured socks at an earlier stage of training.

In the first groups, output fell in the case of every girl to a much lower level than was warranted by the difficulties inherent in linking dark socks. The trainees were greatly irritated, and gave vent to their feeling whenever an opportunity presented itself, irrespective of whether or not it was connected with the change. Asked whether they would like to allocate work on the dark socks they decided that they would work on them continuously, 'to get it over'. The atmosphere in the factory was tense; there was little of the customary singing. One group, all good friends, practically came to blows over their tea. Even when the proposed allocation was abandoned, it took

several days before general progress was resumed. The same change introduced in the case of a later group of trainees gradually and at a much earlier stage in training, had virtually no effect on their progress.

Relations with the community. Some branch factories set up since the war have attempted to copy closely the parent factory's attitudes and methods of management, even when the communities in which the branch factories were started differed significantly from those in which the parent factories were situated—for instance, in size, industrial background, social structure, and customs and habits.

The branch factory started in a small town a few miles from Minetown was a case in point. After formal contact with the local Council the building of the permanent factory began. Local girls were recruited for three months' training at the parent factory in a large town in the south. The managerial staff was almost exclusively seconded from the parent factory. But the plans did not work out happily. The factory took longer to build than was anticipated. Many otherwise suitable girls refused to be recruited for training elsewhere. Some recruits came back without completing their training; others, finding that the factory was not ready for them when they returned, secured other work. Local people resented that the incoming staff secured houses, and were not impressed with the fact that these houses were specially built. When the factory was finally opened, the firm staged a feast for its employees and the local personalities, at which many girls were liberally offered alcohol, to the great consternation of the community.

Summary. In Minetown the aim was to enable the factory to grow up as part of the community. Failure in this endeavour might well have been serious. In large industrial cities the social pattern of a factory can seriously diverge from what little there is of a social structure outside it without ever causing an open conflict: the antagonists there are not sufficiently organized. But in a small community like Minetown, where everybody knows well everybody else, it is unlikely that any differences that arose between factory and community could have failed to have immediate and serious repercussions.

The community's informal channels served to start the flow of recruits. On the basis of knowledge acquired through the selection procedure and through the numerous *ad hoc* contacts with the community, it was possible to take account of the existing social pattern

of the community in the organization of the factory. What is known about good organization indicates that a close conformity of the formal to the informal structure may well be a major characteristic.

An immediate advantage of this correspondence was that the new employees did not have to enter a totally unfamiliar situation. When a girl in a town enters new employment she usually starts as a complete stranger and is expected to build up her social relationships as she goes along. She may or may not succeed. In any case, yet another problem and uncertainty are added to what is already in many other respects a novel situation. In this factory the girls already knew each other well; and this seemed all the more important on a job like linking which, especially during training, could lead to great tension.

The process of learning was facilitated by a continuous adjustment of the methods of training to local knowledge, customs and habits. Initially this required fine sensitivity to all indications that could throw light on the detailed nature of any problem. It became easier as the girls and the community generally felt freer to communicate their problems and wishes to the newcomers, and the newcomers began to be more familiar with the community's social structure.

'Consultation' would be an inadequate term to describe this interchange even when it is accepted that it worked both ways; for much of the interchange consisted in watching out for what the other party *did*, not merely for what it said or asked. A relationship grew up in which management was left to get on with what was obviously its job, without every small action being queried by the workers, and the workers got on with their jobs without continuous detailed supervision.

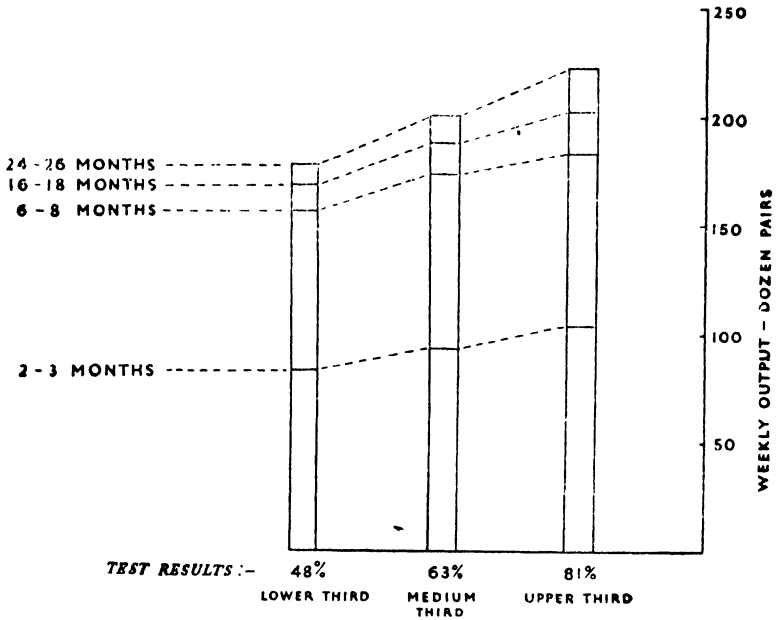
Success in the whole venture depended on the willingness of the parent firm to permit its branch factory the use of managerial methods most suited to its particular needs. In some important respects, for instance in training, supervision, and community relationships, the methods used were very different from those employed at the firm's headquarters.

Postscript: Two Years Later

The factory continued to progress well. In August 1950, output per linker averaged between 190 and 200 dozen socks per week, with some girls exceeding 250 dozen pairs per week. Broadly, the girls compared in output in the same way as they had compared in the selection

tests and after six to eight months in the factory (Graph VIII). This seemed to indicate not merely that the tests had been suitable for measuring capacities required for linking, but also—and this was really more important—that the capacities were being well used in the factory.

Several girls had acquired distinctly personal styles of linking within the framework of proper linking movements. When, as some-



Graph VIII. Comparison of selection test results and performances.

times happened, a girl found it difficult to develop speed in the same way as the others, she was given a short period of retraining.

A simple criterion had been found for judging whether a girl's failure was due to her inability to do the job correctly or to her general state of health and happiness, and, consequently, how best to help her: if she was slow in linking a single sock, she lacked technical ability and therefore needed retraining; if, on the other hand, she linked a single sock at normal speed, her technical ability could not be inadequate and her failure to develop was more likely to be due to physical and/or emotional factors. Then the most useful

first step to help was to give her opportunity to talk about her difficulties.

New steady dial machines had replaced the machines originally installed. Whereas the introduction of steady dial machines had made little difference to output in many mills in the old hosiery district, in Minetown the output of girls increased immediately by up to 20 per cent.

Absenteeism was low and was still more than offset by good time-keeping. It was still usual for the girls to start work early and leave late. Girls returned after absence almost invariably to do better within a day or so than they had ever done before.

The annual rate of labour turnover was 12 per cent. Only one girl left because she was unsuitable. This was Miss Andy: she had failed to keep up with the others (cf. pp. 94–5). Her relations with them had deteriorated so far that her continued presence in the factory despite repeated protests from the girls and particularly from her group had come to be a sore point between the workers and the manager. So he had asked her to leave. Though she was perhaps the one clear failure, her output when she left had been over half as much again as the average output of linkers in other factories in the north. The married woman had to leave because of a death in the family. She had been the leader of Group II and her departure had had a sharp downward effect on the output of the other members of the group. For seven weeks their output had remained below their usual standard.

One girl was allowed to return after marriage, after her fellow-workers had been consulted and their agreement secured. Other vacancies were filled from the long waiting list, and as before, new trainees made faster progress than their predecessors (cf. Graph VII). Formal joint consultation was in abeyance. Contact between the manager and the girls was so close that formal agreements did not seem to be required.

The waiting list included the names of girls who were only due to leave school in summer 1951.

British Institute of Management, 1950.

CHAPTER IV

THE ACORN HOSIERY COMPANY

Effecting Change in a Large Established Organization

1. INTRODUCTION

The Project

SINCE 1945 one of the largest organizations in the British hosiery industry—we shall here call it the Acorn Hosiery Company—has considerably changed. Employment has doubled, and productivity and exports have greatly increased. These results stem directly from pioneer efforts in the training of operatives, in work organization and in quality control; and the efforts in turn depended on marked improvements in relationships, both internal and external, a favourable disposition to change, and the development of means for continued adaptation.

The study describes the conditions and methods which led to these changes.

Methods of Research

Contact with the Company spanned almost the whole period of rapid change, that is, about six years. In 1944-5 the Company secured the help of consultants and of a research psychologist with whom it maintained contact. It has been possible to draw on their experience for this study. It has also been possible to discuss it at length with a consultant whom the Company provided with facilities to gain experience in hosiery work.

On two occasions prior to the present study, in the autumn of 1947 and in the spring of 1949, members of the Field Research Group carried out short field studies at Acorn. The former study included a visit to the first branch factory, then newly opened. The data have now been brought up to date and expanded, and additional contacts made with the community. The research officer was given access to many written records of meetings and performance. He spent time

on the floor of several departments in the head factory, and in the most recently opened branch factory, being for lengthy periods together with managers, supervisors, leading members of the trade union and groups of workers, and attempting to observe the situations with which they had to deal and their resources to deal with them. There were numerous opportunities, at the time and later, to check and elaborate the impressions. Considerable discussion took place over the draft report, involving several directors, managers of production and service departments and a leading trade unionist. This clarified several issues and added further data to the study.

Industrial Background

The hosiery industry was greatly contracted during the war and then, shortly afterwards, expected to expand again and contribute substantially to the export drive. Expansion struck two serious obstacles. Workers, particularly skilled workers, would not return to conditions of work which compared unfavourably with other trades; the shortage was so serious that some manufacturers feared that they would have to curtail production. The other obstacle concerned manufacturing for export. In the inter-war period hosiery exports had steadily declined until they took less than one-tenth of the output. Only high-grade goods would sell in overseas markets. But many manufacturers were not equipped to increase their output of those goods, and the shortage of skilled workers aggravated the problem.

Few resources were available to overcome these obstacles. There was no experience in the industry of systematic recruitment and training of new workers and little interchange of ideas on manufacturing for export and on work organization. Contact with other industries was limited. Relations between management and workpeople were uneven. The 'good' firms showed a high degree of care on the part of management and of loyalty on the part of the workers. But there was no tradition of associating the workpeople or, often, managerial staff, with changes in organization and methods. The seller's market offered some respite, of advantage or disadvantage according to the use made of it.

Summary. Section 2 describes the problems as they faced the Acorn Hosiery Company in the works and in the community outside, and the resources of the Company could muster to deal with them. It had

a flexible organization with a high degree of departmental autonomy; it was large and enjoyed good standing in the trade; and it could draw on new experience.

Section 3 describes how the changes were effected: how the need for change came to be accepted, what obstacles were encountered in the process of change, and how they were overcome. Most changes were introduced through three channels: quality control, training of operatives, and branch factories set up outside the traditional hosiery areas. These channels had different advantages and disadvantages.

Section 4 traces the effect of change on the organization of the Company. It grew greatly in size and complexity, and it strengthened the traditions of flexibility, departmental autonomy, and reliance on informal methods.

Section 5 briefly mentions some of the indications of successful change. The most important indication is the capacity for continuous adaptation to ever-changing circumstances.

2. THE COMPANY AND ITS ENVIRONMENT

The Acorn Hosiery Company is one of the oldest and largest in the industry. For over a century it has been established in a large town in the Midlands, a traditional centre of the industry. In 1944 it employed 2,000 workers.

The town is not mainly dependent on hosiery. But the hosiery industry gives employment to a large number of women, married as well as single, with the result that the town is uncommonly prosperous. It is not, however, very sociable: which is not to say that there are no social activities of any sort, but that the social forces generally favour isolation—a state typical of British suburban life.

Developments in the hosiery industry have contributed to the social isolation. Traditionally hosiery work was done at home, the men knitting the hose and the women finishing it off. Family and working life was then well integrated. This pattern was destroyed when the men were brought together in factories to tend technically improved knitting machines; and it was not restored when the women also were drawn into the factories, for they joined as individuals, not as members of families. By 1900 the destruction was complete.

The importance of social isolation here is this: people whose relations with others are slight and precarious are usually frightened of change, for tenuous relationships are easily destroyed. In the hosiery

industry this fear was strengthened by prevailing methods of management and developed into organized opposition to change. Changes were usually imposed from above—by the directors and owners on managers, by managers on supervisors, by supervisors on workers. Arguments tended to be settled by dismissal or by voluntary departure. Trade unions, constantly taking up individual grievances, grew only slowly and in opposition. They drew strength from breaking down some of the social isolation.

Pressures and Resources for Change

The Acorn Hosiery Company had to deal with the problems of post-war adjustment in an acute form. It had lost half its workers. A survey showed that only one in ten linkers would return. Part of the factory was requisitioned. The Company had little experience of manufacturing for export, as its main lines were goods sold at popular prices. Some work was traditionally seasonal. Some men's work used to proceed at night, but most ex-Service men made their return conditional on the abolition of night work.

The need to deal simultaneously with large and interlocking problems caused great strain, but it also had two important advantages. First, the need was so great that it could neither be ignored nor met along traditional lines. It obviously called for large and lasting changes. Secondly, the interrelation of the problems ensured that any change would be widely felt and that the attitude of questioning normal practices would be transmitted into even the most sheltered corners of the organization.

Flexible Organization

Throughout the history of the Company members of the owning family had become working directors—the only form of directorship —by working their way up through the firm. Since the family was large, the succession of experienced directors was not in doubt in 1944, and their position was secure. They could suggest any change, however radical. Greatly though it might be resisted, there was no doubt at all as to the directors' right to initiate change, as to their long-term interest in the firm, or as to their competence to judge after long years of intimate acquaintance with the Company.

The organization was divided into twelve production departments. These were largely autonomous and clearly designated as the hub of the organization. Each had a manager who was responsible for most

activities connected with the production and sales of one type of article, such as fully-fashioned stockings or knitted dresses. They requested, and were charged for, common services, like machine maintenance, as and when they wanted them. Between production departments there was little contact. Before the war it had not been unusual for a worker discharged from one department to be taken on by another. Arrangements inside departments differed considerably. In fact the Company resembled a collection of twelve independent units drawing some common services from a central organization. These services also were organized distinctly. The whole arrangement was very flexible. It made it possible to introduce a change on a small scale and observe and adjust it without sacrificing the complex reality of an industrial unit in action.

Departmental autonomy depended on managers with all-round experience and capable of independent judgment. They also (thirty or so of them) had worked their way up through the firm, mostly by doing handiwork from the time of leaving school till the age of eighteen, then moving on to foreman's help, foreman, and finally manager. They usually stayed with the firm for many years, many for a life-time. Their loyalty to the Company and extensive acquaintance with its personalities and ways was assured. They were used to stating their views and to having them taken into account. Any objection they might have to change was certain to be raised authoritatively, and to be overcome only by convincing them.

Advantages of Size

On balance the great size of the Company was advantageous. The Company could muster the resources to make imaginative and expensive innovations though results might be long delayed, and even at some risk of loss. Also, it could move out of line with other employers. The position of the Company within the industry and with others such as suppliers of yarn, machinery manufacturers and official institutions was not in danger because they were tied to each other by numerous and strong ties.

The Company played a leading part in the industry's counsels. Its conditions of work provided bases for industry-wide negotiations with the trade unions and models for the rest of the industry. It collaborated with machinery manufacturers in developing technical innovations and had played a leading part during the war in shaping official policy concerning the hosiery industry.

For a period extending over twenty-five years it had built up a relationship of goodwill with a large retail chain store organization for the sale of over one-half of its products. The Company's great size, combined with awareness on the part of the retail organization that it would be unwise to dominate the relationship, safeguarded policy from distant interference. In fact, the retail organization did much to encourage the development of progressive policies in the Company. The relationship gave the Company considerable security in planning requirements of labour, raw materials, space and the like.

New Experience

Much valuable experience had been gained during the war. Several directors had been absent for long periods on service with the Armed Forces and the Government, gaining new impressions and making useful contacts. Of particular importance was the wartime experience of the director with specific responsibility for personnel. He had seen soldiers become proficient in a matter of weeks in the performance of difficult tasks. He had also made contact with people who might help him develop systematic training for skilled work in the hosiery industry.

Those who continued working in the Company during the war had had to deal with unusual problems in novel ways. Conditions had fostered foresight, ingenuity, and improvisation. Many established practices had been overthrown and the value of others was no longer taken for granted. Work had proceeded under pressure, often of unforeseen events.

Summary. Flexibility was thus happily mixed with security. Relationships inside and outside the Company were not endangered by adaptation to changing needs, rather the reverse. And experience as well as material resources were available centrally and in the departments to be devoted to effecting change. This blend of security and flexibility may have been of vital importance.

3. CHANNELS OF CHANGE

In 1944, as the war drew towards a close, three problems required attention most urgently. They were: how to control quality of output; how to increase the number of skilled workers; and how to

acquire more factory space. They were tackled, and will here be studied, in that order. But they were closely connected with each other and threw up other problems. These also were followed up; so that problems of quality control, skilled labour, and space were only the beginnings for a process which diffused change throughout the organization. While this complexity will be indicated, an attempt will be made to separate out and follow each line of development in turn.

Quality Control

The advantage knitted fabric has over woven cloth is great elasticity, due to the loop formation of the stitch. Its disadvantage is that if a break occurs in a horizontal thread (or 'course') the vertical chain of stitches (or 'wale') is uncoupled, and results in the all too familiar pattern of a 'ladder'. To avoid this the quality of yarn and workmanship needs to be high.

The manufacturing operations are intricate, and so closely interdependent that initial faults are difficult to rectify and may well be multiplied. For instance, a machine knitting fully-fashioned hose has up to 250,000 components in thirty-two divisions. High output demands few breakages of yarn and an even tension so that the fabric also is even. The success of each succeeding operation is largely dependent in turn on the quality of knitting.

It may be helpful to describe the manufacture of one product, a fully-fashioned stocking. The knitted hose in this case is a flat piece of fabric so shaped that it will ultimately conform to the contours of the leg. The finishing operations, which are carried out by women, consist, in brief, in 'sewing it up'.

The first finishing operation is linking. The toe of the hose is 'run on' to points breaking out from the edge of a flat metal disc, so that first each stitch is held by a point, and then the sides of the toe are doubled over so that each point holds two stitches. The flat metal disc or 'dial' revolves, and on the side away from the operator a sewing machine attachment threads the top and bottom of the toe together and cuts off surplus fabric. Fine hose has up to forty-four needles per inch. 'Running hose on' quickly is a highly skilled operation, involving good visual discrimination and a fine sense of touch and movement. Any fault in the fabric interferes with the rhythm essential to continuously sound and fast linking.

The next operation consists of seaming the two sides of the flat

fabric together from the toe. It is carried out on a sewing machine, and looks a simpler operation than it is. For while the seamer does not have to discriminate between one stitch and another, she has to pair off the markings on either side of the stocking so that they are exactly level. Quality is again most important.

Finally, menders repair any damage before the stockings are dyed and finished, paired for length, and lastly examined and packed for dispatch.

Throughout the war yarn had been in short supply and of varied quality. It was with yarn therefore that systematic quality control had started. In 1939 the Company had established a laboratory to test incoming yarn. Some faulty consignments could then be returned to the manufacturers or be bought at a discount. At the very least, managers could be warned of yarn defects so that breakdowns could be prevented. By 1944 the laboratory was well established and laboratory specifications were used in purchasing. In addition to carrying out routine tests, the laboratory acquired special tasks, such as experimenting with new combinations of yarn and testing the uses of soluble fibre for easier work identification. Much of this work brought the firm into contact with outside organizations.

The quality of hose next depended on accurate knitting, and this on reliable machines. Regular machine maintenance was started under the charge of the engineer. Quality of work was checked increasingly systematically and the records served as starting points for special investigations. Some improvements were made in machinery design. All this activity involved co-operation with production departments and other service departments, and with machinery manufacturers. For instance, the performance of linking machines was generally improved, and a new brush arrangement was developed to ensure better cleaning of the edges of the fabric, prior to cutting. Again, it was difficult to tension elastic thread for knitting into the welt of knee-length woollen stockings. With the aid of a machine manufacturer, a special gadget was developed which solved the problem. Detailed studies were carried out to discover the machine speeds which gave the best results on different machines, varying the kinds and qualities of yarn.

Unit production. An experiment in work organization was designed to smooth the flow of work and regularize quality control. As it had most important, unforeseen results it may here be considered at some length.

The traditional machine layout placed the same kind of workers together—knitters, linkers, or seamers and so on. After each operation the work was stacked. It did not progress regularly, and considerable time could elapse before damaged articles were found and rectified, and the source of damage removed. It was then often difficult to attribute the fault to a particular machine or operative, and there was little to do but send the damaged articles on to the menders. Much additional damage occurred to goods in transit.

The experiment placed workers in groups, each constituted to make complete articles. The system is known as unit production. Thus two linkers, three seamers, an examiner and a mender (part-time) teamed up to make fully-fashioned stockings and were supplied whenever possible, with hose from the same knitting machine. American experience, with which a director was acquainted at first hand, suggested that unit production would be a mixed blessing at Acorn: some increase in productivity would result from reduced time of handling, but unit production required more space per worker.

Unit production was introduced on a small scale under the charge of a manager just back from the Armed Forces. It took three months to set up the first team. When the results exceeded expectations, unit production was extended to the whole department and to other departments. By 1950 over one-half of the firm's products were produced by units, and what had started as the application of an existing practice had been greatly developed and expanded.

Management reckoned that unit production increased efficiency by a quarter to a third; but as other changes were made at about the same time it is really not clear what increase should be attributed to unit production. It is certain, however, that not much of the increase was due to reduced handling. Clearly unit production had many unforeseen results.

On the technical side, giving out and booking work was easier and quicker. Work was no longer sorted, tied into bundles, and stacked after each operation. It was progressed systematically, difficult batches along with the rest instead of being left behind. Unit production facilitated stock control, reduced work in progress and enabled rush orders to be completed without delay. A group could do long runs of one product; and yet its members could interchange jobs and have more varied work. Everybody saw articles finished, and this also probably gave greater satisfaction.

The advantages of teamwork as such became clearer in time. Standards of behaviour grew up among the workers, covering attendance and application to work and many more subtle matters. The workers continued to be paid according to their individual output, and the standards were probably based primarily on an appreciation of this new close association with others in small largely autonomous groups. (The attempt to introduce group payment was abandoned at the workers' request and earnings continued to vary widely. Perhaps satisfactory group payment had to await better placement of workers and better rate-fixing.)

In some departments unit production grouped together workers traditionally hostile towards each other. Before the change, the knitters and mechanics had been habitually blamed if anything went wrong in the finishing departments. But these knitters and mechanics were a vaguely known set who worked in the knitting shops well out of reach. Anger was therefore often vented at people nearby: the seamers blamed the linkers, and the menders blamed both. As long as linkers had sat in one group, seamers in another and menders in a third, the strain between them had been regarded as an inevitable corollary of hosiery production; and possibly a not altogether regrettable one, if their rivalry was assumed to be some check on the quality of work. With unit production there was considerably less damaged hose, and co-operation tended to supplant hostility between groups.

By 1950 the engineers had become associated with many developments besides systematic quality control. They collected and analysed records, planned new work layouts, worked out requirements of space, examined internal costs and began to devise rates of pay more closely in accord with the work done by different operators.

Directors and managers of production departments asked them to think about all sorts of problems, to do operational research and experiment where required, and to evolve practicable answers away from the bustle of the production departments.

It is possible to pinpoint several features which greatly favoured the engineers in attaining their important position: a recognized primary function—quality control; a technical background; established relations in the organization and particularly with managers of production departments; and adequate freedom to devote themselves to large tasks.

Training

The development of systematic training for skilled operations was the crux of the attempt to enlarge the labour force. As in the case of quality control, training, too, eventually led on to many other problems and helped solve them. But initially it met with many serious difficulties. There was no experience of systematic training. The operations for which training was most urgently required were most intricate. A new department was set up with a manager directly responsible to the directors but with no established relations with the rest of the organization. Many managers of production departments opposed the transfer of responsibility for training. It was generally doubted whether the attempt to establish systematic training would be successful; and initially these doubts were confirmed. This section of the study will therefore concentrate on examining these difficulties and the ways in which they were overcome. For on success in the primary task of increasing the number of skilled workers depended all else.

In 1944 the Company made some attempts to devise a training scheme for one of the simpler operations ('lockstitch machining'). For training workers in the more complicated skills it sought outside advice. It approached a group of industrial consultants who specialized in problems of training. A director inspected a training centre developed by the group, and in the autumn of 1944 the Company secured consultant services for introducing systematic training. The plan was to devise a training scheme for linkers within six months and less urgent schemes as opportunity permitted. The directors presented the plan to managers and supervisors of production departments at a special meeting in November, emphasizing that this was a really serious attempt to overcome the scarcity of skilled workers and would entail considerable changes. Space was then allocated to the new department, and a manager was appointed. The training centre started in the same month.

Immediate difficulties. Devising a training scheme for linking, however, was much more difficult than the consultants had expected. They were not surprised that no linker understood the skill at all clearly or the techniques of imparting it to others, for such were the invariable deficiencies of the traditional way of learning by imitation and perseverance. But they had anticipated that they would, as usual, be able to analyse the skill themselves by observing skilled linkers at

work. This was not to be so. At the end of six months there had been three schemes, but systematic training was still 'deficient in certain important respects'. Though satisfactory schemes had been developed meanwhile for two other operations, linking, the crucial one, showed no signs of yielding to the usual method of analysis.

Problems of changing established ideas and habits among the workers. These difficulties seemed to confirm the general view that training for linking was impossible. Training flatly contradicted all that was known about the acquisition, or rather the source, of the skill. Linkers were not made, it was held, they were born. If they had the aptitude, they could link within eighteen months to two years of starting the attempt. Four out of five starters failed. Linkers enjoyed high prestige and high earnings which explains why enough girls had always tried the job—until now.

The high prestige of the linkers involved management in a dilemma: the harder they tried to counter the prevailing scepticism by stressing the potential value of systematic training, the more did they seem to threaten to deflate the prestige and earnings of experienced linkers. Linkers were therefore doubly inclined to pinpoint weaknesses in the plan, and they were supported by other workers, and by their families and friends outside the factory.

A particularly damaging aspect of this opposition was the great reluctance of linkers to apply for positions as instructresses in the training centre. As long as training was not well established only socially isolated workers cared to become instructresses. One or two others safeguarded their relationships by coming only on trial. Trainees would have benefitted greatly from instruction by women who were themselves sufficiently secure to be able to help others over their difficulties. As it was, instructresses were a source of insecurity in a situation already full of uncertainties.

Three close friends applied for the first vacancy but within twenty-four hours of being interviewed let it be known that they no longer wished to be considered. When a definite offer was made to one, she turned it down. A fourth and less suitable girl had to be chosen, and she found the position very difficult. There was no early application for the second vacancy. Three months later, the sole applicant had to be chosen and was soon found to be unsatisfactory. One worker agreed to be appointed on trial for three months, and left at the end of that period.

The first trainees were conscious of this conflict, and this inhibited

their progress. That they were almost all girls who had failed t make the grade in the traditional way and were sent, with little hop for retraining, aggravated the difficulty. For instance, whenever th trainees encountered difficulties they naturally fell back on the ac cepted explanation that they were not 'born linkers'. Their anxiet was kept alive by contacts with other workers and with the servic personnel, such as mechanics, who were busy in production de partments as well as in the training centre and kept each informed c the other.

Many trainees were anxious to justify themselves to their families But the only terms in which they might have done this were outpu and earnings, and these were not impressive when compared wit the output and earnings of experienced linkers. Owing to the diffi culties inherent in linking, the emotional balance required for pro gress in learning the job is fine in any case. More than in most othe jobs, upsets in the home life of a trainee often immediately reduce her progress. With so much cause for anxiety in the early stages o systematic training, this fine balance was often upset.

When trainees were transferred to the production department they were faced by another dilemma: they were assumed to be wholly proficient, which they were not; and they were expected to conform to the traditional pattern of status and practices. When they were left rather to themselves, many either 'sank and lost interest', o copied the work methods of their neighbours in the hope of attaining speed, and thus recognition. For instance, the first two trainees re turned to their department after more than doubling their previous rate of output. Within three weeks one was back at the centre fo further training and the same step was envisaged for the second Their difficulties were attributed to emotional factors. Another two trainees were blamed for so many unexplainable rejects that they suspected the menders of purposely reporting incorrectly.

Problems of securing the co-operation of departmental management. Traditionally managers engaged and trained their own workers. The training department was established because this method was no longer successful. But many managers did not believe that systematic training was possible, and some resented losing functions. In the prevailing scarcities they could hardly spare skilled workers and machines for the experiment, and their feelings about it ensured that they sent to the training centre the resources they would miss least or were even glad to pass on.

Thus several girls sent to the training centre for retraining had soon to be classified as 'unsuited to linking', 'transferred to X department for other work', 'progress on linking unsatisfactory', 'allowed to continue for experimental purposes'. Some managers declined to have unsuccessful trainees back on their former work. When girls they had sent improved in training, the comments of managers indicated clearly how the girls had been selected: e.g. 'I couldn't do anything with them and I didn't expect you would either; sending them up couldn't do any harm.'

Upon their return to the department, trainees were usually placed on the oldest machines in accordance both with prevailing custom and with the need to get the maximum of work out of the newest machines. Extra supervision was unusual, and what supervision there was was often inept. At one stage supervisors throughout the Company had to be reminded that it was not their job to change the trainees' methods of work. The manager of the training department complained of lack of co-operation between supervisors in the department and instructresses in the training centre.

The directors were consistently concerned to understand these difficulties of adaptation and, besides dealing with specific points as they arose, promoted general measures to overcome them. For instance, trainees were shown round the departments in which they were going to work and were attached to 'foster mothers' who would especially look after them. The training department also continued to keep in touch with them. Conversely, experienced linkers were invited to inspect the training centre and to comment. One day all the workers of one department came. The national trade union took an active interest, and its president visited the centre several times in the initial months and commended, also outside the firm, what was being done.

Managers and supervisors were encouraged to discuss their problems. Their status was respected, for instance by making it their responsibility to select workers for retraining but otherwise putting no extra burden on them. Thus to establish criteria for effective training, the consultants made do with data already available rather than have fresh data collected.

But, good as these measures were, the endeavour to secure general co-operation could only be successful if effective training could be developed. The trainees themselves would then refute the main premise of managers and workers that linking could not be systema-

tically learnt. But failure after three successive revisions of the training scheme made it increasingly doubtful whether this position would ever be reached. True, some trainees had made a success of training. But some had failed. Success or failure was unpredictable, which was merely one indication that training was not on a solid basis. The deficiencies were to become clear in due course: the trainees who succeeded did so because they solved for themselves some problems—particularly emotional problems—of which the consultants had failed to take account.

Meanwhile, as the months passed and the roots of the skill still remained undiscovered, anxiety reached a new pitch. The trainees were afraid of being sent to production departments before they were 'really skilled'. The manager of the training department was no longer able to counter resentment and ostracism even by dogged belief in success. The directors wondered whether they were pursuing a profitable policy. The consultants, little nearer to solving the main problem on which they had been called in, were doubly anxious as this was their first job in the hosiery industry.

The break-through. In April 1945 the consultants engaged a psychologist with special experience in training. She learned linking in the training centre and was able to analyse the skill and the process of learning it.[1] She analysed the important factors, which had escaped analysis by observation. They were taken into account in the new training programme which came into operation in June 1945.

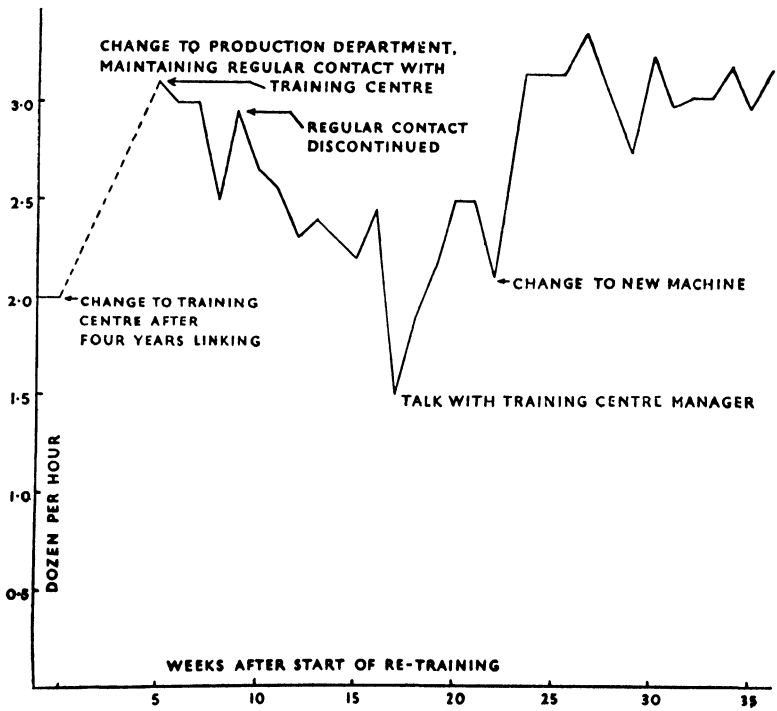
These were the main additions: systematic discussion with the trainees of the problems of analysing movements, of developing a training scheme, and of learning; further training devices and exercises to develop particularly the sense of touch, visual acuity, and stitch recognition; and much greater emphasis on helping trainees to maintain emotional balance, a crucial problem in training linkers.

The psychologist went on to study the pressures to which trainees were subject in production departments. As a result several changes were made in working conditions. For instance, trainees were set back greatly by being placed on old machines. The history of one girl had been as follows: in January 1945, after four years' trial, she had linked only two dozen pairs of fine hose per hour and earned only £2 10*s.* per week. She had then decided to leave. At the suggestion of the personnel director, the manager of the training de-

[1] For an account of this experience, cf. Pearl H. M. King—Task Perception and Interpersonal Relations in Industrial Training, *Human Relations*, Vol. 1., Nos. 1 and 3.

partment had managed to persuade her to be trained in the method then used at the training centre. Graph I shows her progress.

Within five weeks her rate of output had risen to three dozen per hour; on some days it exceeded four dozen. She had then re-entered the production department, maintaining regular contact with the training department. When close contact was discontinued her out-



Graph I. Output of re-trainee in training centre and in production department.

put fell rapidly. After two months it was about to fall below her previous rate, and in the twelfth week it fell to 1.5 dozen pairs per hour. In an interview with the manager of the training department, the girl stressed her difficulties with the old machine on which she had been placed. Investigation revealed that the points of the dial were apt to slip out of alignment, so that the knives cut the stitches of the hose and made it appear that the girl put the wrong stitches on

the points. When she was placed on a new machine her output quickly recovered to three dozen pairs per hour.

This case was studied in detail and led to drastic changes in procedure. Henceforth trainees were given machines with new dials whenever possible. The aim was to put the new dials on in the training centre and to transfer to the production departments the trainee together with the machine on which she had learnt to link.

Overcoming the resistances of workers and managers. The mere fact that a successful training scheme had been devised did not eliminate opposition. Indeed, this very success raised acutely the problems of the linkers' status and the managers' authority. Overcoming these became a matter of long-term policy.

At first, workers, supervisors and managers saw no reason to think any more highly of the new scheme than of those which had preceded it. Then, when they felt that training might be successful after all, they began to test severely the assurances of the directors that status and authority would not be impaired. During 1945 the training centre remained largely unused: in October it was half full, in November only two-fifths. In his review of the first year's operations, the manager of the training department remarked on the lack of interest and help from managers and operatives. 'Certain sections' still insisted on showing operatives how to do 'key jobs' which the training centre had been set up to teach and was waiting to teach. Even while this study was carried out, that is, after five years of successful training, there were still traces of opposition in the form of blaming the training department for difficulties only very remotely connected with it.

The attitude of the directors could be summed up as permissive and reassuring. They took no offence at opposition. They did not force managers to send girls to the training centre, or on any account tell people shortly to change their ways. Instead, they stressed the value of the training department, assuring it of continuing support, and giving liberal facilities to outside visitors. They also promoted in many ways close contact between the training department and production departments. With a successful scheme in operation such contact acquired real meaning.

The process of adjustment was complex and used many channels; and it was cumulative. The trainees themselves were the training department's best ambassadors. They either returned to their departments greatly improved by training, or joined departments as

new, proficient and generally reliable workers. They came to be accepted as good people to work with. Engineers and mechanics early took a special liking to them because they knew how to take proper care of their machines. In time the managers came to look to the training department to provide not only proficient workers, but also advice on many problems more or less closely connected with systematic training. They realized that it was their responsibility to ask for trainees and to accept or reject advice.

Expanding beyond training: selection.—The traditional very high rate of labour turnover had no doubt been partly due to recruiting unsuitable starters. Systematic selection was therefore developed side by side with training. It started with a simple physical test (of eyesight) and expanded into a long and comprehensive procedure. In time it was possible to concentrate on a few items and make selection more efficient. Eye tests were introduced in November 1944. It was discovered that many trainees, including some who had already worked several years in production departments had deficient vision. Tests were also developed to cover intelligence, finger dexterity, perception and temperament. Experienced workers were put through the tests to obtain an initial guide to rating of applicants. Testing temperament has remained most difficult. (Only the dotting machine was reckoned to be sufficiently useful to be retained. Specially systematized interviews were too costly.)

From December 1945 onwards all unskilled applicants were tested and trained in the training centre. Selection data came to be taken into account in grouping workers for unit production and later in filling vacancies among supervisors. These innovations also widened the contact between the training department and the production departments. For instance, one day a shop supervisor came in to see the training manager about a girl who wished to be promoted to higher grade work. Her training records showed that she had always been keen to do high grade work, but also that her ability to do this was doubtful. She had agreed then to do less exacting work until her skill improved. In the supervisor's opinion the girl's work had not improved sufficiently, and he agreed with the training manager that a final decision should be deferred for a few months.

Working conditions. Movement studies connected with developing training schemes suggested many improvements in physical working conditions. These were first made in the training centre and later adopted in production departments. For instance, freely adjustable

seats replaced seats of uniform height, lighting was improved and machines were regularly overhauled.

Developments along these lines continued; and as the instances multiplied, the training department became recognized as a place in the company where alterations in working conditions and some technical developments could be thought out and tried out. For instance, the policy of placing new machines in the training centre and transferring them into the shops with the trainees was later applied also to new types of machines. Also, work flows were adjusted to reduce strain, due, e.g. to frequent changes of style, and the analysis of skills pointed to many anomalies of tasks and earnings.

Supervision. Clearer understanding of the emotional as well as the technical demands of hosiery work led to an increased emphasis on helping newcomers to settle in, on grouping workers well, and generally on securing their co-operation. All this emphasized the importance of good supervision. Supervisors and managers were therefore encouraged to enhance their skills inside and outside the company. Their work was reassessed in the light of the recent developments, and new criteria were developed to guide promotion and training for management.

There were formal visits to the training centre and discussion meetings for managers. In January 1947 the manager of the training department suggested systematic training for supervisors. In October, the directors invited managers and supervisors to attend the three weeks' full-time course on personnel management at the local technical college. A Supervisors' Discussion Group was launched in September 1949 and a Managers' Association in January 1950. Later in 1950 a knitter joined the manager of the training department to devise a training scheme for knitters and became the first instructor in knitting. He later returned to the knitting shop as assistant manager. Several months' work in the training department became a regular step on the ladder of promotion to manager of a production department.

The difficulties encountered in introducing systematic training were not due to the particular make-up of the Acorn Hosiery Company or to chance. They point to several general problems of effecting change.

There was, first, the difficulty of pin-pointing the constituent parts

of a skill without losing the dynamic quality which made the parts fit together in a complex continuing activity. This reintegration was the central problem in training linking. It was not solved till emotional factors were taken into account. Besides the difficulties which learning commonly involves for learners, there were others based primarily on resistance to change on the part of experienced workers and managers.

People were naturally sceptical of an innovation which went right against common experience and understanding, and they opposed it when it threatened to upset established relationships. The relationships had grown up in response to then existing conditions and were maintained mostly with very good reason. For instance, managers naturally allocated trainees to the old machines in the department. This was established practice, and while it marked differences in seniority and status, it also ensured that the greatest output possible would be obtained from the very scarce new machines, as they were operated by the fastest workers. Again some of the functions which the managers resented losing to a new department of unproven ability had been theirs because they had discharged them satisfactorily hitherto.

The development of the training scheme provided the conditions for solving the social problems, but it did not by itself solve them. The solution depended on safeguarding old relationships and on the growth of new ones. Managers, for instance, had to be convinced that the time when they could select and train workers had passed and that this was the justification for change. The implication of incompetence had to be removed and the issue made impersonal. It was necessary for them to have the opportunity to appreciate, first, the need for change, and second, the social implications of the suggested innovations.

Once a start had been made along these lines, further change became easier. Existing relationships were strengthened by the experience, and new relationships grew around new activities. Success in starting systematic training fostered generally and strongly the habit of examining existing practices with a view to making them more efficient.

Developments in New Establishments

Branch factories were started in 1946, 1948, and 1949 in areas short of employment for women. They provided many recruits with

their first experience of factory work, and the Company with an unusual opportunity to promote favourable relationships.

The recent developments in training and unit production were most important in setting up the new factories. Without them branching out could hardly have been conceived and would certainly have been less successful. But the new establishments went further. They promoted sound developments in selection and training, unit production and general management which in time were adopted in the main factory.

Further developments in selection, training and supervision. It was possible in the new factories to be very discriminating in the choice of workers, taking particular account of their likely ability to fit in socially. Recruiting large numbers of workers in a short time provided opportunities for the development of selection tests and of the skills of administering and interpreting them; and, in due course, for testing selection results against performance.

In one new factory five girls were recruited locally and sent for training to the head factory. Back home they began instructing incoming workers, who were recruited in groups of nine to fourteen girls (according to the type of garment which they were going to make). When a group finished training and moved to the production floor, its instructress moved also and became its supervisor. This arrangement did not in all cases work with complete smoothness, but it was generally possible to preserve considerable continuity in the membership and supervision of the groups through recruitment, training and production.

Further developments in unit production. Greater flexibility was the major result of developments in unit production. Accordingly workers were trained in more jobs and eventually became interchangeable, group methods of payment were introduced, and supervision was strengthened.

Allocation of work.—Jobs were graded as more or less difficult. This assessment was not final and, as one of the supervisors pointed out, the group 'worked themselves out' in the final week or so of training. It was then clear which job would be the main concern of any girl. In addition to that main job, each girl was trained systematically in the operation which preceded hers and that which followed it, so that she would be able to move from one to the other and thus help avoid bottlenecks in the flow of production. Most girls could eventually do all the jobs in the group.

Group payment.—Group payment stimulated interest in the output of finished garments and encouraged girls to move about helping, without loss of earnings. Machine breakdowns also became less upsetting.

Standby members.—A number of 'reserves' were recruited who could always fill a vacancy or supply an extra pair of hands where needed. Some teams of fourteen workers had two reserves. They were normally busy making up complete garments. When a girl left for good, a reserve already familiar with the members and methods of work of the group could take her place.

Supervision.—As former instructresses the supervisors were familiar not only with the girls and their work but also with methods of teaching. This was immediately useful when the occasion arose to put a girl on an operation of which she had little or no experience. The supervisors could diagnose difficulties and correct faults. It was found that a supervisor's charge was best limited to two teams, twenty-eight girls at most.

For major changes it was decided to give supervisors extra help. For instance, changes in style, common in garment production, demand that the work lay-out be reorganized, quality be checked in detail, several girls be introduced to new methods, and many problems of adjustment be solved, all at once. There was therefore an extra (senior) supervisor for each of the three sections producing different types of products. They helped in specific difficulties and generally supervised a whole section.

Increased flexibility meant greater autonomy for the groups and closer relationships in them. The groups collaborated closely with specialists, giving valuable help, for instance, in costing and in planning. Usually work could be costed on the basis of experience and group rates fixed accordingly. But there were occasions, especially early in the life of the factory, when there were few reliable data. Management then guaranteed group earnings for the two weeks following a change of style, on the understanding that the new work would be timed and the original rate adjusted if necessary. This rate was then final. Collaboration in planning the change-over to a new style of garment enlisted the groups' special knowledge of members' particular aptitudes, likes and dislikes. They could sort it out largely among themselves.

Summary. If quality control was the first and training the second,

the branch factories were the third area in the organization where changes could be thought out and initiated and the process started by which the Company as a whole adapted to the greatly changed and further changing circumstances. Starting with a clean slate and in small communities, the new factories were best placed to develop rapidly. The engineers, with a network of established relationships throughout the organization, were probably best placed to communicate developments. The training department was without the advantages of the other two. It had neither a clean slate nor established relationships and was therefore hardest pressed.

The differences between these three channels for change were of course matters of degree. They were all characterized by having, first, resources to spare for experiment and, secondly, relationships through which to communicate the results—both features essential to change. But the differences were important. If the training department had not been confronted with so many problems immediately, it might have developed systematic training more quickly. In a closer relationship with the rest of the organization, it might have had less difficulty in getting systematic training accepted. As it was, it tried to do simultaneously what the engineers and the branch factories did essentially in sequence. The engineers maintained existing relationships and withdrew problems for special study. The branch factories, though they started off with the experience of the head factory, developed along their own lines and established closer and mutually beneficial relations with the head factory only when they had had some success.

For the organization as a whole the engineers, the training department and the new establishments provided the flexibility required for change. An analogy may make clear how important this is. In a tight traffic jam no vehicle can move: a little empty space is essential. In the Acorn Hosiery Company the three places discussed in this Section had the resources additional to those taken up in routine activities which were one essential condition of change. The second condition, effective relationships, is the subject of the next Section.

4. GROWTH AND ORGANIZATION

Between 1945 and 1950 employment with the Acorn Hosiery Company increased from 2,000 to nearly 4,000. Many recruits joined

established departments, but the majority went to work in the three new branch factories and in two new production departments set up at the main factory. Six service departments were added (four directly concerned with personnel: training, personnel, surgery and canteen). This brought the total number of departments to fifty.

This growth and the other changes described in the last Section strengthened the organizational traditions mentioned briefly in Section II. Departmental autonomy was emphasized. The directors kept in personal touch with developments in the departments. Some formal channels for communication were evolved to supplement and facilitate informal relationships.

Departmental Autonomy

All fifty managers were directly responsible to the directors. Their scope and their relationship with one another varied. As a matter of policy the directors kept the formal organization very flexible so that they could add new departments as needed and vary a manager's responsibilities according to his inclinations, experience and capacity. One branch factory was wholly engaged on finishing hose from three distinct departments of the head factory. The others were partly engaged on the same lines as departments of the head factory, but also had departments for producing new types of article. The branch factories were largely autonomous units. At the head factory a quality control department was set up. But it covered only the knitting and footwear sides of the business. For the other sections quality control remained a routine function of the general engineers. A sales manager with direct responsibility to the managing director looked after the work of the outside representatives who formerly reported to the warehouse departments; and an engineer with special experience was put completely in charge of erecting new knitting machines.

There were considerable differences in the internal arrangements of departments in, for instance, the use production managers made of the service departments and in the number and responsibility of supervisors. Thus, the responsibility for maintenance staff based in the production departments was shared in varying proportions between the managers of production departments and the chief mechanic. Some supervisors were in charge of as many as eighty workers, while others supervised twenty. Usually their responsibilities included giving out work and materials, but some forewomen

had assistants to help with the routine tasks. There were, also, many *ad hoc* arrangements by which the workers themselves took over such duties as looking after incoming trainees. The trim shop was particularly distinct. The trimmers had their own trade union through which they supervised each other and even disciplined members for unsatisfactory work.

Some managers accepted systematic quality control and training sooner than others, and they made different arrangements for collaboration. For instance, some managers were still recruiting workers through the old channels when recruiting had long become a responsibility of the personnel department. Managers were generally left to put suggested alterations into effect in their own departments and to promote them in other departments. As training developed, the manager of the training department proposed many changes which were of use also in the production departments. Although the changes were approved as ideas, he was left to do something about them; and in time, varying from department to department, the ideas became part of the general policy.

There were three new senior managers, one for each major group of products. They exercised general supervision, dealt with matters which affected all departments of their group (e.g. the recruitment of linkers for the footwear departments), and carried out for it some functions (e.g. costing).

As a result of this delegation the directors could spend a large proportion of their time on the factory floor. They shared their activities among themselves more generally than their functional titles suggested and were each able to help immediately with most problems. They relied largely on personal contact to retain their 'feel' of the situation in the factory and to maintain easy communication between managers, trade union officials and workers, and the board.

Communication

Communication was formalized to only a very limited extent. For a time immediately after the war, directors and managers held regular meetings to discuss forward planning, and a committee representing all sections of the organization helped with the rehabilitation of workers returning from the Services. But these arrangements were discontinued when the particular problems could be dealt with as routine.

Permanent additions to the machinery of communication grew out of more general needs. The meeting of managers and supervisors which preceded the establishment of the training department acknowledged that managers and supervisors had common problems which could usefully be discussed jointly. Such meetings therefore became regular, and in time managers and supervisors formed their own permanent associations. An information bulletin for managers developed into a quarterly magazine for all. When a decision by the Board encountered unexpected resistance in some departments, the directors judged the time ripe for instituting formal joint consultation at departmental and Company level.

An increasing number of records were collected and standardized for analysis in the production departments and in such service departments as personnel, quality control, and training. They helped in locating problems for attention and in forecasting.

Reorganization, then proceeded slowly, piecemeal, according to need. It was continuous, a part of the general and continuing process of adapting to changing needs. It aimed at ensuring sound relationships, and, in doing so, provided the security required for change. The organizational innovations supported the relationships: they did not create them; and they certainly did not supplant them.

The process of change was basically similar in all cases. There was, first, a definite problem sufficiently serious to demand attention. Then and only then, were attempts made to tackle it. Where possible, established relationships were used, adjusted, and possibly formalized permanently. Each change uncovered further problems which were then tackled in the same way.

Two more small examples of this sequence were the problems of reinstating and rehabilitating ex-Service people, and of pilfering. The first led to the formation of a representative committee. According to the minutes of that committee, many problems were discussed besides rehabilitation: some related to the war but raised such wider issues as refresher courses, retraining and transfer, redundancy to make room for returning ex-Service men; others were not related to the purpose of the committee and were raised there probably because they were not adequately discussed elsewhere (applications for work, transport to and from work, problems of night-shift operations, the need for an employees' handbook, how to deal with disputes about time rates). These latter issues the committee usually aired and then passed to the personnel director for attention. They

became part of the assignment of the personnel department set up with permanent staff in 1945.

Pilfering became a problem towards the end of the war when hosiery goods were in very short supply. It led to the setting up of a factory shop where employees could purchase a quota of goods made in the factory. In this way, pilfering was reduced, and at the same time employees were given the opportunity to possess the goods they had helped to make and to show their work to their families and friends.

Summary. The experience of the Acorn Hosiery Company in this respect is in line with an increasing body of evidence, which may be summarized in two propositions: (1) that healthy change grows out of need; and (2) that when the need is felt, then is the time to adapt. When there is no need, or when the need is not recognized, any change has to be imposed and is usually resisted.

Other propositions follow from these. One concerns the purpose of forecasting. Forecasting makes possible more lengthy and thorough preparation for change—securing recognition of the need for change, discussing the implications, and evolving means by which adaptation may best be effected. Where change becomes unexpectedly and urgently necessary, preparation may have to be skimped. Forecasting helps to reduce this danger. It should be possible to take the manifold implications of change increasingly well into account.

Another proposition concerns the initial scale and development of change. Its scale is best determined by the extent to which the need for change is recognized, developing as recognition widens. This underlines the need for flexibility and for opportunities to discuss and agree the change—its need and its process.

5. SOME INDICATIONS OF SUCCESSFUL CHANGE

This study set out to describe the conditions and processes which enabled the Acorn Hosiery Company to adapt to greatly changed circumstances and to evolve means for continued adaptation. The Company's success was indicated by various statistical data and confirmed by attitudes in the factory to further change and by its improved reputation in the industry and the community.

No more general or final assessment was possible. It was not poss-

ible to compare the Company's position in 1950 with the position it might have been in if it had failed to adapt. There was no certainty that it would adapt successfully in future. But indications were favourable: but for its successful efforts, the Company would have been in a worse position now; and it would be better able to meet further pressures for change.

Finance and exports. The Company had a satisfactory balance sheet and paid its employees slightly above union rates. Exports increased from insignificance to between a fifth and a quarter of total output. Three departments exported between 40 and 75 per cent. of their output and all except two of the rest between 10 and 30 per cent.

Employment. Employment increased from 2,000 to 3,800. One thousand three hundred workers were systematically trained. The failure of workers to learn skilled trades fell sharply from 70 or 80 per cent. to less than 10 per cent., and skills were learnt sooner. At the same time the quality of work improved, even though production became more complicated and control stricter.

Management: worker relations. Attitudes in the factory seemed greatly changed, noticeably so even between the first short field study in 1947 and the current study. For instance, the position of the leading trade union member in the firm was quite different. At the end of the war, she led an increasingly militant struggle between workers and management, with hardly a week in which she was not directly involved in some conflict. Three years later she was also a training instructress, and had been elected to one of the highest positions in the national trade union. As she herself put it, 'some union people don't seem to realize that there is an alternative to continued conflict between management and workers in industry, that one can look at problems without thinking of two sides all the time'. Managers and workers seemed to co-operate well and to regard further changes as normal and even desirable.

Relations outside the firm. The Company encouraged firms to visit it and use its experience. Some it put in touch with outsiders able to assist. It gained weight in the counsels of the industry and in many ways benefited in turn. For instance, when one of the branch factories was burnt to the ground, there were immediate offers of accommodation and of machines on loan, and the responsible Ministry diverted machines just arrived from the U.S.A. and issued building licences to help make up the loss. Within one week, close on fifty girls were again at work and within less than three weeks all

were back in temporary premises. Production was soon back to normal.

In the community the Company had the reputation of paying more attention than any other organization to the well-being of its workers. It was generally appreciated that it led the industry towards a more progressive outlook in management.

British Institute of Management, 1951.

PART TWO

INTERPRETATION

CHAPTER V

ORGANIZATION, COMMUNICATION AND CONTROL

THE case studies consist mainly of detailed descriptions of events in three industrial organizations. Some are probably similar to events in the reader's experience; others maybe are not. In any case the events can be compared; that is, it is possible to extract some generalities. We have been doing this only within the compass of each study, comparing the work of various officers, the effects of different management methods, the activities of distinct groups of workmen. In this chapter it is proposed to extend this process, by drawing out some generalizations from the three studies and from others carried out in recent years.

The discussion which follows will be under four main headings:

1. Organization.
2. Communication.
3. Authority and Control.
4. Adaptation to constant change.

There is no overwhelming reason for choosing this particular set of categories as the framework for discussion. It would be quite possible to use, for instance, 'activity, interaction and sentiment'. We have chosen 'organization, communication, control and adaptation' for two principal reasons. First, they are concepts in terms of which administrators are thinking about problems that are currently troublesome. Secondly, the terms 'organization, communication, control and adaptation' enable us to talk cumulatively. Thus 'organization', by which we mean such things as whether jobs are distinguished by men or by function, refers to the structure of relationships within which the main problems have to be solved. 'Communication' refers to the job of ensuring that different parts of the organization are aware of what other parts are thinking, feeling and

doing. 'Control' means modifying these thoughts, feelings and actions to suit the needs of the organization as a whole—e.g. inspection to assure desirable quality of work. And adaptation—the process of continuously changing routines and methods to meet new circumstances, e.g. changed consumer demand—involves all three aspects: organization, communication and control.

Since we set out to study management in the light of the rapid change, specialization and growth characteristic of industrial society[1] all three case studies are in a sense focussed on adaptation. But they had to take account first of routine behaviour (if only to discover what had to be altered in order to adapt), and this determined the scheme of presentation in each case. The discussion which follows is clearly similarly based, but its purpose is different and it is differently ordered. We are concerned to pull together the various emphases and to make the individual instances contribute to the formation of general concepts.

I. ORGANIZATION

Joint activity requires people to sort out their tasks and participate in certain ways. Some initiate action, some supervise it, some question its wisdom, some carry it out. Even a short-lived crowd may possess the rudiments of organization, as is shown when it decides on some action and proceeds to carry it out. A number of people brought together begin almost immediately to 'sort themselves out'. In industry, where men typically work together over an extended period of time, this persistent tendency to spontaneous organization is most important. Yet it may be so much taken for granted that it is overlooked or ignored. In particular it often escapes notice that spontaneous organization changes constantly.

Two consequences are apt to follow this neglect:

(i) Work is rationalized in ways which run counter to the spontaneous, informal organization. One instance of this, recorded in the study of change in Acorn Hosiery Company, was the strict separation of inter-dependent hosiery operations so that each was performed in a different department or group (p. 125).

A more extreme example is the rationalization of work on the basis that individuals are interchangeable irrespective of spontaneous or accustomed groupings. This is evident in such changeable

[1] Cf. Chapter I. *Studying Problems of Management.*

occupations as building and docks, where workmen have to move around, and is seen more generally with foremen and other members of the lower ranks of management.

(ii) The result of this neglect is social sickness. It may manifest itself in decreased efficiency, in absenteeism, labour turnover, strikes, accidents and, the evidence of medicine suggests, in various forms of physically inexplicable illnesses. The instance in the Acorn Hosiery Company just mentioned was particularly illustrative of this. Much acrimony and little co-operation resulted from the break-up of operations. It is a specially instructive instance because relations and work improved greatly when the operations were brought together (p. 125). Symptoms of social sickness are widely manifest in industry to-day.

Specialization by Function

An organization which is working well is subject to infinite variations and adaptations, far more than the calculated ingenuity of man could foresee or devise. They are essential to meeting the endless succession of new circumstances thrown up by physical conditions and daily events.

Examples are to be found in the colliery study. For instance, the training function—an obviously important one in mining—is theoretically focused in the colliery training officer. But it depends on a whole complex of relationships, so much so that effectiveness of training may well be most closely related to the quality of relationships in the colliery as a whole. The study described how the novice is trained largely through the continuous inculcation *by his mates* of certain attitudes, habits and skills. Training by them is supplemented by the work of the training officer in his official capacity; and his work, in turn, consists largely of two functions: (*a*) selecting experienced workmen who are qualified, first, by temperament and social skills and, second, by technical skills, to supervise the trainees, and (*b*) helping and measuring the progress of these teams of training supervisors and novices (p. 43).

The relationship between the training specialist and other personnel is essentially the same, however highly training is developed and systematized. In the two factory studies where training was a most explicit function, its success depended on co-operation between training specialists and other personnel. It is the same outside the workplace: from birth onwards people are educated and trained by

and through the complex of routine relationships with their fellowmen.

The crux of the problem of specialization by function is the conflict between the need for intermittent expert attention to highly technical problems, and the need for close continuous relations between people on the job. The dilemma was posed most clearly in the colliery. There the use of specialists was necessitated by technical advance, but the distances and difficulties of communication and transportation made it difficult and costly to have specialists at hand. The result was that specialists were unable to develop adequate routine relationships with the people on the job. According to this way of looking at the problem of specialization, the age-old dilemma between 'line' organization and 'staff' organization dissolves into a large variety of possible combinations. Different forms of organization have inherent weaknesses and strengths. But overriding all in importance is the quality of spontaneous relationships. When the quality is low, formal systems of organization do not appear to improve, and may worsen, the situation.

A fundamental process of working out forms of organization and determining who shall fill the rôles is in constant operation. A group naturally designates this member or that to specialize in meeting special needs.[1] In this way emerges 'a natural leader', a butt for practical jokes, an expert in dealing with other groups, a scapegoat. Does Smith seem to have a knack for helping to settle quarrels?—he soon becomes a regular specialist in the function. Does Jones show an uncanny capacity for getting the kinks out of stubborn machinery?—he is elected. Does Brown seem to set the pace?—he becomes the ringleader.

Selection is by trial, practice and later by habit. It operates when the group feels the need. When the need passes, when there are no quarrels to settle, no kinks to be removed, no time to be made up or opposition to be organized, Smith, Jones and Brown carry on their routine duties, just like everybody else.

In this manner specialization exists everywhere and has always existed. Every person is a specialist at one time or other, at one place or other, in technical leadership or in some other function. In small communities, as in some primitive societies, the same person can be a

[1] Mr. Chester I. Barnard has called this 'associational specialization'. Cf. *Functions of the Executive*, Cambridge, Massachusetts, Harvard University Press, and Oxford. University Press, 1947, pp. 131, 134, 137.

specialist in several most important functions as the occasion requires—now an elder, now a doctor, now a judge. Similarly, one group of people can resolve itself from time to time into a religious congregation, into a court of law, into a committee of policy, into a legislature. Specialization is thus not new: history is full of it.

What is new, and what sets the problem, is the degree to which specialization has become a matter of conscious, formal organization. Specialized religious, legal, educational, economic and industrial institutions have been developed. People are permanently designated as managers, workers, technical specialists, public relations officers. Whereas formerly specialization occurred spontaneously in the course of organization, there can now be detected a coherent specialist approach to the whole subject of organization.[1]

In practice the problem resolves itself into one of balance. The choice is not between specialist and non-specialist, but between a little more of one or of the other. It is unlikely that any manager believes that parts of an organization or of a problem can be separated into watertight departments, that formal designation alone determines authority, that devices alone can ensure adequate communication and control, that human affairs are essentially simple or can be directed by fiat, that established practice is entirely the result

[1] The specialist approach is fundamentally different from the spontaneous specialization—the integral* approach—which we have been describing. The specialist approach implies two lines of thought: (1) that a process can be broken up into components each of which is capable of separate treatment; and (2) that this division can be rigid. The fundamental contrast between this and the 'integral' approach may be shown most clearly by juxtaposing some tendencies in each approach as they could be labelled in their extreme forms:

	Specialist	*Integral*
Organization	by function	by evolution
Relationships	Rationalized possibly in conflict with informal	spontaneous, informal, complex
Specialization	by technical function	by situation, by associaton
Communication	by prescribed methods along prescribed lines; informal communications not recognized	formal and informal
'Facts'	situations — excluding feelings	situations, plus people's feelings about them
Analysis	symptoms as problems	step by step, treating symptoms as starting points
Policy	uniform, imposed	diverse, autonomous
Control	largely by device	largely by relationships
Authority	by designation from above	evolved

* Integral—'of or essential to a whole: complete, not fractional' (O.E.D.).

of policy, that people are motivated primarily by logic and that it is useful to treat the manifestations of a problem rather than the problem itself. But such are the tendencies and sometimes the clear goals of the specialist approach.

Specialization itself is not necessarily a source of difficulty. What sets the problem is the way in which it is attained and its degree. It is not particularly vivid or forceful when posed in this fashion. But the results of unbalance can often be seen clearly enough, and management's task can be defined in relation to this conception of organization.

Organizationally, management is concerned with facilitating spontaneous processes—not with displacing them—and helping them adapt to changing requirements. The study of the Acorn Hosiery Company contained several instances of how this was done successfully; for example, how higher management was strengthened to cope with new problems (pp. 138-142).

Size and Community

Size of organization is only one factor among many which determine whether spontaneous processes are fostered and adapted or hindered. For two reasons it is lifted out here for attention: first, because it is in the forefront of discussion, usually under the subject of 'optimum size'; and secondly, because it emphasizes the relationship between an industrial organization and its social environment.

The three studies bear out previous experience in suggesting that there is no such thing as *an* optimum size—or at least that, within fairly broad limits, size itself is a minor factor. Altogether about 1,400 men were employed at the colliery. The Minetown factory employed thirty girls, but several hundred were employed at the organization's main factory over 100 miles away. Acorn Hosiery employed nearly 4,000 people, 3,000 at the main factory, the rest in three widely dispersed branch factories. There were no signs that any would have been more effective and efficient if it had been of a different size.

The optimum may vary not merely between different industries, as is often implied, but between the different functions of one organization. The problem then resolves itself into that of finding a size which will best meet different functional requirements—a compromise. But for many purposes the problem need not and often does not arise. Many functions are best organized to cover only part of the organization taken as a legal unit, and others are dealt with

on a wider basis than even the whole organization. Of the latter the connection between the workplace and its immediate social environment is a most important example. In a very important sense the surrounding community is a part of the organization. This emerges clearly in the Minetown study.

The problem of size is perhaps best looked at again in terms of specialization. Optimum for what? Units of different sizes may be most useful for purchasing materials, for working them, for selling the products, for financing the operations, for maintaining satisfactory relations with the social environment.

The only general figure which can be laid down with some precision is the size of the basic working group. The number of people who work closely together and grow into a single group with their own attitudes, customs, norms and organization seems usually to be under twelve; the size of the Army section, and of the average chargehand's group, are probably based on this fact. A larger number of people will tend to form into more than one group. Groups of this size can be seen throughout any organization, forming something like a hierarchical pattern. At managerial levels, this concept of small groups is behind much of the discussion of managerial spans of control.

The next most precise concept consists already of two major variables. It concerns the hierarchical pattern itself; should it tend to be a high pyramid on a small base and a narrow apex, with many levels of management; or a low pyramid with few, say two or three, levels of management? The two major variables are (1) the number of working groups of which the organization is composed, and (2) the level at which important decisions are taken. The Acorn study provided a striking example of an enterprise employing several thousand workers broken down for most purposes into departments with a very high degree of autonomy (pp. 119–20). Or, to put it in another way, the most useful size for purposes of production and most connected activities was the department which was expected to make its own way financially and would draw on common services like technical advice, special training facilities, and building, much as a small firm would draw on outside assistance.

This study showed also how changing circumstances outside the firm caused it to vary the services common to several departments. For instance, yarn purchases were centralized when yarn became difficult and expensive to procure; which is another way of saying

that the size considered by the firm as optimum for the purchase of yarn had changed, and was greater in the new conditions of scarcity than formerly. The process would be reversed in order to increase flexibility. For instance, when the firm experimented with unit production it chose one group of workers and attempted to shield it from as much outside interference as possible. In other words, for the purpose of the experiment the optimum size was small. Finally, the study also contains instances of the size of autonomous units varying with the capacities of the leadership. Thus some managers were in charge of two departments, others of only a small one.

Taken together, the groups of workmen and managers in an organization compose larger units of different sizes for different purposes. These units need not even be, and often are not, within an organization as legally defined. Some functions such as sales and research are sometimes organized as subsidiary companies; holding companies are separate legal entities dealing with the major financial aspects of groups of otherwise autonomous organizations. For many most important functions quite distinct organizations club together to form associations, many voluntary, covering parts of or whole industries. Thus for negotiating with Whitehall there are trade associations, for negotiating with trade unions, employers' federations. Essentially these are all organizations, and their different sizes are related to different functions and conditions.

If discussion of optimum size is confined to individual mines, factories, shops, offices, it is possible to indicate a little more clearly some of the major factors involved. Two factors internal to the organization we have already noted: the size of the working group or span of control, and the height of the hierarchical structure in relation to its base. It has been suggested accordingly that about 500 is the maximum number of people to be employed in a largely autonomous unit. We have seen that the latter factor is largely bound up with the levels at which important decisions are made. Two facts are certainly suggestive: First, that many firms have encountered difficulties when, as for instance, during the war, they had to expand rapidly beyond this figure. Different forms of management seemed to be required in larger organizations. In particular, detailed personal control from the top alone seemed no longer adequate. The second fact may help to throw light on the first: the colliery which we studied (and other collieries of like size) employed 1,400 men in very difficult conditions, yet it was managed by very few officials headed

by a manager with very few technical aids. The comparison suggests that it is not so much the forms as the methods of management that matter. If responsibility is diffused throughout the organization and the relationship between officials is strong and flexible, the optimum size of an industrial unit may be considerably greater than if these conditions do not obtain.

An external factor of great importance is the relationship between the organization and its immediate social environment. This is not an optional consideration. What may be called the 'culture' of the environment is brought into the organization by all who work there, and largely influences their attitudes, habits, standards, and participation at work; and, conversely, the organization plays an important part in shaping the local culture. The balance between a factory and its environment is likely to be upset when it is 'too big'.

Two of our studies, one in particular have focused special attention on the importance of close relations between the organization and its immediate social environment. At Minetown the success or failure of the incoming factory depended to a great extent on this. Only through consultation and agreement with the community at every turn, was it possible to find a suitable site for the factory, to attract workers and to achieve a spirit among them which resulted in remarkable efficiency of training and productivity. In the prevailing conditions it was even possible to make girls who jointly pursued leisure-time activities working groups in the factory. Similarly in the study of Burncoal Colliery we noted how the manager, for instance, took part as a matter of policy in community affairs. This not merely helped to offset his physical isolation at the colliery. It provided him also with opportunities for that less formal and more intimate contact with his subordinates which he felt to be inappropriate at work. The manager was conscious of the value of this. There were several instances in the study also to show how the work of the lower officials benefited from contact outside working hours with people who were their subordinates at work. All engaged at the pit relied on the community to provide some security—not least emotional security—against the vicissitudes of mining.

It is probably only when an important social institution like a mine or factory is closely bound up—integrated—with a place that it is proper to talk about a community; for a community should be a well-balanced, coherent social unit in which people work as well as play and live. This has tended to be ignored so completely that the

disintegration of an increasing number of communities has aroused little, or the wrong kind of, notice. The problem is not that the balance has been disturbed—that is the essence of all change—but that no new balance has been achieved and often just could not be achieved. It cannot be achieved in a dormitory suburb. It is not achieved in the country districts which the young folk leave for the town because there is a lack of industry and other facilities. It is also not achieved if the industrial organization plays an unduly large part in the affairs of the place—for instance, if it is so large that the locality largely depends on it—or if it is not sufficiently autonomous, if important decisions are taken elsewhere which conflict with the ways of the locality or at least fail to enlist community participation. As an attempt to promote real dispersal of small autonomous units in small communities as an alternative to continued concentration in industrial centres, Minetown represents a promising trend.

2. COMMUNICATION

The mere fact that people work in the same organization—or happen to live in the same row of houses or block of flats—even side by side, does not indicate whether or not they understand each other on vital issues, whether or not they communicate. In other words, understanding precedes agreement or disagreement; it is the essential preliminary to either. Without communication no joint action is possible. If working groups are the bricks of which an organization is built, communication is the cement which holds them together.

The Will to Communicate

The studies suggest that the crucial factor which determines whether there is or is not to be communication—whatever its form or content—is the sustained and clearly manifest willingness on the part of a manager to communicate: to be sensitive to others and to satisfy other people's wishes to learn of his ways and views. We use the word 'sensitive' advisedly. Listening to what people say, or reading their descriptions of events or statements of their views, are but two of the many methods of communication. Others are most important. They are obviously to the fore, for instance, when a contact has yet to be established. In setting up the factory in Minetown, continuous adjustments were made in methods of management to take account, for instance, of local customs (e.g. pp. 112–3). These the in-

habitants either took for granted or were reluctant to talk about to outsiders. So that management learned largely by watching what people did. In other words, people communicated by behaviour rather than speech. The complexity of the matter is well brought home by the phrase 'having the feel' of a situation.

Many dilemmas bar the way to unreserved willingness to communicate. The colliery study indicated some of the most important. For instance, there is the choice between, on the one hand, getting information direct by bypassing intervening ranks of authority and, on the other, expecting it to be reported by junior officials. The former way may sometimes be quicker. But it may detract from the junior's sense of responsibility and from his standing with his colleagues and subordinates. In the colliery, where the problem was especially clear, the solution consisted largely in dependence on junior officials, supplemented by some direct contact between pit manager and workmen. The numerous cases of difficulty encountered by 'one man' businesses when they expand to a size requiring multiple control bear out the wisdom of this choice.

Another dilemma concerns more closely the matter which people are willing or unwilling to communicate. More specifically, it is the very human reluctance to state facts that are known to be particularly unpleasant to the listener, for instance, when he is a superior. And the superior, when faced with unsettling, worrying, or threatening news, finds it difficult to accept the news objectively, with full appreciation of the very important fact that he is in effective communication. The result of failure in this respect is the delay and 'soft pedalling' of bad news. For instance, junior officials may take account of their superior's hopes, fears, and weaknesses, as they know them, in deciding how much he 'needs' to know and how to break it to him most gently.

Such dilemmas are very real. For instance, Jones reports an error on his part. Is he to be held accountable for the error, when he might have disguised it? Or if a manager has a particular desire to reduce overhead costs, would he be surprised to find certain borderline costs henceforth allocated to direct expenses? If he expects this, should he then institute an intelligence service at a cost which includes, for a considerable time at least, bitterness, and back-biting and which may lead to more subtle and laborious methods of disguising or hiding painful information?

These dilemmas have to be resolved in the particular complex

situation. But the principle on which they will be resolved is clear enough. It usually goes under the name of 'mutual confidence'; and it is built by dealing with 'bad news' in participation with the closely involved junior officer in such an objective and constructive manner that the junior finds it neither frightening nor pointless to continue communicating the facts. And very considerable benefits arise from the process of listening as an aid to the other person in sorting out particularly difficult problems.

The studies contain several examples of how readiness to communicate is built up and maintained in practice. One may be briefly reiterated here. In Minetown, much suspicion and open or implied hostility was encountered at the beginning of the project. But at no time did those in charge show reciprocal hostility or insecurity. They continued to try to make it clear that they understood that doubts and difficulties were bound to arise in the establishment of a new social institution and that they were anxious to be guided on how these could be best overcome. This itself allayed many suspicions in time. Others were communicated openly and dealt with as they arose.

Communication and Organization

There is a real danger that the intricate and dynamic quality of effective communication will be lost in laying down 'lines of communication'. The formal lines can usefully strengthen and supplement 'natural' communication, if carefully worked out. The problem is, again, to see that formal arrangements do not conflict with informal to the detriment of both.

There is conflict and waste, for instance, if Jones carries the title for work which Smith does in reality, and Jones receives letters, memoranda and notices essential to the work. Such discrepancy between the formal and the informal, actual, structure, absurd as it sounds, is in our observation not at all unusual. To the extent that such a discrepancy obtains, the formal system of communication is likely to be full of blind alleys, side tracks, and garden paths, and to transmit much insignificant matter along with red herrings and other false scents—to put it strongly for the sake of clarity. This position arises frequently when organizations grow rapidly and to very large size.

The informal channels continue to function. To some extent communication will go on effectively—though not as efficiently—

and go on in spite of the formal channels. Smith, for instance, will probably get his information somehow, possibly from Jones himself. There is likely to be some resentment, at least at organizational inefficiency, and this resentment will be communicated via the informal channels. Rumours spread in the same way. This may explain the phenomenon frequently noted and regretted by management, that a formal channel, like a joint committee, is used to unburden nothing but grievances and rumours. It is useful to think first of this fact as indicating that effective communication is lacking; the important question is not whether a rumour is true but rather, why did it arise?

Similar effects follow if formal communication, for instance, through elaborate joint consultation machinery, is excessively stressed. We have noted that only a part of communication can be formalized—not chats in corridors or over machines or lunch-tables or after working hours. These most important facilities are missed if excessive attention is focused on minutes, written statements and regular meetings. Reliance on formal methods may also have the effect of belittling the importance of informal communication. This has been the result sometimes of the vogue of formal 'joint consultation'.

The colliery showed particularly clearly the variety of channels and means by which people in the colliery kept in touch with each other and with the situation outside. Some channels and means of communication were formalized, some successfully, some less successfully. Some statistical records, for instance, which would be accepted as routine communication in many other organizations, were not yet well-integrated parts of the total communication system in mining. It is conceivable that, within the coal industry, some channels and sources of communication useful in some collieries would not be useful in others. Joint consultation in the Minetown factory provided a good example of a means of communication formalized and not formalized, according to need at the different stages of development of the organization. There were signs that formalizing joint consultation at the Acorn Hosiery Company could profitably have come a little earlier; but if error there was, it was almost certainly on the right side.

To summarize, an effective system of communication lacks clarity, symmetry and simplicity. The pattern is complex and dynamic. Important lines of communication rarely get on to paper and seldom is

there any concern to see them on paper. There may be an organization chart, but the manager is aware, consciously or intuitively, that it is an abstraction of the real thing, something to give a 'rough idea' to the visitor. The bush telegraph is an essential part of the system. The heads of 'pipelines' are its focal points. A large proportion of communications is calculated to train individuals—in the broad sense of the word—rather than to direct particular actions. Of this, more in the following section.

3. CONTROL

Of the three aspects singled out for special attention—organization, communication, control—it is control which probably most needs fresh thought. What is control? Often control seems to be the name given to that part of communication which is rather resented, because it implies a lack of trust, or because it demands expenditure of time and effort. Certain it is that in modern industrial society control has become distinct from communication in men's minds, and is associated with authority and leadership. Hence its separate examination here.

Control and Communication

Effective communication, as we have seen, is inseparably bound up with sound relationships: it is their dynamic aspect. Communication makes joint action possible. Of its many forms, imitation of others is probably the most important. Effective communication depends heavily on what has been called 'the contagion of example'. For instance, a manager can be aware of the educational content of his contacts and realize that, for better or worse, it is a most important, possibly the most important, educative element in the organization. Here the word 'controlling' might be substituted for 'educative' in the phrase 'educative element'.

If there is a distinction between a communication which is a control and one that is not, it is exceedingly hazy. Where the distinction has been regarded as hard and fast, it has had unfortunate effects. Two may be mentioned here. First, many devices of control have unforeseen and unwanted effects: for they communicate unintended attitudes and warnings that frighten or insult. A recent American study of supervision has shown, for instance, that the fore-

men of the groups with lowest outputs spent far more time exhorting their subordinates than did the foremen of more productive groups engaged on the same jobs in the same organization. In a relationship lacking mutual confidence, a control that is meant to communicate 'Let us keep costs down for the good of the whole organization,' may be interpreted as, 'We don't trust your intelligence or your spirit.'

A control device inappropriate to the relationships involved is apt to induce people to conform to the letter but not the spirit and to alter their behaviour in uncontrolled directions. This leads to a second effect: their subsequent behaviour may then be misinterpreted. For instance, workers' complaints about industrial canteens, or about wages, are often particular expressions of general grievances. The grievance remains and continues to be voiced in an uncontrolled sector of the organization no matter what is done to improve the canteen or the wages. The grievance is displaced, and the symptom misread. The shadow is mistaken for the substance.

The Authority of the Situation

Our studies throw some light on the effective use of control devices. For instance, exhortation was effective when (*a*) relations between exporter and exported were based on trust and (*b*) the circumstances clearly called for special efforts. The colliery study contained examples where these conditions obtained. For instance, in the informal hierarchy of mineworkers, the faceworkers, the actual coal-getters, stand highest. (Significantly, they only are the colliers of old.) An appeal or rule gained much weight in the eyes of the other workers when it had the faceworkers' approval. In the same way some of the newer positions in mining, e.g. some of the specialists', carried less authority, than established officials. For instance, the training officer encountered more difficulty than the undermanager or oversman in enforcing orders. These differences are further modified by personalities.

With safety such an outstanding factor, circumstances often dictated action in the colliery. If the manager asked his officials to get some large job done—e.g. heightening the roof of a roadway over the week-end—he felt obliged, and rightly so, to explain the reasons why this was necessary; and it was not unusual for some discussion of pros and cons to follow the explanation. If however. the height-

ening of the roadway was required by a new safety regulation, explanation and discussion were usually unnecessary; so much authority attached to safety regulations that they were less likely to be questioned.

Group Norms

We have been hovering on the brink of noting an obvious fact—one of those which are often ignored. It is that generally accepted practice is a key to individual behaviour. Traditions and customs are for a working group what habits are for an individual. They also make living with one's conscience possible. A large part of behaviour is automatic or almost automatic, much of it never reaching consciousness, leaving attention free to focus on novel situations. Habits and customs make it possible to forecast behaviour and to influence it. It could thus be foreseen, for instance, that miners, long accustomed to having advice only from line officials or from their mates, would be slow to take advice from technical specialists however well qualified. The first question which determines behaviour, then, is, what is the usual, the accepted, the 'done thing'?

The widely discussed problem of absenteeism may serve to emphasize the force of this. Many studies have been made of absenteeism. Some enable us to compare the records of similar working groups. Three things stand out: (1) that absenteeism varies widely and persistently between groups working and living under similar physical conditions; (2) that many of these differences can be accounted for only in terms of variations in the desire to be at work; and (3) that the strength of this desire in the individual is determined largely by the general practice of his own working group. Other studies indicate that this applies to behaviour generally and to managers as well as workers.

Group approval or disapproval is probably the strongest factor in control. From this point of view management's job can be defined as helping to make the factory a part of the community's way of life. In the Minetown factory there were interesting examples of this, of both positive and negative control. On the positive side, it became the 'accepted thing' for the employees to work full hours regularly and to try and make up after hours for any hold-up during the day. Ostracism by the groups could reach extreme forms; when one trainee failed consistently and seemingly without justification to reach her target, her fellow-workers recommended that she should

be sacked, and management shielded her at least for a time. It is well known that offences against the accepted norms and customs and against dominant group feelings and social relationships are long remembered. In the London Docks, for instance, people who went to work during the 1912 strike are even now remembered as '1912'ers'.

Group standards of behaviour among supervisors and managers are equally important. Group pressures may make it almost impossible for a manager to adopt new attitudes and methods in his relationships with his workers. This was found to be so, for instance, in a study of the Detroit motor-car industry,[1] where bitter feelings between 'employers' and 'workers' were prolonged on both sides by fear of ostracism for adopting more tolerant views. It is a common enough and important enough phenomenon to have captured the attention of some of the best novelists—for instance, Sinclair Lewis in *Babbit* and *Main Street*. But it is often ignored in the preoccupation with attractive logics of control devices, even when they run directly counter to established behaviour. The problem of altering established patterns of behaviour is the subject of the next chapter.

Permissive versus Restrictive Control

The implications of thinking in terms of raising group standards (or, more precisely, of getting groups to raise their own standards) are profound. Though they need to be further examined, study to date leaves little room for doubt as to their potentialities. The effective solution to problems of individual behaviour seems to lie in attention to group attitudes. And, our studies suggest, effective control of group attitudes is biased towards spontaneity and freedom rather than towards regulation and uniformity. In other words it is permissive rather than restrictive.

Permissive control—which states the broad objective and permits groups to approach it by their own methods—has the great virtue of releasing to the full the self-regulative forces of an organization, the tendencies people seem to have of getting on with each other and of co-operation in a task they can comprehend, which find expression in innumerable ways and through innumerable channels. Restrictive control, by restricting the method of approach in addition to defining

[1] Scott, J. F. and Homans, G. C., 'Reflections on the Wild Cat Strikes', *American Sociological Review*.

the objective, runs the risk of failing to enlist these spontaneous self-regulative forces. With this we have turned full circle: we are back to the problems which concerned us in the section on organization.

Before passing on to a study of the dynamic interaction of the aspects of management we have examined in this chapter, it may be well to sum up briefly by posing a dilemma more succinctly than it was possible to pose it earlier, and to indicate how it may be resolved.

Rigid organization and procedure inevitably give rise to dilemmas. For instance, an imposed rule requires enforcement if it is to have any meaning; enforcement raises the problem of exceptions, each exception granted undermining the authority of the rule and, by implication, the authority of its framers; yet the infinite variety of situations in industry inevitably presents exceptional cases. If 'the rules' are altered to permissive rules the dilemma may be avoided. The authority of the situation takes on real force. The autonomy of groups is emphasized; more general controls are instituted as and when the groups recognize their need. Management is concerned with fostering this understanding. In this atmosphere the self-regulative forces can grow and acquire flexibility of priceless value. The Acorn Study showed this process in action in the relationship between higher executives and middle management. The response to the experiment varied from cautious acceptance to open hostility. But the backing of the directors, combined with safeguarding the autonomy of the departments, enabled the new speciality to find its way slowly to one department after another and to link up with numerous activities, until it now permeates most of the organization. What is apt to happen when these attitudes and facilities do not exist was shown clearly by an example from a crucial stage of the war when the Germans came into possession of a substantial quantity of very useful information about forthcoming movements of Allied troops. Immediate action on this information would have gained much for them; but it went up through channels and arrived at the top too late to be acted on. Junior officers trained and encouraged to discriminate between situations would have acted in time. There undoubtedly are times of crisis for the entire organization when it is fitting and necessary that authority be exercised from the centre; this authority is granted. Without doubt it is always healthier and more efficient if, in day-to-day affairs, authority resides

at the periphery, in the hands of those who are locally responsible. '*The fine art of executive decision consists in not deciding questions that are not now pertinent, in not deciding prematurely, in not making decisions that cannot be made effective, and in not making decisions that others should make.*'[1]

[1] Chester I. Barnard, op. cit., p. 194 (italics his).

CHAPTER VI

THE MEANS OF CONTINUED ADAPTATION

ORGANIZATION, communication and control were the three aspects of management which were abstracted from the case studies for special examination. As a result of this division it was possible, in the last chapter, to define more closely the nature of the three aspects, inherent problems and possible solutions. This purpose served, we now return to management as a complex continuing activity. We want particularly to examine its dynamic quality, the processes by which it changes in a changing environment.

Adaptation is the essence of continued life. Life implies growth, that is, progressive adaptation to new challenge. What is new is the great speed of change in the environment of each individual and each organization. Specialization and expansion are important ways in which we have sought to meet the problem.

This distinction between the process of adaptation and its forms is important and worth a moment's attention. Industry has evolved many means in its persistent attempts to come to terms with, and shape, its environment. Specialization and expansion are two of them. That they are but forms and not the essence of adaptation can be seen from the fact that other means have been used at other times, and also from the manifest success of specialization and large size as forms of adaptation in some cases and their equally manifest failure in others. In the Acorn Hosiery Company specialized training was the successful means of adapting to greatly and rapidly changing circumstances. Nor is great size inherently inflexible: the same Company, the first to adapt to post-war circumstances, was one of the largest in the trade. Again, during the war many small and medium-sized firms found it exceedingly painful to expand and in some cases impossible: whereas the expansion and technical accomplishment of many large firms, for instance, in the aircraft industry, will remain astounding examples of adaptation. But the opposite is not true either: specialization and large size are not inherently flexible.

They are in themselves neither flexible nor inflexible, only forms. The thing to concentrate on therefore is the process of adaptation, not the form. If the process is sound, the result will be sound. If the process is faulty, then there will also, in all probability, be faulty adaptation.

This chapter is devoted to a study of the processes of adaptation. This seems a particularly important subject in view of the many examples of faulty adaptation and of the exceptionally rapid technical, economic and social change to which organizations nowadays need to adapt. We shall again divide our subject so that we can study the parts more closely. We shall talk in terms of a single cycle of change, even though a large change consists of a series of small changes each with its own cycle, and even though adaptation is in reality a continuous series of overlapping cycles. This one cycle we shall divide into four phases, each phase to be discussed in turn. These phases will be called:

1. Disposition for Change.
2. Process of Change.
3. Evaluation of Change.
4. Forecasting and Preparation for Further Change.

1. DISPOSITION FOR CHANGE

T. N. Whitehead has described particularly well how change comes about in the slow course of habitual events, using as his example a skilled mechanic who is also something of a social leader amongst his fellows. A passage is worth quoting at length: 'Such a man has by long application acquired an unusual skill in his art. He is also in possession of a traditional set of methods, or sequences of operations, with which he tackles his technical problems. Perhaps the outstanding characteristic of the mechanic-leader is his intense pride in and unswerving loyalty to the detailed procedure by which he exercises his skill. Any attempt on the part of his "boss" to modify these by one hair's breadth will evoke the most unmeasured anger. It is as though a brutal assault had been made on his household gods. And that is exactly what it amounts to. The simple leader is above all things loyal to his skill and to its accompanying procedures . . . these *are* his way of life, and on them his ultimate values are grounded.

'But a sympathetic study of a skilled worker over a sufficient period will reveal an apparently erratic streak in his behaviour. Sooner or later in his work, our friend will surmount some particular difficulty by an elegant device, and he will explain with pride that "in his young days" they were taught to do such and such, but that he had subsequently "thought of" the procedure just demonstrated. No loyalty is shown towards the discarded traditional procedure, and his common sense would be outraged at the bare suggestion that any value could adhere to the inferior method. In all these respects, he would be followed without question by his group.

'The fact is that our mechanic, for once in his life, is thinking for himself. . . . Up to that moment he was possessed of an implicit skill in action—a practical wisdom below the level of speech. But in the continual practice of his art, he was learning to notice the connection, the causal relations, between the various operations involved. He began to understand the reasons why, and to be able to give a few logical explanations for some of his actions. . . .'[1]

Adaptation thus goes on continuously as a slow natural process. Considering the speed and complexity of present-day change, the question then becomes: can this process be stimulated, and, if so, how? Another example, a hypothetical one, may epitomize the problem: with the background of collieries and colliery managers provided by the Burncoal study, let us assume that the higher officers of the National Coal Board wish to modernize selection methods at the collieries. As things are, many colliery managers use a rough, quick and ready method of interviewing applicants for work. It depends heavily on intuition, particularly on an intuitive knowledge of the kind of person who can be expected to fit into the social structure of the particular pit. If asked to explain why he turned down an applicant after an interview of five minutes, the manager may say that the chap 'wouldn't fit in' or 'could not be depended on'. Higher officials may feel that with the rapid technical, economic and social changes at the pit, and in the country generally, the manager's intuition is no longer wholly reliable.

Two procedures are immediately to hand. First, a functional specialist could be appointed to take over the task of selecting miners. Alternatively, attempts may be made to 'educate' the man-

[1] *Leadership in a Free Society*, Cambridge, Massachusetts, Harvard University Press, and Oxford, University Press, pp. 70-71.

ager. Neither is promising. Given the traditions and sentiments in the coal industry, in particular the manager's feeling that the leadership function cannot be separated from the personnel function, the introduction of specialist selection officers at the colliery would create considerable friction. It is possible, for instance, that the manager would often disagree with the selection officer's choice; yet he would continue to be largely responsible for the kind of working environment into which the newly engaged miner must fit.

'Educating', in the sense of instructing the manager in systematic selection procedure, would probably be at least as difficult. In all his activities, the manager is usually convinced of one thing above all else, namely, of his knowledge of his men and of the kind of man he wants to employ. Many good managers would deeply resent being 'educated' in the task of selection. Moreover, education alone has little chance of altering long-established habits of action closely tied up with many other routines.

Thus both procedures—introducing a functional specialist and educating the manager—would immediately run up against resistance, with deleterious effects on the change and probably also on other aspects of the organization. This is quite different from what occurred in the earlier example concerning the skilled craftsman. The colliery manager's response was rigid, the craftsman's flexible. This difference is the crux of this section on the disposition for change. What makes for a rigid and what for a flexible response to the need to adapt?

The first difference between the case of the craftsman and the case of the manager is that the craftsman recognized the need to change; the manager did not. It was only brought to his notice by higher officers proposing solutions for it. The manager's response is in line with that found in an increasing number of studies: when people do not participate *in the recognition of the need* for change, they resist it; indeed the suggestion of change may seem to them to be an implied criticism of their capacities. Participation is inadequate if it starts only after the decision has been reached that change is necessary. Where there has been no prior discussion, much more time is often spent in getting a change then accepted than would have been spent in facilitating participation from the very first.

Another reason for immediate participation is that the implications and ramifications of change need to be worked out and assessed as the change goes on. Only rarely can they be specified in detail in

advance. The experience of changing over to mechanized methods and the longwall face in coal mining illustrated this clearly. Men were reorganized into larger groups with quite unexpected effects: interest and keenness waned as the novelty of change wore off, skills were disrupted and went uncompensated, the status of the coal-getter was lowered, and this communicated itself to the other workers in the mine and in the community. In the study of change in the Acorn Hosiery Company we traced some of the ramifications of the introduction of systematic quality control and training into the fields of machine maintenance, operational research, working conditions, selection of new workers, methods and organization of supervisors, and so on. In that factory, as in Minetown, the problem was met by continuous and habitual participation. All three studies are in effect detailed illustrations of this very point.

The second of the factors which determine whether the response to the need to change is rigid or flexible is the assessment, by those involved, of the effects of change. Upsetting change always is: routines are broken, new habits have to be acquired. The results expected of change must be attractive enough to outweigh these troubles. Where this is not the case the response is rigid. Indeed, people may be so frightened of relinquishing any of their relationships and habits that they may not be able even to contemplate the potentialities of change and may quite genuinely fail to perceive the need for it. This is likely to be the case where the social fabric has been greatly and rapidly impaired, as happened, for instance, in the London docks and dock communities during and since the war. Dock workers seem to be intent on clinging desperately to whatever threads remain of the life with which they are familiar. In such an extreme case the connection between people's assessment of the effects of change and their recognition of the need for change is obviously very close. Put positively, a feeling of security is necessary to dispose people to change.

There are instances on all sides of resistance to technical and administrative changes which are themselves eminently reasonable and desirable; they illustrate the importance of the social cost of change. The cost has been so great in many people's experience that they and their colleagues and children tend to look askance at further instalments. The mine-manager in the hypothetical example given on pp. 168–9, may be inclined to regard the promotion of systematic selection as yet another of a long line of threats to his status

and accepted ways of behaviour, and he may resist it for that reason. The change to the longwall method of mining provides a clear instance of a change accepted at first, entailing unexpected social costs, and hence raising resistance to further change of all kinds. Machine-minding at the longwall face did something more than lower the coal-getter's status: it splintered and reassembled groups of miners without reference to the interrelation of their task and their spontaneous and long-standing relationships. With the old social structure destroyed and not satisfactorily replaced, the miners were determined to defend what was left, namely their skills and their broad hierarchies of status. Where, as in coal mining, physical conditions are constantly and unpredictably changing and are relatively incapable of improvement, miners—and managers—may find almost all their security in the certainty that the social structure they know will continue and in the foreknowledge of personal environment which the structure provides. This, as it were, offsets the unpredictability of the physical environment.

If such highly important sources of security are not threatened, there may be a remarkable willingness to try changes in techniques. The experience with introducing longwall mining is in line with this: the miners who so soon came to resist mechanization had at first adapted to it. It was only later, when they found that an effect of the change to the mechanized longwall had been to destroy or splinter their spontaneous groupings, that they began to resist.

It is possible to proceed from this to a conclusion of wide implications. If a working group have come, by unpleasant and unexpected experience, to find that technical change destroys their spontaneous organization, they will be inclined to resist further change. They may fasten their resistance to traditional skills, and this will then be the issue on which the battle is fought. Sometimes, as when security depends largely on highly specialized skills carrying high social status, the skills may be resolutely, even fanatically, defended—as witness the forlorn fight of the handloom weavers in the nineteenth century against mechanization.

But in neither case is the perpetuation of skills the real issue. The real issue is the maintenance of the group's social fabric and of its standing in the larger community, 'Skills' and 'wages' may be the terms in which the matter will be fought, because they are a 'concrete' language and because the aggrieved deduce, from bitter experience, a correlation between loss of skills and the splintering of

their organization: therefore, 'We will not see our skills displaced.'

The opposite may also obtain. There may never have been any certainty in the social aspect of the job: supervision, continuity of working groups and methods of management may always have been unstable and uncertain. In such case, technical skill may provide the only part of the work situation in which the individuals can create certainty. If this is the situation, then skills will again be the focus of resistance to change. But, also again, the basis of the trouble is not the need for technical certainty but for social certainty.

Finally, there are instances where a group has always been isolated and, like any group ignorant of other groups, is suspicious or hostile towards outsiders. (This is the typical problem in introducing new methods to primitive societies, for instance.) Yet once again the evidence from careful examination of particular cases is that it is the social organization and not the skills that are feared for. The successful colonist has now learnt to respect local social organization and to work through it. The initial hostility and vague suspicion then dissipate; and the community gains the advantages of new skills and new industries without bitterness and strife.

In fact, there is no convincing evidence that the exercise of a particular skill is a basic necessity to human life (although it may become very important), whereas there is convincing evidence that a sense of function and belonging in a group is essential. This is recognized in the traditional ultimate in severe punishment—short, perhaps, of physical cruelty—which is to place a man in solitary confinement or to subject him to ridicule, not to force him to change his work. Where, as in Minetown, people's fingers have not been burnt, the skilful introduction of new industry, carefully integrated with the existing social structure, may—we have shown—achieve astonishing success.

The usual present-day context of change includes a large legacy of mistakes from the past. Social organization has been largely neglected in the surge of technical development. Many working groups are now organized around defending what remains of their customary relationships and practices. The observations in the Bank Wiring Room of the Hawthorne experiments illustrated in detail the forms that this defensiveness takes. It is as though a rigid defence had become an automatic reaction to the very approach of management and technical specialists. Difficult as it may be to modify such

an automatic reaction once it has become established, when it *is* overcome great results are possible, as in the Acorn Hosiery Company.

We have gone into detail in this matter of resistance to change because it is important and complicated. One overriding consideration is common to all the situations which we have mentioned: it is that, although adaptability is normal and rigidity abnormal, a man requires a balance of security in his relationships with others if he is to remain adaptable. Without the roots of security, he cannot, so to speak, afford to be flexible in other matters, much as he cannot afford to take a 'header' on the Exchange until he has assured financial security for his family. This becomes a paramount consideration for the industrial manager in a mobile, comparatively rootless society, where people have to look to the workplace for a stability that they once found in the community. And it suggests that the social function of a factory is essential to its economic function.

The 'balance of security' and consequent disposition favourable to change can be deliberately strengthened. For instance, spontaneous organization may be respected and confirmed by having informal leaders participate in fathoming the need for change and its implication, and in relying on them to carry their groups with them. Whitehead's craftsman leader (whom we described a few pages back) was able to change his working methods because his social position was secure and thereby strengthened. A co-operative response from coal-getters usually carries with it the co-operation of the other colliery workers. At Minetown the successful approach to the community was made through the club leader, the parson, the solicitor, and other community leaders—such people as are sometimes aptly called 'social gatekeepers'. To enlist their co-operation serves at least two positive purposes and one negative one. It reflects recognition of the social structure and makes the group's social environment secure. It gives standing to the proposal for change and makes likely its general acceptance. Its negative purpose is to avoid opposition by the 'gatekeepers', which in itself could inhibit change.

The balance of security and flexibility is strengthened also by clear readiness on the part of higher officials to discuss difficulties at all stages and in all ramifications and to help minimize the disturbance. An immediate superior can be a most important source of security. Indirectly, he assures the group of its importance and inviolability—for instance, by acting as a shield against possible

'threats' often inferred in the intermittent attention of functional specialists.[1] Also he has daily routine opportunities for enlisting the continued participation of the group, and for acting as a receptor of residual feelings of insecurity. The study of the Acorn Hosiery Company contained instances of these functions successfully carried out and most conducive to profound and rapid change: the opportunities for joint discussion and decisions: the respect throughout for departmental autonomy; the uneven tempo of change in different parts of the firm; the patient consistency with which higher officials, in face of severe testing of their sincerity, held to permissive methods of management.

The alternative is clear from many instances. In the absence of an acceptable balance of security and flexibility, logical argument based on 'concrete' facts fails to convince those affected of the need and benefits of change. Instead it may shift the discussion to an irrelevant level and lead to purely tactical demands on one side or the other. The most concrete and indisputable economic, accounting and engineering facts, such as the distance between two places, are disputed hotly. On large issues experts may be engaged to argue about such facts. Three results may follow: first, the change may not come about and the proposal may have merely created bad feelings. Secondly, the change may be imposed and get out of hand, and have unexpected and undesirable results. Thirdly, a vicious circle may be started in which people chase security as an objective. For instance, the mine-workers may have recently succeeded in momentarily increasing their own security at the cost of greater insecurity for mine management and the organization as a whole; which is one way of saying that increased security brought about in this way is, from the point of view of the organization as a whole, largely illusory. What is required for a disposition favourable to change is security in the process of change—confidence that the change is necessary, and that the change and the methods by which it is carried out are really beneficial.

[1] For a good example of this see: *Teamwork and Labour Turnover in the Southern California Aircraft Industry*, Boston, Massachusetts, Harvard Graduate School of Business Administration, 1944.

2. THE PROCESS OF CHANGE

The main characteristics of the process of change follow naturally on the preparation for it, which we discussed in the last section. The first important fact is that the people involved agree that the change should take place, which itself is a very considerable accomplishment. They recognize that it will involve some difficulties and trouble. Sometimes they confirm this by setting aside deliberately some resources, such as man-hours and materials, with which the change is to be started. For instance, setting up a training department was part of the special effort the Acorn Hosiery Company made to overcome the shortage of workers. This was an unusually large change. More often an organization draws on latent capacity, which may express itself in extra effort over a short period, overtime work and such-like. An important principle is involved: there must be some reserves—physical, mental, emotional—to deal with the troubles involved in adaptation. Change would be virtually impossible in a fully extended organization, and is often not even begun because people are 'too busy to think about it'.

With the change agreed and extra resources available, change then proceeds gradually. It begins before the planning of it is complete, and it is initially on a small scale. Unit production in the large Midlands factory, for instance, involved initially only one team, and three months passed before it was properly set up as an experiment. Starting on a small scale and allowing for a period of gestation carry the usual advantages of the pilot run: unforeseeable ramifications have some chance to show; teething troubles can be overcome; more risks can be taken with a small unit than a large, and it can be better isolated for intensive observation. Of great importance also is the fact that other groups can compare their hopes and fears of the change against events in practice and revise them without being directly involved. At the large factory the new training arrangements were inspected, queries were raised and first impressions revised over a period of many months before training was generally accepted.

From small beginnings change soon permeates throughout the organization. This re-emphasizes the importance of a general disposition for change. For an organization is in complex balance and even changes in a small sector have some ramifications throughout the organization. This was clearly shown in the case of such a major

change as introducing systematic training into the large factory. Almost immediately there were repercussions on physical working conditions, machine maintenance, and the selection of new workers; and the effects of the change could before long clearly be traced to supervision and supervisory training, machine layout, managerial promotion, and numerous items of personnel policy, to mention only a few things. This communication took many forms, with unchronicled learning by example probably the most important. Systematic training suggested new ways of thinking about old problems. The newly trained workers as they dispersed from the training centre to the production departments were an important channel for disseminating the effects of change.

The examples we pick out for illustration are uncommonly large and distinct. At their best, consultation and participation are continuous and habitual and small issues are much more numerous than large and can hardly be specified in the normal run of activity. In Minetown, for instance, the trainees were continuously consulted about their progress, and the community participated directly in many important innovations. There are many examples in the study: e.g. when a girl, who had left the factory and married, sought reemployment, the decision was taken by her fellow-workers. New ways of working together were worked out jointly. For instance, how to pay advanced trainees when they acted as part-time instructresses for newcomers was decided jointly. (The main difficulty was that the instructresses could not build up their speed and earnings as fast as they would have done if they had spent all their time on the machine.) Formal machinery for consultation was established and later allowed to rest dormant—a good illustration of the fact that means of consultation are best formalized only when formality serves a purpose. Arbitrary formality may inhibit spontaneity and reduce consultation and participation. This would probably have been the result in Minetown, if consultation with the community had been formalized. The inhabitants welcomed all opportunities to participate in a local project and were glad to be consulted and, occasionally, to come and visit the factory.

In the process of change, as in the recognition of its need, the participation of none is more important than of the established and accepted functionaries. This finding suggests that introducing change cannot be left to specialists merely because they are specialists, on the grounds that they may be readily receptive to new ideas. Many

specialists no doubt combine ready receptiveness with an adequate awareness of the complexities and balances of the social setting in which the change must take place, and they can help greatly in working out the change and its implications. But they work with and through the 'social gatekeepers' whose participation is essential. A specialist completely new to the organization is handicapped by having to build up from scratch good informal relations with these informal leaders. It is suggestive that, in the Acorn Hosiery Company, the manager of the new training department had much greater difficulty in making headway than had the engineers in their different sphere: the engineers had better opportunities to develop effective relationships with new departmental managers. In the case of training it had to be emphasized again and again that the new function was to be a service to production departments, for them to use or not largely according to choice; and this permissive attitude had to be maintained in the face of severe testing. Thus the directors continued to recognize the managers' freedom to train some workers in their departments rather than send them for retraining in the new departments, even when the training department was operating at only half its capacity. Managers were not told shortly to change their ways but were rather encouraged to visit the new department and discuss problems with the manager. The manager for his part consciously set out to improve and strengthen his relations with the production departments. In time this policy bore lasting fruit. Managers came to look to the training department to provide a specialist service which they valued, and they sought advice on many problems. But this happened only when they were satisfied about the relationship, sure that accepting or rejecting advice remained the responsibility of the production departments.

3. EVALUATING CHANGE

Assessing change as it progresses is akin to testing a hypothesis in science. Probably the main importance of evaluation lies in emphasizing the tentative experimental character of change. A problem has been recognized. Ways have been agreed to try to deal with it. Is adaptation effective—this is, does it meet the technical need? Is it also efficient—that is, do its benefits outweigh its economic and social costs? If it passes these tests, the achievement can be acknow-

ledged and can help further change. If it fails, the course of change can be altered or the attempt abandoned.

Where consultation and participation are the rule, evaluation of change is continuous and comprehensive. For instance, in the Minetown factory, the trainees were able to bring up difficulties connected with the training programme immediately they occurred, and adjustments could usually be made without delay. Evaluation might be in terms of 'I find that I am not doing well on one part of the job; I feel like keeping on trying, though I am due to do something else'. Or again, when more difficult coloured work had to be done, the girls first agreed to concentrate on it till it was finished; but the strain was unexpectedly great, and after one day the attempt was abandoned.

Much evaluation is wholly implicit. If asked what he thinks of a certain innovation, a manager may reply that it does not 'feel' right, without being able to specify its shortcomings. But often some of the effects of change can be specified and assessed. For instance, in the above example, the strain under which the girls worked to complete the coloured work was unmistakable. The usual friendliness disappeared and the atmosphere in the workshop was tense. There were also numerous complaints about the machinery and various aspects of working conditions.

An important distinction is to be noted here. The lack of co-operation could be observed, but the complaints were only second-hand and might or might not give an accurate picture of the situation. In important respects they did not give an accurate picture in this situation: many matters were complained about which usually received no comment. On the basis of this distinction it could properly be concluded that the change had not led to greater trouble with machines, though that was the complaint, but to more numerous complaints about the machines brought forward in an unusually aggressive manner. Attention to the machines alone would probably only have led to complaints about something else.

A number of statistical criteria for evaluating the effects of change are in general use, and others can be evolved from case to case. Figures of profits, costs, output, and sales are generally collected in industry, and figures of productivity, labour turnover, absenteeism, sickness, accidents and disputes increasingly so. They are often useful. For instance, the trainees at the Minetown and Acorn factories had specific targets against which their progress could be judged.

But warning in the use of statistical criteria of evaluation is called for on three counts. First, statistics reflect only *some* of the effects of adaptation, and often not the most important. Such effects as increased human satisfaction, strengthened relationships through participation in a common task, or enhanced reputation in the community, are usually not directly measurable.

Secondly, figures are highly abstract and hence difficult to interpret. As with the girls' complaints about machinery, there is a danger that the indices themselves become the object of concern and attention. Once this happens, once effort is concentrated, for instance, on reducing grievances, it is quite likely that grievances will no longer be expressed in the usual way and that this will be interpreted as a sign that they have disappeared. In reality, dissatisfaction may be expressed in other forms or be repressed with serious results. The danger is particularly great when attention is paid to only one or two indices, such as the incidence of strikes or absenteeism, or the ratio of indirect to direct workers. And even full statistical evaluation is no more than suggestive and needs to be used in conjunction with larger and more important clues provided by judgment based on daily experience and close observation of events in the organization.

Thirdly, figures must relate to a substantial period before they can become useful indices for evaluating change. For instance, in many organizations figures for output and absenteeism just before the annual holidays would be unreliable guides. This caution is even more necessary when the reasons for doubt are less obvious. As in the Acorn Hosiery Company, the effects of change may be slow in showing. Moreover, as was the case with the change to longwall methods of mining the eventual effects may contradict the immediate. The first mechanized coalface was often the most productive despite its teething troubles; later after the novelty had worn off, the social disadvantages increasingly affected performance.

In the final analysis, it is not even the efficient achievement of a change which is important but the capacity for continued adaptation. Changes in skills and working arrangements are often enough effected in the face of great opposition. But the cost is usually high, and the point that frequently escapes reckoning altogether is the fact that the new situation is basically the same as the old. Unable to find a satisfying focus for their loyalties through participating in the continuous process of adaptation, people attach themselves to the new skills and arrangements as strongly as they had been attached to the

old; and convulsions and bitterness will attend further change as they did the first. The best criterion of adaptation is therefore not its speed or its magnitude, but its effects on the relationships and processes by which further adaptation can come about.

4. FORECASTING

Before we finally return to adaptation as a continuing process, we shall close our cycle by considering the function of forecasting in determining the disposition towards further change.

Forecasting is valuable because it prepares people and prevents their being caught off balance, so to speak. Forecasting lengthens the time during which the diverse needs for change can be generally recognized and ways worked out for meeting them. As far as sudden and temporary pressures are concerned, forecasting helps the organization to avoid them (for instance, pressures arising from a chance cut in supplies of materials or fuel). Lasting pressures for change, on the other hand, are foreseen in order to be communicated and so to prepare the organization for change. At Minetown a change in the pay week raised considerable worries mainly because it was unexpected.

Preparation immediately following forecasting would usually include spreading the idea that change is likely to be necessary, affording opportunities for discussion and getting generally acquainted with its probable implications, and, most important, evolving means by which adaptation may be best effected. In this way forecasting effectively leads into the cycle of change. Management may take the lead in these matters. But essentially forecasting, like the rest, is in the general run of activities by which the organization as a whole is continuously prepared to adapt. Only if these activities are well developed can adaptation become a habit instead of a recurring crisis.

Conclusion

We have discussed the problems and processes of change at length for two reasons. First, adaptation to the extraordinarily rapid changes of to-day is the crux of management's problem. Organizations are pressed every day and from all sides to meet the large variety of social changes, to expand production, to make it more efficient, to change

over to goods for export or defence, to make do with substitute materials, to recruit new workers. The second reason for emphasis is that each change, however small, has in it the makings of good or evil on a large scale. The concept of the vicious circle, old as it is, is all too often forgotten. The point may be made more vivid by the two rather typical examples which follow, of vicious circles ensuing from imposed change, compared with an example of a beneficial chain reaction drawn from the study of the Acorn Hosiery Company.

(i) An old-established large-scale business which has traditionally stressed the autonomy of line managers introduces functional specialists to meet new needs without consulting line officers. The managers become suspicious and fearful. They express these sentiments indirectly, in their behaviour and by deprecating the general worth and qualifications of the new specialists. They keep important facts and situations to themselves. This reduces the specialists' actual capacity to deal with problems, and thus bolsters up and begins to justify the managers' opinion. And these are only the main direct effects.

The indirect effects may be myriad and just as serious. For instance, top management may henceforth substitute advice from the specialists for advice from line managers. This might seriously weaken top management's contacts with the facts of situations on the shop-floor. It may also widen the breach in the relationship between top management and surbordinate managers which was opened by top management's unilateral action in introducing specialists. Another chain of unfortunate events would be set off by the managers' success in flouting the authority of the specialists and, by implication, the authority of top management.

(ii) The management of a large firm with several branch works may decide to introduce, without consultation, controlled planning and allocation of scarce raw materials. If the need for this change is not generally recognized, the reaction of those hitherto responsible is largely irrelevant to the problem of scarcity. Some branch managers, for instance, may fear that central allocation indicates a shortage so serious that it may cause their works to go on short time or even be closed down. Others develop exaggerated notions of the difficulties they will have in getting raw materials under the new arrangements. This leads on to hoarding the scarce material in the branch factories. Reports on requirements and stocks may be 'ad-

justed' to maintain stocks at a level regarded by individual managers as necessary and in the best interests of the business. But hoarding temporarily exaggerates the 'shortage', and may in turn lead to stricter control and smaller allocation. This can go on until there is a state of disequilibrium so serious that some branches or departments really do have to be closed down—which justifies the managers' fears and promotes further hoarding. As in the previous example, there are the indirect effects of authority undermined and relationships worsened.

The two examples show how it becomes increasingly difficult to break vicious circles. In the long run the organization becomes accustomed to their continuance, and attracts the kind of people who are prepared to accept the situation. Eventually the authority of democratic government itself may be threatened. This has happened for instance in the docks in Britain and overseas. In the British docks the exigencies and destructions of war brought sudden and drastic changes to a situation already unsatisfactory in many ways. Work arrangements and the communities of dockland were disrupted. Technical changes were forced through at high cost. To these were added administrative changes which were intended to alleviate defects but had many unforeseen and damaging effects on the traditional organization of dockworkers. The results, even if measured only in terms of inefficiency and strikes have been exceedingly serious. But their implications are greater still. When authority is opposed and democracy is pressed to a choice between force and anarchy we become vividly aware of the delicacy of the balance of forces in an organization. In many present-day industrial situations the dilemma, although not as dramatically presented, is far from being merely hypothetical. Imposed change is fundamentally incompatible with freedom: there is always the serious risk that it will have to be withdrawn under threat, with consequences for authority, or that it will have to be promoted by force.

(iii) We may compare this with the findings on adaptation contained in our studies, choosing the experience of the Acorn Hosiery Company as the most striking example. There the social structure of the organization was respected, and change was introduced slowly and in full consultation. As it proved itself effective in meeting the needs of the organization and in supporting and strengthening relationships, an increasing number of people went out of their way to help it along. The change grew cumulatively in importance and

gathered momentum with remarkable results. Of greatest importance was the waxing strong of relationships and the growth of effective means of continued adaptation.

With this way of introducing change, the integrity of the organization is maintained: no parts are isolated or severed. Communication remains effective: the left hands know what the right hands are doing. The disposition is favourable to change, since neither the recognition of the needs nor the methods of adaptation have caused fear and paralysis, or the empty repetition of useless routine, nor serious disruption. On the contrary they have strengthened the organization and its systems of communications.

Mary Parker Follett often spoke of the 'law of the situation'. The changing circumstances of an organization's environment are the 'law of the situation' for that organization. The function of management is not to create the consequent need for adaptation—the forces of nature and society at large do that—but to help the organization as a whole to perceive the need and to adapt accordingly. The best methods of doing this are based on a principle which T. H. Green enunciated in political science and which we may here paraphrase to 'Will, not force, is the basis of industry'. With the study of the colliery for our reference points, we have shown in the studies of the Minetown and Midlands factories that there are ways by which an organization may adapt rapidly to drastically changing circumstances in a civilized and efficient manner.

APPENDIX A

RESEARCH METHOD[1]

'. . . sometimes an observation essentially simple carries an importance for practical affairs far beyond anything that can be claimed for it of intellectual illumination.'

ELTON MAYO—*The Social Problems of an Industrial Civilization.*

'. . . the utmost abstractions are the true weapons with which to control our thought of concrete fact.'

A. N. WHITEHEAD—*Science and the Modern World.*

In a very real sense everyone is constantly engaged in study of human relationships and in consequent adaptations; and in helping others in doing the same. The distinctive contribution of the scientist lies in his attempts to formulate and make explicit and communicable a framework of general statements based on study, which will account for particular facts and make systematic prediction possible.

Scientific Method and Management Situations

In essence scientific method is brief to state. It consists in: an initial hypothesis as the basis for observation of facts; selection of suitable opportunities to observe situations; observation and accompanying modifications of the hypothesis, and, when possible, controlled experiments, in which selected factors are isolated to see what part they play in the situations; statement of the hypothesis, if proven, as a useful theory.

The collection of data for the study of management problems raises three basic difficulties: (1) on the one hand observation is liable to affect the situation studied; (2) on the other hand second-hand data are very difficult to evaluate; (3) the uniqueness of each social situation in all its complexity makes comparison with other situations and consequently generalization difficult.

(1) *The observer* is part of the situation he is studying. His presence affects the facts he is studying, i.e. the behaviour of other people. In principle this difficulty exists in all sciences, but the observer's influence is particularly great in social study. People adapt to each other in most

[1] Parts of this Appendix are taken from the authors' book *Community and Technology* UNESCO, 1952.

subtle ways. In particular, they alter their behaviour to suit their ideas of what any observer ought and ought not to see.[1]

The point is obvious when some crude adjustment takes place, such as occurs when a policeman intrudes on the activities of a solitary burglar. But it is of fundamental importance even when less obvious. For instance, it is unrealistic to walk to a group of workers unexpectedly and expect to get a true picture of what they do and say. Immediately they adjust to the newcomer. They may shift to make room for him. More important, their behaviour will take into account that they know him (or not); like or dislike him; that he is a fellow-worker, a foreman, or the manager; why they think he has come over to join them.

The following instance, recorded by the Acorn study, shows the trend of output during the attendance of an observer for purposes of study: 'In February 1943 one of the consultants decided to spend a considerable proportion of his time over the next few weeks on the further study of experienced linkers at work. During the seven weeks in which he was a frequent visitor the output of the thirty-five girls in the department increased steadily until it exceeded their previous three months' average by 11 per cent. Within four weeks of the consultant's departure output was back at its old level. Yet the consultant's visits had not led to the ending of the impasse in the development of training. The only physical change made during the period was the installation of a new clock at the request of the linkers.'

In some organizations workers delight in fooling time-study men. Occasional success has sometimes led to attempts to carry out time-study unseen. To that extent a problem of collecting social data has at least been acknowledged. But this method of overcoming it is despicable, and also incompatible with co-operation—just like making use of any kind of information expected to remain confidential.

The ideas of what the observer ought and ought not to see depend largely on the nature and the quality of the group's relationship with him. If the relationship is satisfactory, the observer can reduce his 'interference' to a minimum so that the situation remains largely natural, and can to some extent take account of his influence on it in his assessment of what he observes. We shall return to the matter of research relationship in the next section.

(2) *Second-hand information*, that is, statements made to the observer by others, raises further problems of evaluation. Even when a person is talking about himself—often particularly then—his statement usually reflects more accurately his own wishes and his relationship to the listener, than his actual behaviour in situations he describes. The same applies when

[1] For illuminating instances of this cf. Roethlisberger and Dickson, *Management and the Worker*, pp. 385–7.

a person makes a statement about others. It applies even to what are too often regarded as virtually infallible 'facts and figures', such as statistics of stocks and materials, accounts, output, which are merely statements in a certain form. Statements are not likely to be accurate in the sense of giving a wholly unbiased report of what happened in fact. They are to be considered primarily as symptomatic, referring not only to the situation under discussion but also to the reporter's own thoughts, feelings and relationships.

For instance, a worker may explain to his foreman that he was absent because ill. In a more candid conversation with a workmate he may expand this to say that, although he was 'slightly off colour', he might well have been at work if he had not had something else to do; he had said 'illness' to the foreman because it was the easiest explanation. In the relationships between worker and foreman 'illness' was the most reassuring explanation to give. In the more candid relationship, the more complete explanation was 'illness' plus 'personal business'.

Second-hand data are difficult to evaluate also for another reason. We have noted that at best the statement consists of the reporter's views of what happened, coloured by his attitudes and relationships to date and in the particular situation he is describing; and that the statement is liable to be affected further by the situation in which the reporting takes place, particularly by the reporter's relationship with the listener(s). Thus, mostly unnoticed by the reporter, but sometimes deliberately, his statement is distorted. It is also liable to be incomplete. This is so partly because his choice of data to report out of the numberless details that make up a social situation may not correspond to the choice the listener would have made if he were assessing the situation. A fundamental reason for incompleteness lies in the social conditioning of the reporter which leads him to take for granted, and hence not to notice or mention, what are perhaps the most important aspects of the situation. Abstraction is inevitable. But unwittingly the reporter is liable to omit from his description features of the situation which are essential to make it meaningful to a person of different background.

For instance, a case of absence may result from a complicated network of factors. The most obvious factor may be illness or business. But an equally important factor may be the failure of the absentee's desire to be at work, or of his sense of responsibility to offset the inclination to absent himself. This in turn may reflect the management of the department. But only the first kind of factor is at all likely to be reported without much further thought.

The difficulties of evaluating second-hand data can be overcome to the extent that the student can get to know the views the reporter has of the situation and of the listener, and can create the conditions in which statements can be elaborated, checked, and supplemented. A wise listener will

not expect a 'yes' or 'no' answer to a question that could not be answered without further thought and in less than a thousand words, or a balanced statement from a person afraid that what he says may do harm. He will rather attempt to create the conditions, and particularly a relationship, in which the reporter can speak at length and at ease.

The following instance, taken from the colliery study, shows how a statement becomes meaningful through elaboration:

'. . . in discussion of mining matters with a mining man, it is not uncommon for him to say something like this: "Changing 'Y' colliery over from direct (electric) current to alternating current resulted in substantial increases in output."

'Such a statement does not explain a great deal. On the basis of it, one might jump to all sorts of conclusions. But one might be able to get it expanded. "How is that?" the outsider asks.

' "Well, some of the machinery was changed, for one thing," is the reply.

' "Oh, so better machinery accounted for the increase?"

' "Not entirely. Some of the plant was reorganized at the same time."

' "How did that help?" (Quite clearly the situation has a lot more to it than the outsider might have thought.)

' "In the reorganization, the pit was reorganized, and some sections which had been widely dispersed were brought closer together."

' "So it was easier to supervise?"

' "That's part of it. But what was probably more important was that as a result of the reorganization, it was possible to work the men in smaller teams, and the spirit improved."

'Thus, by going into the matter—and often only by going into the matter—the outsider discovers that a mining man's phrase may subsume whole paragraphs of relevant information. So accustomed is he to talking with his colleagues that he uses a veritable verbal shorthand.'

It is important to emphasize that the difficulties of describing, measuring and evaluating social situations are essentially inherent in the nature of social data and are not limited to the early stage of development of systematic social study. Various techniques are available to reduce the difficulties. It is technically possible, for instance, to supplement observation and memory by the use of recording instruments, and thus secure such important facts in a conversation as repeated statements, pauses, tones, overtones, and data on general behaviour. It is possible also to measure certain aspects of the situation, e.g. how many people are present and the length and number of observations, and to compile indices of such matters as output, absenteeism, labour turnover, and sickness. And these data can be subjected to complicated analysis. But evaluation remains and will remain most difficult. The recorders of social data remain human beings who note what they are preconditioned to note. The ob-

servations remain liable to the double effect of incompleteness and unconscious distortion. Finally, by their very nature, social data can hope to be only approximately exact.

(3). *Generalizations* have to be made on the basis of accumulated observations of situations which are broadly similar but never exactly identical. In all its complexity each situation is unique. Experimentation is possible only within broad limits. There is no exact knowing of what 'might have been', no possibility of re-establishing the *status quo* and trying an alternative course of action in identical circumstances. For instance, a doctor cannot compare the effects of (*a*) amputating and (*b*) not amputating a leg in one case. He can only compare the effects in similar situations. Either he can compare two patients of whom one has been operated on and the other has not, or he can compare the condition of one patient before amputation with his condition after amputation. All generalizations on social data rest on a similar procedure.[1]

Significant statistics are therefore difficult to collect and difficult to interpret. Statistics simplify complex, unique facts into standard units. To take a blatant example, we may be able to count the human inhabitants of the earth. But when we count *men* we are reducing individuals to a common denominator. For many practical purposes that would be inadequate or misleading. There are men in Britain and men in China; Britons married and unmarried; Britons with larger or smaller families or none at all, poor and rich Britons . . . and so on down to the man Smith and the man Jones. Again, in an industrial situation the 'yes' and 'no' responses of workers to some questions can be counted and correlated. But, should a 'yes' from Jones be reckoned the same as a 'yes' from Smith, or just enough to offset a 'no' from Brown? Jones, maybe, is the natural group leader, Brown an unpopular member of the group. In short, classification, indispensable to measurement, eliminates detail. Now, the degree to which detail can be usefully abstracted varies with the purpose for which the data are to be evaluated. So that the mere number of underground workers is a good guide to the number of miner's lamps required to be kept at a colliery, while it is only a partial guide to, say, the number of supervisors required, and a very inadequate guide to the kind of leadership the men want. Often social statistics eliminate too much detail to be usefully judged.

The difficulty in appraising statistical data can be put in another way. The choice of phenomena to measure already implies evaluation. Stati-

[1] In principle the difference between the exactness of physical science and the 'approximateness' of social data is, again, only a difference of degree. Much in physical science is uncertain, and physical phenomena are no more than statistically probable. But the difference is so great as to constitute for practical purposes a different order of things; by comparison with the range of behaviour in social groups the physical world is one of certainties.

stics abstract a feature of a complicated social situation and thereby stamp it as significant, in the same way as observation and memory fasten on to facts that are regarded as noteworthy. But standards of what is and what is not significant are barely developed and may vary from situation to situation. Important features are thus liable to be omitted by the statistics and in their evaluation. At every turn the observer is thrown back on his experience of similar phenomena in their whole context, in the total situation.

We can summarize this section as follows. What are commonly called 'facts' can relate to any of a variety of levels. The first level is the situation itself in its reality; this is strictly 'facts'. From the facts there are several stages of remove (or abstraction) thus:

	Level of remove from the facts
the situation: 'the facts'	
photographic plus phonographic record	1st
full report by one medium	2nd
detailed description	3rd
generalized description	
classified (statistical) description	etc.
statement of uniformities (theory)	

With social data there is considerable danger of falling into what A. N. Whitehead has called 'the fallacy of misplaced concreteness'—to get the levels mixed up and to regard the data as more factual or more significant than they really are. The danger springs from the wider scope of social data. What physical scientists regard as 'facts'—the 'objective' world—is only one part of social data. The ways people see the objective situation are as important social facts as is the objective make-up of the situation. Both are parts of reality.[1] Thinking does, in a sense, sometimes, 'make it so'.

For example, in one company the assistant manager of a large branch factory was thought by his subordinates and by his immediate superior to be inadequate to his job. But the organization's general manager was of the opinion that this assistant manager was quite adequate. Both these contradictory opinions were relevant 'facts' about the organization and both influenced behaviour, that is, the objective situation.

High levels of abstraction are as yet rarely attained in the complex and

[1] Again, the difference between physical fact and social fact in respect of objectivity is only one of degree: since the development of the concept of relativity it has become accepted practice in physical science to describe the relationship between observer and observed (physical fact). This aspect of 'relativity' is far more important in the social sciences than in the natural.

dynamic field of social science, and even then form only a small part of the total description. For instance, a doctor's observations are probably one part measurement (e.g. of temperature, pulse, blood pressure, blood composition) to ninety-nine parts description. The proportions may be much the same for social data in general.

Assessing of social data in terms of 'factualness' is a continuous process. It guides the collection of data; and new data affect the evaluation. The collection and evaluation of data are thus closely interwoven and the basic difficulties connected with them are continuously present.

The Research Relationship

The observer affects the situation he is studying and needs to take account of this disturbance in his evaluation of the data. In assessing secondhand data, he depends on knowing the way the reporter looked at the situation he is reporting and on creating the conditions conducive to a full and accurate statement. Finally, given the uniqueness of each social situation as a whole, generalizations about the parts are difficult to draw and to apply. There is no hope of solving these basic problems of collecting and evaluating social data except within a satisfactory research relationship.

If the relationship is satisfactory, the observer's disturbance is likely to be small and possible to assess with fair accuracy; it is possible to secure statements from people whose points of view are known and who report as accurately and fully as they can, and to check and elaborate them; last, but by no means least, the conditions exist in which the findings can be applied. If the relationship is unsatisfactory, the observer finds it difficult or impossible to secure access to significant data; statements, when it is possible to secure them at all, are incomplete and biased—maybe deliberately so—and not possible to evaluate accurately; and it is difficult if not impossible to apply the findings. The use and value of techniques to aid the collection and evaluation of data themselves depend on the quality of the research relationship.

Three basic features of a satisfactory research relationship may be distinguished:

Permissiveness. A satisfactory research relationship is based on the agreement of the people concerned with the study, its purposes and methods. Significant data cannot be obtained or applied against their wishes. They can sabotage the study, and if inclined to, they will. This is known to happen sometimes in the cases of time studies prior to fixing rates, and the various devices by which organizations seek to check and control the activities of constituent units. To secure sound data it is not enough that the purposes and methods of study be essentially sound and helpful. They must be seen to be so by the people concerned.

Agreement cannot be assumed to exist even when a group or an or-

ganization itself asks for a study to be carried out. The group may not be aware of the implications of what it is asking. The suggestion may not be approved by important members. It may have arisen on the spur of the moment. The agreement needs to be real and representative, and it is necessary to learn the criteria 'real' and 'representative' proper to the group. A study approved, for instance, only by top management, or only by the supervisor, or by only a few of the workers would be regarded as an extension of that section's views and activities. Where the suggestion originates elsewhere, special efforts may be required to secure adequate agreement.

This early stage cannot be skimped. Systematic study begun without agreement is likely to be inadequate and may well fail its own purpose. Sometimes considerable time passes before agreement is secured, particularly if the observer is not well known to the group and is tested out by it to a certain extent before it agrees that systematic study might start. The stage may yield little by way of coherent data. But it allows important processes of adjustment to get to work. The group examines the suitability of the outsider to carry out the study and adjust itself to him and his prospective activities. Initial relationships are strengthened. The outsider begins to learn the manners and customs of the group in which the study is to be carried out, which can differ in important respects from those of similar groups quite close by. He becomes increasingly sensitive to these local traits, widens his relationships to include other people essential to the study, notes his progress as an indication of the likely importance attached to the study and the problems it is likely to meet, and clarifies his function and the purpose and methods of the study until agreement is secured.

The outsider is, in short, permissive—allows himself to be guided in matters of aims and procedures by the group which is the focus for study. This attitude on his part is a basic feature throughout. He does not rush, he poses problems without forcing answers, and generally proceeds only with the substantial agreement of the group with which he is working.

The problem then agreed for study may be small and to the outsider's good knowledge inadequate in coverage. It usually is. But it performs the function of a trial run, in which the personnel, the aims and the methods of the research are put further to the test and adjusted to requirements. Considerable insights can be gained and understanding can be significantly increased through the process and findings of a very small study. This done, it may be possible to move on to something of greater significance.

Regarding the scope of study, people may agree, for instance, to study the problem of a high labour turnover of recruits by seeking the shortcomings of the selection procedure. Before long it becomes clear that applicants have certain characteristics in common which may suggest

that recruits are drawn from special sections of the community; also that there is a sharp drop in trainee performance and an increase in the rate of leaving as new workers finish training and start production alongside senior workers. So that what started as a study of the selection of young recruits comes to include problems of contacts with the community, and of change-over from training to production; and to involve new and old workers, supervisors, and other members of the organization and the environment.

The following illustrates the dependence of research procedure on developing relationships; a day to two after his introduction to the officer who was to be his main liaison with the organization, and after seeing the works and learning something about the company, a research worker asked the officer if he might spend a little time on the factory floor with no other purpose than to 'get the feel' of the place. His request was instantly turned down on the grounds that 'people in the shop would start all kinds of worries and rumours that the firm is to be sold or something like that'. The outsider dropped the subject. Only a few days later the officer himself spontaneously suggested that the observer might 'just wander about the shop and chat with whoever he liked'. Clearly the relationship beween them had strengthened and the same danger was no longer apprehended.

The permissive attitude of the outsider helps the process of adjustment and promotes the study. He listens to people's anxieties; enables them to raise problems they wish to raise and to raise them in their own way; helps to clarify their problems—many of them very indirectly related to the study; and reassures them, less by word than by deed, that he only proceeds by agreement. Often anxieties are greatly reduced in the process of communication. Permissive listening has further advantages over guided discussion: the sequence and ways in which issues are raised provide clues to the significance attached to them; and the reporter does not consciously or unconsciously address the outsider's preoccupations as he would if the outsider posed problems and asked specific questions.

Permissiveness is put to its ultimate test if there is a persistent failure to agree at any stage, and the outsider offers to discontinue the study. This makes it absolutely clear where the primary initiative lies—namely, with the group studied. Agreement to continue the study can result from such an extreme form of testing and reassurance. The study ends as it began, with real and representative agreement.

Collaboration. In a satisfactory research relationship, the people studied do not merely allow the study to be carried out, but participate in it. Securing their active participation is like securing a vote of confidence; they consider it worth while to collaborate. This reflects on the aims and purposes of the study, the methods for carrying it out, and on the relationship between the group and the outsider.

The values of collaboration are clear. For instance, it vastly increases the resources of study. The group make up the deficiencies of the outsider in observing and assessing the total situation. Almost invariably the observer is deficient at least in his initial knowledge of the group's attitudes, habits, norms and structure—its culture, in standing with the group, and often in appreciation of technical issues. The group, and others more or less closely involved (such as specialists in various fields), have much to contribute. They help the outsider to avoid pitfalls and to develop the study towards increasingly significant observations and analysis. The outsider is then not alone in the study; he works together with the people right in the situation immediately studied and, beyond them, with others also, more or less closely according to the degree to which they are concerned.

Through combined effort, much more data can be secured than by the outsider working largely on his own. The findings can also be discussed, elaborated and checked. The responsibility for the study is spread. Understanding increases as the study progresses. And the communication and acceptance of the eventual results are but the last, almost foregone, stage of a continuous process of joint activity.

But the closer relationship of collaboration can be secured only through overcoming several important difficulties. The study of significant problems tends to arouse anxiety in the people involved. They feel strongly about them and look forward apprehensively to the findings. Even eager welcome of outside assistance they are likely to mix with an inclination to draw the observer away to areas of slighter importance. Sometimes, indeed, it is more comfortable for a group, like an individual, to live with a deficiency—sometimes even using it as a shield or crutch—than to go through the painful process of recognizing and dealing with it. To some extent this applies to the whole group. But it often applies particularly acutely to single members or small sections of people included in the study. They may appear eager to collaborate, perhaps in the (conscious or unconscious) hope of guiding the study towards findings of greater comfort to themselves. They may try to monopolize the attention of the outsider. One way of doing this is to burden him with information which is expected to remain confidential. The permissive attitude of the outsider lends itself to this. The outsider may have to straighten out this confusion. He can clarify his function and his relationship. He can help individuals and sections specially with the approval of the whole group. All can jointly agree under what conditions data are collected and evaluated.

Fundamentally the difficulties of collaboration are overcome in the general context of the research relationship. The progress of the study is governed by it. The outsider does not disclose confidential information. His standards of ethics are as high as, and similar in kind to, those of

doctors and lawyers; confidential information is, per definition, information capable of causing harm to someone if misused.

Mr. Chester I. Barnard reflected this high sense of responsibility in the course of describing a situation in which he participated:

'I have not made it available in printed form sooner because it involves some criticism . . . and because I was reluctant to run any risk of appearing to make the representatives of . . . "guinea pigs" in a public way. The lapse of ten years now makes it unlikely that any embarrassment will follow its restricted publication. The case was not reduced to writing until after my first lecture in 1938.'[1]

The same applies to insights on the part of the outsider into problems with which the group is not yet able to cope. He does not, for instance, upset a delicate situation by making relationships explicit whose balance depends on their remaining implicit. Data are collected, communicated, and jointly evaluated. The decision of when and how to communicate findings to other outsiders is a joint decision. The progress of the study is joint progress of all people concerned.

Effecting and recognizing change. Collaboration results in change. People who participate in collecting and evaluating data themselves change. They gain understanding of their problems. And they gain understanding of the process of understanding—collecting and discussing data, seeing other people's problems, finding that problems can be resolved, working together with an outsider. Participation in a research relationship thus may effect change in the attitudes, habits, norms and structure of the group, its culture and informal organization.

Another basic aspect of the research relationship relates to getting these informal changes recognized formally, for instance by corresponding changes in the formal organization of the group's activities. This may be in the complex balance of forces that make up a community, for even quite small changes are likely to have repercussions and involve many people at different levels of the organization and its social environment. It is probable, therefore, that the processes through which the study develops from its small beginnings towards significant problems gradually involve many persons to help in their solution, that the whole community becomes engaged in 'working through' a problem, and that the need for formal rearrangements is generally recognized.

The features of a satisfactory research relationship which we have described in this section correspond closely to the features we ascribed in the last chapter to efficient organizations. There is nothing surprising in this. Study and adjustment are continuous processes in healthy communities. The particular features of the satisfactory research relationship reflect the general features of the community: permissiveness goes with auto-

[1] Chester I. Barnard, 'Riot of the Unemployed at Trenton, N.J., 1935,' in *Organization and Management*, Harvard University Press, 1948, pp. 51–2.

nomy; collaboration for study with general participation; and, as we have seen, a socially effective organization is continually concerned to have formal arrangements take account of the informal, and to be closely integrated in the community.

'Outsiders'

In discussing the basic problems of collecting and evaluating data and of their solution within a satisfactory research relationship, we have used the terms 'observer' and 'outsider' without specifying who this might be or when his collaboration is called for. This section is devoted to the consideration of these questions.

As suggested earlier, we are all social scientists in a more pervading sense than we are all chemists or singers. For all of us life consists of a continual process of collecting and evaluating social data and adapting ourselves to our environment. It is probably true to say that this adaptation is by far the most complex and difficult of human skills.

Often the process of checking and evaluating data and of adapting is so closely integrated that it is not noticed at all. We eat, sleep, and generally rely on habitual responses to the varied stimuli of our environment. The next stage can be seen as one in which the processes of collecting and evaluating data and making the adjustments considered necessary are separated out. This happens whenever we are required to adapt to an 'unusual' situation. With more and more difficult problems of adaptation the process may be increasingly deliberate. But it is usually possible for us to deal ourselves with such problems as we meet, by solving them or by living with them. In the social course of events no one outside our own group is required at any stage in the process. Indeed, if an individual or a group ignores unrequested outside assistance, this is often a sign of good health, of personal and social integration.

An outsider is, in brief, a person regarded as not closely concerned. A passer-by trying to stop boys fighting in the street is an outsider to their conflict though he has some interest in maintaining the Queen's peace. Their teacher is an outsider, though one more closely concerned and more likely to become a significant part of the situation to which the boys are trying to adapt. Even more closely concerned are their class-mates and families. The word 'closely' depends for its definition on the attitudes of the boys. They are at the centre of the problem, surrounded by people whom they regard as outsiders, more or less. If somebody not closely concerned tries to interfere they are likely to feel that he ought 'to mind his own business', and, if they dare, they may jointly tell him so.

We have seen how an outsider can help those immediately concerned to collect and evaluate data and to adapt. Mostly this again is a process too usual to be specially noticed. Our habits and skills of adaptation are mostly drawn from other people—family, friends, others with special

standing. We continually rely on them, as a matter of course, to help current adaptation. Thus members of a working group enlist each other's help in meeting personal or general problems. Depending on their relationships with them, the supervisor, the workers' immediate representative, and other people, are drawn in more or less frequently to assist in the solution of problems within the group, and almost always to help groups to adapt to each other. 'Supervision', 'co-ordination', 'advice' are all directed primarily towards facilitating adaptation. Social processes and organization in general can be looked at in the same way.

The function of specialists is to advise on particularly difficult problems of adaptation. Thus the development engineer advises on technical problems, and the sales manager on how to dispose of the organization's products. That is, they advise on a part of the complex process of adjustment. In recent years further specialists have begun to be employed to concern themselves with the organization itself—to increase the members' capacity to adapt and to advise on organizational structure. The appointment of specialists for personnel training, and administration, is to some extent a tacit acknowledgment that adaptation is becoming more difficult.

Specialists on problems of personnel and administration are not all equally well placed to assist in the process of adaptation. Some, particularly administrative officers, tend to be concerned mainly with formal arrangements. They may often be, in consequence, too preoccupied with perfecting administrative techniques and structures, and too little concerned with formalizing arrangements that work in the particular organization. To that extent they are out of touch with the real problems of the organization. This possibility is the more likely the larger the organization, and it is usually only the large organizations which have specialist administrative officers.

A personnel officer is usually in a more advantageous position. He often sees individuals when their problems of adjustment are likely to be particularly great, for instance, when they apply for work, when they have special difficulties at work or at home, when they leave. He is usually closer to the workshop and better able to build up good relationships. He is expected to draw from his experience observations and principles to guide personnel policy.

One personnel manager puts it as follows: '. . . one of the most important responsibilities of personnel men is to conduct constant research. . . . We (personnel managers) have at our command the finest research material in the world. . . . If we can but analyse this material and experience, to draw from it certain observations and principles, and to record such findings as a history of progress in our companies, we will have done a marvellous research job.'[1]

[1] Lawrence A. Appley, *Functions of the Personnel Executive*, Bulletin No. 1, Industrial Relations Section, California Institute of Technology.

An officer immediately responsible for training workers for their job may be in a particularly good position to assist adaptation. (Where it is separated from general supervision at all, training is usually a part of the personnel officer's job, but sometimes there is a specialist training officer.) Like the personnel officer he has close contact with individual workers when they are faced with special problems of adaptation—during training and retraining—and his contact continues for a considerable period. He can often help trainees to find suitable work and to team up satisfactorily with other people. He usually has the advantage that his function is better understood by supervisors and other specialists than the personnel officer's. It is therefore less likely to be interpreted by them as a threat to their status. It is usually regarded as quite proper for him to maintain some contact with the trainees after they have joined a work group under a supervisor, and to collect data for further study.

The basic advantages and disadvantages of having outsiders to help collect and evaluate social data and in adaptation are seen most clearly in the case of specialists from outside the organization. They have varied experience to contribute to solving the problems of a particular group or organization; and, having only limited status in the solution of the problems, they can ease the tension which often prevents people from facing issues and from altering to meet new circumstances. But they know little of the intricate network of forces which make adaptation in a particular situation difficult and determine the ways by which it can be achieved; and they may disturb the situation.

Mr. Chester Barnard, again in 'Riot of the Unemployed', compares the position of outsiders and insiders thus:

'. . . A mere description of the events as seen by a keen observer having no knowledge of the forces at play would be a bare recital of acts, incomplete, probably misleading, and possibly quite erroneous, because of the omission of the understanding and the intentions of the participants, although it might be dramatic and the acts even attended by important consequences. A part of the point of this observation lies in the fact that in many instances the mere introduction of such an observer into the situation would itself be a sufficient change of circumstances to radically alter the cases . . . in many situations in which social forces are at work, direct objective observation is either necessarily deficient or even destructive of the data.

'The alternative, . . . presents the other horn of the dilemma. The statements of participants certainly are capable of describing many of the overt acts involved, and in addition much of the understanding of the participants, and of their intentions, especially those of the relater. But such statements are subjective. They are often interpretative of events much more than descriptions of events. They are notoriously unreliable, and can only be safely used, like the patient's statement of symptoms, by one

skilled in interpreting such statements and possessed of a thorough knowledge and experience.'

Specialist Social Scientists

The main contribution of specialist social scientists is more general and long term than the help they may be able to give to any group or organization. It can be separated for convenience into, first, the study of normal, healthy social conditions and processes; and, second, the development of systematic knowledge and understanding.

Studying the normal. The evolution of standards and of guides in the solution of social problems depends on the study of normal behaviour. Without such study it is not possible to see wherein a social problem really consists or how it might be prevented in future. The position is the same, for instance, in medicine. Illness calls for medical help. The doctor relies on his knowledge of the complex balance and activity of the healthy organism to pick out, from the welter of facts to be observed, those for attention and treatment which are relevant to the illness. The process is basically the same in all human learning. An appreciation of the non-problematical, the normal, determines what we regard as the problematical, the abnormal, and hence select for attention.

The study of the normal is as yet little developed in the social sciences. As a result, analyses abound in which attention is concentrated, for instance, on the changes in the environment to which people find it difficult to adapt; whereas the peculiarity may lie rather in the insecurities, particularly of human association, which make adaptation so difficult.

One reason for the lack of development in this direction is that these are early days in social science, and social scientists have felt obliged to make immediate contributions to pressing problems of industrial society. Another reason is that social scientists are often not well qualified to study the normal in the society in which they live. Unless they know a culture other than their own they do not really know their own. They are part of their culture and they are apt to take for granted the disciplines and routines which their culture takes for granted. These may include many most important features which though 'simple', 'obvious', 'commonplace' are peculiar to the society in which the scientist lives. As Homans puts it, '. . . the things we take for granted about a social system are apt to be amongst its most important features. When we say, "People do not often commit murder," our statement is commonplace, but it is of the first importance.'[1] The study of other cultures helps us to learn what is innate and what is learned in our habits and customs. Hence anthropologists have been called 'constant rediscoverers of the normal'. In other cultures we find, for instance, the active practice of that 'knowledge that

[1] G. Homans, *English Villagers of the Thirteenth Century*, Cambridge, Harvard University Press, 1941, p. 403.

has escaped us', the knowledge of the skills of maintaining spontaneous co-operation.

Developing the structure of social understanding. As Calverton writes in *The Making of Society*, 'theory without fact is worthless; but fact without theory is even more worthless'.[1] Both are essential; no theory was ever formulated without facts, although the formulator may have been unaware that he was using facts, or what facts, or how selected; and no facts have any meaning without theory, however unaware he may be that his 'common sense', for instance, is indeed theory. A child holds his hand under the hot water tap and concludes that doing so heats the water; he later learns other ways of observing and notices that the water gets hot whether he holds his hand under the tap or not, and changes his theory accordingly. An adult, noticing a close correlation between the human birth rate and the stork population of Canada, refuses to believe that the two are related as cause and effect. Another adult finds a correlation between the youthfulness and the rate of absenteeism of employees in factory X and assumes a causal relationship; but when he later finds that in factory Y there is no such correlation, he discards his theory and seeks another.

The social scientist's appreciation of theory, which includes his own past experience, guides his search for significant data among the limitless facts that might catch his attention in a situation in real life, and leads him to differentiate between symptoms and causes, to recognize the situation where treatment has led only to the substitution of one symptom for another, and generally to assess his data and compare them with those of other workers in his and other fields of study. The data substantiate his theory as it stands or lead him to supplement or revise it. Thus a body of knowledge is built up, differentiating between kinds of phenomena, between phenomena of varying degrees of generality, and generalities more or less well tested or hypothetical. It can happen that two apparently contradictory theories seem equally valid. In the physical sciences, for instance, current evidence suggests that light can be seen as a wave motion or as a corpuscular movement; so that, according to Sir William Bragg, physicists use the wave theory on Mondays, Wednesdays, and Fridays, the corpuscles theory on Tuesdays, Thursdays and Saturdays—which is, Sir William observes, 'after all, a very proper attitude to take' in the circumstances. As more data become available and as the structure of knowledge is tested and elaborated and advanced further, such contradictions will be found to be illusory, or be resolved in favour of the one or the other or a new theory.

The body of theory to which most social scientists would subscribe—the hypotheses which have been most widely tested—is as yet inevitably small. Those of greatest generality, of 'utmost abstraction', may be summarized in six statements:

[1] New York, 1937, Random House, The Modern Library, p. 3.

1. Man is a social animal: by which is meant that a very considerable part of his behaviour is inculcated by his culture and social environment, but not that his individuality is sacrificed to the herd instinct as is the case with, say, bees and ants.

2. An individual's behaviour is a composite of his reflexes, trained reflexes, socially conditioned habits and thought—all four. The normal response in any given situation is a response of the whole being. This response is always a product of heredity, plus total experiences, plus capacity for novel thought.

3. In all his complexity each individual is unique: but though the whole defies quantitative assessment, aspects of people's make-up and activities can be usefully measured.

4. A group of individuals has a distinct character and can be considered as a unit for some purposes: which means that the group is something more than the sum of its parts, namely, a system of relationships among individuals, which modifies the behaviour of members; but not that it is an organism in the proper sense, in which the parts would merely be cells of the larger unit.

5. A system of human relationships is a complex balance: a change introduced into the system will have manifold effects as the system reachieves an equilibrium integrating the new element, or seeks to regain its old equilibrium without it.

6. The relationship between cause and effect is always complex: 'all (i.e. every persistent factor) is cause and all is effect',[1] and any change is likely to have ramifying effects, with causes producing symptoms and symptoms causes. (Langmuir has termed such effects 'divergent phenomena'.)[2]

The elaboration and refinement of the structure of social knowledge is not a 'mere academic exercise', something of no practical use. The phrase itself suggests a false division of activity. It also suggests a false relationship; the social scientist is not trying to 'apply science of management', as a common phrase so carelessly puts it, but trying to find the science in management, that is, the structure which leads to the understanding of social phenomena within the compass of the 'oldest of the arts, newest of the professions'. Structure makes the difference between knowing a fact and understanding its meaning. We have noted how theory guides the choice and evaluation of social data. It guides also the methods by which data are collected. The following, for instance, are four 'tentative working principles' which a group of social scientists extracted from its experience.

[1] L. H. Henderson, *Pareto's General Sociology*, Cambridge, Mass., Harvard University Press, 1937, p. 72.

[2] Irving Langmuir, 'Science Common Sense and Decency,' *Science*. Vol. 97, January 1943, pp. 1–7.

1. It is essential to obtain the approval and co-operation of both management and workers before initiating research into industrial relations.

2. The study of sub-groups within a firm is unlikely to be effective without studying the over-all relationships between groups in the firm as a whole, particularly the relationships among groups at the top of the hierarchy.

3. To achieve successful changes in relationships within a firm it is likely that adaptation should go on at the top of the hierarchy as well as in groups lower down.

4. The outsiders are subject to strong influences from the social field in which they are operating, just as they affect the situation. Study of the effects upon the outsiders is, therefore, necessary in order to understand the contributions of the outsiders to social changes.[1]

The structure of social knowledge determines to what extent the observer can limit his attention to features of greater or lesser significance and use and develop accurate diagnostic tools. Indices of productivity, earnings, labour turnover, absenteeism, sickness, accidents, and strikes are just a few of the tools we have mentioned. Others are being developed and improved. For instance, S. D. M. King has found it very useful to evaluate the status and rôle of each member of a group according to (*a*) the member's own perception of his status and rôle, and (*b*) the perception of the rest of the group of the member's status and rôle. Somewhat similar measures have been developed by J. L. Moreno, John G. Jenkins and others, and may eventually yield refined classifications of human qualities and relationships. Again, interview techniques are being refined and some yield quantifiable data. But such measures are useful only in relation to wider understanding.

Finally, understanding of social data governs our ability to foresee the trend of events, and can guide our actions. The better the conceptual structure, the more accurate the forecast and the guide. Thus existing social theory allows us to assume for instance that each person (or a particular set of people) will have the common characteristic of wanting to associate closely with others; that requiring him to move rapidly about on his own reduces the conditions in which intimate association is possible; that the failure to meet this need will result in some sort of social sickness; and that the sickness is more likely to express itself in illness, absenteeism or labour turnover than in, e.g. a strike, which requires corporate action. We can assume again that in intimate association with others, people develop common attitudes, habits, norms and a structure which make them into a cohesive group; and that this group, given the opportunity to grow and to co-operate with other groups in developing the policy, procedures and structure of an organization, is likely to be

[1] H. A. Hutte, 'Experiences in Studying Social-Psychological Structures in Industry,' *Human Relations*, Vol. II, No. 2, 1949.

socially healthy, responsible and co-operative. Such a sequence of events may not apply strictly to every person or every group of persons. But even at this stage of social understanding the chances are that it will.

The slightness of the structure of social knowledge to date is thus no reason for not using what there is. It provides the best available guides to the collection and evaluation of data. It makes meaningful the particular experiences of men and women in their capacities as workers, housewives, officials, administrators, educationists and social scientists. The structure will be improved and strengthened through use, through having new experiences fed into it to be evaluated.

We cannot be certain that the progressive development of social understanding will be accompanied by equally progressive improvement in social skills. It may be, for instance, that the weight of evidence will grow to show that such aspects of modern industrial society as great geographical and social mobility are essentially ill-suited to human life. Again, we cannot be sure that consciously acquired skills will be immediately effective. The evidence suggests that the substitution of conscious for intuitive skills results at first in decreased effectiveness. But there is no other way of progress. Like the player who has reached a stage where he can improve his game no further except by changing his stroke, we may expect a period of awkwardness and decreased effectiveness while the old stroke is unlearned and the new painfully acquired. This period comes to an end only if and when the new skills are fully integrated in the dynamic pattern of everyday life.

In the matter of our own behaviour we have already taken the first step. To self-consciousness we are committed: the problem now is to sift the old skills and to construct and integrate the new.

APPENDIX B

SOME FURTHER READING

This will be no attempt at a full bibliography: it would be impossible, and needless, to give a complete list of relevant literature. The following are simply descriptions of some of the books which seem to us to be particularly useful. Any short reading list is bound to reflect the compiler's own approach. The selection, and the brief descriptions or comments, may in places seem superficial and even invidious. But we felt that an undifferentiated list of books would simply confuse or overwhelm the reader who is looking for ideas.

The books mentioned below will be grouped under the following headings:

Elton Mayo, *et al.*
Industrial sociology
Management
Biography
Anthropology and psychiatry
Community
Communication
Effecting change
Personal.

Elton Mayo, et al. Many readers will have heard of the books of Elton Mayo. In particular, references to the Hawthorne experiments may be getting rather tiresome; but, after all, the experiments are a unique gold mine of solid, concrete detail in a field where facts are notably elusive. For our own part, we must record that every time we open Mayo, Roethlisberger, *et al.* we almost doubt if we have read them before. The brevity of Mayo is particularly deceptive: the slimness of *The Human Problems of an Industrial Civilization*,[1] of *The Social Problems of an Industrial Civilization*,[2] and *Some Notes on the Psychology of Pierre Janet*[3] completely belies the great amount of incisive thought that they contain.

Roethlisberger and Dickson's *Management and the Worker*[4] is not slender

[1] New York: Macmillan, 1933, vi, 194 pp. Boston: Harvard University, 1946. vi, 187 pp. $2.00.

[2] London: Routledge & Kegan Paul, 1949, 148 pp. 21*s.* 6*d.* Boston: Harvard University Divn. of Research, $2.50.

[3] Boston: Harvard Univ. Press, 1948, vii, 132 pp. Oxford Univ. Press. 16*s.*

[4] Cambridge, Mass: Harvard Univ. Press. Oxford Univ. Press, 1947, 615 pp. 40*s.*

at all, but quality does not fail quantity. The best-known report of the Hawthorne experiments, it is particularly stimulating, and really needs more than one or two readings. It attacks the subject in two ways, first by a chronological account of the Hawthorne experiments, then by discussions on various topics. Roethlisberger's *Management and Morale*[1] is yet a third approach. Then there are T. N. Whitehead's *Leadership in a Free Society*,[2] B. Gardner and D. G. Moore's *Human Relations in Industry*,[3] G. Homans' *The Human Group*[4] and other volumes that use conceptual schemes closely allied to Mayo's.

Industrial Sociology. Of what might be called more general 'surveys' of industrial sociology, we must again restrict ourselves to a few good samples. W. F. Whyte's *Industry and Society*[5] is a collection of short pieces; it contains, for instance, an abridged account by Warner and Low of a detailed study of a community and its impact on its industrial organizations, and *vice versa*—an illuminating and prophetic story. Stuart Chase is mainly a popularizer and disseminator: his *Men at Work*[6] (in co-operation with Marian Tyler Chase) and *The Proper Study of Mankind*[7] are very readable, if sometimes slightly rosy, summaries of work in industrial sociology, including the Hawthorne studies, the Tennesee Valley experiment, etc. *Industrial Sociology*,[8] by D. Miller and W. Form, claims to be the first text-book on the subject, a comprehensive volume which contains both vast quantities of research into the literature of the field and considerable helpful comment. For instance, the authors quote some interesting criticisms of the ideas of Elton Mayo.

Management. On the subject of management proper, perhaps the outstanding authority is C. I. Barnard (*The Functions of the Executive* and *Organization and Management*). *The Functions of the Executive*,[9] particularly, is far from being easy reading, but it is well worth the effort. 'The Functions and Pathology of Status Systems' (in *Organization and Management*)[10] sums up an ubiquitous and complex aspect of organization in a few pages —and leaves nothing out. The feeling of some that Barnard (and Mayo too) is a second Machiavelli reflects a misreading. However, an author so telegraphic runs the risk of misinterpretation.

[1] Harvard and Oxford Univ. Press, 1941, 218 pp. 22*s.* 6*d.*
[2] Harvard and Oxford Univ. Press, 5th imp. 1950, xv, 282 pp. 22*s.* 6*d.*
[3] Chicago: R. D. Irwin, 1945, xi, 307 pp. rev. ed. $6.65.
[4] London: Routledge & Kegan Paul, 1951, 484 pp. 25*s.*
[5] New York and London: McGraw-Hill Book Co., 1946, viii, 211 pp. bibliog. 34*s.*
[6] New York: Harcourt Brace & Co., 1945, 146 pp. $2.50.
[7] New York: Harper Bros., 1948, xx, 311 pp. London: Phoenix House, 1950. 16*s.*
[8] New York: Harper Bros., 1951, xi, 896 pp. bibliog. $6.00.
[9] Cambridge, Mass: Harvard Univ. Press, 1947, xiv, 334 pp. Oxford Univ. Press, 1947, 350 pp. 30*s.*
[10] Boston: Harvard Univ. Press, 1948, xi, 244 pp. Oxford Univ. Press, 1948, 258 pp. 25*s.*

E. P. Learned, D. N. Ulrich and D. R. Booz's *Executive Action*[1] is a further application of the Mayo conceptual scheme to management practices, short, to the point, and full of examples. *Managers, Men and Morale*[2] by W. B. D. Brown and Winifred Raphael, contains, for a book on management, much material on actual relationships. M. T. Copeland and A. R. Towl deal with a particular aspect of general management in *The Board of Directors and Business Management*;[3] perhaps the best chapter is the one on what the authors call 'discerning questions'—that is, asking the right questions as opposed to giving answers and orders—as a tool of top management. Sir Charles Renold's *Joint Consultation Over Thirty Years*[4] discusses from long experience another way of management—one which is very much in the limelight just now. *Papers on the Science of Administration*[5] (edited by Gulick & Urwick) is a gold mine of material on organization, functionalization and other matters. J. Mooney and A. Reiley's *The Principles of Organization*[6] contains much case material on the organization of such institutions as the Roman Catholic Church. Metcalf and Urwick have edited some of the papers of Mary Parker Follett in *Dynamic Administration*,[7] whom we read mainly for a way of thinking which helps us to get ourselves into perspective, to see that there is a 'law of the situation' which governs an administrative situation.

Off the track though it may at first seem, Liddell Hart's *The Strategy of the Indirect Approach*[8] tells something about military strategy which, after the difference between the objectives of industry and war are allowed for, leaves some useful thoughts about just what is the shortest distance between two points in human affairs. *Conflicts of Principle*,[9] a little and little-known volume by A. Lawrence Lowell, a great president of a great university, shows with example after example that almost every administrative decision inevitably involves conflict between two or more sound and accepted principles of fair play or good sense. By inference, his book suggests that knowledge of principles is far from enough to make a manager. A. H. Leighton's *The Governing of Men*[10] is a detailed descriptive account of the actual problems of an entirely new community and how they were handled. With all the re-location of industry that is going on in Britain to-day, this book should prove immediately useful to many.

[1] Boston: (Div. Res.). Harvard Business School, 1951, 218 pp. London: Bailey Bros. Swinten. 26*s*.
[2] London: Macdonald & Evans, 1948, 163 pp. 10*s*. 6*d*.
[3] Boston: Div. of Research, Harvard Business School, 1947, 202 pp. $3.25.
[4] London: Allen & Unwin, 1950, 195 pp. 7 org. charts. 18*s*.
[5] New York: Inst. of Pub. Administration, 1947, 195 pp.
[6] New York and London, Harper, 1947, rev. ed. 223 pp. 21*s*.
[7] London: Pitman's, 1950, 320 pp. 12*s*. 6*d*.
[8] London: Faber & Faber, 1946, 332 pp. O.P.
[9] Harvard and Oxford Univ. Press, 1932, vi, 161 pp. O.P.
[10] Princeton Univ. Press, 1945, xvi, 404 pp. Oxford Univ. Press. 25*s*.

Biography. History, particularly biography, provides much material for the administrator. So many books are relevant here that it must suffice to suggest a sample or two. J. Buchan's *Augustus*[1] is both a fascinating insight into a great administrator's methods and, of course, first-rate literature. F. S. Oliver's *The Endless Adventure*[2] shows Walpole the administrator in vivid concrete detail, particularly in his handling of the situation arising from the defeat of his Excise Bill of 1733.

Anthropology and Psychiatry. Anthropology shows the extent to which group life moulds individual behaviour in man's 'natural', pre-civilized state. In the studies of anthropologists we are also able to see more vividly the extent to which manners and morals, standards of behaviour, indeed standards of sanity, vary from group to group—the kind of variations which the executive must be quick to recognize as he deals with different people. Two samples here may suffice, R. Benedict's *Patterns of Culture*,[3] and J. T. MacCurdy's *The Structure of Morale.*[4] MacCurdy looks at some modern societies in the same way as Benedict studies primitives, showing national and group characteristics in contrast, all against a background understanding of group behaviour.

Mayo distinguishes between the *stable* societies (which the anthropologists have tended to study) and the *adaptive* societies of modern industrial civilization. The mobility of present-day life raises problems, particularly administrative problems, of its own. In *The Fear of Freedom*[5] E. Fromm explores the often frightening new responsibilities on the individual in the adaptive society—responsibilities of choice and self-discipline —which used to be discharged by tradition and group discipline. Sometimes fear of this new freedom has led him to react into the kind of personal subservience that we saw in Hitler's Germany. B. Malinowski, an anthropologist, explores, in *Freedom and Civilization*,[6] the idea that true freedom has always lain in responsible group co-operation; from the individual point of view, this is perhaps a paradox, but the freedom of anarchy has never lasted long before it turned to despotism. In *Personality and the Cultural Pattern*[7] J. S. Plant, a psychiatrist, shows from clinical experience that there is little hope of emotional balance and health for the individual unless he does indeed grow in an environment which contains some standards of behaviour and objectives, a solid background to his life. Where that is lacking a kind of obsessive thinking and behaviour results which characterizes in some degree many persons to-day; it is aptly

[1] London: Hodder & Stoughton, 1937, 337 pp. 4*s.* 6*d.*
[2] London: Macmillan, 1931-5, 3 vols. (1), 438 pp. (2), 333 pp. (3), 241 pp. ill.
[3] London: Routledge & Kegan Paul, 1949, xii, 211 pp. 12*s.* 6*d.*
[4] London: Cambridge University Press, 1943, 223 pp. 12*s.* 6*d.*
[5] London: Routledge & Kegan Paul, 6th ed. 1952, 257 pp. 15*s.*
[6] London: Allen & Unwin, 338 pp. 1947, 16*s.*
[7] Harvard University Press, Commonwealth Fund, 1937, 442 pp. Oxford University Press. 20*s.*

described by K. Horney, e.g. in *The Neurotic Personality of our Time*[1] and Mayo, particularly in *Some Notes on the Psychology of Pierre Janet.*[2]

Community. Graham Wallas (*The Great Society*)[3] P. Drucker (*The End of Economic Man*),[4] and E. Jaques (*The Changing Culture of the Factory*),[5] all explore the theme of community in their own ways and with their own emphases. The conclusion is always the same: that men have always needed social satisfactions and heeded social sanctions in work as well as in play, that as the social rôle of the general community recedes the factory's emerges.

Communication. Against the foregoing background the thorny problem of communication takes on more shape and sense. Understanding of the workings of physical organisms, e.g. the human body, particularly its characteristic of constant delicate adjustment to maintain a complex balance, may help further; W. Cannon's *Wisdom of the Body*[6] provides such an understanding. W. Lippmann's *Public Opinion*[7] discusses the stereotyped ideas evolved by individuals and groups which impede objective observation and judgment, whilst S. I. Hayakawa's *Language in Action*[8] shows how the stereotypes get embedded in our language, so that words themselves—which are, after all, only symbols—come to colour thinking. All this is exceedingly relevant to the process of reaching understanding between individuals and groups—communication. R. Tredgold (*Human Relations in Modern Industry*)[9] treats of communication in industry, and generally; B. Selekman (*Labour Relations and Human Relations*)[10] deals with relationships with trade unions; and Wallas (*Human Nature in Politics*)[11] explores politics in like manner.

Effecting change. We are brought now to the ultimate aspect, the ultimate problem of administration and communication, viz. helping people to change their routines and stereotypes. Inasmuch as that is one way of looking at the whole process of administration, any number of volumes could be recommended, notably some that have already been mentioned, e.g. *Management and the Worker.* We might just add here two examples off the beaten path: Lilienthal's book on the Tennessee Valley Authority (*T.V.A.*)[12] and a collection by Brunner, *et al.*, *Farmers of the World.*[13]

[1] London: Routledge & Kegan Paul, 1937, 299 pp. 18*s.*
[2] Boston: Harvard University Press, 1948, vii, 132 pp. Oxford University Press, 16*s.*
[3] New York and London: Macmillan, 1914, 383 pp.
[4] New York: John Day Co. London: Heinemann, 1939, 268 pp. O.P.
[5] London: Tavistock Publications Ltd., 1951, 341 pp. 28*s.*
[6] London: Routledge & Kegan Paul, 2nd ed. 1939, 333 pp. 21*s.*
[7] London: Allen & Unwin, 1922. 13th imp. 1950, 427 pp. 32*s.*
[8] Chicago: Harcourt Brace & Co., 1940, 106 pp. $1.90. London: Allen & Unwin, 1952, 397 pp. 18*s.*
[9] London: Gerald Duckworth & Co., 1949, 192 pp. 8*s.* 6*d.*
[10] New York and London: McGraw-Hill Book Co., 1947, xi, 255 pp. 15*s.*
[11] London: Constable, 1948, 301 pp. 10*s.*
[12] Harmondsworth: Penguin Books, 1945, 221 pp. illus. bibliog.
[13] New York: Columbia University Press, 1945, 208 pp.

T.V.A. describes a now famous experiment in democratic administration, where numerous people were given the freedom to persuade themselves (or not) of the value of new methods. Perhaps the success of the experiment is a major proof of the paradoxicality of human behaviour! *Farmers of the World* describes work in far-off lands, where, by much the same methods as T.V.A.'s and with an awareness and active respect for local customs and traditions, scientists have been able to help introduce radically altered methods of farming and sanitation without creating social havoc.

Personal. The above notes, like any reading list, cover a lot of ground; maybe the comments will make it easier for the busy reader to select what he has time for. In his concern over his relationships with others, however, he should not forget his relationships with himself, and for that reason perhaps our last suggestions should be our first. Cannon's *The Way of an Investigator*[1] describes some processes of creative thought which will either reflect or inform the experience of most of us; so do Wallas's *The Great Society*[2] and *The Art of Thought.*[3] It is a fairly general observation that for ultimate harmony with others a certain inner tranquillity is essential. Such will never come through reading alone, but many have found help in a little book by Joshua Liebman, *Peace of Mind.*[4]

[1] New York: Norton, 1945, 229 pp. $3.50.
[2] New York: Macmillan, 1914, 383 pp.
[3] London: C. A. Watts & Co., 1946, 126 pp. 3*s.* 6*d.*
[4] London: Heineman, 1947, 218 pp. 8*s.* 6*d.*

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