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VOLUME III

THE HAWTHORNE INVESTIGATIONS

By

L. URWICK, O.B.E., M.C., M.A., F.I.I.A.
Sometime Director of the International Management Institute, Geneva

and

E. F. L. BRECH, B.A., B.Sc. (Econ.), M.I.I.A.
Consultant in Personnel Management

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FOREWORD

LYNDALL URWICK was the first person to take public notice of the successive studies of human relations in industry undertaken by the Western Electric Company. He was at the time Director of the International Institute of Management at Geneva; and somewhere in the early 1930's he published a monograph on the Hawthorne experiments. At that time the enquiry was still in being and no books dealing officially with the tortuous course of the study had then been published.

This has since been altered; approximately seven books, including the official *Management and the Worker* by Roethlisberger and Dickson and *The Industrial Worker* by North Whitehead, have appeared and have circulated widely in the United States and even beyond the American borders. Unfortunately these books, and other books that comment on them, are not easily obtainable at the moment outside the United States. This is of course due to the "dollar shortage" and other disturbances of social and economic balance that have followed the latest European war. So that, at a moment when everyone needs to know more of the Western Electric findings, anything that approximates to a careful record is practically unobtainable.

And it is at this moment that Urwick, with the effective aid of his close associate Brech, has again come to the rescue. It is, I feel, timely and appropriate that one who first noticed the interest of the Hawthorne study should again undertake to make available to that section of the British public who desire to be further informed something of its details and probable significance. Such information is necessary; both the claims made for, and some criticisms of, the Western Electric experiments are often based upon extensive misunderstanding. I hope that the book will be read widely by the many who are, in these days of difficulty, vitally interested in the human problems of modern industry.

ELTON MAYO

Sept. 1st, 1947.

PREFACE

THIS volume sets out to meet a keen demand from the British management movement. Over recent years, passing references to "the Hawthorne investigations" at professional management meetings have been frequent—tantalisingly frequent, when one takes into consideration the difficulty of access to the published findings. The descriptions of the Investigations and an analysis of the conclusions drawn have appeared in three or four monumental American publications from the hands of those most intimately concerned with the work, but recent events have severely restricted their availability in this country, and so have hampered the wider diffusion of knowledge. To those who are seriously concerned with the study of the human factor in management, the Hawthorne Investigations have a great deal to offer. It is in the hope of providing both a brief review of what the Western Electric Company has accomplished, and a stimulus to the study of the more detailed official publications, that this summary volume has been prepared.

We should like to express our sincere appreciation to the Harvard University Press and the other publishers who have given us permission to reproduce the considerable extracts that are included in this volume. It is our belief that the true value of the Hawthorne work can be best presented by using the words of those intimately concerned with it rather than our own.

L. URWICK
E. F. L. BRECH

London, May, 1947.

1

THE PURPOSE OF RESEARCH

IT is something over two hundred years since a great English writer made the observation that "the proper study of mankind is man." Yet this thought has been little in evidence in the history of the industrial and social evolution of this country during those two centuries. Perhaps its truth is only now being recognised, in a Britain—and a world—that has suffered the painful experience of two major wars in a generation. The concept has, however, been a dominating influence on the minds of some of the pioneer thinkers and writers on industrial management—as will have been apparent from foregoing volumes in this series. In terms of action, too, it has figured repeatedly in their lives. Owen and Cadbury, F. W. Taylor and Mary Follett differed widely in character and temperament. But each in turn bore witness to the significance of "the mental revolution" that was the crux of Taylor's teaching and that placed a primary emphasis on the man rather than on the machine.

It fell to a great American Company to carry the principle into practice in a way hitherto unparalleled in industry—if not indeed in any other branch of human endeavour—through a long and intensive study of the social and inter-personal relations of the men and women in an industrial organisation. The Western Electric Company, at its Hawthorne plant, engaged in serious research into the physical factors of the working environment in its factories, found, to the amazement of the investigators, that unknown, unsuspected and unconscious forces within the human being were capable of playing havoc with the results of carefully planned and controlled scientific experiments. They set out to study the effects of lighting on output. But they found that no study of the environment was effective that did not include the most detailed investigation

of the individual worker, the human factor in the equation. As one of the team at a later date put it—" somehow or other that complex of mutually dependent factors, the human organism, shifted its equilibrium and unintentionally defeated the purpose of the experiment."[1]

Having a true appreciation of what is meant by the scientific approach, the Company could not rest content with positing an unknown quantity and labelling it x. They proceeded with great patience and ingenuity with their efforts to identify this unknown. Thus they launched what was to become one of the great pioneer enquiries of the modern world—the famous " Hawthorne Investigations." They attempted nothing less than a study of man in his informal natural state within the unfettered social environment of his working group. " It became clear," said another member of the team, " that what was most significant was not conclusive answers to specific questions, but a development in the understanding of human situations which would help to improve employee relations and aid in resolving the problems arising in them when and where they occur."[2]

These investigations have not yet attracted in this country, especially among the ranks of sociologists and industrial managers, the degree of interest that their quality deserves or the appreciation and attention that their importance demands. Yet they are in themselves a handbook of all that is implied in the modern approach to management, which sees it as in essence a leadership of people and a social task of human beings among other human beings. There is no thought among these newest ideas on the social and personal character of the responsibilities of the executive that has not an echo or a reflection in the vast treasure house of the work at Hawthorne. There it will be found on a small scale, not generated in the brain of the analytical thinker, but thrown up out of the everyday behaviour of the men and women in the team, on the experimental bench. The very fact that the scale was in part small and simple, though tremendously detailed and prolonged, adds to its reality and safeguards it from the swamping effect of generalisation. Here are the facts of management

and supervision at work, shorn of all the glamour of organisation charts and schedules of responsibilities. And here too are the reactions of the men and women employed, uncovered, natural, not screened by the formalities of joint negotiation or deflected by the pleasant domesticity of the personnel manager's office.

Equally remarkable is the way in which the findings and interpretations of the Hawthorne Investigations link up with the pioneers whose stories have already been told in earlier volumes in this series. The one who comes most obviously to mind is Mary Follett. There is no record that she ever came into touch with the research activities at Hawthorne. She was still living in America when they started, but had already taken up her final residence in this country by the time that any findings or comments were being published. But the essential parallel between her thought and the most vital conclusions from the investigations is most striking. Fundamental to her whole teaching was recognition of the emotional factor in the human being—*Creative Experience* was a psychology of the whole person, in whom emotions are a driving force. "Power-with" instead of "power-over," the doctrine of "integration" instead of "compromise," the four cardinal principles of co-ordination—these are the core of Mary Follett's philosophy of management. They are based most definitely on the dominance of the emotions in human behaviour.

No single truth has emerged more clearly from the work at Hawthorne. There is the reply of the relay assembler when questioned about the progressive fall in output of her team in the spring of 1932: "We lost our pride." Nothing else, no factual or physical causes, but just a powerful emotional reaction that ran counter to all the logic of the situation. One of the investigations had to be abandoned because of "considerable friction among the other employees . . . (and) in order to preserve the Department's morale." That an important investigation was being conducted was not a fact of sufficient appeal rationally to overcome the objections that the employees were raising on purely emotional grounds to the establishment of experimental conditions for "a favoured few."

Similarities can be found also with Robert Owen and Henry Dennison (to take two instances a hundred years apart) in their approach to the human problems of their organisations. There is a parallel, too, with Taylor himself, not only because, as already suggested, the real significance of his philosophy was the appeal for a new outlook on the problems of management, but also because of his emphasis on the significance of the intellectual approach to the human factor in production. As he wrote, "There is another type of scientific investigation which should receive special attention, namely, the accurate study of the motives which influence men."

Because they were led to such an investigation, the men and women who worked at Hawthorne are in the direct line of intellectual succession from the founder of Scientific Management—pioneers of our own day. Individually they are very little known outside the circle of those engaged on the job. In this, as in other branches of scientific work, research today has become essentially a matter of team work. The degree to which this fact was appreciated and the ideal realised by all those who worked at Hawthorne constitutes one of the most remarkable and original features of the undertaking. To a man, those who took part would be equally reluctant to claim or to seek any outstanding role or any lion's share of the honour. They all recognised that each of them had a particular contribution to make. This applies not only to the scientific workers and experts who gave their services so readily both in the enquiries and in the collation of the evidence. It is equally true of the many un-named participants, the employees and supervisors who formed the subject of the investigations and the observers who did the detailed work. Indeed, one of the most senior executives of the company who had much to do with inspiring the enquiry, has written:

> "Perhaps the greatest credit should go to the many employees who participated in this work. The members of the research staff were constantly inspired by the spirit of helpfulness of the many hundreds of employees who expressed themselves so fully to the interviewers and by the whole-

hearted co-operation and interest of the group of employees who through a considerable period participated in the various test room experiments. The willingness of employees to collaborate in the studies and the co-operation which they gave the people conducting this research contributed in a large measure to its success."

And another official who played a leading part in all the detailed arrangements has put the case equally strongly:

"The individuals were scarcely visible anywhere. It was more like a blurr of team work. . . . In the published accounts there are many quotations from employees who participated in each phase of the work. They told us what they thought of what we were doing and often made suggestions which influenced our thinking. These comments and many more which could not be published formed the foundation upon which the investigations were based. Approximately 20,000 employees in the Hawthorne Works took part in the investigation. . . . In addition, there were at one time between 75 and 100 investigators involved in the studies. . . . Their main contribution was in the pooling of any thoughts or feelings that they had about the investigations they were making. The entire staff was encouraged to make regular contributions in weekly conferences. In these conferences new ideas were discussed and subsequently tried. If they were found to warrant further study and investigation they became an active part of the programme. We feel that the putting of this process into operation probably makes this research unique as compared with many other investigations. Those who were directly responsible for the supervision of the research in the Western Electric Company acted more as co-ordinators than they did as directors. . . . We would much prefer that credit for the success of the studies be given to organisations which made them possible: The National Research Council, The Massachusetts Institute of Technology, The Rockefeller Foundation, The Harvard School of Business Administration and the Western Electric Company."

From the standpoint of the story-teller, it is always attractive to isolate individuals and to colour the bare facts of scientific development with details of personality. But the clearly expressed wish of the Western Electric Company must readily command respect. Apart from this, is not the fact that the officials should unanimously have expressed these sentiments even more arresting? Here was a broad scientific enquiry, covering every detail of the lives of those involved, lasting over a number of years, and as exciting in the impact of its results on the field of social study as the discovery of a new drug or a new element in the physical field. Yet never for a moment has any individual who took part in this famous adventure allowed himself to forget that the work was a collective enterprise and that the contribution of each and all in their place and function, the job as a whole, was the first consideration. The way in which the work was done and the spirit in which it was carried through were, from the standpoint of social service, themselves as original and significant as any one of the many valuable results which have flowed from their combined efforts.

The tribute which is owing must be paid not to individuals but to all the men and women who participated in the experiments. It is collectively that they have earned their honourable place among the Pioneers of Scientific Management. What their contribution means many managers in industry do not yet realise. Those alive today may see the knowledge that they have unfolded accepted as a common-place of everyday practice. Or it may be left to writers of a later century to relate how this group initiative was translated from a series of books and reports into principles and methods adopted by all responsible for executive control and supervision in industry. For, whether general recognition and acceptance comes sooner or later, their work is securely founded on scientific method and will endure.

. . . . .

The findings and interpretation of the Hawthorne Investigations have been presented in seven main publications, four of them dealing directly with the research activities and what

they revealed, and the other three using certain aspects of the findings as illustrative material in wider industrial and sociological studies. This volume is built up entirely from these sources and quotes freely from them. This, the authors feel, will be the most valuable service they can render to readers, giving them an outline and a critique of matter that in its total published form covers more than fifteen hundred printed pages. As a preliminary, brief notes on the books themselves will be of value, if only to guide those who wish to study in closer detail the findings here presented.[3]

(*A*) *THE HUMAN PROBLEMS OF AN INDUSTRIAL CIVILISATION—Elton Mayo.* (*Macmillan*, 1933.)

Apart from one or two monographs and articles which had appeared in the United States from 1929 onwards, this book gave the first full published comments on the Hawthorne Investigations. The author was at the time Professor of Industrial Research in the Graduate School of Business Administration at Harvard University and has been associated with the Investigations from a very early stage. The contents of this volume are the reproduction of a series of lectures which cover various human problems centring on fatigue, monotony, morale and social relations in industry. Three of the chapters deal with the Hawthorne findings, though they are concerned only with the relay assembly room and the interview programme. These chapters form a very useful introduction to the study of the Hawthorne work, since they are of a general character, giving broad lines of interpretation rather than any detailed presentation of findings. Yet they give a good general picture of the trends in the assembly room experiments and show how the investigators were gradually led on to the different phases of the whole enquiry.

(*B*) *THE INDUSTRIAL WORKER—T. N. Whitehead.* (*Harvard Press and Oxford Press*, 1938.)

Two volumes (bound together in English edition). This is a comprehensive and detailed analysis of the relay assembly

test room findings. It is intended for the student who can devote serious study to the details of the experiments. It is not a book for the general reader who needs broad conclusions. Hourly records of five years of continuous work have been submitted to the most rigorous examination, coupled with a critique of the observations recorded as to the conversations and behaviour of the girls under test. In other words, these volumes contain an exact and detailed scrutiny of the influences that were at work at any given moment to affect the trend of output or the behaviour of the operatives. The English edition suffers from being bound in one volume because this makes difficult simultaneous study of text and charts, which is essential to a proper reading of the data presented.

(*C*) *MANAGEMENT AND THE WORKER—F. J. Roethlisberger and W. J. Dickson.* (*Harvard Press*, 1939.)

This large volume may well be called the "final report on the Hawthorne Investigations," for it contains a full survey, descriptive as well as analytical, of all that took place. Its authors are respectively the Associate Professor of Industrial Research at Harvard and the Western Electric Company's Executive in charge of employee relations research. They thus represent the two organisations who were the major partners in the experiments. The book is less detailed than Whitehead's study, but is wider in scope and different in purpose. It may be regarded as the one single volume which must be studied if any thorough knowledge or appreciation of the Investigations is to be obtained.[4]

(*D*) *MANAGEMENT AND MORALE—F. J. Roethlisberger.* (*Harvard Press*, 1942.)

Perhaps most aptly described as the author's second and wider thoughts on the findings, this rather briefer study sets out to re-interpret the Hawthorne conclusions in terms of a philosophy of management. An interesting feature—as the author appreciates—is that it includes within its train of thought the influence of Chester Barnard's later study *The Functions of*

the Executive. It is therefore one of the most up-to-date analyses of the theory of management in terms of social relationships. It gives little space to any description of the Hawthorne activities. But it stems from that source, as the trend of its argument and a number of its illustrations clearly show. Elton Mayo in the Foreword says that " this book by my colleague Roethlisberger is a study of what is in fact involved in human collaboration. . . . Its approach is primarily in relation to the industrial field and it makes a special pioneering contribution in a chapter entitled " What is Adequate Personnel Management ? "

(E) *LEADERSHIP IN A FREE SOCIETY—T. N. Whitehead.* (*Harvard Press and Oxford Press*, 1937.)

This publication is a study of society as influenced and shaped by industry, rather than of industry itself. It is prompted by rather than concerned directly with the Hawthorne Investigations. To some degree, its title has made the book a victim of circumstances. Published in 1937, it was inevitable that the contemporary interpretation of the phrase " a free society " should be made in terms of " politically democratic " as opposed to " totalitarian." The author, however, used these words in the sociological sense of a natural or primary group. Its subtitle is " A Study of Human Relations based on an Analysis of Present-day Industrial Civilisation." This is certainly a valuable extension of the material thrown up by the Hawthorne findings. Every manager interested in the wider implications of his work should study it. But its special character should be borne in mind. It is an analysis of " the relations of business to social activity and of the ceaseless interaction between human motives and the shape and development of organised institutions."

(F) *FATIGUE OF WORKERS—ITS RELATION TO INDUSTRIAL PRODUCTION.* (*Reinhold Publishing Corporation*, 1945.)

A Report by the Committee on Work in Industry of the National Research Council, U.S.A., 1941. This contains

certain summaries, descriptions and analyses of the findings, but is not a direct study of the Hawthorne Investigations.

(G) *THE SOCIAL PROBLEMS OF AN INDUSTRIAL CIVILISATION—Elton Mayo.* (*Harvard Business School of Research,* 1945.)

This is a brief sociological study of the Hawthorne findings and other investigations of a similar kind with which Mayo was subsequently associated. In form, the book represents Mayo's farewell report to the Industrial Research Division of Harvard Graduate School of Business Administration, after twenty years of service in the continuous study of the human problems of industry. In content the book is an analytical review of the significance of social relations in the human group and a revelation of the failure of contemporary industrial managers to understand the implications of this aspect of their responsibilities. The matter of this study will be drawn on only for the concluding chapter of the present volume.

• • • • •

It would be ungracious at the outset not to pay a tribute to the attitude of the great industrial Company which made the studies possible—its inspiring concern with the problems of its employees, the scientific interest of its executives, and their objective approach to the task of management. If leadership means anything, this attitude goes far to explain the spirit of co-operation from all ranks of employees concerned in the enquiry. The patent generosity of the Rockefeller Foundation, the support of the National Research Council and the scientific skill contributed by the Harvard School of Business Administration and the Massachusetts Institute of Technology all combined with this attitude to create a pattern which will long remain a model of the way in which a major piece of social research should be conducted. It may well be that the great industrial and technical achievements of the Western Electric Company will fade into the background of the past, under the impact of a century which can see no bounds to the revolution produced

by the physical sciences. Should this happen, its place in industrial history will remain assured, if only because of its pioneer contribution in making possible this first full-scale investigation into the human factor in management.

[1] *A, v. later footnote.*

[2] *C, v. later footnote.*

[3] *As it is intended to quote many extracts from these texts, the authors feel that it will be tedious to give page or chapter references on every occasion. Accordingly reference will be made only to the book from which the quotation is taken and this will be designated by the code letter used in the list above*: *A, B, C, D, E, F, or G.*

[4] *A very interesting review of the book was published in the form of four articles in the British monthly journal "Business," September–December,* 1941.

II

THE PROGRAMME OF RESEARCH

SOME appreciation of the situation within the Western Electric Company at the plant concerned is essential to a proper understanding of the investigations. In particular, a grasp of the character of the Company's employment policy adds to the significance of the findings.

The Company was engaged mainly in the manufacture of telephone apparatus. It thus falls into the category of light electrical engineering. At the pertinent period—the later 1920's—the factory pay roll was something in the order of 30,000 men and women. This was in itself the population of a good sized town and was an important element of the great industrial city of Chicago. It was claimed that these employees of the Western Electric Company were drawn from sixty nationalities, in various degrees of descent from original immigrants. They clearly represented a typical cross-section of the American industrial population. Moreover, within each of the national groups there was a wide variety of occupations and of grades of skill. This is a factor which has special significance in regard to the phase of the investigations that was known as "the interview programme," in which several thousands of the employees were subjects who participated in the investigations.

Even at the time when the first experiments started—just over twenty years ago—the Company had an outstanding personnel policy; it was in the front rank of contemporary industrial undertakings. Elton Mayo (A) spoke of it as "a company definitely committed to justice and humanity in its dealings with workers, and with general morale high."

His elaboration of this general comment is worth quoting in full:

"The Western Electric Company would stand very high in a list of industrial institutions if the order in such list were determined by consideration of the worker and a real concern for his welfare. In respect of hours of work and wages the company stands above its compeers. It has provided a restaurant in which good food is obtainable at moderate prices; guests are commonly taken to lunch there by executive authorities and make their selection from food provided for workers. There is an excellently appointed hospital, adequately equipped, and staffed by medical officers of high qualification. The personnel division makes use of every established method of vocational guidance in an effort, which statistics show is highly successful, to suit his work to the worker. There has been no strike or overt symptom of discontent for over twenty years. There can be no question that the general morale, in any accepted meaning of that term, is good and that the company stands high with its employees. I have not mentioned the various thrift and investment plans which the company organises for employees, the vacation provision or numerous other evidences of an unmistakable determination to fulfil humane intention to the utmost." (A).[1]

With an outlook of this kind the Company might be expected to show an interest in new ideas about the well-being of those it employed. But the launching of the investigations can only be understood fully when a further factor is taken into consideration. The Company was also "research-minded." It not only gave keen support to technical development. It also encouraged its executives to be alive to any development of knowledge which might suggest directions in which its policy might be extended or improved. To this end it frequently collaborated with the American National Research Council and the Universities in specific enquiries. Thus the right basic setting was provided for executives who were scientifically minded. Indeed, among many factors which helped to bring this particular investigation to fruition one of the most outstanding was the patient interest and perseverance of the

executives of the company, of all grades, who participated in the work.

The Hawthorne "experiments"—as they are popularly called, though "investigations" is a more appropriate title—can best be summarised as a series of enquiries into human association in work and the nature of the social relationships arising from such association. But it would be a mistake to imagine them as starting with that flavour. To study the human being in his or her working environment regarded as a whole became the paramount objective of the enquiry. But it was only as new findings emphasised the significance of the dynamic personal and social forces at work that attention was focused on the true character of the results. Each investigation, and in the early stages of the Relay Assembly room each phase of the investigation, was directed to a specific object and the emphasis of many of these objectives was physical rather than psychological. Yet gradually "that complex of mutually dependent factors, the human organism," obtruded itself. The logical development of the purely physical enquiry was checked and thwarted by some factor which, at the time, appeared inexplicable. Nowhere is this more clearly seen than in what proved to be the critical stage of the Relay Assembly room—Period XII. This was the point at which the subtle influence of the human emotions first attracted attention as a determining element in the equation. This influence, as the enquiry proceeded, was to be recognised more and more as the driving force behind all the increases in production that, in the earlier stages, had been attributed primarily to improvements in physical conditions of work.

The origin of this long series of experiments was, in itself, simple. For some time the Company had been experimenting with lighting in the workshops, examining the influence of illumination upon the level and maintenance of output. A particular series of tests were being conducted between 1924 and 1926. They were based on parallel observation of two groups of operatives, one a "test" group and the other a "control" group. Both were working under conditions identical in every respect save lighting. The control group

remained with constant illumination of the level and type with which the two groups started. Experimental changes were introduced periodically in the test group's room. The details of this work are not significant here, but a few incidents are of interest both in themselves and as pointers to the following enquiries. At one stage, two operatives worked for a considerable period with a light intensity of 0.06 f.c., equivalent to ordinary moonlight. They maintained their level of output. At another point the test group's lighting, starting at a high intensity, was gradually reduced to 3 f.c. : output continued to increase. Changes in intensity of lighting were made without the operatives' knowledge : they were unable to recognise the change. Alternatively the operatives were told that illumination had been decreased or increased : they confirmed that the illumination was worse or better—whereas in fact no change at all had taken place. Despite the allegations of " worse " light on such occasions, there was no fall in output.

Far and away the most significant feature of these lighting experiments was the overall trend of output. Despite the variations in light, the trend of output of the test group mounted steadily—*but so did that of the control group:* The words of a popular article have put the point with vigour :

> " The test group was given increased light. And, under more light, its output went up. Good—that was to be expected. But the output of the control group—without a single candlepower of extra light—went up too ! This was completely screwy. But screwier results were to follow. Light for the test group was decreased below that of the control group. Its output went up again: So did that of the control group ! ! What, in Heaven's name, was going on ? "[2]

The Company was in no better position to give an immediate answer than the writer of the article. But they decided to try to find out. They had learned that a controlled experiment conducted with the best scientific advice available into an isolated and single factor and an apparently simple factor

within the human industrial environment could encounter some undefined obstacle which made nonsense of scientific expectations, so that the experiment failed to elucidate the problem in any particular. Clearly, the human organism was shifting its equilibrium and allowing unrecognised forces to modify what had hitherto been accepted as a specific relationship between a physiological cause and its effect, measured in terms of output. The Company set about devising a suitable experimental technique. So, several months after the conclusion of the lighting experiments, the first Hawthorne Investigation, "The Relay Assembly Test Room," began.

In the conduct of the significant lighting enquiries, a special feature of the arrangements had been the segregation of the two groups of operatives. Later this was to be revealed as a factor of major importance. But for the moment it seemed an unimportant and convenient procedure. Accordingly it was adopted for the new enquiry. Another important feature, equally adopted as a natural corollary of the type of investigation, was the active participation of the subjects in the work—their views had been sought, their comments invited. This again was made a character of the new enquiry.

It was in April, 1927, that the Relay Assembly test room came into being. Though planned as an enquiry into the total human situation, it was not specifically concerned with any aspect of human relations—if indeed any such aim was even thought of at this stage. Its one basic principle was that there should be no attempt to test for the effect of single variables in working conditions, even though specific environmental changes were to be introduced separately as occasions offered. What was to be observed was the general effect of such changes regarded cumulatively on the total human situation. Possibly specific conclusions might emerge in respect of some of the changes introduced. As will be shown later, it was only as the enquiry progressed that the relative insignificance of the environmental changes became evident and the real character of the balance of human motives was fully appreciated. In the end the Relay Assembly test room experiments were carried on for five-and-a-half years—until the summer of 1932. They

outlasted by a considerable period all the other enquiries that sprang from them.

The next stage in the investigations in point of time was the double enquiry into the influence of incentives, not only on output but on the whole human situation. In connection with this further enquiry the company set up the Mica Splitting room (August, 1928–September, 1930), largely paralleling the Relay Assembly group. It was again a separate group of operatives working under conditions that would admit of continuous and close observation. It differed from the relay group in one feature. The individual piece-work incentive was continued as the basis of payment, whereas the relay assemblers in the test room constituted a group on their own for piece-work purposes.

The second immediate outcome of the Relay Assembly test room was another group drawn from the same department and known as the Second Relay Assembly Group (November, 1928–February, 1929). This was to be the reverse of the mica group, namely, a team of operatives continuing to work in their department under ordinary conditions, except that for convenience they were physically removed to one end of the shop. The only change made in their circumstances was that for piece-work purposes they became a group apart, self-contained and no longer sharing in the general group-incentive scheme that operated regularly for the department as a whole. This group ran for only a short time, hardly long enough to afford any systematic or conclusive evidence, though the investigators felt that it provided some useful pointers to the value of the small group incentive as an influence on effectiveness of work.

Perhaps more was learned about the human beings from the circumstances in which this investigation had to be abandoned. To quote from the authoritative record (C):

> " After a few weeks of the experiment, the foreman began to report to the investigators that the presence of the special group in his department was causing considerable friction among the other employees. They too wanted similar special consideration. This difficulty continued to become more

and more acute until finally it became necessary, in order to preserve the department's morale, to return the operators to the regular method of payment."

Something else was learned, too, about the human situation, though its significance was not recognised until much later. The only physical change in this group had been their segregation to one end of the shop. But this was enough to focus a sense of rivalry with the official and much-publicised experimental group in the Relay Assembly test room. So their rapid rise in output was a response to an emotional stimulus as well as to a more direct type of incentive. This in turn had illuminating consequences. It threw into relief the lower level of output among the general operatives in the department and so jeopardised their security—a further reason for the agitation that eventually made it necessary to abandon the separate group.

The next phase in the programme was on quite a different plane, though again prompted by preliminary conclusions that could be drawn from the investigations so far conducted. It will be recalled that the investigations were a joint activity of the company and the Harvard Graduate School of Business Administration. Both organisations participated in the general planning and direction of the work. But whereas the company's tasks were the detailed arrangement of the plan and the supervision of the work of those of its employees who were the subjects of the enquiries, the responsibility for observation and interpretation of findings rested more with the university members of the team. This point had a special significance in relation to the objectivity of the observations made in the various test rooms and the high degree of collaboration that was obtained from the employees concerned. Thus, from the outset, trained minds were following everything that emanated from the investigations week by week. In particular, they were watching for any really significant events or trends that would indicate the need or advisability of a shift in the line of enquiry or suggest another avenue to be explored.

The third phase of the investigations came from this source.

In both of the longer studies that were in being during 1928 and 1929 (the Relay Assembly test room and the Mica Splitting group) one of the most striking features was the "tone" of the group, the exceptionally good relations among the employees themselves as well as between them and the officials of the company supervising them. The precise character of these relations, how they arose and what they could be held to imply will be discussed when these two investigations are analysed in detail. For the moment, the fact that such relations existed is significant in itself, and it had made itself quite clear to those in charge of the studies at a comparatively early stage.

> "The records of the (Assembly) test room showed a continual improvement in the performance of the operators regardless of the experimental changes made during the study. It was also noticed that there was a marked improvement in their attitude toward their work and working environment. This simultaneous improvement in attitude and effectiveness indicated that . . . we could more logically attribute the increase in efficiency to a betterment of morale than to any of the alterations made in the course of the experiment. We concluded that the same relationship might exist throughout the plant and that the best way to improve morale was through improved supervision." (A).

This conclusion led to the establishment of the work that has since become known as the "Interview Programme." Interviewing of employees began on a small scale in the inspection division in September, 1928, and continued for a few months. But the results soon led to the decision to extend the enquiries into the manufacturing divisions and a full-scale series of employee interviews was launched; it eventually lasted for some two years. By early 1931 over 20,000 of the company's employees had been interviewed separately, informally, "incognito" and in confidence. Each was given adequate time to develop to a skilled interviewer, not associated with the management of the company, his or her own thoughts on any aspect of employment or conditions. Some went back for

a second interview. In the early stages there was a good deal of diffidence and hesitation. But as the programme got under way, and the employees recognised that their confidence was strictly observed, interest and enthusiasm accumulated. Ultimately employees competed with each other for the privilege of being chosen for interview.

Three aims underlay the plan:

"(1) To learn from employees their likes and dislikes relative to their working status.
(2) To provide a more definite and reliable basis for *supervisory training* and for added control of proper working conditions, placement and efficiency.[3]
(3) To supplement and verify conclusions reached from the Test studies." (A).

The emphasis on supervisory training (using the term "supervisor" in the broad sense of managers and foremen) is the more interesting and significant in the light of what has been said about the company's general personnel policy and the level of employees relations that it expected its supervisors to attain and to maintain. What the interviews revealed forms a large part of Roethlisberger's study (C) of the Hawthorne work. From the point of view of the company's practical development the findings provided an overwhelming syllabus of material for supervisory training programmes. They were also a very important guide to the relative emphasis required on different aspects of supervisor-employee relations. To the Interview Programme also must be attributed the later development of "personnel counselling", perhaps the most permanent and important legacy left by the investigations to the Hawthorne plant.

The final phase of the Hawthorne investigations consisted of a detailed study of the social organisation and forces within a working group—the enquiry known as the "Bank Wiring Observation Group." This enquiry is perhaps the least known of the series and yet from some points of view it is the most arresting. It arose, again, as a deliberate decision based on

findings in the earlier series, linking particularly with the interview programme.

> "The investigators' attention had been drawn to the fact that social groups in shop departments were capable of exercising very strong control over the work behaviour of their individual members." (C).

From certain aspects of the interview findings the investigators had become aware of important trends in behaviour which seemed to run counter to the accepted interests of the group concerned—"chief among these was restriction of output" (C), despite the existence of a well-established wage incentive scheme.

> "Informal practices by means of which certain operators were placed under pressure and kept in line were brought to light. There was evidence of informal leadership on the part of certain persons who took upon themselves the responsibility of seeing that the members of a group clung together and protected themselves from representatives of other groups within the company who could interfere with their affairs." (C).

To focus these leads and obtain first-hand evidence of their real character and importance, the Bank Wiring group was set up and studied for the seven months November, 1931, to May, 1932. It consisted of fourteen male operators working on the wiring of connector and selector banks for telephone equipment, a straight-forward job, but one calling for a good degree of specific skill. The group was transferred to a room on its own, but was otherwise left working under standard shop conditions, with the same supervisor and the ordinary methods of incentive payment. The only experimental changes thus consisted in segregation in a separate room and the continuous presence of an observer. He, however, was soon readily accepted and apparently ceased to be in any way a significant factor in the behaviour of the group. No special changes were

to be introduced and no specific study of conditions or output made. The purpose of the enquiry was an objective observation of the social behaviour of an informally constituted working group and of the influence that social environment exercised on the individual's outlook and attitude. From many points of view it is to be regretted that it was found impossible to continue the investigation for a longer period. Even in the short time available a considerable amount of important and useful knowledge was accumulated.

With the Bank Wiring experiment, the actual investigations at Hawthorne were completed. To imagine that the work all ended in the summer of 1932 would give a totally wrong impression. The next immediate task, on which something like ten years were spent, was the interpretation and publication of the findings. Had these been in the nature of clearly observable correlations between certain given conditions or factors and specific results attributable to them, the task would have been simple and straightforward. It will however already have become clear that the conclusions to be deduced from the series of investigations ran on quite different lines. Of course, certain definite lessons were learned in regard to the influence of specific working conditions and methods of payment. But whether the investigations are considered in the broad or in detail, the greater body of findings lay in the realm of social relations. Thus, for example, T. N. Whitehead's study, *The Industrial Worker* (B), is a comprehensive analysis of the trend of output as shown by continuous one-minute records throughout five-and-a-half years, covering the five girls in the Relay Assembly test room. Yet even this detailed study emphasises that the inter-personal relations of the members of the group were of much greater importance measured in terms of their effectiveness than their response to changes in hours of work or rest-pauses. And so with the other studies.

It may therefore be said that the years spent in the interpretation of the findings of the various investigations at Hawthorne—and the first full report did not appear earlier than 1938—represented the most valuable phase in the whole

project, and was certainly a continuance of the joint effort of company and university.

In the meantime, other developments were continuing within the company itself. These may be regarded as the practical application of the research findings. Chief among these developments was the elaboration of the plans for supervisor training. Early in 1929, after the exploratory work on employee interviewing, the company had created an " industrial research division " within its organisation. This was the body that carried into effect the main interview programme during 1929–30, having on its staff some thirty trained interviewers. When the programme was completed, the division took over responsibility for the supervisor training programmes, as well as continuing to collaborate in the preparation of the research material and dealing with any problems that arose in the course of daily personnel operations.

A further achievement resulting from the investigations was the establishment of " personnel counselling " in 1936. This became a regular feature of personnel management in the company, and aimed at preserving permanently the close contact with employees that had been attained in the test groups and in the informal interviews. The counsellors had a wealth of knowledge to call upon and were thus able to start their task with an appreciation of where the chief " rubs " occur in an industrial organisation. They had the vast accumulation of data on the social relations of the working group. They knew too from the interview material the sentiments with which a large cross-section of the employees evaluated the various factors in their environment. Brought down to a few words, the development of the " counselling " programme meant in effect the elaboration of an entirely new approach to personnel management. Procedures and routines have their part to play. But the essence of the personnel function is seen to lie in its fusion of the employees into the organisation that employs them—its character being less that of a specialised executive function and more an integral aspect of the executive process itself.

To outline this conception of personnel management was the aim of Roethlisberger's *Management and Morale* (D).

All through the later years of the investigations, attention was being drawn to the problems centring round the social relations of the working group. It was to this aspect of the findings that Whitehead addressed special attention, from a sociological standpoint, in his study of *Leadership in a Free Society* (E). But the real significance of the social factor in industrial relations probably came home to the investigators only when they could look back at the series of studies as a whole and when they could throw further light on some aspects by parallel enquiries in other places. Thus it was that only in Mayo's swan song—in *The Social Problems of an Industrial Civilisation* (G)—is the final commentary on social relations problems set out.

One concluding thought suggests itself. A Company, which an independent observer could describe in the terms quoted earlier, set out to try to understand the human situation involved in its relations with its employees and of those employees with each other. By all contemporary standards they were employed under good supervision. Yet the Company was forced to conclude that its standards of supervision were still inadequate. It had not yet secured the whole enthusiasm of its people. So far it had not arrived at the real fundamentals of personnel management, despite a policy that was outstanding in the whole country. It had still a long way to go before it could claim that the human problems of an industrial civilisation, as far as its own organisation was concerned, were effectively on the road to solution. The key to everything seemed to lie in "supervision."

Elton Mayo concluded in his earlier report on the investigations (A):

> "It was clear that there were disabilities of some kind in the (Hawthorne) works situation, disabilities that could be mitigated for small groups by the method of the test room. But this mitigation left the larger question unanswered. The interviewing programme showed that the major difficulty was no mere simple error of supervision, no easily alterable set of working conditions: it was something more intimately

human, more remote. 'Supervision' indeed had shown itself to be another word which meant so many things that it meant nothing. In every department there was a human situation; these situations were never identical—and in every different situation, the supervisor played a different part."

APPENDIX

Statement of personnel policy of the Western Electric Company: as given by Mr. W. F. Horsford, Vice-President in charge of Manufacturing, to the Sixth International Management Congress (1935), but stated as having been in operation since about 1925. (Extracted from the proceedings of the Conference.)

TO EMPLOYEES RESPONSIBLE FOR DIRECTING THE WORK OF OTHERS

It is the purpose of this statement to promote a more complete understanding of the Company's employee relations policy. Attention is called to your responsibility for carrying out all of the provisions and to the methods adopted for maintaining uniformity of practice in all departments of the Company.

Although personnel departments have been established to advise and assist executives and supervisors in their dealings with employees, responsibility for making the policy effective in the everyday relationships with all employees must rest with you.

Right relationships with employees is one of the fundamental elements in the success of the Company, and must be founded upon the conviction of every employee that the policies of the Company are based upon a spirit of justice in its dealings with every person with whom it comes in contact.

It is the policy:

To pay all employees adequately for services rendered.
To maintain reasonable hours of work and safe working conditions.
To provide continuous employment consistent with business conditions.
To place employees in the kind of work best suited to their abilities.
To help each individual to progress in the Company's service.
To aid employees in times of need.
To encourage thrift.
To co-operate in social, athletic and other recreational activities.
To accord to each employee the right to discuss freely with executives any matters concerning his or her welfare or the Company's interest.
To carry on the daily work in a spirit of friendliness.

[1] *As a matter of interest, a formal statement of the company's personnel policy has been added as an Appendix to this chapter.*

[2] "*Reader's Digest*," *April*, 1941—"*What Makes the Worker Like to Work?*"

[3] "*It was thought that if all employees could be interviewed and their honest comments secured, they would give a comprehensive picture of the supervisory practices followed and of the desirability of these practices.*" (*A*).

III

THE RELAY ASSEMBLY TEST ROOM

OF all the investigations carried out at the Hawthorne plant, that concerned with the Relay Assembly test room is perhaps the best known. In the first place, it ran for the longest period, almost five-and-a-half years, and overlapped all the other phases of the enquiry, except the "Personnel Counselling" programme. It was, moreover, the investigation recorded in the greatest detail, and provided the largest volume of factual information. In consequence, it has also been the subject of the most penetrating analysis, particularly in the statistical study made by Professor T. N. Whitehead (B). As a consequence, it attracted the largest amount of public interest and attention. In one sense the Assembly room can be regarded as the central theme of the Hawthorne investigations. It was the origin from which all the subsequent phases sprang. It was also their main focal point. It gave to these other phases their significance in relation to the whole enquiry, although this fact in no way detracts from their individual value as contributions.

The work in the Relay Assembly test room, to quote the words of one of the executives of the Western Electric Company, "grew out of a desire on the part of the management to know more about their workers." It was directly promoted by the experience that had been gained in the course of the lighting experiments. The baffled observers, it will be recalled, could only conclude that their investigations of apparently isolated physical factors within a given personal situation failed to achieve any conclusive result because "somehow or other, that complex of mutually dependent factors, the human organism, shifted its equilibrium. . . ." Besides this direct investigation into the workings of the human organism, the Relay Assembly test room was also directed towards certain

other factors, primarily of a physical character, which appeared significant in their bearing on the effectiveness of an industrial group. They centred in the main around fatigue, and the kind of questions that the investigators had in mind may be summarised briefly as follows:

"(1) Do employees actually get tired out?
(2) Are rest pauses desirable?
(3) Is a shorter working day desirable?
(4) What is the attitude of employees toward their work and toward the Company?
(5) What is the effect of changing the type of working equipment?
(6) Why does production fall off in the afternoon?" (F).

That such physical questions were in the minds of the investigators at the beginning of the Relay Assembly test room experiments is a point of some importance for the understanding of the earlier phases. As the enquiries progressed, the psychological and social aspects of the findings became so dominant that the significance attached to physical factors in framing the initial technique of investigation is apt to be forgotten. In fact, at the outset of the test room experiments, the investigators were torn between two sets of influences that they were seeking to elucidate simultaneously, the one the physical questions, such as those concerned with fatigue set out above, and the other the psychological factors entailed in the "shifting equilibrium of the human organism" which had been the precipitating cause of this particular enquiry. In reviewing this apparent dilemma, the investigators "finally came to the conclusion that if a small group of workers were isolated in a separate room and asked to co-operate, the psychological reactions would in time disappear and the workers would then work exactly as they felt; that is, changes in their rate of output would be the direct result in their physical conditions of work, and nothing else." (F).

How wrong the investigators were in this assumption is the major conclusion issuing from the Assembly room experiments.

Only as the investigations proceeded did they come to realise that in the very act of "isolating a small group of workers" the psychological foundation had been altered, and with it the whole meaning of the phrase "working exactly as one feels". But this aspect of the enquiry will be covered later.

In studying the Relay Assembly investigations it is important to realise that no attempt was being made to test for the effect of single variables, even though the earlier stages of the investigation did actually consist of isolated changes of single factors in the working situation.

But such specific changes in the environmental circumstances were regarded by the observers primarily as occasions of experiment, and the subject of study was at every turn the total human situation within that environment. At least at the outset the observers—naturally enough—tended to give considerable importance to these specific changes. They had been trained in the belief that the technique of isolating factors was a sound approach and they were attempting to find answers to physical questions. As the experiments progressed, they were able to see more and more clearly the true inter-relation of the changes in the total human situation and the correspondingly diminishing importance of the individual physical factors which were changed from period to period.

The Relay Assembly test room started in April, 1927. Very broadly, it consisted of a section of the main Relay Assembly Department divided off by a high wooden partition at one end of the room. It contained an ordinary work bench along one side, with equipment, layout and all other physical factors identical with the department as a whole, except for a single item. This was the inclusion in the bench of a hole and chute down which completed relays were dropped (as a device for output-recording purposes). Five assembly operatives and one layout operator (better known in English terminology as a "service" or "feeding" operative) were selected to constitute the working team for investigation purposes. They were all chosen as average workers, being neither inexperienced nor learners on the one hand, nor with outstanding skill nor excessive speeds on the other. They were to carry on with the normal

operation of the Department, namely, the assembly of telephone relay units, consisting of a number of small components which had to be assembled in a jig and then fastened by means of four machine screws. The operation was essentially repetitive and of short cycle, the standard time being a little over one minute for one complete assembly.

For the purposes of the investigation, it was decided to compile very complete and thorough-going records. They included not only such natural factors as room temperature and humidity throughout the day, but also the results of periodic medical examination of the girls themselves. For checking outputs an electrical device was used which operated through the bench chutes and printed on a moving tape a continuous count of completed relays, on a scale giving a quarter-inch of tape per minute of working time. Thus a minute-by-minute record of output for each girl separately was maintained for the whole duration of the investigation. It was decided that the effective co-operation of the operatives would be more readily secured if they were formed into an independent group for piece-work payment purposes (i.e. separated from the main "group scheme" in the department). It was so designed that they could earn at least as much as they had customarily earned prior to entering the test room: in point of fact the change in the piece-rate basis formed a stage in the experimental work and was itself the subject of certain useful findings.

Another variation from the normal necessitated by the circumstances was a change in supervision. The six operatives were to be a part of a continuous investigation and for this purpose had been segregated from the department. It was necessary to have close observation of the developments in the test room, which meant that an observer had to be allocated to spend the day there continuously. To have continued with normal supervision as well could only have led to complications. Accordingly "the observer undertook the twofold function of keeping accurate records of all that happened and maintaining a friendly atmosphere within the test room, in addition to exercising a general oversight. Daily supervision in regard to the assignment of work and the flow of output rested with

the layout operator in accordance with the normal practice in the department. The position of test room observer was given to the man who more than anyone else had been responsible for initiating and planning these experimental studies." (*C*).

Among the detailed records that the observer kept was a log of incidents in the room and of conversations among the girls themselves. At first only such conversation as referred to output or rate of work was recorded, but subsequently almost anything and everything in the girls' conversation became the subject of log entry. Thus, through the mechanically recorded output, the temperature records, the health examinations and the detailed log entries, these five operatives were subjected to far closer oversight and scrutiny than anything ever known in the normal industrial set-up.[1] This feature needs to be borne in mind when the findings of the investigation are being considered in relation to supervisory practice, and particularly when the experience of the Assembly test room is compared with that of the Bank Wiring observation room.

The basis on which the girls were selected may possibly have been an important factor in the social trends that the investigations exhibited. "The method adopted for selecting the group was to invite two experienced operators who were known to be friendly with each other to participate in the test and ask them to choose the remaining members of the group." (C).

The opening phase of the investigation (March–April, 1927) consisted of two weeks' observation of the five girls selected while they were still working in the Department. These observations were made without their knowledge. Their purpose was to provide a record of their normal rate of output under standard conditions in every respect. They were then transferred into the test room (April, 1927) and for five weeks continued working there under standard departmental conditions in all respects save the presence of the observer and the continuous record of output. This was regarded as a period of adjustment to a new physical environment prior to the commencement of experimental changes, and also, as was thought, to allow for the psychological reactions of the change-over.

But already a significant feature of the test room made its first appearance; output from each of the five girls began gradually to rise, and this without any change other than the physical segregation.

In June, 1927, the first changes were introduced, and during the ensuing seventeen months various further experimental developments followed according to a pre-determined schedule. The total span covered by these first nineteen months from the starting date fell into eleven experimental periods; for convenience, the investigators referred to the periods by numbers, these being I–XI, March, 1927–September, 1928. Each was characterised by a specific alteration in working conditions and each ran for a sufficient number of weeks to allow that change —as it was thought—to work out its effects and become a normal influence on the trend of output. Periods XII and XIII were of rather longer duration and characterised by rather special developments which will be described later. Thereafter the periods ran on as phases of the investigation, but were not in the main separately distinguished by specific experimental changes.

A general summary of the different features of the first periods (I–XIII) is given in the chart on pages 35–37 (adapted from C).

For the purposes of the present survey, the total programme of the Relay Assembly test room work can be divided very broadly into four parts. The first covered the preliminary arrangements and the early periods just referred to, and exhibited in the chart. It represented the phase in which, on the assumption that the psychological reactions had been played out, interest centred chiefly on the influence that physical changes could be expected to exert on output. These changes were not regarded as isolated factors. The idea was to assess their impact on the whole situation of the group, looking at the trend of output for the main evidence of this impact. As it will be seen from the chart, the various changes were concerned with such things as the total length of the working week, the hours worked each day, inclusion or exclusion of Saturday in the working week, the duration of rest pauses and their incidence. Physical working conditions in the sense of temperature, lighting, and so on,

were constant throughout and not subject to experimental alteration, although they were under continuous observation in relation to output and have been analysed in the studies. (B).

The second phase was transitional. It coincided with periods XII and XIII (later months of 1928 and first half of 1929), in which the change in the character of the investigation first became apparent. This was the point at which the interview programme started. The further development of the test room was influenced by the interviews of the assembly girls themselves.

The third phase began towards the middle of 1929 and ran on until the latter part of 1931. Its chief feature was the concentration of the investigators' attention on the psychological and social factors in the Assembly test room. Output, which had by now risen to an unprecedented high level, was regarded as of decreasing significance as the index of experience or behaviour. The material on which the investigators concentrated was now more and more the content of the informal conversations of the girls themselves, their spontaneous behaviour in and out of the test room, and such observations as they made in their "formal" interviews. It was during this period that the investigators really began to understand the breakdown of the earlier physical experiments in lighting. They had come at last into contact with the clue for which they had so long been groping and had uncovered the real factors which explained the "shifting equilibrium of the human organism."

The rate of output had a particular significance only at two points during this period; these were the few weeks in April, 1930, and again some months later when, as part of the experimental programme, the original seating order of the girls was changed, and subsequently restored.

The fourth and final phase of the Assembly test room work began late in 1931 and continued until the closing date in the following summer. In this period output once again became a significant index. The initial progressive increase of five years before was reversed, and the investigators found themselves confronted with falling figures over which the operators seemed

to have no conscious control. But, whereas in the initial phases the investigators had been at a loss to find an explanation of the involuntary upward trend, the history of the intervening years made it easy for them to understand this subsequent decline.

Within the limits of a short survey it is impracticable to do full justice to the detailed findings of an original and prolonged investigation. All that is possible is to select the most significant events and to endeavour to relate them to the observed causes. Fortunately, it so happens that even a superficial presentation of the investigation emphasis the fundamental character of the lessons to be learned from it.

The chief conclusion to be drawn from an analysis of the output trends is the virtual absence of any correlation between the level of output or a change in its rate and any specific experimental change in working conditions. This will be seen from Table 1, in the first few phases of the investigation. Here and there what appears to be a direct relationship is exhibited. But it endures only for a period and is usually obscured by an overall trend in which it forms but an incidental fluctuation. Professor Whitehead's searching analysis (B) of the five years' output records indicates that the fluctuations correlated with many things in the total situation of the relay assemblers, but seldom with the physical factors that formed the stages in the first phases of the enquiry.

Almost immediately after the establishment of the test room (Period II, April–May, 1927), the rate of output of the five girls began to rise. There had been no change of conditions of work as against those prevailing for the department as a whole, except the segregation into the separate room and the introduction of the observer. The investigators had anticipated some psychological repercussions from this initial change, but not of the kind or order now experienced. This upward trend of output could only be ascribed to unseen and unrealised changes in the operators themselves; that is, they were due to psychological forces, of a character comparable to those operating in the case of the "control group" in the earlier lighting experiments.

TABLE I.

RELAY ASSEMBLY TEST ROOM

SUMMARY OF EXPERIMENTAL CONDITIONS AND OUTPUT CHANGES

Period No.	*Date and Duration*	*Conditions and Special Features*	*Hours*	*Pauses*	*Output*
I.	March–April, 1927 (two weeks).	In ordinary Department. Standard conditions.	48	—	(Recorded individually without operators' knowledge, to give a base: 2,400 per week.)
II.	April–May, 1927 (Five weeks).	Transfer to Test Room. Standard conditions.	48	—	(Period of adjustment to new conditions.) Output rising.
III.	June–Aug., 1927 (eight weeks)	Group piece work scheme for the Test Room alone (i.e. Group of 5 instead of 100).	48	—	Definitely increasing.
IV.	Aug.–Sept., 1927 (Five weeks).	Two 5 minute rest pauses. Overall hours unchanged.	47.05	2 × 5 mins.	Level.
V.	Sept.–Oct., 1927. (Four weeks).	Two 10 minute rest pauses. Overall hours unchanged.	46.10	2 × 10 mins.	Sharply up; bigger rise than in any period so far.
VI.	Oct.–Nov., 1927 (Four weeks).	Six 5 minute rest pauses. Overall hours unchanged.	46.15	6 × 5 mins.	Slight falling off. Girls complained of the "interruptions."

TABLE I.—*Continued.*

Period No.	*Date and Duration*	*Conditions and Special Features*	*Hours*	*Pauses*	*Output*
VII.	Nov., 1927–Jan., 1928 (Eleven weeks).	Two rest pauses : 15 mins. a.m. and lunch given by the company ; 10 mins. p.m.	45.40	A.M. : 15 mins. P.M. : 10 mins.	Output back to high level of V.
VIII.	Jan.–Mar., 1928 (Seven weeks).	Stop work at 4.30 p.m.	43.10	do.	Both sharply up.
IX.	Mar.–April, 1928 (Four weeks).	Stop work at 4.0 p.m.	40 40	do.	Average hourly rose. Daily and weekly total fell slightly.
X.	April–June, 1928 (Twelve weeks).	Back to 5.0 p.m. stop, i.e. same as in VII.	45.40	do.	Average hourly down. Daily and weekly up to highest level yet.
XI.	July–Sept., 1928 (Nine weeks).	Saturday morning off.	41.40	do.	Unchanged from X except for slight recession in weekly total, but this still higher than any period except VIII and X.
XII.	Sept.–Nov., 1928 (Twelve weeks).	All previous changes withdrawn and return to conditions of period III, i.e. ordinary standard, but retain own group piece-scheme.	48	Nil.	Hourly slightly down. Daily and weekly up to record high level (3,000 per week).

TABLE I.—*Concluded*

Period No.	*Date and Duration*	*Conditions and Special Features*	*Hours*	*Pauses*	*Output*
XIII.	Nov., 1928, to June, 1929 (Thirty-one weeks).	Back to conditions as in period VII but Company supplied coffee only (i.e. own food).	45.40	A.M.: 15 mins. P.M.: 10 mins.	Increase to new high record (above XII).
XIV–XXIII.	June, 1929 to July, 1932.	Continuing as for XIII.	do.	do.	(Not relevant in present context).

N.B.—Period VII became virtually a standard of conditions for the rest of the experiment.

Already, then, the investigators were facing the manifest results of the latent factors in the human organism which they had set out to study. As yet they could not suggest any explanation, nor was there need to attempt one. Only very much later did the nature of these unseen forces become clear. Even more puzzling was the persistence of the upward trend after the first few weeks, in which it was assumed that the process of adjustment to the new physical environment would be complete. It was then that the first change was introduced (Period III, June–August, 1927): it was still in the nature of a transitional change, i.e. an adaptation of normal conditions to make the control of the investigations easier. It consisted of the separation of the five operatives and the feeder into a distinct team for piece-work purposes, apart from the single group formed by the whole department. But there was no change in the basis of payment and nothing that would make earnings easier. (In this connection it must also be recalled that the five assemblers were of average skill and experience). The output trend continued upward much as though the impetus of Period II was still the driving force. There was no apparent causal relation between the change in piece-work grouping and the output curve. The piece-work grouping would only be likely to affect operatives directly by increasing the sense of solidarity of the group—a social factor.

Period IV (August–September, 1927) saw the first experimental development in working conditions, by the introduction of rest pauses in the morning and afternoon spells. But it was only in the ensuing period (V, September–October, 1927) when the rest pauses were both increased from five to ten minutes, that a really sharp increase in production was exhibited. Here it is possible to argue a causal relationship. But the evidence for such a relationship is weakened by the absence of any increase in output when the rest pauses were first introduced in the preceding period. A similar appearance of correlation between physical changes and the output trend can be found in Period VI. The rest pauses were increased to six per day, each of five minutes duration; output declined and the girls themselves complained severely about the " interruptions."

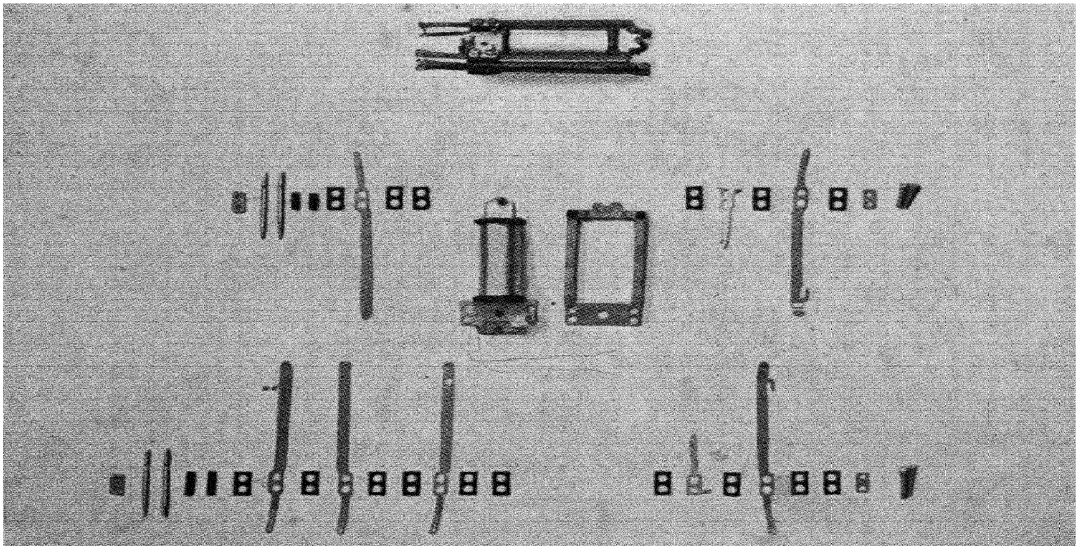


Figure 1. PHOTOGRAPH OF RELAY PIECE PARTS AND COMPLETED RELAY

In the following period (VII, November, 1927–January, 1928), the two rest pauses were restored but were lengthened to 15 and 10 minutes each, respectively for morning and afternoon, and the Company gave a mid-morning snack free of charge. The trend of output went back again to the high level of Period V and this rest pause and lunch arrangement became standard for the rest of the experiment.

For Periods VIII to XI (January–September, 1928), the alterations were concerned with the length of the working day and week, involving a gradual reduction of hours by the shortening of the day and the omission of Saturday. Throughout the year, the output trend in general was consistently upward in a way that seemed to bear little relation to the individual changes themselves. In fact, at certain points it contradicted the results anticipated from a given change. For instance, in Period X (April–June, 1928) the working day was lengthened by one hour each day, Monday to Friday: the average hourly output trend decreased slightly as compared with that of the shorter day, but the daily and weekly levels of output rose to a higher point than any so far attained.

Thus, at the close of the first eighteen months of the experiments, the investigators were uncertain as to the degree to which they could ascribe the increase in output to the alterations in the working week or to other factors in physical working conditions. They could not determine what in fact they had learned or what conclusions they were entitled to draw as to the inter-relation of the experimental changes with the fluctuations in output level that had appeared to follow them. Above all, what was the connection between these changes and the overall upward trend that had been in evidence from almost the outset of work in the test room? If there were definite correlations between output and the physical changes, then the only reasonable method of verifying this was to withdraw all the experimental alterations of working day and working spell, and so revert to the original conditions obtaining prior to Period III. The reasonable assumption was that output would also fall off to something like the level of the earlier period. Such was the experimental development selected for Period XII

and put into operation in September, 1928, to run for the following twelve weeks.

> " According to all the rules of common sense and factory management, this should crush the girls' spirit and reduce their output. Instead it jumped to an all-time high of 3,000 relays a week per girl. The staff swooned at their desks: They had thought they were returning the girls to original conditions, but found those original conditions were gone for ever. Because of some mysterious x which had thrust itself into the experiment, the experiment had changed under them. . . ."[2]

This somewhat colourful description is valuable: it gives light and shade to the picture. For the events of Period XII were unquestionably of the highest significance, if not indeed the most important in the whole course of the investigation. The point had been reached at which the true relative force of " that complex of mutually dependent factors, the human organism," had revealed itself clearly and given patent evidence of its power. Speculations as to the possible influence of this or that condition in the working environment could no longer have any particular value. The investigators' assumptions had proved completely false, and, on the contrary, the doubts they had begun to entertain since Period X were confirmed: " Up to that time it had been possible to assume for practical purposes that the changes were of the nature of adaptation to special circumstances and not necessarily otherwise significant. Equally, it had been possible to assume that the changes recorded in output were, at least for the most part, related to the experimental changes in working conditions singly and successively imposed. At this stage, this assumption had become untenable. . . ." (A).

The conclusion to be drawn from the devastating experience of Period XII could only be the necessity for a change in the direction of the investigations. Thus emerged the phase in which the psychological and social factors involved became the main topics of interest, paralleling the interview programme and one or two other special enquiries that were initiated.

Period XIII reinforced the investigators' convictions that these lines of thought were the key to the problem and confirmed the wisdom of their decision. It was a period of 31 weeks (November, 1928 to June, 1929), far longer than any that had so far been adopted, and for its entire duration all the standard conditions of Period VII were re-established. Output rose to and stayed at a new high record level exceeding even the peak which had been attained in Period XII.

No other experimental changes had been introduced, but it was now known that the high level of productive performance was not to be attributed to anything concerned with a shorter day; nor to an overall shorter week; nor to rest pauses or the grant of a free snack. It was connected with personal reactions to a group relationship in which social solidarity had been attained, and through which interest and motive were harnessed to the muscle-power of the human body. From this point onwards in the work of the Relay Assembly test room, output ceased to be a significant index of the general situation. Attention was concentrated primarily on the inter-personal and social relations among the little group, in an endeavour to see it as a sample of the larger human groups which in total make up the structure of an industrial organisation.

Output was still recorded and analysed minutely. Here and there, in relation to specific incidents, it re-gained its importance as a measure of the unseen actions of the human organism. But, in the main, it was no longer regarded as reflecting the real motives and driving forces. These could only be isolated by studying the inter-play of the six human beings themselves —seen in their behaviour, their group solidarity, their conversation, their intimate social relations, their common sense of responsibility for the task on which they were engaged.

Looking back over the periods covered by the first two phases (two and a quarter years, from April, 1927, to June, 1929), the investigators could recount a story of industrial effectiveness which was almost unprecedented. The trend of output had in the main moved persistently and obstinately upwards to a level beyond the wildest dreams of those working in terms of the customary departmental management. A level

of discipline had been achieved that had no parallel among girl operatives anywhere in the length and breadth of America. Absence, for instance, was not only lower than that in the regular department, but had declined among the test room girls themselves from a yearly rate of 15.26 days per operative to 3.56 days. Or again, the incidence of sickness among the girls was about a third of that in the main department, and the medical examinations indicated that, despite the enormous increase in the output, there was not only complete absence of cumulative fatigue, but actually a reduction in the individual symptoms of muscular fatigue.

The Company's production records indicated a marked improvement in quality of output, despite the increased speed of working. The log entries of conversations and behaviour gave ample evidence of an increase in contentment, reflected in a greater eagerness to come to work, among the six girls themselves.

They also bore witness to a marked development of informal social relations not only within their working environment, but in the extent to which they sought and enjoyed each other's company in parties, entertainments and other off-duty pursuits —among which was a lively and regular interchange of birthday greetings and presents.

. . . . .

In looking back over the Assembly test room, the observer is struck by three outstanding points. There was first the overall trend of output. Production was persistently upward for almost a year and a half and was maintained at that high level for a further period almost double as long. In the last few months of the investigation there was a further interesting feature which will be dealt with separately in a later paragraph. Secondly, there was the marked social solidarity of the six girls. Thirdly, they displayed genuine happiness in their work, which reflected itself in a remarkably high standard of discipline. In respect of all these features, the little world bounded by the wooden partitions within the main Assembly Department differed materially from that immediately without

as well as from that traditionally accepted as normal for any section or group within a factory. From the physical standpoint it was in no way markedly different. To what then was the discrepancy in atmosphere to be ascribed? Wherein lay the "secret spell" that had influenced this group of ordinary working girls and had given them a new and different prospect, a setting for their daily task which made their Monday morning journey a thing of joy?

Reviewing the output trend first, Roethlisberger (C) suggests that an explanation can be sought along any one or more of five channels. "The first hypothesis pointed to the (few) improved material conditions and methods of work that had been introduced in planning the test room: . . . slightly better lighting and ventilation . . . the chute mechanism for recording output which also made handling the assembled relays slightly easier . . . fewer different types of relays. But for many reasons this first interpretation was never very convincing to most of the investigators. The second hypothesis ran somewhat as follows: even though the major output change could not be attributed to this or that type of working day, nevertheless the rest pauses and shorter working hours had provided a relief from cumulative fatigue." But the experience of Periods XII and XIII left little doubt that relief from fatigue was inadequate as a sole or major cause of increased productivity. "A third interpretation was that the introduction of rest pauses and shorter working hours had been effective not so much in reducing fatigue as in reducing the monotony of the work . . . by introducing suitable rest pauses during the working day, by allowing the operators to be paid more directly in accord with the output produced and to work in a compact social group rather than as isolated individuals, the monotony of their work had been dissipated."

"The fourth hypothesis was concerned with the increased wage incentive that had followed incidentally from the alteration in the method of payment—the girls being given an opportunity to earn more directly in proportion to effort expended. According to this hypothesis, the girls were primarily motivated by economic factors." But this explanation was not

supported by the social implications of their lives and behaviour in the test room and was in fact contradicted directly by the experience of the closing months of the investigation. " Finally, there was this fifth hypothesis: the increased output and improved attitude could best be associated with the changes in the method of supervision that had gradually taken place . . . the experimental periods being essentially . . . a means of gaining the operators' confidence and of establishing effective working relations between operators and supervisors."

While undoubtedly each of these five hypotheses had some elements of validity, the factors indicated contributed something to the total answer, the later stages of the investigation made it increasingly clear that the major share in the influence which had changed so profoundly the attitude of the test room team must be attributed to the third and the fifth. It might indeed be argued that the dissipation of monotony—the third hypothesis —was really a consequence of the environment created by the fifth, a revised method of supervision. In other words, the change in the basis of supervision was something more fundamental than any mere alteration in the customary lines of authority. Mayo has a pertinent comment in this connection (A): " In the early stages of development it was inevitable that the group should become interested in its achievement and should to some extent enjoy the reflected glory of the interest the enquiry attracted. As the years passed, this abated somewhat but all the evidence—including the maintenance of a high output—goes to show that something in the reconditioning of the group must be regarded as a permanent achievement. At no time in the five-year period did the girls feel that they were working under pressure: on the contrary, they invariably cite the absence of this as their reason for preferring the test room. Undoubtedly there had been a remarkable change of mental attitude in the group. This showed in their recurrent conferences with high executive authorities. At first shy and uneasy, silent and perhaps somewhat suspicious of the Company's intention, later their attitude is marked by confidence and candour. . . . What the Company actually did for the group was to reconstruct entirely its whole industrial situation."

To understand the findings fully, it is important to realise the method adopted in interpreting the data yielded by the experiments. The investigators were a joint team of university professors and members of the Company's Industrial Relations Division. The observers stationed in the test rooms, or responsible for other direct sections of the programme, were participators in the team. They represented the eyes and ears of the research unit and were immediately concerned with the marshalling and presentation of the facts and figures.

The frequent conferences among the members of the team were the milieu within which, as well as the mechanism by which, the sifting of the evidence was carried out, and the appropriate conclusions drawn, or plans laid down for the direction of further phases of study. The minds at work on this evidence were those of men thoroughly accustomed to the scientific method of approach to their problems, that is, to the objective and dispassionate examination of all that the observations presented in the way of factual material. They entered into the enquiries with no preconcieved ideas. Some hypotheses were essential as a foundation for the initial planning of the work but these were regarded merely as guiding lines in the formulation of the programme and never as predetermined conclusions as to what results were likely to emerge from the investigations.

During the course of the Relay Assembly test room experiments, the immediate findings and their first interpretation by the investigators formed the subject of periodic reports to the executives of the Company. These reports in turn, supplemented by the voluminous original notes and records of the findings, formed the basis from which the published volumes were prepared. It will be recalled that, apart from Elton Mayo's three chapters in a more general study (A) dated 1933, the publication of the findings did not begin until 1938, that is, six years after the close of the investigations. This in itself is a measure of the painstaking study and analysis devoted to the evidence and observations culled during the enquiries. Mayo's chapters were in the main built up from the reports to the Company, supplemented by one or two papers, presented

to professional bodies in the U.S.A. in the earlier stages of the enquiry by the two executives of the Western Electric Company most intimately concerned with the work, under Mayo's general guidance.

From the vast amount of data, statistical, factual and psychological, which had been accumulated during the many months of close observation of work and conditions in the Relay Assembly test room, many conclusions could be drawn, though not mainly in the form of set answers to a series of specific questions. Indeed, to have come to conclusions of that character would have been foreign to the primary intentions of the investigations. The lessons learned eventually corresponded closely with the aims with which the enquiries had been started. It will be recalled that the investigators began with a certain dilemma confronting them. On the one hand they were interested in a number of specific points relating to physical working conditions and their possible correlation with rate of output. At the same time they had as their general aim " getting to know something more about the workers," an aim prompted by the puzzling character of their earlier experiences. The first stage of the enquiry deepened the dilemma. Once more, it presented a continually rising trend of output which could be ascribed to no particular cause. This experience was to be repeated on many subsequent occasions.

Sifting of further evidence, careful probing beneath the surface, eventually brought to light the latent causes, and so made possible the basic interpretation of all that had been occurring—the social and psychological phenomena to which alone the rising level of productive effort could be ascribed. Any objective reader who studies the published findings seriously will find himself in agreement with the investigators' interpretation and will be able to see—as they did—how little industry has hitherto known about the real make-up of the men and women it employs.

From a superficial reading of the Assembly room data, it is easy enough to draw the wrong conclusions. This is particularly true in the case of the findings concerned with the influence of changes in the physical working conditions. It is incorrect,

for instance, to suggest that physical conditions are unimportant as a factor bearing on the rate of output and that the investigation proved this. What the evidence showed was that physical working conditions are not in themselves a sufficient explanation of variations in rate of output or a determinant of the level of productive effort. They are only one factor in a total human situation. In this connection, in interpreting the Assembly room data, it is important to bear in mind the personnel policy of the Western Electric Company and the high general level of conditions provided even before any of the investigations were started. It may be said that physical working conditions vary in importance in inverse ratio to their standard : the worse conditions are the more important they become as determining factors of a rate of output, and conversely. Thus it was that in the Hawthorne case, where the initial standard of conditions was high, the significance of improvements in such conditions was far less than that of the psychological factors involved in the conduct of the investigations.

An attempt to summarise the major conclusions to be drawn from the Relay Assembly test room in general form could only be in terms of the significance of the human elements in an industrial environment and of the meaning of " getting the best out of people." It seemed that this required, in the first instance, providing such mental and social conditions as would encourage the individual men or women to assume a real sense of responsibility for the work on which they were engaged. This appeared to turn primarily on motive and on relations with those in authority—the responsibility being a response to the trust displayed by " authority " and to the freedom afforded by participation in one's own governance. Thus, and only thus, was an outlet provided for the spontaneous, personal expression of the forces latent in the human make-up.

" With what facts, if any, can the changes in the output rate of the operators in the test room be correlated ? Here the statements of the girls themselves are of the first importance. Each girl knew that she was producing in the test room more than she ever had in the regular Department, and each said that the increase came about without any conscious effort on her

part. It seemed easier to produce at the faster rate in the test room than at the slower rate in the regular Department. When questioned further, each girl stated her reasons in slightly different words, but there was uniformity in the answers in two respects. First the girls liked to work in the test room; it was fun: Secondly, the new supervisory relation, or, as they put it, the absence of the old supervisory control, made it possible for them to work freely without anxiety." (F).

In one sense, indeed, the word "supervision" epitomises everything that explained the experience of the test room. Taking into consideration the presence of the observer, the log entries, the continuous recording of output, the medical examinations, and so on, these girls were closely—almost minutely—supervised, to an extent unprecedented in industrial organisation. Yet they stressed, and with emphasis, their sense of freedom from supervision as they had hitherto known it in years of industrial employment. This was a topic that figured most prominently in the girls' conversations and in their observations at interviews. (It was a point that was also to emerge consistently from the statements of other employees in the course of the main Interviewing Programme.)

The chief burden of the test room girls' comment was much to the disadvantage of the regular Department: they now felt strongly a sense of relief from constraint. In fact, "they were exceedingly disparaging about the supervisors in the Department, although management felt that that Department had particularly good supervisory personnel . . . (which) suggested that the management of the Company knew very little about what constituted good supervisory methods." (F). On the positive side, the attitude of the girls clearly indicated that they had found, in their new supervision—despite its close scrutiny—something in which they themselves could feel a sense of participation. It was no longer something apart from and imposed on them, but a part of their total situation. They formed as it were, "an organised social group in a peculiar and effective relation with its supervisors."

The second major factor to which the events of the test room could be ascribed was one closely allied to the altered character

of supervision and, like it, flowed directly from one of the fundamental points in the constitution of the experiment. From the outset, it had been a principle that the girls should be consulted in regard to the changes to be put into effect in the course of the investigatory programme. Every aspect of the experiment was discussed with them fully and in advance at each stage, and on one or two occasions they even vetoed a suggested development. Acceptance of this veto was in consonance with the voluntary character of their service in the test room, but it represented yet another direction in which the traditional features of an industrial set-up were altered fundamentally. Freedom in the fullest sense of the term was accorded to these six girls, because they had a voice—virtually the decisive voice—in the determination of the conditions under which they worked.

One interesting consequence was the emergence of a high sense of responsibility. This is in part reflected in the excellent disciplinary standards referred to earlier. It is also seen in the absolute control which the group as a whole exercised over the leave of absence granted to its members. In accordance with regulations, it lay with the official supervisor to authorise absence for approved causes, but that sanction was not effective with the group unless they approved too. So it soon became customary for requests for leave of absence to be put by any one girl requiring it to the other five and for her to abide by their decision. Nor was leave readily granted except for worthy reasons. The tightness of the control can be seen from the absence figures already quoted.

Freedom of conversation was another respect in which the conditions were changed fundamentally from the normal. In the regular Department, conversation in a low tone was tolerated, although "officially" it was not allowed. For the early periods of the test room the same practice was observed —or at least efforts were made to observe it. But very soon it disappeared and full freedom of conversation became customary. In fact, conversation between the girls became before long one of the major sources of information. Talking was common, mostly between immediate neighbours, but also, in louder

tones, between pairs of girls who were separated, or among the group as a whole. Apart from being another contribution to the full sense of freedom, this facility for conversation meant that one of the most important mechanisms of social intercourse was allowed untramelled operation.

The next factor was an extraneous one, though it undoubtedly exercised a major influence on the " atmosphere " of the test room. This was the " publicity " to which the girls were subjected. At first within the company itself, and then very soon among many members of the university staff and a growing section of the general public concerned with personnel matters, the Relay Assembly test room became an object of lively and concentrated interest. Senior officials of the company made frequent visits. Members of the collaborating university departments were often present. There were the periodic reports to top management, and before long papers given to professional societies and articles in the specialist journals. To themselves and to their fellow-employees and neighbours, the girls were no longer just assembly operatives, mere numbers on a payroll or hands at a bench. They were people who mattered, who shared some of the light that shines on high places, and who had a major role to play in the " important affairs " of a great Company.

From this consideration the transition to the next factor, the question of motive, is obvious. Possibly it was the most important of all the influences at work within the Assembly test room. In the regular Department, the girls had been producing components that somehow found their way into the working mechanism of an automatic telephone system. They had little technical knowledge and less interest in what it all meant. They started off in the test room with much the same outlook. But almost from the very beginning a difference became evident: for they had volunteered to share actively in an " experiment." As time went on it became more and more apparent that " they were taking part in what was considered an important and interesting experiment. They knew that their work was expected to produce results—they were not sure what results—which would lead to the improvement of the working

conditions of their fellow employees." They had ceased to produce mere components of a piece of telephone equipment. They were producing instead knowledge, data, reactions to experimental changes—not anything that they could understand or appreciate or consciously interpret, but something which appeared to be very much more significant to a number of important people than their output of assemblies in the regular Department. They had a new motive for work, a social purpose. It was a motive which industry in general seems unable to arouse, except in special circumstances, as, for instance, when " working for the war effort " can be posited as an aim.

Thus in summary—and leaving aside for the time being the " social relations " aspects of the findings—the Relay Assembly test room by its very constitution and development occasioned a number of fundamental changes in the working environment. These were of such a character that they unleashed, without conscious reaction or decision, the fullest forces latent in the human mind and emotions. Five factors have been outlined —the absence of constraint by supervision, consultation and participation in decisions, freedom of conversation and interpersonal contacts, a sense of importance or recognition, and the establishment of a full and satisfying motive. In each case, the test room entailed conditions radically different from those of the traditional factory set-up. It was different because it afforded scope for the full play of certain basic human instincts and not only appealed directly to the workers' sense of responsibility, but directed that responsibility to the highest level attainable by the human mind, the service of the community. Emotions, in other words, were harnessed to the job instead of wasting their energy in the frictions and frustration set up by the obstacles that are the almost invariable concomitants of the constrained environment of the traditional workshop. The girls themselves spoke readily of the " distinctly pleasanter, free and happier working conditions " of the test room: in turn they responded—unconsciously—by the display of a steadily improving mental attitude and a social solidarity which again added to the zest and interest of work, and so to the level of

physical exertion that they were able to sustain without any sense of fatigue.

The evidence on which these conclusions were based was not accumulated till well on into the investigation. It was probably not recognised fully until something like period XIII. But, looking back, it provided a complete explanation both of the first upward swing of output at the outset of the enquiry and of the persistent upward trend throughout the early phases. In retrospect, it gave too part of the answer to the puzzle of the "control" group in the lighting experiments. There again the character of events called into play the supporting constructive force of the operatives' emotions.

In this new mental attitude—the counterpart of F. W. Taylor's "mental revolution"—lay the clue also to the results of period XII. In abolishing all the experimental improvements in working conditions and hours, the investigators had proposed to return the operatives to their original environment. They had not realised that the "original conditions" were gone for ever. Those "conditions" had disappeared almost at the first moment that the test room had been established. The very decision to return to the old standards—a decision in which, let it be remembered, the girls themselves had participated and of which they knew the precise reason—had stimulated a new excitement, a new interest in the events of every day. It was one, moreover, of which there was an unceasing daily reminder, in the very absence of the things that had come to mean so much—rest pauses, a snack, an early stop and a Saturday off.

Was there any deliberate effort at putting up the level of output? The girls had been told at the beginning and often again afterwards that they were to work as they felt and not to race. But "as they felt" could admit of a much faster rate, in the light of the personal forces now seen to be operating. The girls knew that output was an important index closely watched, and that decisions on the next stage were carefully related to the output trend. The mere fact that they had started off on an upward swing may well have given them an impetus to keep it going. Yet their physical condition, the better health record and the absence of symptoms of fatigue over a five year

period, are virtually irrefutable evidence against the maintenance of any conscious " self-driving."

On the other hand, how much subconscious influence was exerted on the output rate by knowledge of its significance as an index cannot be determined. There was quite definitely no deliberate pegging or setting of a rate of production. Further evidence can be drawn from conversations on various occasions, from variations in the output levels within the general trend, from the differences in pair-relationships at different intervals, and from such incidents as the change of seats in April, 1930. This caused a disturbance in the social relations of the group, in particular by bringing into neighbouring positions two of the operatives who, for known reasons, were not on the best of terms. All the girls commented adversely—and frequently—about the change and their attitude was reflected in a marked initial downward movement of the output rate in each case (taken in terms of a four-week moving average) and an interruption in the overall upward tendency. The change back to the original positions after some ten months also occasioned a disturbance before there was a resumption of the upward output trend. (B). This incident is also significant evidence of the influence on effectiveness at work of purely personal factors, an aspect of the matter on which some of the later investigations were to prove even more illuminating.

It is a strange, indeed an ironical comment on the whole experience, that the changes forced on the investigators by outside circumstances in the concluding stages of the enquiry, changes which were the product of misfortune, emphasised still further the truths that the preceding years had revealed.

The hurricane of industrial depression which struck the United States in 1930 could not spare a capital-goods industry like telephone equipment. The Western Electric Company was soon caught up in the whirlwind. With the best will in the world, no company could carry squadrons of idle operatives. The terminations mounted steadily into the hundreds and then into the thousands. A ghost stalked through the organisation. Its presence was felt in the test room. First, because it absorbed so much of the attention of management and distracted their

interest from the investigations: the tragic turn of events had pushed experimental work into the category of lesser topics. Later its influence was more direct. It became the spectre of fear itself, insecurity, the anxiety that eventually even the favoured six would be among the thousands to whom the Company could only say, "Good-bye and good luck." In the language that has been used above, the relay assemblers ceased to be important people; their work no longer seemed to matter to anyone save themselves and the few "outsiders" with whom they were immediately in contact.

Slowly, but inevitably, the mechanism of the human organism dropped to a lower gear. Theorists might argue—some of them did—that with the threat of unemployment there was a high incentive to work harder and to build up a nest-egg on piece-work earnings. Human emotions did not respond in that way. The output curve turned down—from January to July, 1932, when the test room was finally closed, there was a persistent and marked decline on the part of each of the operatives.

The unseen forces that had baffled expectations and sent production soaring up five years before, now confounded the logic of a hedonistic economics and obstinately dragged the level down. There was no longer any real and positive motive for the work; it would all peter out before long. What was the purpose of experiments on the environment of work, when for half the population the fact that there was no work was the most important and ominous feature of their environment? In the wretchedness thus engendered, the sense of depression and frustration even among those still in employment, emotion was still the driving power determining the level of production, forcing it down to a low gear as inexorably as formerly it had been supercharged by a sense of exhilaration.

The girls themselves knew it too. They had been instinctive years before in their explanation of the upward swing—"the pleasanter, happier conditions." They had the same intuitive sense when all the zest was crushed out of the job. Two years after the close of the experiment one of the girls, at work in quite a new environment, was questioned about those last

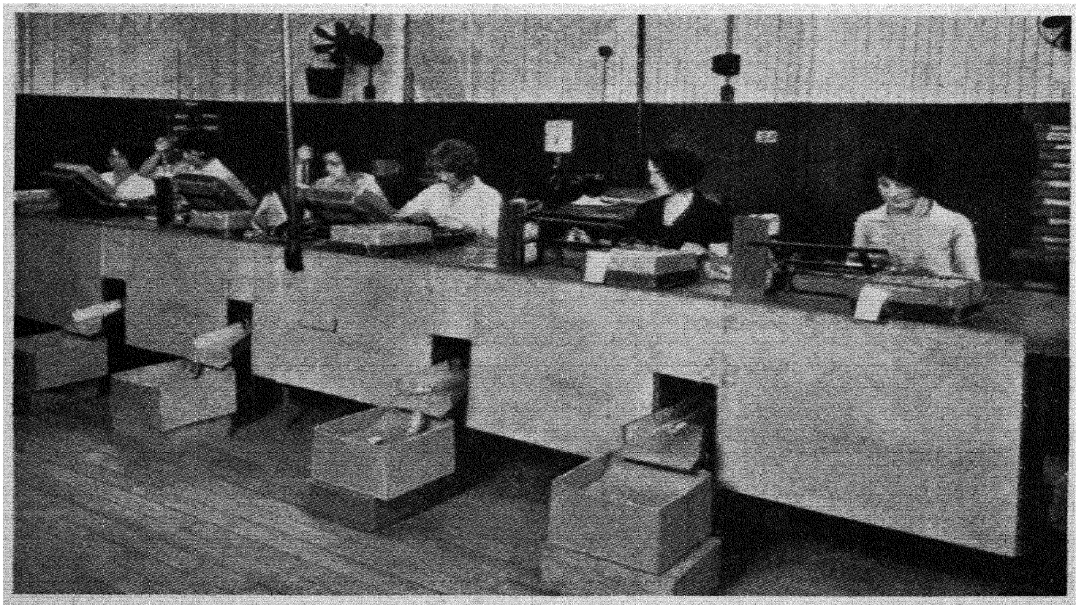


Figure 2. PHOTOGRAPH OF RELAY ASSEMBLY TEST ROOM

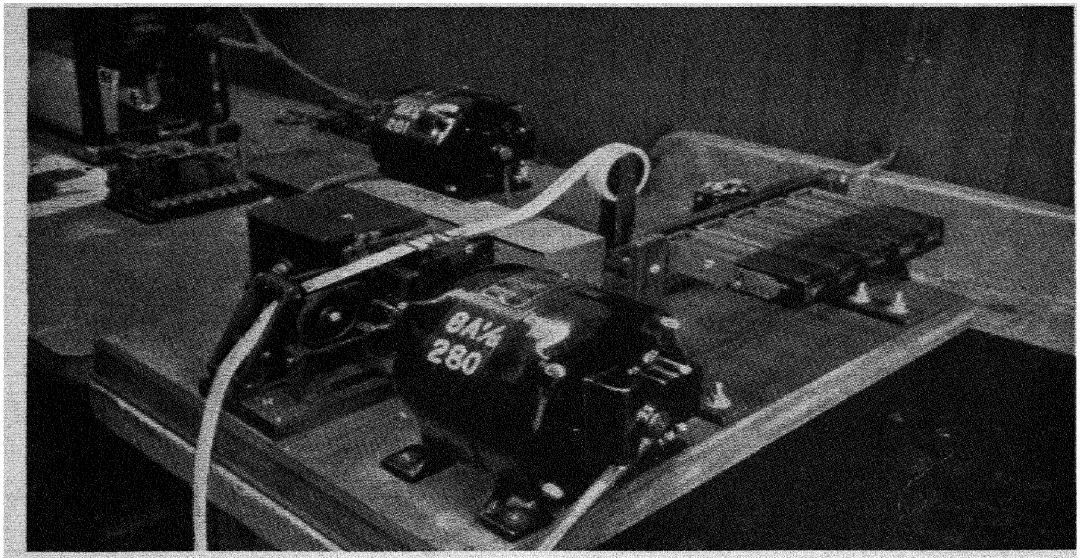


Figure 3. PHOTOGRAPH OF RECORDING DEVICE (RELAY ASSEMBLY TEST ROOM)

desperate months—to what did she and the others attribute that unreasonable downward curve? Her answer was simple, but in its four poignant words lay the whole history of the Relay Assembly test room—"We lost our pride!"

[1] *At one point a special inquiry was made by questionnaire as to their responsibilities at home, how they slept, and what sort of tasks or activities their out-of-factory lives entailed.*

[2] *From the articles in "Business" referred to in Chapter I, footnote* [4].

IV

THE VALUE OF INCENTIVES

THROUGHOUT human history there is ample evidence of man's intense interest in competitive effort. This has not been directed exclusively to rivalry with his fellow men. The same interest stimulates him to trials of strength with material things, and with the forces of nature herself. It is associated with one of the deepest human tendencies, the satisfaction of achievement or, as it has sometimes been called, " the instinct of workmanship." Normally, human beings cannot find contentment in an environment which denies them opportunity for focussing this urge to do better, to surpass the attainments of others or to overcome the obstacles placed in their path by circumstances or by nature. Tradition is full of stories which illustrate this, instances such as the building of the Tower of Babel or the legend of Icarus. Competitive games were among the most cherished activities of earlier civilisations, especially those of Greece and Rome. Down to our own day there have been adventurous journeys of exploration far into the unknown, and it is impossible to pretend that these were inspired solely by their scientific or commercial possibilities. The dangers risked, the hardships cheerfully endured were beyond the price which men will pay for curiosity or greed. The lure of adventure and the joy of achievement have been large elements in all these undertakings.

How soon this factor in human motive became an active force in the industrial environment is not easy to say. We know comparatively little about the inner workings of the early industrial systems. But there are pointers here and there that, apart from financial incentives, the urge to achievement was playing its part. There was, for instance, the principle laid down in the Medieval Guilds by which a man could not qualify

for membership until he had produced his masterpiece, that is, until he had proved that he was able to attain a given standard of craftsmanship.

In later industrial times, and particularly in the epoch of the Industrial Revolution, it becomes more difficult to segregate the workings of the principle of achievement from financial incentives : the two motives are, of course, almost inextricably interwoven. Sir William Morland in the 1660's was apparently making use of incentive rates for some of the workmen he employed on civil engineering constructions. There is also evidence that Boulton and Watt made use of the piece-work principle in their Soho Foundry after 1795. Again, Robert Owen in the New Lanark Mills made regular and evident use of the system of colour distinctions to mark the well-behaved and accurate from the less satisfactory workers, a clear case of a stimulus based on achievement without any complicating financial element.

In more recent times we find the idea of financial incentives to production intimately associated with the early history of scientific management. Premium bonus was among the most widely and closely discussed topics in the later years of the nineteenth century. Men such as Halsey, Weir and Rowan have left their names in the annals of industrial history solely in relation to incentive systems that they had pioneered. F. W. Taylor's own first contribution to the literature of scientific management in 1895 was a study of *A Piece-Rate System*. Much of his early work was concerned with the building up of incentive methods as a basis for the control of production. This approach to production management was, as will be recalled from earlier articles, the main line of development in industry for the following twenty to thirty years. But, oddly enough, it tended quite as much to bring the system into disrepute as to prove that the principle was sound or the methods evolved adequate to contemporary needs. On more than one occasion organised labour has gone on record in the most outspoken terms, dissociating itself from those incentive methods and protesting against their further adoption as a tool of industrial control, though whether the objection was to the incentive or the

improved control deriving from the records used in calculating the incentive was not always clear. The two elements are not inseparable: it is perfectly possible to establish the control without the incentive. In this country the protest has, on occasions, come to a head in strikes against certain well-known systems to which epithets such as " infamous " have been freely applied.

Underlying all this thought and development in regard to premium bonus, and other financial incentive schemes, has been an overriding emphasis on man's interest in economic motives. Many present-day industrial executives approach the whole management problem on the principle " Their pay packet at the end of the week, that is all the workers think about." Merely to mention this thought is a reminder of how commonly it is held throughout the ranks of works managers and others who hold sway over the men and women working in industry. Is it a sound working hypothesis based on a reasonable volume of scientific evidence, or is it merely a popular superstition, a relic of the folklore of Malthusian economics?

Modern thought on the principles of management owes to the Western Electric Company another great debt for having made the first attempt to probe this assumption. This was not part of the aim of the investigations, but the findings from the general enquiries point unmistakably to the falsity of the common view, showing it to be just another of the myths so frequently evolved in the course of human history as an explanation of phenomena which man has not yet troubled to investigate. It may be noted in passing that events in British industry in the past three or four years have provided other instances in which the so-called economic motive has proved itself to be largely a fiction.[1]

The study of financial incentives obtruded into the enquiry in the first instance as the result of experience in the Relay Assembly test room. The relay assemblers were set up as a separate piece-work group primarily for reasons of convenience and only incidentally as an experimental move. The group's trend of output had been upward before any change in the

piece-work arrangement was introduced. During Period III, when the separate piece-work calculation for the group was established, the continuing rise in the output level might have meant nothing more than that the momentum of the preceding period, whatever caused it, had been carried on into the third period. Naturally enough the investigators voiced the question: "To what extent has the change in the piece-work basis contributed to this continuing rise of production?"

"In order to study the effect of changes in the methods of payment two experiments were conducted. The aim of the first experiment was to reproduce the test room situation only in respect to the one factor of method of payment, using another group of operators. . . . In the second experiment the test room situation was to be duplicated in all respects except for the change in pay incentive." (C).[2]

In the Relay Assembly test room, there were too many influences at work, and they were far too intimately bound up with the personal and social relations and attitude of the group of operatives to admit of any objective conclusion regarding a specific factor such as methods of payment. Accordingly, the Relay Assembly findings have their greatest value as a comparison with conclusions derived from the other two investigations. Further evidence of a rather special character was also derived at a later stage of the investigations from the Bank Wiring observation group. Although each of these groups was small in size, the objectivity of the findings and the searching nature of the enquiries enabled conclusions to be deduced, which stand as valid pointers to the real value of financial incentives. It is a body of evidence which the serious-minded industrial executive cannot lightly disregard.

The first of the two specific experiments was the short-lived Second Relay Assembly group, referred to in Chapter II. It was started in November, 1928, and ran for only nine weeks. During that period the group, consisting of a small number of operatives set apart within the main Department, but with no changes either in working conditions or in physical environment, was under observation. The only change from normal arrangements was that they were set up as a separate group for

piece-work purposes. This isolated their reaction to an immediate financial incentive and ensured that it would be reflected in productive effort and output. A test period had been taken prior to the separation of the group from the main Department so that outputs could be compared. From the data obtained it was clear that " the output rate for each operator was higher during the experimental period than during the test period . . . (and when) the old method of payment was restored the hourly rates of the operators fell quickly." The increase varied among the operators and it is probable that in the case of one or two of them the statistical data were not significant. But the general tendency gave a useful picture. The overall average increase in production during the experimental period was some 12½ per cent above the test period, and when the group was returned to the main department the output level fell to a point lower than any recorded during the experimental period.

It will be recalled that this investigation had to be discontinued owing to the development of friction within the Department.

Did this Second Relay Assembly group prove during its brief nine weeks' existence that financial incentives do lead to an increase in output? Looking merely at the fact of the 12½ per cent average increase in production, the answer might well be " Yes." But in the light of what is now known, both about the Relay Assembly test room and the earlier lighting experiment groups, there is another possibility. The increase in output may have been attributable to the mental and social influence deriving from the establishment of the group as a separate unit for experimental purposes. The very fact that its separate existence led to demands from the rest of the Department for a share in what was apparently regarded as a special privilege seems to point in this direction. Accordingly it would be safer to conclude that the Second Relay Assembly group did not afford any conclusive evidence as to the value of financial incentives.

The second experiment specifically developed was that of the Mica Splitting test room. This reproduced the conditions of the Relay Assembly test room in everything except that the operatives continued to work on their normal basis of individual

piece-work. They were set apart in a separate room. They were under the observation and supervision of an investigator concerned in the conduct of the experiment. The operatives had been selected on the same basis by way of initial volunteers and co-option of friends. The principle of consultation in regard to changes or developments was applied in exactly the same way. Their two years' history as an enquiry group was similarly divided up into experimental periods.

The Mica Splitting job could be regarded as a skilled one, requiring precise movements and close attention. Experience had shown that the learning process sometimes continued for two or three years. The Mica Splitting test room started in October, 1928, and ran until the latter part of September, 1930, when it was discontinued owing to the onset of the American industrial depression. Many of the findings of the group, in matters apart from that of the influence of incentives, confirm the important conclusions of the Relay Assembly test room: some of the wider studies written round the Hawthorne investigations have drawn fully on their experiences as well as on those that are better known to the general reader. To the investigators themselves it was the differences and similarities of the two groups that formed the subject of the keenest enquiries. This is particularly so with the findings on the influences of the piece-work system. It could serve little useful purpose in the present context to give in detail the events and general conclusions of the Mica group. A few general comments provide a useful prelude to the summary of the findings concerned with incentives.

Broadly, the trend of the Mica group, as evidenced from the output levels, can be summarised in four phases, as follows:

"(1) A slight decline in the rate of output during Period II, when the girls were first moved into the test room.
(2) A moderate but steady rise in the rate of output when rest pauses were introduced in Period III, a rise which was sustained until the autumn of 1929 (and so ran through the first four months of Period IV).

(3) A slight decline in output from Autumn, 1929, until March, 1930.
(4) A fairly constant rate of output although at a much lower level during the last six months of the test."

For the moment it is the third and fourth phases which are of the greatest interest. The declining trend of output was in evidence for the best part of a year, i.e. for virtually half of the period of the investigation. The cause of this decline, comments Roethlisberger (C), " was not difficult to locate. Everything pointed to its relation to the operators' anxieties over the uncertain future of the mica splitting job. . . . (various changes) gave grounds for the fear that sooner or later the job would be discontinued at Hawthorne and that they themselves would be either transferred to other work, or laid off. . . ." Here, in fact, was a forecast of what was to be experienced two years later in the Relay Assembly test room itself. In both instances there is powerful evidence against the conclusion that the economic motive is of primary importance as an influence on men and women at work, and in favour of the conclusion that purely emotional factors exercise a greater influence.

In the case of the mica splitters, in the last year of their work, just as in the case of the relay assemblers for their last few months, logic dictated that production should be kept up at a high level in order to accumulate a nest-egg against the unemployment that depression might entail. If the economic motive had the force as a human incentive commonly attributed to it, then the entire efforts of the individual would have been directed inevitably to this logical end. The girls in both groups might have been expected to maintain the high level of production which they had previously achieved and of which they had shown themselves so easily capable. But events moved otherwise. The unfettered human being acted in a way contrary to logic, contrary to its own best economic interests, and made it clearly manifest that the pay packet was not a primary factor in its motivation. From this point of view, the Mica Splitting group, equally with the relay assemblers, proved that the financial incentive is of ambiguous value and derives any stimulus

it exercises not from an isolated financial calculus but from a complex of circumstances within which the part played by the volume of the actual financial reward may vary widely.

A comparison of the Mica Splitting and Relay Assembly test rooms throws up further very interesting features which have a useful bearing on the assessment of the value of incentives. In the first place the mental attitude of the operatives was a little different. " The evidence, both from recorded conversations and interviews left little doubt that the change in attitude towards supervision, previously noted among Relay Assembly operators, had been duplicated in the Mica Splitting test room. The evidence of a change in attitude of the operators toward one another, however, was less convincing. In fact, in this respect there seemed to be a decided difference between the relay assemblers and the Mica Splitting operators."

There were also differences in other directions. For instance, the attendance records of the Mica operators did not show any improvemnt common to all of them, such as was evidenced among the relay assembers. Then " the Mica operators did not join in common social activities outside of working hours. They had no parties similar to the gatherings of the Relay Assembly girls." Moreover, " their conversation during the day dealt mainly with personal topics from each individual's own social sphere and there was no evidence of willingness to help one another. Each girl's output seemed to be an individual problem, and, while occasionally one operator did criticise another, this was never interpreted as bringing pressure to bear on that operator." Finally, " the weekly average hourly output gave no suggestion that the operators were pacing each other at work."

The meaning of all this can be given best in the investigators' own words: " In short, no matter where the investigators looked, whether at the output changes, the attendance records, the recorded comments, or the interviews, the same essential difference was presented: the Relay Assembly test room was a group story; the Mica Splitting test room was a story of individuals. It was clear that the change in supervision was not solely responsible for the observed improvement in morale in

the Relay Assembly test room, for with a similar change in the Mica Splitting test room the same effect had not occurred." The crux of the difference lay in this, that the relay assemblers had developed a social solidarity which was markedly conspicuous by its absence in the case of the mica splitters. The latter were on individual piece-work, in consequence "they did not have a vital interest in one another's output round which to organise as a social group."

Upon the question of the value of incentives as reflected by investigations so far conducted, Roethlisberger comments: "(1) there was absolutely no evidence in favour of the hypothesis that the continuing increase in output in the Relay Assembly test room during the first two years could be attributed to the wage incentive factor alone. (2) The efficacy of the wage incentive was so dependent on its relation to other factors that it was impossible to consider it as a thing in itself having an independent effect on the individual. Only in connection with the inter-personal relations at work and the personal situations outside of work—to mention but two important variables—could its effect on output be determined."

Had the earlier investigations at Hawthorne left any doubts as to the value of financial incentives, as generally conceived in the industrial structure, the experience of the Bank Wiring observation room would have removed them, although again this phase of the investigation was not intended to deal with incentives at all.

In general the observation room was intended to provide a study of the natural social organisation of employees.[3] The men gathered in the observation room were working "under a system of group piece-work according to which the entire Department was considered a unit for purposes of payment. For each unit of equipment the Department assembled and shipped out it was paid a fixed sum. The amount thus earned each week constituted the fund out of which all wages were paid. The greater the number of units completed each week by a given number of employees, the larger would be the sum to be distributed among them.

"The allocation of the weekly Department earnings to the

individual employees in the Department was based upon their hourly rates. The hourly rates differed for individuals, depending largely upon differences in efficiency, and were guaranteed by the firm in case piece-rate earnings were insufficient to cover them. . . .

" Inasmuch as the employees were paid weekly and it took some time to compute the amount due to each workman, the foreman estimated the number of units his Department would complete in a given week one or two days before the end of the week. The pay roll organisation computed earnings on the basis of these estimates. At the end of each four-week period the amount of work actually accomplished was compared with these estimates and the difference, if any, was paid to the employees along with their usual checks. The amount thus paid every four weeks was called a ' monthly balance.'

" The only way the group as a whole could increase its earnings was by increasing total output. Partly because of this, a ' bogey ' was established for each job. The bogey was simply an output standard in terms of which an individual's efficiency could be measured. It was something ' to shoot at ' and was intended to serve in much the same way as a record does for an athlete. The closer to it the employees came, the higher the group earnings would be. It will be readily seen that a raising or lowering of the bogey would in no way affect earnings except in so far as it might influence output. Raising a bogey had none of the effects of reducing a piece-rate or hourly rate.

" It is apparent that under this system the earnings of any one individual were affected by the output of every other person in the group. If a person did an unusually large amount of work one week and the other operators did not increase their output proportionately, his earnings would be but slightly higher than if he had not increased his output at all. The results of his increased efforts would be spread among all the workers in the Department. Conversely, if a person were unusually low in output for a time, the output of the other operators would serve to sustain his earnings at about their ordinary level."

From the investigators' own observations and from their findings in the course of interviews with the group, they became

aware of the existence of a fairly general conception of a day's work. This appeared to be 6,000 to 6,600 terminals, that is two sets of equipment per day. How this figure came to be adopted by the men and to be generally accepted by them cannot be explained with precision, though several possible explanations could be advanced. It may have been due to the influence of maximum rates, i.e. that the people who wired this level per day were at the maximum of the labour grade for this kind of work. It might also have represented a point of balance between, on the one hand, the figure at which the work demanded exceptional effort or caused undue fatigue and, on the other, the satisfactions derived from the earnings. Yet, with reference to this line of approach it should be mentioned that none of the operatives was prepared to increase output in face of opposition from the other members of the group. Therefore, ' their concept of piece-work did not represent a personally calculated equilibrium between work and monetary return.' A third possible explanation was that supervisors had mentioned some such figure in an attempt to stimulate some of the slower men. Finally, it can be argued that the wiring of two equipments was a ' natural ' day's work in the sense that a wireman could finish two, but not three, sets per day.

" As the study progressed, it became more and more apparent that the operators' conception of ' a day's work ' had a much wider significance than has thus far been suggested. The interviewer, while enquiring further into this belief, found that it was related to other beliefs which the operators held quite generally. These other beliefs, which, incidentally, are quite common and more or less familiar to everyone, usually took the following form : ' If we exceed our day's work by any appreciable amount, something will happen. The " rate " might be cut, the " rate " might be raised, the " bogey " might be raised someone might be laid off, or the supervisor might " bawl out " the slower men.' Any or all of these consequences might follow. It is difficult to produce evidence in which such apprehensions were articulated as clearly as here suggested. This statement represents the summation of a variety of employees' remarks in which these fears were more or less implied."

Further, there was evidence to suggest that " a day's work " implied something more than a standard of output, and was, in fact, a norm of conduct. The men who persisted in exceeding the standard were looked upon generally with disfavour and were subject to subtle forms of sarcasm and ridicule. Nor were the beliefs regarding the level of " a day's work " and the dangers involved in exceeding it, confined to a few persons only. They were held quite generally both by the men in the observation room and throughout the Department.

These observations can only be interpreted correctly when they are considered against the background of the Western Electric Company's personnel policy. It will be recalled from the statement made in the opening chapters that the Company's approach to its employment responsibilities was both broad-minded and generous. There was nothing in the nature of a desire " to get away with things " in relation to its employees. On the contrary, its whole philosophy and all its intentions in regard to management practice were in the opposite direction. Moreover, there was no record that the Company had on any occasion cut rates in consequence of high earnings, or had ever attempted to do so. This was certainly not an allegation that figured in any of the complaints or criticisms that individual employees had raised in regard to the Company's conduct.

The upshot of the findings in the observation room in relation to the piece-work system could, therefore, only be this, that quite obviously the official scheme did not operate as an incentive. It lay within the power of the operatives to increase their own earnings by their own productive efforts. But for reasons of a purely emotional character they preferred not to do so. They even went so far as to work out an elaborate organisation which would prevent any individuals who felt so inclined from responding to the incentive and so serving his own economic interests.

. . . .

Admittedly the investigation at Hawthorne into the influence and value of financial incentives covered only small groups and were thus limited in scope. Yet they did result in certain

useful pointers, from which general conclusions may legitimately be argued, especially if regard is paid to evidence derived from other sources. Prominent among the latter is Matthewson's study of *The Restriction of Output among Unorganised Workers*, representing the published findings of a first-hand enquiry over numerous firms in varied industries. The greater part of his data Matthewson obtained from working and mixing with the men as one of them, and his evidence leaves no doubt as to the extent to which, for one reason or another, output is deliberately restricted even when piece-work incentives are applied. The Bank Wiring observation group, in fact, was a replica in this respect of many of the situations uncovered by Matthewson.

This subject is again one on which the Hawthorne findings need careful interpretation. It would be easy to conclude that " financial incentives are of little or no value," but this would be somewhat removed from the truth. What the investigations did show with certainty was that the economic incentive is a long way from being, in most instances, either the only or one of the most potent of the factors in the total motivation of the individual. The value of financial incentives is dependent on a variety of other influences, chiefly those concerned with personal reaction to environment. The stories told in earlier paragraphs are striking illustrations of this point. The last months of the Relay Assembly test room and the second year of the Mica Splitting group were both occasions in which the logic of the situation (or common sense, as some people prefer to say) dictated the need for response to an economic stimulus. Faced with the certainty or the fear of unemployment, the operatives should logically have tried to accumulate a reserve of earnings. But in fact they acted in just the opposite way. Emotion proved more powerful than logic, an occurrence for which every industrial executive can produce many examples from his own recent experience.

Similarly with the Bank Wiring men. No one had ever known the Company to cut rates because of high individual or Department earnings, or to step up targets. No one could produce or allege the slightest evidence or concrete expectation

that this was likely to occur. Yet the " fear " of these possibilities acted as a concerted inhibition to response to a piece-work incentive. It induced large groups of men, whose livelihood and comfort in living depended on their daily earnings, to elaborate a complex system of social controls to prevent any one of them from working at even a reasonably fast pace if that would take his output above a self-imposed and inexplicable norm.

To repeat the words quoted earlier, what the Hawthorne findings showed was first that " the efficacy of a wage incentive is so dependent on its relations to other factors that it is impossible to consider it as a thing in itself, having an independent effect on the individual."

The second general conclusion lay in the social influence of a group incentive. Whatever other items of difference there were between the relay assemblers and the mica splitters, the only one which appeared to the investigators significant from this standpoint was the difference in the basis of payment. This alone appeared to explain the fact that the former were a " team," with a genuine and active sense of social solidarity, while the latter remained always " a collection of girls " who shared certain working conditions and participated jointly in experimental changes but did not acquire any sense of mutual inter-personal relations that afforded a basis of community. Their individual incentive system had prevented the emergence of the corporate or group spirit, just as the collective payment scheme of the assemblers had provided an unconscious focal point of common interest in output. Similar evidence came from the short-lived Second Relay Assembly group. In their brief nine weeks of separate existence they had already begun to coalesce into a new social unity, a fact recognised by their colleagues and friends in the rest of the department by the vocal resentment that they manifested.

. . . . .

The question of financial incentives is one of such great practical moment at the present time that it may be useful to enquire whether any immediate and practical lessons can be

drawn from this aspect of the investigations. The practical value of a well designed financial incentive scheme is in no way called into question by the Hawthorne conclusions. Thus, for instance, they do not conflict with the findings of the Industrial Health Research Board's enquiries of 1934 and 1935 (Reports Nos. 69 and 72). These Reports show that reaction to an incentive springs from a deep-seated urge in the human being and that the incentive stimulates both the intensity and duration of effort by its influence on the will to work: " the worker who has no desire to perform a given industrial operation for its own sake is induced to do so by an arrangement of conditions which enables him to see that the performances of the task procures for him something which he does actually desire." Usually this is the additional earnings. But these Reports also place special emphasis on the extent to which the will to make the extra effort which secures increased earnings depends on external conditions as well as on the worker's general attitude of mind which reflects content or discontent with working conditions apart from the incentive scheme. While confirming these broad conclusions, the Hawthorne findings bear more particularly on the methods by which the financial incentive is applied.

First and foremost among the lessons is the principle that the mere establishment of a piece-work or bonus scheme is not of itself enough. As a member of a management brains trust put it on a recent occasion, the keys to a successful output bonus scheme lie in the co-existence of a sound personnel policy and an effective mechanism of production control. The former is necessary to provide the essential framework of co-operative personal relations within the organisation. The second is the means of eliminating the most serious obstacles to all bonus schemes—badly set times, faulty flow of material, erratic loading of orders to production, supplies of defective materials or components, hold-ups in machinery, assembly or inspection, and other similar symptoms of poor production management.

Hawthorne's second lesson may be summed up as the importance of " preserving the social integrity of the working group." An individual piece-rate system disintegrates a group or prevents the corporate sense from emerging. This is not an

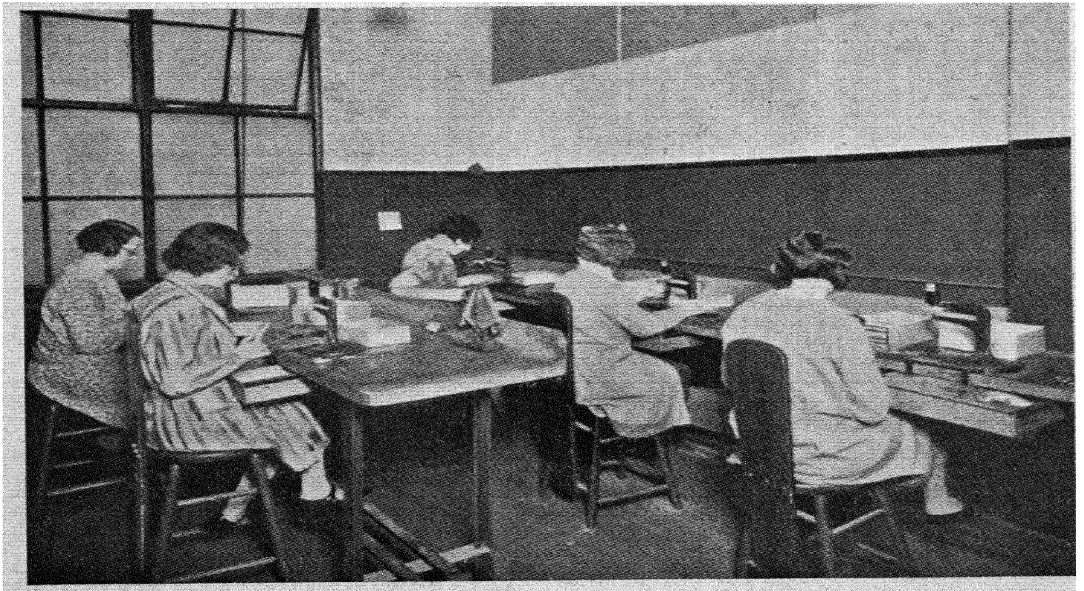


Figure 4. PHOTOGRAPH OF MICA SPLITTING TEST ROOM

argument in favour of " departmental or group bonus " schemes as they are commonly understood. The need is for an incentive that comes as near as possible to the " primary groups," that is to those little knots of men and women who share in the inter-personal relations that spring from association in a co-operative task. Twenty girls doing the same operation on an assembly line are not necessarily a group in this sense—they probably never could be. But five or six girls working together on an integrated series of operations might well form a " primary group " for which separate identity in incentive payment could form a bond of considerable influence.

It is possible that this point supplies the explanation of the many strikes and demonstrations that efforts to apply incentive systems have caused in this country. All the best-known of such systems offer higher earnings for higher effort: they have indeed certain other features that may have limited their appeal; but none can deny that their main theme was an offer of better earnings. Why then have they aroused such violent opposition from the trade union movement? Why did organised labour in this country go on record nearly forty years ago with a clear resolution against " premium bonus " proposals? The appeal of the incentive as such was not challenged, for piece-work rates have long been accepted and approved. Was it not perhaps that these newer systems, with their emphasis on individual hourly or daily performances against standard, underlined the fact that the appeal was to the individual's desire for higher earnings and thus they appeared to threaten the solidarity of the men and women at the bench? In other words, the core of the workers' objections lay in the " anti-social " tendencies of the incentives, in their power to dis-integrate the primary groups—and the opposition was thus probably less a reasoned argument derived from principle than an instinctive effort to preserve primary group relations. The " rate-buster " and the " scratter " have always been unpopular, because they sin against what the group expresses as "fair-play," what is in reality the norm of conduct which it feels instinctively to be necessary if the members are to retain mutual confidence and sense of common interest which are

essential to solidarity. The persistent "miker" is equally disliked.

There are as yet in this country few instances of financial incentive schemes that provide the kind of influence exerted on the relay assemblers. What a different picture would industrial relations in any country present, if throughout its undertakings the primary social groups bore the stamp and character of the Relay Assembly test room! There the response of the girls to their participation in the incentive scheme reflected a situation of happy co-operative effort, backed up by the vigour of genuine social relations within the group. True, there were also many other factors which contributed to the record-breaking output trends. But their piece-work incentive scheme was a unifying force, which by the social solidarity it created released further stimuli to productive effort: the direct monetary incentive was thus reinforced by a variety of secondary indirect influences. The mica splitters, on the other hand, who had all the favourable conditions of the Relay girls, lacked the unifying force of a common or shared incentive. Their productive effort in consequence lacked social purpose. In that deficiency lay the secret of their different story.

This, in simple words, is the best lesson of the Hawthorne work in this direction—that the true value of incentives should be sought and found in their potential force for social integration, their power to provide a primary group of men and women working together with an obvious *common* purpose.

[1] *This aspect of the question in relation to contemporary British industry is further discussed in E. F. L. Brech's paper on "Management Lessons of the War —Industrial Relations," British Management Review, Vol. V, No. 3.*

[2] *All quotations in the present chapter are extracts from reference (C).*

[3] *The main features of this investigation form the subject of Chapter V.*

V

THE BANK WIRING OBSERVATION ROOM

THE work carried out in the Bank Wiring observation room forms the final phase of the actual investigations carried out at Hawthorne. It followed and arose out of the Interview Programme. From many points of view, it is the most interesting of the series. At the same time it is probably the least known, despite the fullness of the report on it which, in Roethlisberger's volume (C), covers over 160 pages. This is possibly due to the fact that its findings were less concrete than those, for instance, of the Relay Assembly test room. The conclusions or lessons that could be drawn from it are less amenable to immediate practical application than, for instance, those drawn from the Interview Programme, which immediately preceded it. The findings from the Bank Wiring room did not present managers with a series of specific recommendations. They offered instead a jigsaw puzzle composed of a considerable number of pieces. The task of fitting these various pieces together in order to see what the picture itself was like was left to industry. Managers had to face it before they could derive from the material something of value for their everyday use.

There was considerable variety in the features presented: for instance, illustrations of the value of incentives, of factors bearing on output levels and of important causes leading to voluntary restriction of output. There was much information bearing on the lining up of the men in informal associations on varying bases. Sometimes groups were formed for purposes of opposition and sometimes for co-operation and mutual assistance. There were other groupings which cut across those with a more serious purpose and were devoted to amusement, not infrequently amounting virtually to horse-play. If, in fact, any one particular conclusion could be drawn from studies in

the Bank Wiring room, it would be this: that "unofficial social groups are a compelling factor in determining output in the modern factory."

The Bank Wiring picture is rather more difficult to reduce to summary form than the other aspects of the work of Hawthorne; its origin is best described in the words of the report (C).[1]

"The final phase of the research programme consisted of a detailed study of a shop situation from a sociological point of view . . . giving a picture of a spontaneous, informal social organisation functioning within the formal framework of the Company's structure. By a series of studies which were conducted early in 1931 by members of the interviewing staff, the investigators' attention had been called to the fact that social groups in shop departments were capable of exercising very strong control over the work behaviour of their individual members." This impression had been gained during the rather spasmodic interviews in the earlier stages of the Interviewing Programme and it was amply confirmed when the more concentrated efforts were undertaken. It was, in fact, during these latter phases of the interview work that attention was first seriously attracted to the importance of the problems of employee inter-relations and group organisation. It seemed from the interviewers' reports that the focal point of a good deal of this informal social activity was "the restriction of output."

"Although restriction in some form is not an uncommon occurrence and most industrialists recognise its existence in varying degrees, the investigators had hitherto been unaware of its implications for management practice and employee satisfaction. Some of the evidence obtained suggested that the wage incentive systems under which some of the groups worked had been rendered ineffectual by group pressure for controlled output. Informal practices by means of which certain operators were placed under pressure and kept in line were brought to light. There was evidence of informal leadership on the part of certain persons who took upon themselves the responsibility of seeing that the members of a group clung together and protected themselves from representatives of other groups within the Company who could interfere with their affairs."

This widespread experience among the investigators led quickly to the conclusion that here was a problem urgently calling for more systematic inquiry. With the work that had so far gone on, there had been little opportunity to observe the groups at work, since in the earlier days of the experimental unit studies, the participants had been isolated from their natural environment. On the other hand, in the interviews the employees concerned had given evidence of individual reactions to the group situation and of their own particular view of what goes on in the shop. This again was not a first-hand study of the group as such. Group relations had necessarily to be studied within the framework of their total situation.

The ideal would, of course, have been to study a whole department at work, but for various reasons this was not a practical line of approach. In the first place, there was the question of physical size: studying a department of a hundred employees would entail a very large staff of investigators and a labour research organisation. Again, there was the problem of change since most working departments are subject to minor variations at least, at fairly frequent intervals, and even minor alterations would not leave the social situation of a department unchanged. Further, there would be a difficulty arising from the sociological nature of working groups—the tendency to protective or defensive attitudes surrounding shop departments, such that the intrusion of visiting investigators might of itself create a quite artificial situation.[2] With all these considerations in mind it was eventually decided to concentrate on a small group engaged on one type of work rather than spread investigations over a number of groups in dissimilar situations. Thus it came about that the study was made as "a vertical section of a department." It was also decided, as a measure of essential practical convenience, to place the group in a separate room despite the change in situation involved; but there were to be no other alterations in the working environment.

An observer was appointed in the role of a disinterested spectator, and associated with him was one of the interviewing staff. Normally his part of the task was to be away from the study room. The observer's function was to keep the records

of performance, as well as to record any events and conversations which he considered significant. His task was no light one, the more so as he had to beware of projecting his own personality on to his findings.

"It was decided beforehand that he would adhere to certain general rules:

(1) He should not give orders or answer any questions which necessitated the assumption of authority.
(2) He should not enter voluntarily into any argument; if forced to do so, he should be as noncommittal as possible.
(3) He should not force himself into a conversation or appear to be either anxious to overhear what was going on or over-interested in the group's behaviour.
(4) He should never violate confidences or give any information to supervisors, whatever their rank.
(5) He should not by his manner of speech or behaviour set himself off from the group."

Very broadly, the observer's task was twofold, namely:

"(1) To watch for
  (*a*) recurrent verbal utterances or overt acts which were indicative of the relations between two or more people;
  (*b*) manifestations of the kind and extent of a person's participation in the immediate group situation;
  (*c*) evidences of the existence of a group solidarity (the importance of crises in bringing out the group organisation was stressed);
  (*d*) if there was such a group solidarity, the occupational groups to which it extended and how it was expressed.
(2) Should he detect evidences of an informal organisation he should attempt to understand the functions it fulfilled for the employees and how it was related to the formal Company organisations."

The importance of these details about the observer's position and responsibility will become manifest as the story of the Bank Wiring observation room is unfolded.

Having selected the Department within which to conduct the study, the investigators then decided to select one of the operations in the assembly of switches for step-by-step central office equipment, namely the operation of "selector and connector bank wiring."

"The task of selector and connector bank wiring was divided among three groups of workmen: wiremen, soldermen and inspectors. A worker in each one of these groups performed a specific task and collaborated with workers in each of the other two groups in the completion of each unit of equipment. The work-rate of any workman was necessarily related to the rates of the two other workmen engaged on the same units. The output of an inspector, for example, was limited to the number of wired and soldered terminals completed. So, also, the solderman's output was limited to that of the wiremen with whom he worked. The wiremen did, as a rule, set the pace for the other two groups, but it was quite possible for the latter to limit output by refusing to work as fast as the wiremen."

It is not necessary for present purposes to describe the operation, but it is important, for a better understanding of some of the findings, to underline one or two aspects. The complete product of the assembly operation was called an equipment. Two types were in production, differentiated only by the spacing of the terminals—and it was noted that of the two main groups of performers (wiremen and soldermen) the one found one type more convenient for working and the other found the other one preferable. In view of its later contribution to the social situation, *it is most essential to appreciate that the only difference between the connector and selector equipment lay in the number of banks forming an equipment and was in no way associated with difference of operation or of skill required.*

The Bank Wiring observation room was started in November, 1931. The group selected consisted of nine wiremen plus three soldermen and two inspectors. Six of the wiremen were on connectors and three on selectors. The natural configuration

in the shop was one solderman to three wiremen; there were thus three units within the group.

"The men selected were first informed of the study by the foreman. He told them that he had promised to co-operate with the Research Department in making the study and solicited the co-operation of the men in carrying out his pledge. He also stressed the point that they would still be members of his Department and responsible to their regular supervisors. Then the foreman took them to the observation room, where they were met by one of the Research Directors and the person who was to be the observer. The Research Director explained the purpose of the study in detail. He told the men briefly about the work of the Research Department and how it had become necessary to study an ordinary department more closely. They had been selected, he said, because the type of work they were doing was particularly suited to measurement and because the Department supervisors had promised their co-operation. The men were told that the Research Department would not interfere in any way with their usual routines. Two points were stressed: first, that no one on the research staff would have any jurisdiction over them and, secondly, that whatever they did or said in the presence of the investigators would in no way be used to their detriment. They were introduced to the observer and were told that he would be in the room most of the time to record output and to make any other observations he considered important. The operators were asked to express their opinions and ask any questions which might occur to them."

The main point which the investigators had in mind was that the men should carry on just as usual and express themselves perfectly freely in the presence of the observer or the interviewer.[3] They had no interest in output for its own sake and certainly no expectation of harder work. In fact, if the group's output had suddenly increased in the observation room the investigators would have felt that they had failed in one of their primary objectives, namely keeping the normal situation in the shop unchanged. It was for this reason that no privileges or experimental changes were introduced. The men still

continued to be paid out of departmental earnings and to conform in other ways to customary discipline, including their accountability to the ordinary supervisory personnel.

This was the setting within which the studies of informal social relations in a working group were made over the period of seven months between November, 1931, and July, 1932. In common with the Company's other experimental work the observation room was eventually brought to a close by the threat of catastrophe which loomed up with the ever-deepening phases of the American economic depression. But enough had been learned to give evidence of the need for an entirely new view of the influences that govern the behaviour of men and women at work.

Some important findings were discussed in Chapter IV, especially the influence of group solidarity in maintaining social activity developed for restricting output and for safeguarding any encroachment on their control of production, even though such restrictions entailed a direct personal financial loss through nullifying the effects and intentions of a well-designed incentive scheme.

In the Bank Wiring observation room there was no story comparable to that of the Relay Assembly test room—no upward swing of output, no inexplicable responses of productive effort to unseen stimuli, no wave of surging enthusiasm and ever-increasing morale. As quoted in the previous chapter: "The output of the group remained practically unchanged and their attitude toward their work and supervision remained basically the same during the time they were in the observation room." This was not of particular significance to the investigation, for output was not in any sense a primary object of the study. At the same time, it was intimately bound up with the social and group issues that were the real subjects under investigation. The group's behaviour in regard to output was in fact an important symptom or indication of the "social relations" problems—it was the means by which those relations and the group sentiments underlying them were expressed. This evidence was amply supported by the testimony from the observer in the room (particularly from his records of

conversations) and from the comments made to the independent interviewers to whom the Bank Wiring group from time to time reported. Apart from the major issue of restriction of output, other aspects of the production position have been usefully summarised as follows :[4]

" (1) The workers fixed for themselves a figure well below the bogey to which they were supposed to work.
(2) The individual rate was not precisely on this unofficial bogey line but either a little above or a little below it. But each man's output curve remained constant.
(3) Departmental output records were distorted in two ways. There was a difference between actual output and reported output and there was a difference between standard working time and reported working time. Stoppages were lengthened where they actually occurred, they were invented, they were brought about by the operator himself, and where there was a genuine stoppage, no effort was made to work a little harder to make up.
(4) Inspectors actually rated a worker more on their personal opinion of the man than on the quality of his work, and their ability to rate at all varied greatly.
(5) The most intelligent and dextrous workers often produced the lowest output. Indeed output had no relation to the results of intelligence and dexterity tests.
(6) Everybody stopped work before knocking-off time, particularly the fastest workers."

The importance of these findings requires their explanation by a few notes. The most striking feature of the statistical picture of output during the months that the group were under observation is the steady rate from week to week. This, it so happened, had been a point that had come to light very frequently in the course of the general Interview Programme, many employees reporting that their weekly average hourly output showed little change from week to week. " This did not mean that all of them would try to achieve identical average hourly outputs each week. It did mean that each of them would try to be fairly consistent week after week irrespective of differences

in the absolute levels of their output. Their reasons for this were similar to those they advanced for not exceeding their day's work. They felt that if their output showed much change either from day to day or from week to week ' something might happen.' An unusually high output might thenceforward become the standard their supervisors would expect them to maintain. The men felt it would be a way of confessing that they were capable of doing better. On the other hand, they felt that a low output would afford their supervisors a chance to ' bawl them out.' If output were kept fairly constant, they thought, neither possibility could happen." In the case of the Bank Wiring group their curves are not " strictly speaking horizontal lines, but nevertheless they approximate to horizontal lines and are certainly devoid of individual difference. No upward or downward trend is apparent except in the case of one wireman."

Perhaps one of the strangest aspects of the output position was seen in the discrepancies between actual output and reported output. This again was a feature that had come to light in the interviews, many employees remarking that they sometimes " saved up connections on days when their output was high and reported them on days when their output was low. They said that having some work saved up made them feel better." In the case of the Bank Wiring group the observer kept track both of the outputs reported by the men and of their actual output (by making a physical count at noon or at night). His records showed " that no wireman reported exactly what he actually produced each week. Sometimes the two figures did agree but more frequently they did not." It was also found that in some cases the men's weekly balances were almost always negative, that is, that the men always reported more work than they had in fact produced. (It should be mentioned in passing, their piece-work payment was not determined upon the reported output but, as will be remembered from the descriptive notes given earlier, was calculated from the actual production attained by the department as a whole.)

" One of the most interesting things about the group was that each man seemed to know just where he stood at any time.

The men could tell, and with a startling degree of accuracy, not only how much they had accomplished at a given time, but also how much their neighbours had accomplished. Some of them could even calculate the other way and tell the time of day by the number of connections they had wired. As far as the observer knew, the men kept no written records; yet they frequently carried rather difficult figures over from day to day. Thus, during one week W2 had surpluses on Tuesday, Wednesday and Thursday of 440, 432 and 1,128 respectively, making a total of 2,000. On Friday he reported exactly 2,000 connections more than he had wired, thus achieving an even balance for the week. Again, on the first three working days of the week ending March 5th, W6 had surpluses of 286, 1,386 and 352 respectively. On the fourth day, Friday, he reported 1,804 connections more than he had wired, thus leaving a surplus of 220, which was a comparatively easy figure to carry over to the next week. These observations are significant in that they show how enormously preoccupied these men were with the quantity of output."

Claims for day-work allowance provided yet another field in which unusual features characterised the output position. The Department directed employees to claim daywork for unusual stoppages beyond their control, but no specific definitions were laid down. "It was assumed that the employees would resent any stoppages which interfered with their work and, as long as the opportunity of doing piecework was present, that they would never either deliberately bring about a situation in which they could get only daywork or claim more daywork than they were entitled to. Yet that is exactly what happened. Some of them claimed more daywork allowances than they were entitled to or contrived to bring about occurrences which would justify their claims. The interesting thing about these claims is that they meant nothing to the operators in terms of payment. The operators were here addressing themselves not to financial gain but to the security they felt came from uniform output curves. They saw, of course, that the more daywork they were allowed, the less output they would have to produce in order to maintain a given output rate."

Finally, there was the question of the quality of output or the occurrence of defects in wiring and soldering. Eleven defects were listed on the quality form which the inspector filled out for each equipment, but the inspector's personal judgement had necessarily to play a considerable part in the determination of the defect and thus of the quality ratings allocated to the wiremen or solderman. This meant, of course, that there was opportunity for the inspector's judgement to reflect relations between himself and the individuals whose work he inspected. From the detailed analysis of the incidence of the defects, their causes and their allocation to the operators concerned, the investigators were able to conclude that this in fact occurred. "If a solderman was in fact responsible for certain defects, then one would expect his ratings to be about the same, irrespective of who did the wiring. But if it is found that his ratings do vary with different wiremen, either of two conclusions may follow. Either the personal relations between the different wiremen and the solderman were affecting the solderman's work, or the personal relations between the wiremen and the inspector were influencing the inspector's judgement of the solderman's work. In either case it may be concluded that the personal attributes of the wiremen were affecting the solderman-inspector relation.

"With this point in mind, it is apparent that:

(1) Inspector 1 detected fewer defects in Solderman A's work when Solderman A was soldering for Wireman C than when he was soldering for Wireman A or Wireman B, and he found more defects in Solderman A's work when Solderman A was soldering for Wireman B than when he was soldering for Wireman A.
(2) Inspector 3 found considerably fewer defects in Solderman D's work when Solderman D was soldering for Wireman I than when he was soldering for Wireman G or Wireman H.

This evidence strongly suggests that the various inter-personal relations in this group did affect either the quality of the

solderman's work or the inspector's judgement of the solderman's work."

A particular clear example occurred in the case of Inspector 3, who "aroused the antagonism of the group whose work he inspected, and they expressed their antagonism by charging him with exorbitant amounts of day work. The analysis shows that he reciprocated by charging them with large numbers of defects. He was able to do this because so many of the defects depended upon his personal judgement. This does not mean that he did it consciously; it means that a person is likely to be more critical of the work done by an opponent than of that done by a friend."

As a concluding note on the output position reference may be made to the inter-relation of actual performance and capacity. "Differences in weekly average hourly output rates for different wiremen did not reflect differences in capacity to perform. This conclusion was based on the following observations:

"(*a*) Most of the wiremen stated definitely that they could easily turn out more work than they did.

(*b*) The observer said that all the men stopped work before quitting time. Frequently a wireman finished his work quite early and stalled until quitting time. In general the men who ranked highest in output were the first to be finished. This point was verified by a comparison of individual morning and afternoon output rates, which showed the greatest differences in the cases of the faster wiremen.

(*c*) Tests of dexterity and intelligence showed no relation between capacity to perform and actual performance."

From the evidence obtained through the Interview Programme, as well as from observations over the factory as a whole through other channels, the investigators were able to tell quite objectively that this output behaviour among the members of the Bank Wiring observation group was not

peculiar to the fourteen men composing the group. Within the confines of the experimental room they were behaving as they had always done in the Department and as hundreds of their colleagues in the other Departments behaved. In fact, the output position of the Bank Wiring room was simply a reflection of the general industrial behaviour among the employees of the Company as a whole—and, by inference, one could say of industrial employees as a whole.

A most valuable lesson had been learned as to the emotional tone of the employee's outlook. Even where the immediate practical issues of output and earnings are concerned, men are capable of deliberately restricting output and consequently their own earnings simply on the basis of a " feeling that something might happen." All the circumstantial evidence might be to the contrary. But they would go to elaborate lengths to build up a mechanism by which the restriction could be supported systematically, and enforced on members who might personally wish to respond to the incentive provided for higher production.

. . . . .

A parallel field of findings concerned the inter-personal relations of individuals within the group, having little or nothing to do with output. They were exhibited in the many incidents and events that made up the daily life of the observation room. Yet obviously they centred round production activities, since such activities were the milieu in which the group developed social behaviour. In this particular direction a full reading of the findings is of much greater value than a summary. A picture of the intra-group relations is made up by an accumulation of detailed incidents. A general view can, however, be presented. It emerges most clearly if the material is studied from two different standpoints—the relations between the fourteen men in the room and their supervisors, and the relations among the men themselves.

(1) The Bank Wiring operators in the observation room

were in the first place responsible to a Group Chief,[5] who was able to spend only about half his time in the observation room, the rest being taken up with operators located in the Department. " The Section Chief, to whom this Group Chief reported, spent on average only about an hour a day in the observation room. The Assistant Foreman and the Foreman of the Department had so much of their time occupied elsewhere that they could visit the observation room only once or twice a day."

The position of supervisors in regard to the observation room was, of course, to some extent unusual. Normally they would be working in the regular Department where the higher ranking supervisors were located, this making for greater ease in maintaining order and discipline. The segregation of the men in the observation room meant that the entry of a higher ranking supervisor was an incident of which everyone was clearly aware, and consequently relations between supervisors and operators were more formal. To this extent the findings of the group in relation to supervisory relations may be regarded as artificial, yet even so some of them are of interest and worth presenting in extended quotations.

Take, for instance, the attitude of the Group Chief towards daywork claims and towards job trading, a practice formally forbidden by the Company's regulations. It was quite evident that the Group Chief shouldered responsibility for certain irregular practices in both directions in order to keep on congenial terms with his men, knowing himself to be protected by the possibility of submitting a plausible explanation should any question be raised. The Group Chief endeavoured to steer a moderate course. " He tried his best to make the men obey his orders, sometimes successfully, but he never on any occasion ' told the old man on them '."

" Not all of his orders were disputed. Those which obviously originated higher up were carried out without question. If the men were told to report to the hospital or to the Foreman, they obeyed immediately and without protest. Only in his attempts to enforce certain rules and practices did he meet with resistance. The investigators felt that he countenanced disobedience to some rules largely because he himself thought

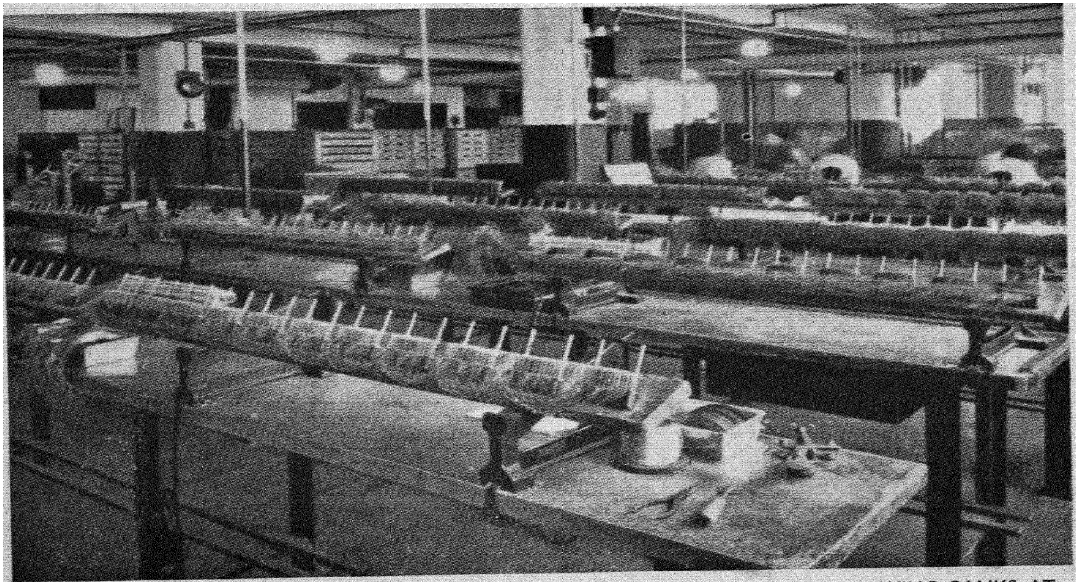


Figure 5. PHOTOGRAPH OF A SECTION OF THE BANK WIRING DEPARTMENT, SHOWING BANKS AT DIFFERENT STAGES OF COMPLETION



Figure 6. BANK WIRERS AT WORK

them unimportant; yet his position demanded that he give lip service to them. His chief interest was in seeing that the men turned out an acceptable day's work, and this they unquestionably did. If they liked to talk and 'cut up' a bit while doing it, he did not object strenuously."

The attitude displayed towards higher supervision was also a feature of importance. "The Assistant Foreman was regarded by the group as possessing much more authority than the first-line or second-line supervisors. When he gave an order or advised them, they listened to what he had to say with respect and never ventured to argue with him. They might protest as soon as he left the room, but never in his presence. His chief concern with the group was in seeing that they maintained satisfactory output standards and that they conformed to rules and regulations. He entered the observation room less frequently than any other supervisor, and his comings and goings were always matter of interest to the group. When he came in they 'expected' something in the form of either criticism or of news which would affect them vitally, perhaps notification of a change in working hours, of transfers, of layoffs, or other official business. The Assistant Foreman's relations with the group were pleasant, and the employees, as well as the first-line and second-line supervisors, felt that they could get certain things done better by going to him rather than to the Foreman."

Much the same was also true in regard to the Foreman himself. The men talked very little about him, but when they did it was always favourable. Yet, "in their daily relations with one another these attitudes rarely found expression. Because of the Foreman's position of prestige and authority, he felt compelled to maintain an outer mask or social personality which effectively concealed his real attitudes and sentiments toward his subordinates. Whenever he entered the observation room, the behaviour of the group underwent a sudden change. Talking and singing stopped immediately, and the operators scuttled back to their positions or, if too far away to return, they pretended to be where they were for some purpose. When he moved about or talked to someone,

the men cast furtive glances at him and attempted to overhear what he was saying."

Many of the findings of these investigations emphasised supervision, and this is more true in the case of the Bank Wiring room and of the Interview Programme than of any of the other experiments. In the present instance, not only did the study throw into relief the effects of supervisory practices and the ways in which the exercise of supervision reacted upon the employees, but there also emerged a fairly clear picture of the pattern of relations among supervisors and subordinates. This can be seen most clearly in Roethlisberger's own words which are worth quoting at length:

> "Examination of the attitudes and behaviour of the employees toward the different supervisors did not reveal a simple, sharp dichotomy between supervisor and employee. Most of the employees looked upon the Group Chief very much as one of themselves. They did not regard him as possessing much authority and they thought nothing of disobeying him. Although they recognised the Section Chief as possessing more authority, they did not always obey him either and they frequently argued with him. But toward the Assistant Foreman their attitude was quite different. They never disobeyed him or argued about his orders. Their behaviour when he was in the room was much more restrained than when only the Section Chief was present. Toward the Foreman they were still more apprehensive. They not only obeyed him with alacrity but also when he was present refrained from doing anything that was not strictly according to rules. The difference between their attitude toward the Group Chief and toward the Foreman was well illustrated by the fact that a mild caution from the Foreman was regarded as a 'bawling out', but the Group Chief would have had to lecture them very severely before they would have felt that they were being 'bawled out'.
>
> "Just as the degree of apprehensiveness exhibited by the operators increased with the rank held by the supervisors, so the degree of strictness shown by the latter varied also.

The Group Chief was most tolerant, the Foreman least. Implicit in the Foreman's attitude and in his every judgment was the 'logic' of management, the pattern in accordance with which the department was technically organised. He was constantly insisting that the 'rules of the game' as conceived by management be carried out. To the Group Chief many of these rules were just as annoying as they were to the operators, and he did not try to conceal that fact from them. The employees had their own rules and their own 'logic' which, more frequently than not, were opposed to those which were imposed upon them.

"It has been pointed out that the chief function of the supervisory organisation was to maintain order and control, and, furthermore, that to maintain control it had to perform two functions. First, orders had to be transmitted downwards essentially as they were given, and, secondly, accurate information about what happened on the working line had to be transmitted upwards. Examination of the facts showed that both of these functions fell short of their technical fulfilment. Orders, in the narrow sense, were carried out. But if orders include the way in which a person is supposed to execute them and the way he is supposed to conduct himself, the actuality fell far short of the ideal. Those rules and regulations which related specifically to conduct were, on the whole, disregarded by the employees.

"But it was in its performance of the second function that the supervisory organisation was found most deficient. The root of the difficulty here was that the employees did not act as it might be assumed they would. Had they acted in accordance with the logic of their wage incentive plan, the difficulties encountered by the Group Chief would not have existed. There would have been no job trading, helping one another, exorbitant daywork claims or 'stalling'. The method of control which had been set up by the Company was based upon the assumption that, given certain inducements or incentives, employees would act in certain ways. That they might act differently was a possibility with which

neither the incentive plan nor the supervisory organisation was prepared to cope.

"The employees were making certain demands of the Group Chief which he could neither recognise nor repudiate without either betraying the trust placed in him by the Company or arousing the hostility of the workers. If their demands could have been tested or verified objectively, the situation might have been different. As it happened, however, none of them could be verified. It was simply a matter of one man's word against another's. Largely because he did want the good will of his men, the Group Chief acquiesced in their demands. He, in effect, became one of the group he was supervising. Having taken that position, he then had to conceal from the Foreman everything which was contrary to the logic of management he, as well as the Foreman, was supposed to represent. This he did in the various ways described. The Foreman had little opportunity to find out what the situation was for himself. When he entered the room, the behaviour of the men underwent a sudden change, they acted as they were supposed to, while he was present. The Group Chief and Section Chief sided with the men and did not dare to give the Foreman an objective account of the facts. It is even doubtful if they could have done so; their own hopes and fears were too much involved. The outcome was that the departmental performance records became distorted and the Foreman remained ignorant of much of what was going on. There was something in the relation between subordinate and superior which inhibited the free upward passage of facts necessary for intelligent control."

(2) The field of inter-employee relations is yet another in which the findings of the Bank Wiring observation room have interesting and valuable results to offer for the guidance of management. Here again they reflect events which are met with in every ordinary factory department but which are seldom realised or correctly interpreted by the inspectors or supervisors responsible for its control. It is in this connection particularly

that, as was suggested above, the full text of the final report of the Investigation needs to be studied in detail at first hand in order to get the true value of the observations recorded—this because the salient features of the observation room in this direction lie in the day-to-day incidents, conversations and relationships among the men composing it. Yet, once again, certain useful general pictures can be extracted from the total material presented.

The first one that claims attention is that of the informal social grading of the occupations within the room, and by implication in the main Department. The five occupations lined themselves up from the standpoint of social status in a clear and readily accepted hierarchy, namely, inspector, connector wireman, selector wireman, solderman and trucker. These five were all " operators " in the sense of that term as used by the management: their status was supposed to be identical. But every man in the group was fully aware of the distinctions which separated the five categories. The inspectors were regarded and admitted as a superior grade: but at the same time their standing in the group was that of interlopers. Their superiority derived partly from the nature of their work and partly from their different customs; for instance they had the right of free access to other parts of the factory outside of the Department. They were interlopers because they reported to their own functional chief. Yet, despite their superiority in social status deriving from their occupation, their character as interlopers was the determining factor which governed their behaviour within the room. For instance, although they were accepted as members of some of the informal groupings formed among the men, they could not claim any rights there, not even the right to open or to close a window. Only once in the months of the investigation did an inspector attempt to usurp such a right and he was promptly snubbed for his temerity, the snub being rubbed home by allowing a solderman to close the window for him, just to show him his precise position.

Equally interesting was the distinction between the connector wireman and the selector wireman. As already pointed

out, there were no major physical or operational differences in the wiring process on the two types of banks. Such very slight differences as did exist could not have been responsible for the differentiation between the two types of wiremen; this was confirmed by the job trading taking place among the wiremen in the observation room. Careful study eventually revealed the real significance of the difference.

> "In the Department the connector wiremen were all placed together toward the front of the room, the direction the men faced while working, and the selector wiremen were located back of them. They were, therefore, spatially arranged in such a way as to suggest that the connector wiremen, since they were in front, were somewhat superior to those to whom their backs were turned. From talking to the supervisors and some of the wiremen, the investigators learned that the newer members of the wiring group and some of the slower ones were located 'in back.' As these men 'in back' acquired proficiency and new men were added, they were moved forward. Inasmuch as increases in efficiency were usually rewarded by increases in hourly rates, this meant that the people who were moving forward spatially were also moving upward socially. An individual's location roughly reflected his relative standing in efficiency, earnings and the esteem of his supervisors. The connector wiremen felt injured if they were 'put back on selectors' and regarded such a change as a demotion even though their hourly rates were not changed. Here, then, a minor technical distinction had become so elaborated that it provided a basis upon which the wiremen were in some measure socially differentiated."

In short, the accident of location formed the basis of a strong, readily accepted distinction of social status or grading.

A similar explanation underlay the distinction between wiremen and soldermen, although here there was the further factor that each solderman, in a sense "served" two or more wiremen in so far as he completed a process by performing a

task which was dependent upon the completion of the wireman's part. There was a tendency in the Department for newcomers to begin soldering before being "promoted" to the wiring job. In consequence it soon became common to regard soldering as the junior job and there became attached to it such marks of inferiority as being expected to fetch the lunches for the whole group, a service that no wireman ever undertook. So too with the trucker, whose occupational inferiority was frequently marked by the spate of joking and practical joking that was levelled at him on almost every occasion that he brought supplies into or from the room.

The investigation thus threw clearly into relief the existence of considerable social gradations or status attaching to the occupations performed by the various groups in the Department. "An ordering process had taken place in the organisation of the human element in the Department, and social significance had become attached to the various tasks."

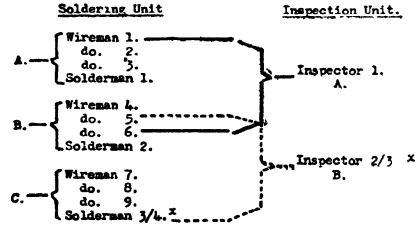
Yet, strangely enough, stratification into this hierarchy of of occupations did not enforce a corresponding personal grouping into occupational cliques as the basis of everyday behaviour within the room. Instead, the inter-relations among the fourteen men in their daily activities, whether serious or otherwise, cut across the occupational groups and appeared to be more dependent on personal attractions or antipathies. These groupings of relationships were varied to some extent in accordance with the different purposes to which they might be directed. This position is best illustrated by reproducing the series of charts with which Roethlisberger has presented the findings in this connection. (*See Fig.* 7.)

It will be noted that in a number of cases there is a tendency for the internal individual relationships to split the total group into two parts, though with one or two individuals isolated from both. This comes out very clearly, for instance, in regard to participation in "games": the "games" referred to there were for the most part games of chance including "matching coins, lagging coins, shooting craps, card games, bets on combinations of digits in the serial numbers of their weekly pay checks, pools on horse racing, baseball, and quality

records, chipping in to purchase candy and 'binging.' The men usually engaged in these games during brief respites from work or during lulls in activity resulting from interruptions in the flow of work. The games were extremely varied and were seemingly elaborated spontaneously with reference to anything into which the element of chance entered. Financial gain was not the main inducement, for most of the wagers were small, ranging from one to ten cents. However, those who participated in the betting on horse races usually did so seriously. They dubbed their favourite the 'Test Room Horse' and bet on him fairly consistently." It will readily be observed that participation in these games formed a natural means of expression of inter-personal relations. They tended to accentuate the differentiation between the two groups, for participation was not determined on a random basis, most of the gambling games occurring in the one set and most of the "binging" in the other.

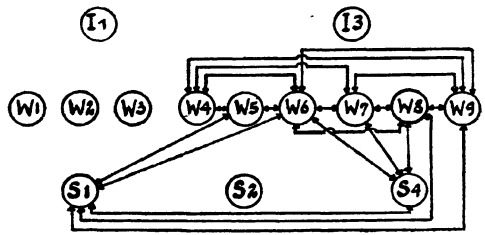
Only in regard to mutual assistance on the job was there any marked departure from the two-clique structure. In regard to helping each other there was a very general intermingling, irrespective of any inter-personal relationships. Everybody participated in their mutual assistance and it cut right across even the occupational groups and hierarchy. To anticipate general conclusions, mutual assistance was an expression of group solidarity expressing an antagonism towards external forces. "It was the unwritten rule that wiremen should not help one another wire. This rule received its sanction from the belief that employees could turn out more work by working only on the equipments to which they were assigned. There would be less opportunity for talking, less likelihood of their getting in one another's way, and less likelihood of their delaying the solderman and the inspector. There was, in other words, no logical reason why workmen should want to help one another in this fashion. To the wiremen, however, this was just another arbitrary rule. Many of them preferred to work together occasionally. It was one of the ways in which they expressed their solidarity; it was one of the integrative mechanisms in their internal organisation."

Solderman 4 replaced Solderman 3 early in the investigation. Inspector 3 replaced Inspector 2 early in the investigation. The overlap of the inspection units indicates that one half of the work done by Wireman 5 and Solderman 2 was inspected by each of the Inspectors.



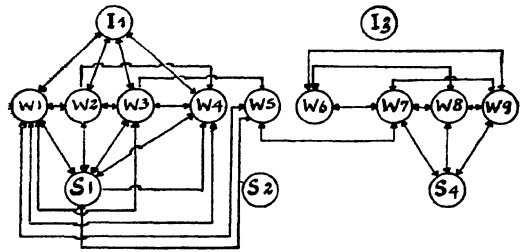
(I) THE WORKING GROUPS (formal)

The diagram is to be interpreted in the same way as that for games. A person was judged to be involved in these disputes even though he participated only verbally.



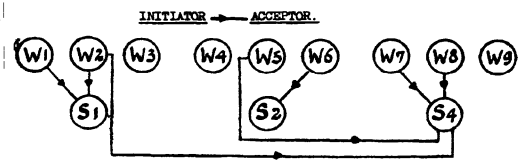
(III) PARTICIPATION IN CONTROVERSIES ABOUT WINDOWS

The figures in small circles indicate the operators. W1, W2, W3 and S1 are soldering unit A ; W4, W5, W6 and S2 are soldering unit B ; and W7, W8, W9 and S4 are soldering unit C. The arrows connecting the different circles indicate that the people thus connected participate in one or more games, either as pairs or as members of a larger group.



(II) PARTICIPATION IN GAMES

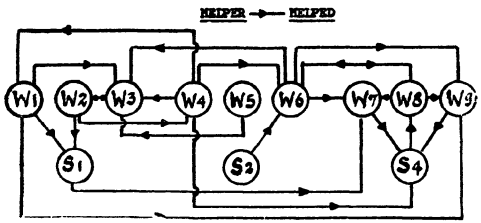
The Inspectors did not participate. The arrows point from the person who initiated the request to trade to the person who accepted the request. The numbers alongside the arrows show the number of times the people so designated traded.



(IV) JOB TRADING

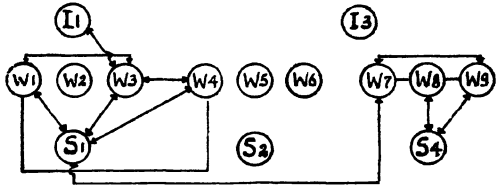
Figure 7. INTERNAL ORGANISATION

The Inspectors did not participate. The arrows point from helper to the person helped. Everyone participated in helping and it was not confined within work groups.



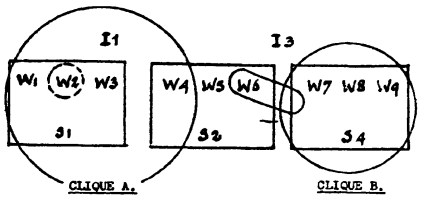
(V) PARTICIPATION IN HELPING

Friendship clustered in two groups. One group includes five people who were in the front of the room, W1, W3, W4, S1 and I1. The other group were members of soldering unit C, the four people in the rear of the room. W2, W5, W6, S2 and I3 were not bound by any strong friendships.



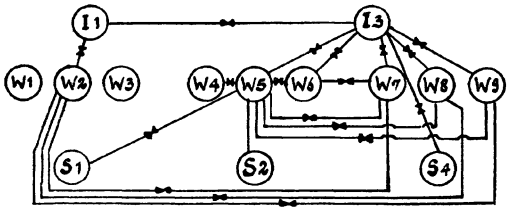
(VI) FRIENDSHIPS

The workers did not form occupational cliques. Clique A was located towards the front of the room, Clique B towards the back. W5, S2 and I3 were outside either clique. W2 participated in the games of Clique A, but tended otherwise to isolate himself from them. W6 tended to participate in Clique B, but was still in many ways an outsider.



(VI) I INTERNAL ORGANISATION OF THE GROUP

Antagonisms originated chiefly from wiremen in soldering unit C, and were directed towards W2, W5 and I3, who were not bound by any strong friendships. Antagonisms arising outside soldering unit C were directed chiefly towards W5 and I3.



(VIII) ANTAGONISMS

Figure 7 (Concluded). INTERNAL ORGANISATION

Other illuminating points emerge, however, from particular details of personal relationships. For instance, there was the strong desire displayed by one of the wiremen (W.6) for leadership of the group and the refusal of the group to accord him the position. " The men constantly tried to belittle him by calling him all sorts of nicknames and by making fun of him and his nationality." Partly on personal grounds, but mainly because of his persistent attempts to secure leadership of the group, he became personally unpopular and a source of irritation ; he conformed to the group's sentiments regarding output but he contravened those attaching to personal conduct.

Again, one of the inspectors (I.3), apart from being an interloper because an inspector, failed to win the esteem of the group because of his lack of functional competence. As a result he was the object of persistent practical joking which even went to the length of preventing him performing his task—despite the fact that it stopped the men themselves from earning the piecework to which they were entitled! Eventually the treatment meted out to him got him down and he asked to be removed from the room.

Another wireman (W.5) displayed a persistent tendency to " squealing," one of the cardinal sins in the social group organisation. Quite naturally, he was excluded in consequence from all the group relationships founded on the purely personal factors. But he was admitted into those directed to the preservation and solidarity of the operator group as a whole.

Once again, the words of the report are the best interpretation of the findings, as in the following paragraphs :

> " Nearly all the activities of the group in the Bank Wiring observation room may be looked upon as methods of controlling the behaviour of its members. The men had elaborated spontaneously and quite unconsciously an intricate social organisation around their collective beliefs and sentiments."

The analysis of the purposes for which this intricate social organisation had been raised is pursued along lines described under the heading of " formal versus informal organisation."

. . . . .

The chief function of the informal organisation (or group) in the Bank Wiring observation room was to resist changes in the established rates of work or in personal inter-relations. Its other purpose, as already mentioned, was to control and regularise the behaviour of its members. The former motive may be regarded as an external function of the group, serving to protect the group from outside interference by manifesting a strong resistance to change, or threat of change, in conditions of work and personal relations. This resistance to change was reflected not only in all the wiremen's tactics to keep output constant, but was also implicit in all the reasons they gave in justification of their actions. Had it been explicitly stated as a rule of behaviour it would have run something as follows :

> Let us behave in such a way as to give management the least opportunity of interfering with us.

" There is no doubt that the most pronounced over-all characteristic of the interhuman activities described was their peculiarly protective or resistive quality. The problem, therefore, became that of discovering those external factors which gave rise to this resistance."

Those factors can be summarised as the elements that made up the formal organisation of the enterprise—that is the structure of responsibilities, procedures and the like, instituted in the governance of the enterprise and directed towards the achievement and maintenance of technical efficiency in the widest sense. Its very purpose demanded susceptibility to change ; it might almost be said to stand for change or to be the embodiment of change. In the modern industrial community the practices and procedures of management are developing rapidly, and new mechanisms and methods are continually being elaborated. Such changes, moreover, because of their increasing complexity, tend to assume a technical character of which the individual operator or employee working in the organisation cannot be fully cognisant. Nor are their effects on the social status of the employees normally taken into consideration or the wishes of employees consulted about them. Thus they represent to the

employee ranks an incessant threat of disruption and insecurity against which the informal organisation or group structure needs to be developed. It is almost a " natural " and quite unconscious response—the only means by which resistance and protection can be attained. In other words, a group solidarity motivated by the urge for security, becomes the necessary antidote to the threat of change implied by the structure and purpose of the formal organisation.

A comparison of the findings of the Bank Wiring observation room with those of the Relay Assembly test room throws this problem into very clear relief. In the former, the social organisation was restrictive, an integrating of the individuals concerned for purposes contrary to those of the efficiency of the organisation. But in the Assembly room the natural grouping of the individuals was directed to all of the things that best served the purposes of the formal organisation: output and productivity increased, absence and lost time declined, discipline improved, and so on. Wherein lay the difference? Only in this, that the relay assemblers participated in the decisions that brought about the changes affecting their everyday lives, whereas the bank wirers were required to carry out the " imposed dictates " of an outside authority, unconsulted and unconsidered. This was admittedly the deliberate intention of the investigators in each case, and thus the complementary character of their purposes is reflected in the opposite character of their results.[6]

. . . . .

How best to apply the lessons from the findings of the Bank Wiring observation room is not easy to decide in short compass. Why is there among the employee groups resistance to change? Is it due purely to lack of information? Or to misunderstandings? Or to suspicion based on an unfortunate history? Or to an over exaggerated sense of dependence? Or is it that an innate desire for participation in one's own government is frustrated?

From a comparison of the two investigations it would seem that many of these factors are pertinent, but that possibly the first and the last are the most significant. The desire of the

employee to know the factors that govern his own working life and to feel that he shares in their determination would seem to unleash a sense of responsibility and co-operation of an unparalleled magnitude. If this is so, it appears to lead to three principal remedies for the industrial malaise of the contemporary world.

The first is the conception of "personnel management" as Roethlisberger develops it (E), a process of communication and consultation, one of the final conclusions drawn from the Hawthorne investigations. The second fundamental principle may be summed up under the large heading of "democracy in industry," but understood as meaning a genuine two-way consultation on all matters of management. The third is the development of adequate training for those with managerial or supervisory responsibilities in industry, with particular reference to making them aware of the significance of interpersonal and social relationships among employee groups. Such a process of education, it is useful to record, has already begun to emerge in Great Britain in recent years in the Works Supervision and Foremanship Courses sponsored by the Ministry of Labour and National Service and, in a more highly developed form, in the "Training Within Industry" programme under the name of "Job Relations Instruction." That this programme was first designed and operated in the United States under the direction of an executive of the Western Electric Company is perhaps the best comment on the practical value of the Hawthorne findings as a lesson in the real significance of supervision.

[1] *Unless otherwise stated, all quotations in this chapter are taken from* (*C*).

[2] *Roethlisberger cites an interesting instance of this, well worth relating in detail*:

"*One day an interviewer entered a department unobserved. There was a buzz of conversation and the men seemed to be working at great speed. Suddenly there was a sharp hissing sound. The conversation died away, and there was a noticeable slowing up in the work pace. The interviewer later discovered from an acquaintance in the department that he had been mistaken for a rate setter. One of the workmen,*

who acted as a lookout, had stepped on a valve releasing compressed air, a pre-arranged signal for slowing down."

[3] *"Of particular interest were the conversational habits of the men during the first week. From a distance one could not see whether they were talking or not. They neither looked up from their work nor slowed down the pace. Only a barely audible murmur indicated that they were conversing. If the observer got up and walked about, the murmur stopped. The observer felt that their attitude toward him was similar to their attitude toward the foreman. Whenever the foreman entered the room, the men became absolutely quiet and cast furtive glances at him as he moved about. Whenever he talked to a worker, those near made an effort to overhear what he said. This attitude was not so evident in the Department, where the foreman seemingly could move about as he pleased without arousing unusual curiosity. The observer noticed that whenever he himself left the room the volume of conversation increased and that as soon as he came back the men all became quiet just as they did when the foreman came in. Toward the middle of the week, the tension lessened. The men began to talk more loudly, and occasionally someone would laugh."* (*C.*)

[4] *From the article in "Business," December,* 1941.

[5] *This and other names occurring in this section are actual titles. It must also be recalled here that the Observer in the Bank Wiring room—in contrast with the one in the Relay Assembly room—did not accept or carry out any supervisory duties or in any way participate in the work of the operators.*

[6] *"It is curious how at all points the Relay Assembly room and the Bank Wiring observation room form a contrast. In the former, the girls said that they felt free from the pressure of supervision, although as a matter of fact they were far more thoroughly supervised than they had ever been in their regular Department. In the latter, the men were afraid of supervision and acted so as to multiply it. The bank wiremen were in the position of having to respond to technical changes which they did not originate. The relay assemblers had periodic conferences with the superintendent. They were told what experimental changes were contemplated; their views were canvassed, and in some instances they were allowed to veto what had been proposed. They were part of an experiment which they felt was interesting and important. Both groups developed an informal social organisation, but while the bank wiremen were organised in opposition to management, the relay assemblers were organised in co-operation with management in the pursuit of a common purpose. Finally, the response of the two groups to their industrial situation were, on the one hand, restriction of output and, on the other, steady and welcome increase of output. These contrasts carry their own lesson."* (F.)

VI

THE INTERVIEW PROGRAMME

ALTHOUGH often overlooked among the investigations, the Interview Programme was a major item. It ran for something over two years and covered more than 20,000 of the Company's employees. The interviews were very carefully conducted, and equally carefully analysed with a view to isolating both major and secondary findings. Apart from their own intrinsic value, they gave point and purpose to the other investigations which were being carried out at the same time. They knitted these other investigations together and facilitated a correct interpretation of specific findings.

The immediate practical purposes to which the findings of the Programme were applied lay in the field of supervisory training, by supplying material for the courses and conferences conducted by the Company. In addition, there were a number of indirect benefits, which have been summarised under three headings :

(1) the correction of unfavourable conditions of work ;
(2) the psychological benefits accruing to the persons interviewed ;
(3) the provision of material for research.

" Considered from any one of these various points of view to the exclusion of the others, the Programme could be found lacking. For example, from the point of view of correcting unfavourable conditions of work, it is probable that other less laborious methods could have been utilised to achieve the same results in less time. Also, although the use of interview material as basis for supervisory training had been very effective compared with the conferences conducted before such material was available, similar material could have been collected without undertaking such an extensive

programme. It is doubtful, however, whether any other programme could have been devised by the Company at the time which would have made simultaneously equally substantial contributions from all these points of view. It was this consideration, together with the 'lift' that management people themselves obtained from the Programme, that made it in the opinion of management worth the effort and expense put into it." (C.)

"The interviewing programme marked a turning point in the research and, for a time, overshadowed the other activities of the research group. The Programme started essentially as a plan for improving supervision. The need for this improvement had been shown by the test room studies, which had clearly indicated that there was close relation between employee morale and supervision. But how was the improvement to be accomplished? If it involved a re-education of the supervisors themselves, by what methods and with what material were the supervisors to be trained?"

"Supervisory training was not new at the Company. For a number of years a systematic training in Company routines and policies had been given to supervisors. But, although it was useful as far as it went, this kind of training did not enable the supervisors adequately to understand and to handle the personal and social situations under their care. The Company tried to meet the supervisors' needs by organising a series of discussions and conferences on 'morale,' but the outcome was not entirely satisfactory." (C.)

The broad form of the "employee interviews" which constituted this further phase of research was suggested by two lines of thought arising from the Company's other activities. The first was the altered attitude of the girls in the Relay Assembly test room *vis-a-vis* their supervisors. These girls had lost much of their shyness and fear, or what came to be called their "apprehension of authority." The girls themselves frequently commented on the greater freedom of conditions in the test room and in particular upon the easier tone of supervision. Clearly, then, their improved morale appeared to be

closely associated with the different methods of supervision in the test room. The second was that those responsible for the conduct of the supervisory staff training courses felt a dearth of factual material on which to base the training conferences in employee morale.

> " Much of the material consisted of the personal experiences and opinions of different executives. These opinions were often conflicting and did not provide adequate information about what constituted the effective working together of supervisor and employee. It became apparent that any discussion of morale must be based upon something more definite and factual before any improvement through supervisory training courses could be realised." (C.)

The test room technique was unlikely to yield data of this kind. The practical answer seemed to be the simple one of direct approach to the employees themselves : " Why not cover the essential facts by approaching employees and asking them to express frankly their likes and dislikes about their working environment ? " Under suitable conditions of confidence and anonymity they would no doubt be ready to express their views as to working conditions and other aspects of their daily industrial lives, including supervision. It was this line of thought that led to the inception in September, 1928, of the first phases of the Interview Programme covering the Inspection Branch, which then consisted of some 1,600 skilled and unskilled employees in factory, shop and office work. It was felt that a group of this kind, being both large and varied, would give a fair idea of what the employees of the Company liked and disliked.

The interviews of the Inspection staff ran for six months, that is, until February, 1929. Very careful planning was necessary in order to avoid unfavourable consequences and to ensure the necessary measure of success for the programme. The co-operation of the supervisors of the Branch was obtained by calling them into conference and meeting their particular comments and criticisms. Most of the supervisors reacted readily

to the proposals and offered cordial collaboration. Five interviewers were selected, women to interview women and men to interview men, and were given not only general training in the purposes and methods of the investigations but also very precise instructions as to how they were to carry out their task. At this stage the plans were based on the idea of an interview with a number of specific questions clearly formulated in the mind of the interviewer. These were not to be put forward in the form of a questionnaire, but they were to be signposts by which the interviewer guided the conversation if the employee under interview tended to take the discussion off on to other seemingly irrelevant channels of thought.[1]

The main points which ensured the success of the plan can be summarised very briefly under four headings:

(*a*) The whole-hearted collaboration of the supervisors of the Inspection Branch.

(*b*) The guarantees of confidence and anonymity, both of which were religiously maintained throughout the programme, and in the subsequent analysis and interpretation of the results.

(*c*) The precise instructions given to the interviewers. At a later stage of the programme these precise instructions were modified into a general training of interviewers. This plan, in its turn, brought an additional indirect benefit. In a later phase, the interviewers were selected from among the supervisory staff, who thus learned how to converse personally with the employees working with them.

(*d*) The careful recording of the interview conversations. In the earlier phases copious notes were taken Later the interview was reproduced virtually verbatim not only to provide accurate material for analysis, but also to indicate the setting or background of any particular point that arose or was discussed.

From its inception the Interview Programme was accorded a very favourable reception by the employees as well as by the supervisors. Spontaneous comments both during the interviews

and on other occasions were almost completely unanimous in praise of the scheme and on a number of occasions benefits were attributed to the programme for which it could not in any way have been responsible.

The success of this earlier phase led very soon to the preparation of plans for an extension. In the first place the Programme was extended early in 1929 to cover the Operating Branch of the Hawthorne works and about a year later was expanded to all the eight Branches of the organisation. Moreover, in February, 1929, the Company established an Industrial Research Division to take over the direction and conduct of the interview work, as well as to continue supervision of the test room studies. The Division was conducted in four departments, covering respectively: interviewing, interview analysis, supervisory training, and test rooms, an arrangement which emphasises both the importance attached to the Interview Programme studies and how closely they were linked with the improvement of supervisory practice. Another expansion was a special Interview Programme conducted among a group of 2,500 supervisors.[2]

Within the two years which the initial stages of the Programme covered, over 20,000 employees were interviewed, many of them more than once, and their distribution has been summarised as follows (C):

Number of Employees Interviewed in Each Branch in 1928, 1929, *and* 1930

Branch	1928	1929	1930	*Total*
Public Relations			8	8
Industrial Relations			130	130
Accounting			637	637
Production			963	963
Operating		10,300	5,109	15,409
Inspection	1,600		514	2,114
Technical			1,166	1,166
Speciality Products			699	699
	1,600	10,300	9,226	21,126

It was about the middle of 1929 that the important change was made in the method of conducting the interviews. Hitherto, in accordance with the instructions issued, the interviewer had led the conversation on the basis of a set of specific questions carried at the back of his mind, not to be used as a questionnaire, but denoting questions to which the interviewer expected to have answers wherever possible.

Usually, he was not satisfied until, in some way or other, he had solicited some comment from each employee about supervision, working conditions, and so on.

> "But it soon became clear that this method tended to diminish the usefulness of the interview period, in so far as time and again interviewed employees tended to 'digress' on 'irrelevant' topics."

These forced the interviewers to realise that they were not getting at the things that were really of importance to the employees themselves. They were trying to get only what they themselves felt was significant. Yet it was the particular views of the employee that coloured all his thoughts and feelings about the conditions composing his environment. In some instances "there was something uppermost in his mind which completely over-shadowed everything else and it was about this that he wished to talk."

In the light of this experience it was eventually decided to adopt what may be called an indirect approach, leaving the employee to talk freely on topics of his own choosing.

> "As long as the employee talked spontaneously the interviewer was to follow his ideas, displaying real interest in what he had to say and taking sufficient notes to enable him to recall the various statements put forward. While the employee continued to talk no attempt was to be made to change the subject."

This change of approach also entailed a change of time, for whereas in the earlier phases the interviews lasted only thirty minutes, the average time for a single interview on the new basis grew to approximately one and a half hours.

Another change in method took place some months later when the written report of the interview was developed in greater detail. Instead of brief statements on likes and dislikes grouped under headings, the interview record became virtually a verbatim report of the conversation showing the comments made by both interviewer and employee and thus the setting in which the employee had expressed his views. Naturally the interview report now became a ten-page document instead of a couple of sheets.

The economic hurricane that hit America during 1930 burst into the Interview Programme just as it had done into the other phases of the Hawthorne investigations; it was suspended until conditions became more favourable. A certain amount of interviewing was conducted for experimental purposes. When the programme was resumed on a more regular scale in 1936, it had taken on both a new character and a new title: this was the plan for "personnel counselling." The fundamental difference introduced at this stage was that one interviewer was allocated to a suitably small group of employees who were re-interviewed from time to time. The interviewer thus came more closely into touch with the particular employees with whom he was associated. He was able to interpret attitudes and feelings more fully than when he had been confined to one or, at the most, two interviews with a large number of employees drawn from different sections. This later phase is, however, in a separate category.

. . . . .

It is possible to look at the findings resulting from the Interview Programme in a number of different ways. They could be classified under a variety of specific headings. One or two of these are in the nature of research results. Others have rather the character of lines of action for immediate application. Among the latter category one of the most important was the question of dealing with employees' complaints. Quite early in the course of the Inspection Branch interviews it became clear that the employees wanted to use this opportunity for putting forward complaints or alleged grievances

on a number of topics. With a view to codifying such comments the interviewers drew up "a list of 74 topics ranging from washrooms, lighting and ventilation to advancement, fatigue and monotony." Subsequently the original list was regrouped and the number of separate items reduced to 34. The accuracy and usefulness of this analysis of subjects may be judged from the fact that after a further 10,000 interviews had been taken and analysed in 1929, it was necessary to add only three further topics to the original list of 34. The full 37 topics with their sub-headings are shown in Table II.

But the interviewers had no intention of just collecting complaints for their own amusement. The urgency and emphasis with which some of these subjects were discussed made it clear that prompt and proper action should be initiated with a view to remedying the causes. Accordingly a procedure was designed in association with that used for the analysis of the interview material, by which notification of complaints could be sent from time to time to the three particular branches of the Company's organisation immediately concerned with them—namely,

(1) the section concerned with the regulation and maintenance of physical plant condition,
(2) the safety and health division,
(3) the section dealing with employee amenities, including restaurant, Hawthorne Club, employees' service division and the hospital.

By the end of 1929 some 40,000 comments, of which 28,000 were complaints and 12,000 approvals, had been separated out and sent forward to one or other of these organisations. In the earlier phases, a large sample of the complaints had been analysed and investigated in detail and this showed that out of 471 unfavourable comments from the Inspection Branch, some 78 per cent were worthy of investigation while the remaining 22 per cent did not justify detailed enquiry, being vague or ambiguous. On about half of the total investigated action was advised, considered or taken.

In regard to the important field of supervisory staff training,

the findings of the Interview Programme afforded a wealth of material that gave to the existing training activities a value not previously attainable. Moreover, there was the specialised training given to several of the supervisors or potential supervisors through their service as interviewers for a period of about one year.[3]

> "The recognition of the need to understand personal situations was for a long time the central idea of supervisory training at Hawthorne. The purpose of this training was to convey to supervisors the technique that the interviewers had developed and had found to be so effective; that is, to listen rather than to talk, and to exclude from their personal contacts with employees any moral admonition, advice or emotion. It was believed that by using this technique, supervisors would be able to become better acquainted with the employees they supervised and to handle more intelligently those complex human situations the general results of which were unsatisfactory to the worker." (C.)

In brief, the data collected from the interviews and the experience of first hand approach to the mind and heart of their subordinates gave to supervisors an opportunity of seeing their tasks in a new and clearer perspective, from which they derived four chief benefits:

(*a*) they were able to see their own practices through the eyes of employees;

(*b*) from the discussions they learned that their individual problems were not unique in the plant and that many other supervisors had similar problems; from the opinions of other supervisors on problems similar to their own they were able to see how other people handled such difficulties;

(*c*) they had acquired greater self-confidence and freedom of expression by talking before a group of men: it was a new experience to speak their own minds freely and to participate openly in discussing problems of management;

(*d*) the conferences gave them additional opportunity to become acquainted with their fellow supervisors.

TABLE II
Topics discussed in Employee Interviews

Absence
Advancement
Aisles

Bogey

Club activities
  (Hawthorne)
  General
  Entertainment
  Club store
  Educational
  Sports

Dirt

Fatigue
Floor
Furniture and Fixtures
  Time clocks
  Drinking water and fountains
  Chairs
  Trucks
  Pans
  Elevators
  Fans
  Benches
  Miscellaneous

Hospital
Hours
  Standard
  Night
  Overtime
  Rest periods

Interest
Interviewing
  Programme

Light
Lockers

Material
  Quality
  Quantity
  Finished product
  Miscellaneous
Monotony

Noise

Payment
  Wages
  Group piecework
  Straight piecework
  Rate revision
  Piecework rate
  Piecework in general
  Pay roll routine
  Miscellaneous
Placement
  Company placement
  Job placement
  Transfers
  Personnel organisation

Restaurant

Safety and health
Sanitation
  Spitting
  General

Smoke and fumes
Social contacts
Steady work
Supervision

Temperature
Thrift
  Stock purchase plan
  Building and loan
  Life insurance
  Ready money plan
  General
Tools and machines
  Tools
  Machines
Transportation

Vacation
Ventilation

Washrooms
Welfare
  General
  Benefit plans
  Employment
  Service (continuous)
  Publications
  Pensions
  Loans to employees
  Christmas welfare
  Legal service
Working space

General
  Miscellaneous
  Education

There was a marked improvement in the tone of the supervisory conference discussions as the evidence of the social and personnel relations in their own sections were gradually laid before them. There was "a tendency for the supervisors to become less dogmatic about supervisory practices and to be less sure of many of the techniques they had previously applied without analysis or question. There was a growing spirit of open-mindedness among many supervisors who, in the early stages of the programme, were inclined to believe that good supervisors were born and not trained, and that supervisors could learn nothing from their subordinates. This type of supervisor was becoming more willing to seek the advice of others and to take into account the feelings of his own subordinates."

The next main group of results from the Interview Programme were those that centred round the employees themselves. These were benefits of a more directly personal character than those arising from the solution of grievances or the improvement of working conditions. Roethlisberger writes on this point:

> "The most unexpected results, however, were the personal values which came to the employees from being interviewed, and which in turn reflected to the benefit of the Company. These values were twofold. In the first place, the employees appreciated being recognised as individuals who had valuable comments to make. They enjoyed the opportunity of offering their opinions and also of participating jointly with the Company in its endeavour to improve supervision and working conditions. In the second place, from the interview itself the employee seemed to obtain a certain 'lift.' Over and over again employees commented on the beneficial effect of expressing freely their feelings and emotions.
>
> Comments of this sort from thousands of employees could not be overlooked. Moreover, it was startling to find the number of employees who had nursed for many years grievances which they had never had the opportunity of expressing to any person of authority in the Company.

Many of their grievances were trivial in nature, but they were of real importance to the worker. It was found frequently that employees' opinions had tended to become exaggerated and distorted, probably because of continued pre-occupation with unpleasant experiences. These distortions were modified when expressed freely to a sympathetic and critical listener. The interviewers received the impression that many employees, when given an opportunity to state their thoughts and feelings to someone trained to listen carefully, discharged in the process emotional and irrational elements from their minds. It was thought that many adverse attitudes had been improved by these emotional 'abreactions' which the interviews afforded." (C.)

This experience was reflected in the many expressions of pleasure offered spontaneously by employees when invited to come for an interview. In practically every case the individual reaction was one of praise for the Company on having developed this particular activity. This attitude was the main motive that prompted the later phase of the Interview Programme in the form of " personnel counselling." The employees were experiencing a cathartic or releasing effect from many long pent-up feelings. This gave them a sense of relief from strain and frustration. Moreover, they could regard their interview as something in the nature of participation in management. Their own individual opinions were being sought on many matters that affected the governance of the Company and the supervision of their own particular section. Their ideas were invited on this and that—anything in fact that contributed to the well-being and development of the organisation. On a larger scale employees were thus experiencing what the girls in the Relay Assembly test room had marked as one of the outstanding phases of their experience, the sense that " We matter."

A similar personal reaction among employees has been experienced in a number of cases in this country where well-run suggestion or joint consultative schemes have been in operation during recent years. This effect of release and the opportunity

for participation in management are among the chief—if not the chief—benefits of a joint consultative scheme or committee. Too much emphasis is placed in many quarters on the value of the technical suggestions that employees put up through the medium of a joint production committee. Too little attention is focused on these other and rather more general consequences which, in the last analysis, are probably of far greater importance as factors in the development of morale.

. . . . .

The " research results " which the investigators drew from their meticulous critical analysis of the findings are worth closer examination and can best be classified under three headings :

(*a*) those concerned with the nature and tone of the comments submitted by the employees in the course of the interviews ;
(*b*) the significance of the distinction between the factual content of an employee's comments and the personal or social sentiments underlying the comments and thus providing their setting or milieu ;
(*c*) the principles and rules for the conduct of interviews in which the elucidation of fundamental thoughts and outlook is the primary aim.

That an analysis of the nature and significance of the comments should have been regarded as a matter of high importance follows immediately from the purpose of the Programme, which the Company had laid down as :

" To learn from the employees their likes and dislikes relative to their working status ;

To provide a more definite and reliable basis for supervisory training and for added control of proper working conditions, placement and efficiency ;

To supplement and verify conclusions reached from the Test studies conducted with small operating groups." (A.)

The classification of the comments was made, as explained earlier, on the basis of thirty-seven main topics, with a number

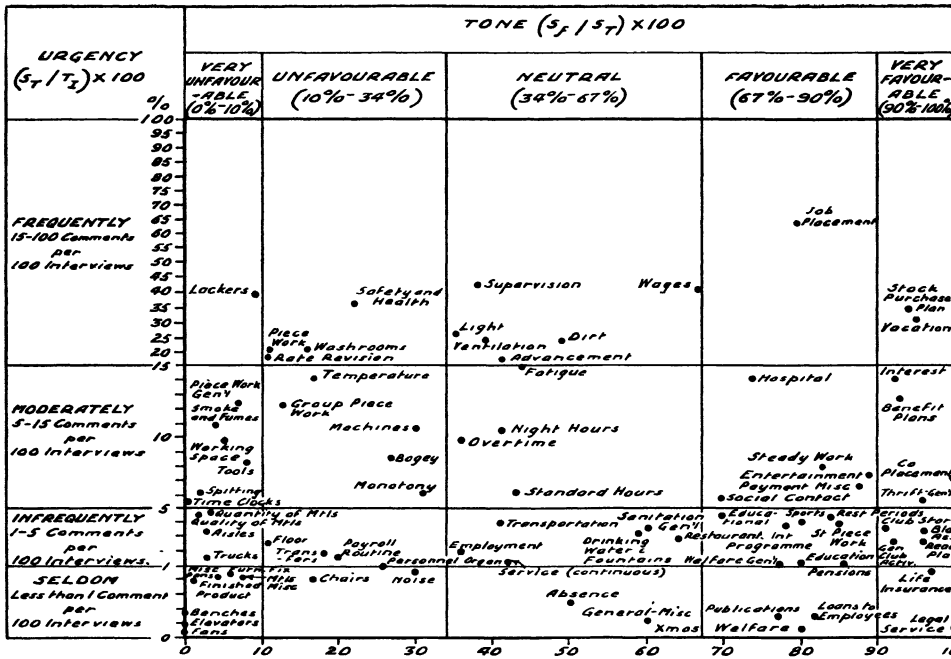


Figure 8. DISTRIBUTION OF TOPICS ACCORDING TO URGENCY AND TONE FOR MEN BASED UPON 6,800 INTERVIEWS
OPERATING BRANCH, 1929

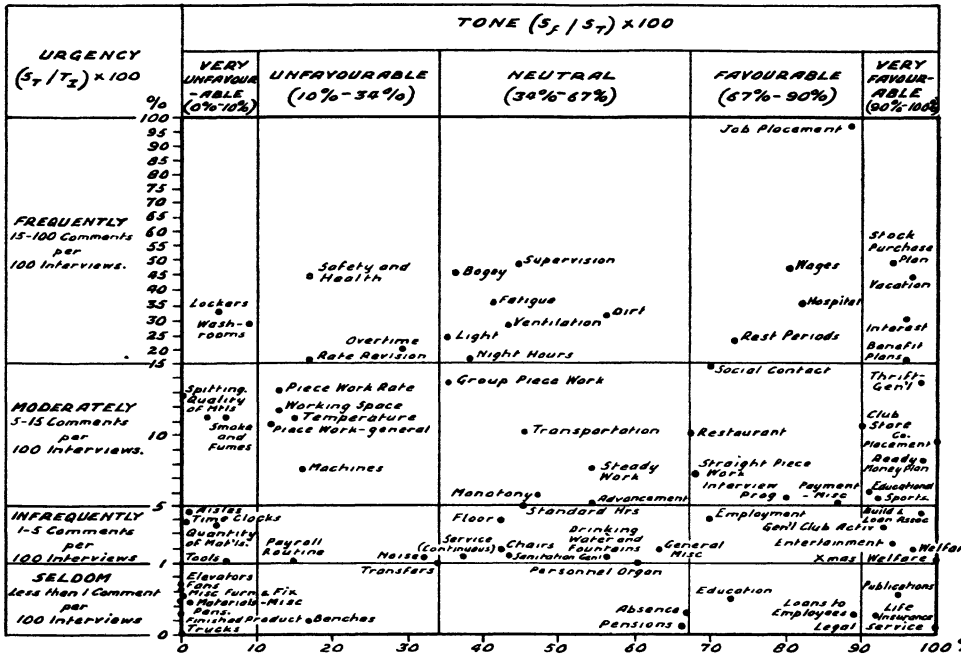


Figure 9. DISTRIBUTION OF TOPICS ACCORDING TO URGENCY AND TONE FOR WOMEN BASED UPON 3,500 INTERVIEWS
OPERATING BRANCH 1929

of sub-headings in certain cases. In order to construct an objective picture of what the topics " meant to " employees, the investigators analysed their findings on a basis of two characteristics which they described as " urgency " and " tone." The former term they used to describe a ratio indicating the number of times a particular subject was mentioned in proportion to the total number of interviews taken, thus overcoming the difficulty arising from the fact that any one employee mentioned a given topic several times in a single interview. The term " tone " was adopted to refer to the favourable, neutral or unfavourable character of the comments. A formula was used which related the number of favourable or unfavourable comments to the total of comments made on that topic. Thus " a subject described as having a favourable tone is one on which the index of comments expressing satisfaction is about .66 or higher. An unfavourable tone means an index of satisfaction of about .33 or lower. A neutral tone means that the favourable and unfavourable comments on that subject were fairly equally distributed."

Many detailed data were obtained by this analysis of urgency and tone. A general picture is given in the attached charts reproducing *Figs. 8, 9 and 10* from *Roethlisberger*, and *Fig. 11* from *Mayo*, covering various results from 10,300 interviews with men and women in the operating branch during 1929.[5]

It is doubtful whether general conclusions could be drawn from the large mass of data furnished by the employee comments or based upon the variety of opinions expressed. To interpret correctly the import of the opinions, much information about the background and situation of each of the individuals submitting them would be necessary. Accordingly, the Hawthorne investigators wisely refrained from attempting any general summary, although with their close knowledge of the people concerned and their conditions, they were able in the later stages of the analysis to deduce for presentation to their supervisors certain generalisations about common employee attitude.[6]

On the particular problem of plant conditions at Hawthorne, such generalisations were less useful. The data drawn from the comments might be said to support the view that in the opinion

of the workers plant conditions in the Company were inferior to those under which they had worked elsewhere or to what they thought conditions ought to be. But this conclusion is not substantiated by external evidence. Moreover, most of the comments on Company placement and on the Company in general were favourable, although it is probable that such comments were made primarily with industrial relations policy and practice in mind. All endeavours to relate comments on issues of fact to the facts or conditions in the Hawthorne plant viewed objectively failed to give any adequate results.

In consequence, the investigators were led to the rather important conclusion that an employee's comment on any particular item of the Company's policy or practice or conditions was not simply a statement of his own considered judgement as to such a policy, practice or conditions *vis-a-vis* a similar situation elsewhere. Instead, the comment may well have been little more than an outward expression of an underlying thought or feeling which led the employee to display a certain attitude towards all the factors influencing the immediate working environment. This thought or feeling may have had no relation at all to the temporary situation in which the employee was placed. In other words, these studies of the interview material led the investigators to the conclusion that

> " employee comments had a dual character: they could be used just as readily to express sentiments as to indicate facts. The fact that all topics frequently mentioned had one thing in common, namely, that they were particularly adaptable to the expression and elaboration of social sentiments, seemed to suggest that these social sentiments, their nature, and their inter-relation with other factors, were of particular importance for the understanding of employee complaints and well-being.
>
> . . . . . .

The conclusion that, in order to understand the comments submitted by employees in the interviews, it was necessary to draw a distinction between a " fact " and a " sentiment "

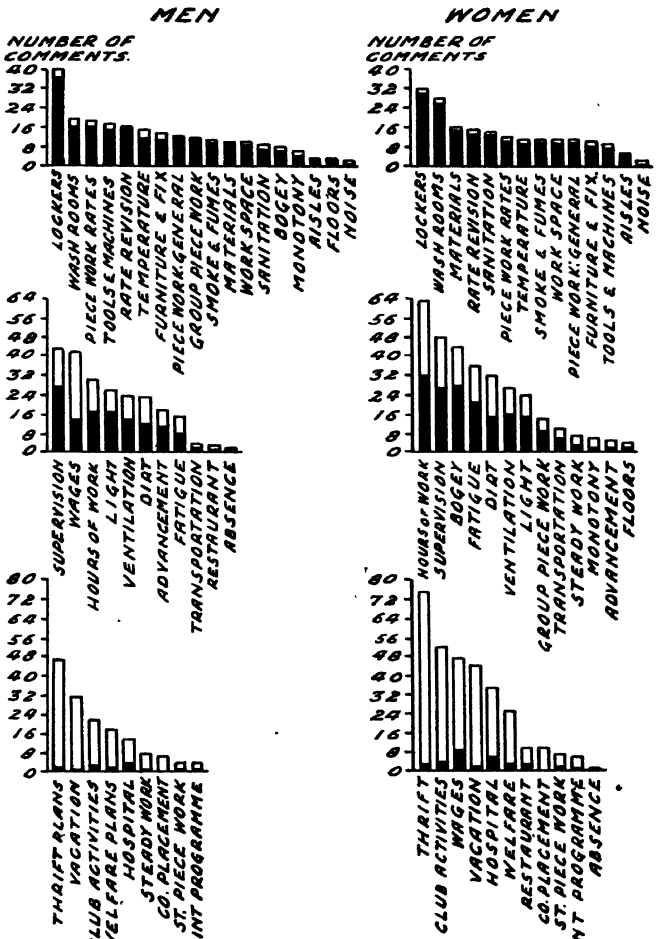


Figure 10. INDUSTRIAL TOPICS ARRANGED ACCORDING TO TONE, BASED UPON 10,300 INTERVIEWS : 6,800 MEN, 3,503 WOMEN. OPERATING BRANCH, 1929

White—Favourable Black—Unfavourable

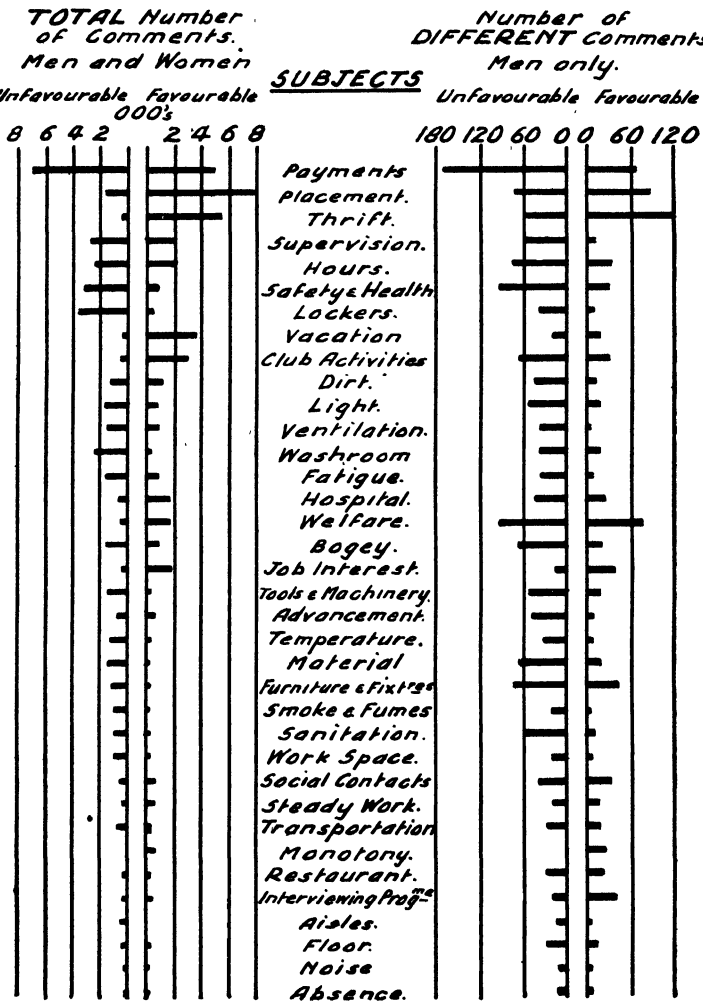


Figure 11. WESTERN ELECTRIC COMPANY OPERATING BRANCH, 1929

constituted one of the major findings from the Interview Programme.[7]

> " As the Programme continued, the utility of employee comments, in the direct fashion originally conceived, became more and more questionable. It was not that the employees were wilfully telling falsehoods; the skilled interviewer was able to detect such responses fairly easily. But the use by management of the complaints made by employees depended on three conditions: (1) the extent to which the complaints were accurately stated; (2) the extent to which the complaints had an objective reference, and so could be verified independently of the individual who made the complaint; and therefore (3) the extent to which the conditions complained about could be stated in terms of standards which are generally accepted." (C.)

This was equally true of comments or opinions other than complaints. Their significance could only be appreciated if allowances were made for the broad standpoint or background from which the employee had put forward his observation. The comments of any individual may often be the product of logical reasoning, a judgement based on consideration of all the factors in the case. But more frequently " they are expressions of sentiment and reasonings in accord with sentiment, which are very common phenomena in all social life. They are neither facts nor errors. They are non-facts, involving the sentiments of individuals and as such verification in the strict sense cannot be applied to them."

For instance, in the case of complaints submitted by employees a large number have either or both of the following characteristics:

> " (1) They are complaints in which fact and sentiment are so inextricably inter-mixed that verification in most cases is impossible; any attempt at verification involves an arbitrary definition which frequently cannot be agreed upon, so that it ends in a meaningless process (a verbal

argument); the workers' complaint still remains a complaint even though it may be unjustified from a certain definition, and to apply arbitrary criteria is to miss the nature of the complaint.

(2) They are complaints which refer to the significant personal and social life of the worker, and apart from such a context they are meaningless; they cannot be assessed apart from the situation of the individual who makes them." (C.)

Quite obviously complaints with either of these characteristics involved no direct relation between the substance of the comment and the object towards which it was directed. In fact the listener might be well aware that the matter raised was not one in which the organisation showed any real deficiency. Accordingly, unless allowance was made for what could be called the " personal reference " of the complaint it could not have any useful meaning. This " personal reference " is a symptom of the outlook of the individual concerned and can be appreciated only as a result of further study of that individual's self or background. " To put it in other words, the latent content of a statement, that is, the attitude of the complainant, was in many instances just as important to understand as its manifest content of a complaint, and although the manifest content of a complaint might shift and vary, being sometimes directed to this object and sometimes to that, the psychological basis, its real cause, might remain the same.

The conclusions to which the investigators came as a result of their research into the latent content of employee comments all laid particular emphasis on the significance of " sentiment " as a background to opinions or attitudes. " From a research point of view, this was the first finding of great importance which resulted from the Interview Programme, and it had an important bearing on the future activities of the interviewing staff. It shifted the direction of the research from merely an exploration of industrial conditions to an exploration of human situations as well. Certain complaints were no longer treated as facts in themselves but as symptoms or indicators of personal

or social situations which needed to be explored." From the standpoint of their findings in this direction the interviewers set up their simple rule for the analysis of complaints in the words: "Consider the complaint not only in relation to its alleged object, but also in relation to the personal situation of the complainant."

This rule may well be expanded into a more general form covering not only complaints but all conversations, reports, instructions, or other verbal contacts between managers or supervisors on the one hand and subordinates on the other. None of the findings have greater potential importance to management employee relations than these, which centre round the social function and social significance of words as used in the industrial environment.

Perhaps one general thought may occur to readers of this aspect of the Hawthorne Investigations. Are we here dealing with the periphery of psychiatry? In a sense the answer must be "Yes," in so far as the term "psychiatry" is stretched to refer not to abnormal mental study only, but to ordinary individual mental and emotional attitudes. The point is taken up by Roethlisberger himself, who remarks that "the Company's employees were not in the main candidates for a mental hospital. It seemed contrary to common-sense to assume that for the majority of workers their likes and dislikes were unrelated to their immediate work situation and merely rooted in factors in their personal histories. The obsessive character of the thinking which determined their reactions to their environment, although somewhat similar to that found in the psycho-neurotic, was occasioned by a different total situation. . . ." The cure was found in the main, not by the fundamental re-adjustment of outlook which is essential to the therapeutic treatment of the neurotic, but by simple corrections of adverse physical factors in the environment, or by providing an adequate explanation of the deficiencies to which the employee was objecting. The very process of listening to the complaint and submitting the explanations, often had a cathartic effect on the employee, which in itself was sufficient to secure whatever little re-adjustment might be needed to balance adverse "sentiments"

or to correct a biased outlook. It was precisely this experience and the recognition of the immense value obtained by the releasing readjusting process inherent in the interview that determined the character given to the Programme in the later stages (1936) when it was resumed as " personnel counselling " —the repeated, continuous personal contact between each interviewer and a given group of employees.

. . . .

Methods of conducting interviews was the third major field in which the Interview Programme afforded research results of more general application. As a result of their experience, the investigators were able to lay down a code of rules or guiding principles for the conduct of interviews in which what is being sought is the elucidation of the " personal reference " of an employee situation—such, for instance, as those that make up the procedure of " personnel counselling." For their own needs, and supplementing the general rules for the arrangement of interviews (see Appendices I and II) the investigators drew up the following code (C.):

" (1) The interviewer should listen to the speaker in a patient and friendly, but intelligently critical, manner.
(2) The interviewer should not display any kind of authority.
(3) The interviewer should not give advice or admonition.
(4) The interviewer should not argue with the speaker.
(5) The interviewer should talk or ask questions only under certain conditions:
   (*a*) to help the person talk;
   (*b*) to relieve any fears or anxieties on the part of the speaker which may be affecting his relation to the interviewer;
   (*c*) to praise the interviewee for reporting his thoughts and feelings accurately;
   (*d*) to veer the discussion to some topic which has been omitted or neglected;
   (*e*) to discuss implicit assumptions if this is advisable."

In applying this technique the interviewer made it his first principle to keep the relationship easy and informal. After introductions, " he made no effort to bring up any particular topic; instead he ' caught on ' in a conversational way at any starting point mentioned by the employee, and so long as the latter was willing to talk made no effort to change the subject. A basic assumption of this procedure was that the employee would choose his topics largely in order of their importance to him. The interviewer talked only so much as he felt was necessary to show the employee that he was interested, to keep the employee talking and to instil confidence. A skilful interviewer would listen carefully for signs of unusual or exaggerated feeling in what the employee said, and then, when he felt that the employee was otherwise ' talked out,' would try to press those topics further by proper questions and suggestions. But in no case would the interviewer try to impose on the employee discussion of a series of questions in which the employee had shown no interest." (F.)

The key to the interviewer's success lay in his skill in reaching the " latent content " of the employee's comments.

That elucidating and teaching the appropriate technique for this was no easy task is readily seen from Roethlisberger's comment that " only after some 20,000 employee interviews had been taken had a personnel capable of doing such a job been trained." Studies in psychology and social anthropology were examined with a view to arriving at the best methods, and eventually a set of working " rules of orientation " were arrived at as the means of guiding the interviewers. These have been worded as follows (C):

" (1) The interviewer should treat what is said in an interview as an item in a context.
  (*A*) The interviewer should not pay exclusive attention to the manifest content of the intercourse.
  (*B*) The interviewer should not treat everything that is said as either fact or error.
  (*C*) The interviewer should not treat everything that is said as being at the same psychological level.

(2) The interviewer should listen not only to what a person wants to say, but also for what he does not want to say, or cannot say without help.
(3) The interviewer should treat the mental contents described in the preceding rule as indices and seek through them the personal reference that is being revealed.
(4) The interviewer should keep the personal reference in its social context.
(5) The interviewer should remember that the interview is itself a social situation and that therefore the social relation existing between the interviewer and the interviewee is in part determining what is said.
(6) The interviewer should see to it that the speaker's sentiments do not act on his own."

Because of their later value in the development of personnel counselling, when this form of employee interviewing was to become a regular and continuous feature of the personnel function and staffs were to be permanently available, Professor Mayo yet further refined the rules into a brief summary code for the conduct of the interview, covered by six points (F):

"(1) Give your full attention to the person interviewed, and make it evident that you are doing so.
(2) Listen—don't talk.
(3) Never argue; never give advice.
(4) Listen to: (*a*) what he wants to say;
(*b*) what he does not want to say;
(*c*) what he cannot say without help.
(5) As you listen, plot out tentatively and for subsequent correction the pattern that is being set before you. To test, summarise what he has said and present for comment. Always do this with caution—that is, clarify, but don't add a twist.
(6) Remember that everything said must be treated as a personal confidence and not divulged to anyone. (This does not prevent discussion of a situation between professional colleagues. Nor does it prevent some form of public report when due precaution has been taken.)"

" Words are wise men's counters " is an adage that in modern times seems more conspicuous by its neglect than by reference to its truth. In the social group, words are tools—or weapons. Within the industrial structure, with the progress of large-scale enterprise and increasing mechanisation, words have come to acquire a particularly high importance in the pattern of interpersonal relations. They are the means of communication between the grades in the organisation; they are, as it were, the nerve impulses that set the body in motion or bring it to a stop. In the daily exercise of management and supervision, discussions and conversations—that is " interviews " in one form or another—are the major channels for the flow of authority and responsibility. Increasingly, opportunities for misunderstanding are multiplied. It is in the light of this peculiarity of modern industry that this third group of findings from the interview programme—the rules for effective interviewing—find their greatest practical value.

. . . . .

That the investigations covered by the Interview Programme provide a wealth of valuable findings in regard to social and personal relations within the individual organisation will have become apparent from the variety of items that have been covered in the foregoing pages. It will be wise to recall that " the programme started essentially as a plan for improving supervision," and that the most important and useful findings were those that pertained to the meaning and effectiveness of supervision, including the need for the training of supervisors. " Both the test rooms and the interview programme showed the importance to morale of good first-line supervision." The situation has been well described by Elton Mayo:

> " The fact that one man has been set in control of others has usually been taken to imply that he is expected to give orders and to have them obeyed. So supervision has frequently come to mean ' Ordering people about.' There is only one objection to this, and the objection is not in any sense political, it is simply that the method is exceedingly stupid. If there is

difficulty or delay in obedience, or eccentricity, or ' slackness,' the supervisor is expected to yell and bawl and swear, or, what is even worse, to indulge in lengthy admonition. So he ' talks ' and does not ' listen ' ; and he never learns what is really wrong. The workers are often terrified, they harbour a grievance and at last, if they express it, they tend to overstate or to distort. At once the overstatement is seized for attack, and the possibility of understanding is lost. Perhaps in this, I am myself indulging in overstatement. But at least I can claim that where the good supervisor listens and becomes acquainted with personal eccentricities of attitude—and the causes of such eccentricity—the usual supervisor does not; he prefers to talk and to give futile orders."

The recognition of the need to understand personal situations was for a long time the central idea of supervisory training at Hawthorne. " The purpose of this training was to convey to supervisors the technique that the interviewers had developed and had found to be so effective; that is, to listen rather than to talk, and to exclude from their personal contacts with employees any moral admonition, advice, or emotion. It was believed that by using this technique supervisors would be able to become better acquainted with the employees they supervised and to handle more intelligently those complex human situations the general results of which were unsatisfactory to the worker."

The factors that determine sound inter-personal relations within a working group can be summarised as the attitude and outlook of the individuals composing the group, but not forgetting to consider each individual as a total person. Many illustrations could be cited from the Hawthorne archives and a few may well serve to drive home the point.

In the first place, for instance, the case of operator 2A in the Relay Assembly test room, a girl who frequently indulged in excessive talking, sometimes defiant, frequently moody, inattentive and non-co-operative. On being interviewed in regard to these faults she readily promised to amend but equally readily reverted to the unsatisfactory behaviour. Eventually

in the interests of the experiment she had to be taken out of the group. Circumstances subsequently led to a re-examination of her case and it was found on checking her medical records that she had developed a severe anæmic condition ; a re-analysis of her case revealed that this reduced vitality accounted for her relatively lower performance and that the consequent criticism of her fellow workers was the cause of the attitude of insubordination.

Or again, the case of operator M5 in the Mica Splitting group. The youngest girl in the group, she was living at home under strong parental control, against which she nursed considerable resentment, inflamed by the knowledge that other girls of her own age were living an altogether freer life. In the test room her output was characterised by pronounced irregularity and failure to keep up with her fellow workers. She herself frequently complained of headaches and began to express freely among her companions her preoccupation with her home troubles. The older women working with her then began to listen sympathetically to her and to give her motherly advice. Coincident with this development one can observe a decrease in the irregularity of her output curve and the emergence of a tendency to rise (January to June, 1929). Towards the end of June she decided finally to move away from home and to take an apartment with a girl friend. An almost instantaneous alteration in her output trend is observable : a marked stability and a steady rise which is maintained until the latter part of November, 1929, when, owing to her mother's illness, she was again confronted with the necessity of returning home. From December onwards, when she had returned to the parents' home, her output curve not only declined noticeably but resumed its former irregularity.

Other instances may be cited in the case of wireman No. 7 in the Bank Wiring group or in the changes in output levels and trends that attended the switching round of seating places among the five girls in the Relay Assembly group in 1930. It was from cases such as these that " the interviewers began to understand better the relation between personal preoccupation and output." There were only a few instances in which a

relation could be objectively demonstrated, but it is obvious that only in the test rooms had there been prearranged routines which made it possible to relate personal factors to output. In the interviewing programme, the daily or weekly variations in output of the employees interviewed had not been recorded. It is clear, however, that had there not existed in the test rooms an arrangement for the observation of factors other than those in the immediate work situation, many of the changes in output, such as those that occurred in the case of M5 and W7, might have been attributed to " learning," " fatigue " or " monotony." Therefore, it seemed plausible to assume that wherever obsessive preoccupations were divulged in the interviews, a set of factors similar to those revealed in the test rooms was operating: (1) some circumstances interfering with the worker's total orientation, and (2) a reduced capacity to attend to work.

" The investigators marked off a set of symptoms as diagnostic of some interference in the worker's total equilibrium: (*a*) obsessive verbal response, (*b*) a reduced capacity for attending to work, and (*c*) marked or pessimistic preoccupations."

The same thought can also be put in Mayo's words:

> " The investigators had learned that opinions are not detachable. What a worker thinks on a given subject is a symptom of what he is; his ideas cannot be turned out of their personal context and accepted as significant. An interview that occupies nearly two hours and is largely made up of confidences as to personal history and personal experience gives an observer some insight into the significance for the individual of his experiences and beliefs. But it yields little that affords to management a secure basis for executive action. Further, the more intimate the interview, the more difficult is it to analyse its content in such a fashion that it may be related to other interviews." (A.).

These personal situations and attitudes are the warp and weft of sound industrial relations. Put another way, it may be said that sound relations within an organisation are a product

jointly of personal and social equilibrium. The Interview Programme showed up the close relation between complaints and personal equilibrium as well as the widespread tendency towards an obsessive response by an individual to factors in his or her personal background. " Personal situations in which there was a serious disorientation of general attitude were frequently accompanied by a reduced capacity for work and an increase in morbid reflection."

" In order to fit these findings into a coherent whole the investigators had to evolve a new way of thinking about the workers and those things about which they complained. Their conclusions emerged in terms of a conceptual scheme for the interpretation of employee complaints which can be stated as follows :

(1) the source of most employee complaints cannot be confined to some one single cause, and the dissatisfaction of the worker, in most cases, is the general effect of a complex situation ;
(2) the analysis of complex situations requires an understanding of the nature of the equilibrium or disequilibrium and the nature of the interferences ;
(3) the interferences which occur in industry can come from changes in the physical environment, from changes in the social environment at work, or from changes outside the immediate working environment, and the ' unbalances ' which issue from such interferences may be organic (changes in the blood stream), or mental (obsessive preoccupations which make it difficult to attend to work) or both ;
(4) therefore, to cloak industrial problems under such general categories as ' fatigue,' ' monotony,' and ' supervision,' is sometimes to fail to discriminate among the different kinds of interferences involved, as well as among the different kinds of disequilibrium ;
(5) and, if the different interferences and different type of disequilibrium are not the same ill in every instance, they are not susceptible to the same kind of remedy.

"For purposes of convenience, this way of interpreting complaints has been roughly depicted in *Figure 12*, which shows the major areas from which interference may arise in industrial situations and the kinds of responses which can be expected if unbalance results. It is apparent that this way of thinking substitutes for a simple cause and effect analysis of human situations the notion of an inter-relation of factors in mutual dependence: that is, an equilibrium such that any major change in one of the factors (interference or constraint) brings about changes in the other factors, resulting in a temporary state of disequilibrium until either the former equilibrium is restored or a new equilibrium is established. The interconnections between the boxes in the diagram express the futility of trying to determine what is cause and what is effect.

"More particularly, with regard to the different types of interference and different kinds of equilibrium to be found among the workers at Hawthorne, the investigators concluded:

(1) the interferences which occur among the workers at Hawthorne and which diminish their capacity to attend to work are not chiefly confined to the physical conditions of work; and for the average worker engaged in repetitive or semi-repetitive tasks, that type of organic unbalance characterised by changes in the blood stream such as an increase in lactic acid, a dimunition of alkali reserve, and 'oxygen debt,' and generally called physiological or muscular fatigue, is not of frequent occurrence (see relations G, C, D, A, and B in *Figure 12*);

(2) although in the case of some employees the constraint or interference can be traced to factors in their personal history, that type of mental unbalance which has been studied by psychopathologists and is ordinarily referred to as 'psychoneurosis' does not occur with sufficient frequency to constitute a major problem at Hawthorne (see relations F, E, D, A, and B in *Figure 12*);

(3) a very common form of induced unbalance in the worker, which diminishes his capacity to work effectively, can best be understood in terms in which:

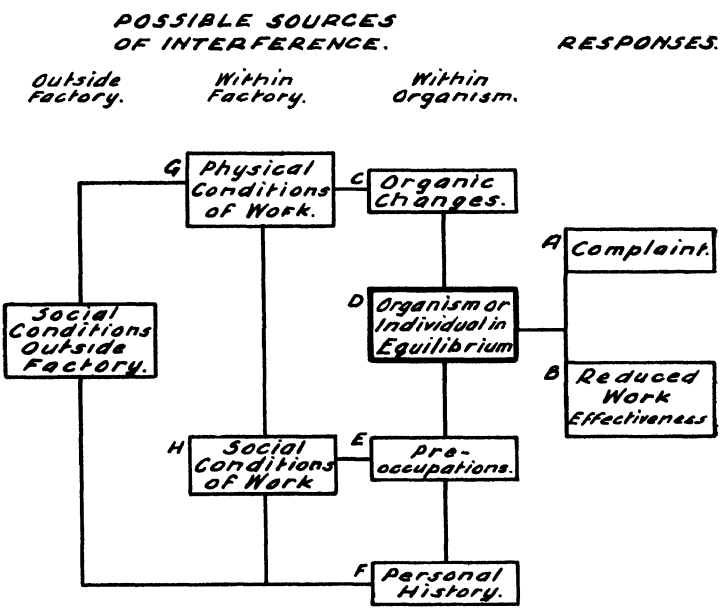


Figure 12. SCHEME FOR INTERPRETING COMPLAINTS AND REDUCED WORK EFFECTIVENESS

(*a*) capacity to work, or to fix and sustain attention, is to be regarded as a product of the personal equilibrium of the worker with the socio-reality about him (see relations I, H, E, and D in *Figure 12*); and,

(*b*) any circumstance adversely affecting this personal equilibrium is likely to reveal itself in a reduced capacity for active work, in obsessive reveries, and in irrational responses (see relation E, D, A, and B in *Figure 12*);

(4) workers whose personal unbalance is due to factors in their personal history (F) or social situation (I) are less

capable of standing any pressure at work (overtime, repetitive work, indifferent methods of supervision, and so on), (see G and H) than those workers who have more satisfactory personal or social situations;

(5) where the social conditions of work are such as to make it difficult for a person to identify himself or his task with any social function (see H), the worker is also liable to obsessive responses and hence to a diminished capacity for work.

"From these conclusions there issued not only practical consequences but also leads for future research. With regard to practical consequences, it was evident that the supervisor in his daily duties was frequently forced to take account of many factors in a complex human situation such as we have described, the general consequence of which was unsatisfactory to some one of his subordinates. Inasmuch as in most cases the worker could not adequately specify the locus of his dissatisfaction, it was important that the supervisor be alert to interferences of many types and kinds, those arising from within as well as from without the immediate working environment. By encouraging the worker to talk freely and by refraining from hasty disapprobation, the supervisor was in a better position to 'spot' the locus of interference and consequently to handle his employees more intelligently. This was the lesson which had been learned from the interviewing programme. Management believed that more adequate personnel work could be done if people whose daily duties consisted largely of dealing with human situations were trained to take account of the many factors which went into the determination of employee dissatisfaction and particularly to understand those complaints which were more symptoms of the complainant's situation than accurate statements of the particular interference or disability. The supervisory training programme was therefore directed towards this end." (C.)

It is also interesting to note that, "in the opinion of the management, supervision improved almost simultaneously with the beginning of interviewing. This improvement was not

the result of fear on the part of the supervisors that their methods would be disclosed and shown to be faulty. There was no such fear. It was the result rather of an increased knowledge of and interest in workers as individuals and an increased interest in the method of supervision which came from the knowledge that it was being made a subject for research." (F.)

. . . . . .

If the Interview Programme could be said to have any immediate consequences apart from the improvement of the supervisory training arrangements and the amelioration of certain deficiencies in working conditions, it would lie in an exploration of the interview technique itself. " Personnel counselling," that is the deliberate use of the interview method as a tool for the advancement of inter-personal relations, can in fact be described as a new approach to personnel management. The benefits that were obtained from it in the Hawthorne plant have been closely reflected in more recent times in British experience with joint consultation committees, notably those where on the part of management and operatives alike there has been a genuine desire to attain a mutual regard for the other's standpoint. The " counselling programme " cannot rightly be called a further stage in the Hawthorne Investigations, but rather a permanent outcome of them, and it was adopted (early in 1936) as a sequel to a general conference on industrial relations at which the following question had been asked :

> " If you were to devise a personnel programme it would take into account all of the factors which your research in this area shows to be significant. What sort of plan would you recommend ? " (F.)

The technique of the programme was to appoint an interviewer to a group of some 300 employees in one department. Interviews were repeated ; this meant the building up of a continuous contact between the interviewer and the group.

The task of the interviewer was "to listen very carefully for indications of stress and strain in the expressed thought of the individual." The aim was to provide "an impartial, non-authoritative agency whose function is that of interviewing employees, diagnosing their problems and where necessary counselling with the supervisor regarding his methods of supervising these people." (F.)[8]

If from the test room studies the Hawthorne investigators learned a good deal about the causes for the particular behaviour of individual employees or groups of employees within their working environment, from the Interview Programme they learned as much about the internal interpretations of the individuals themselves. They secured, as it were, an opportunity for insight into the mental and emotional workings of the human mind, and were able to get a glimpse of men's motives, not only as seen by their overt manifestation, but also as they are interpreted by the minds of the individuals themselves. They were able to see and to show that, not only are there external factors which the supervisor or manager has to take into consideration in his dealings with subordinates or equals, but that the behaviour of an individual can be and is affected by purely non-factual influences, by his own personal environment away from the organisation, by his sentiments—in fact, by all those things which go to make up the total personality of the human being at any given moment.

APPENDIX I

INSTRUCTIONS FOR CONDUCT OF INTERVIEWS

(Extracted from Roethlisberger and Dickson's *Management and the Worker*, Chapter IX)

"(1) Whenever possible, the employee was to be formally introduced to the interviewer by the supervisor. Interviewers were not to interview employees whom they knew, since their acquaintance might influence the employees' comments.

(2) When interviewer and employee were seated and ready to proceed with the interview, the employee was to be told the interviewer's name again.

(3) The interviewer was to explain to the employee the purpose of the interview: that is why any comments the employee cared to make, either favourable or unfavourable, about his supervisors, working conditions, and job were being solicited.

(4) The employee was to be told how the interviews were to be used: that is, that any complaints the employee had to make with regard to working conditions would be investigated together with those of other employees, and that, in so far as practicable, remedial action would be taken. The manner in which the material gathered from the interviews was to be used in supervisory training conferences was also to be explained.

(5) The interviewer was to make clear to each employee that the interviews were to be kept strictly confidential: that is, the employee could say anything to the interviewer, no matter how bad it was, without getting into trouble himself or getting his supervisors or his co-workers into trouble. The interviewer was to explain that no names or organisation numbers would appear on any interview and that the people who read the interview or heard them read would not be told who the employee was or where he worked. Anything the employee said which might identify him with his supervisor would be deleted from his interview.

(6) The employee was to be told that the Company was as much interested in the things which he liked as in those things with which he was dissatisfied and which he thought needed to be corrected.

(7) The interviewer was to take almost verbatim notes as the employee talked. The interviewer was to explain to the employee that he was writing down what was said word for word in order that there would be no possible chance of misrepresenting or forgetting anything said. (At first it was thought that taking notes might make the employee reluctant to talk, but it was found that this was not true.)"

APPENDIX II

NOTES ON INTERVIEW PROCEDURE

(Extracted from Roethlisberger and Dickson's *Management and the Worker*, Chapter IX)

"(1) Each interviewer was assigned a certain territory to cover. From the foreman of each department in his territory he was to obtain a list of the employees' names.

(2) When the interviewer was ready to start interviewing in any department, it was recommended that he go first to the foremen in charge and make known his presence.

(3) It was recommended that the interviewer select the man he wanted to interview because otherwise the supervisor might be tempted to give the interviewer all his 'problem cases' first. However, the interviewer should co-operate with the supervisor in such a way as to cause the least interference with the operation of the department.

(4) The interviewer was to ask the supervisor's advice about where the employee should be interviewed, whether he should take him away from the job for a while, or whether he should interview him on the job. (Subsequent experience showed that it was usually advisable to take an employee away from his work for the interview. At this later date it was recommended that the interviewer ask the department chief for a bench or desk where he could conduct the interviews without interruption.)

(5) The interviewer was to make sure that the necessary arrangements were made for paying the employee his average earnings for the time consumed in the interview.

(6) In his contacts with the supervisors in the department the interviewer was to be very careful not to betray the confidence of any man in that department and to refrain absolutely from discussing the content of the interviews with the supervisors.

(7) Only a few employees from any one location were to be interviewed on the same day, so that the work of the department might go on normally and without undue confusion or curiosity."

APPENDIX III

NOTES ON URGENCY AND TONE OF INTERVIEW COMMENTS

(Extracted from Roethlisberger and Dickson's *Management and the Worker*, Chapter XI)

" (1) On no topic is there a one-one ratio, that is, one comment per interview. No subject was of such paramount importance that it was discussed by every male employee. Moreover, the ratios drop rapidly. Job placement, which tops the list with 65 comments per hundred interviews, has 50 per cent more comments than the second topic (supervision) and by the time the 15th topic in urgency (fatigue) is reached there are only 14 comments per 100 interviews.

(2) The topics having relatively high urgencies vary widely in subject matter. Among the 15 subjects which were most frequently discussed appear such varied topics as supervision, wages, stock purchases plan, lockers, fatigue, and ventilation. These topics pertain to distinctly different problems and to quite different aspects of the workers' environment.

(3) It is interesting to note those topics which are not included in this ' urgent ' group. Such subjects as bogey, hours of work, monotony, group piecework, and straight piecework, are relegated to lower ranking. Trade unionism fails to appear because it occurred so infrequently that it was not made a special subject heading, statements pertaining to it being placed in the miscellaneous group.

(4) There is no correlation between urgency and tone. Topics which rank high in urgency vary widely in tone. Among the fifteen topics which rank highest in urgency, three subjects (job placement, stock purchase plan, and vacation) are talked of favourably, seven subjects (supervision, wages, light, ventilation, dirt, advancement, and fatigue) have a neutral tone, and five subjects (lockers, safety and health, piecework rates, washrooms, and rate revision) are discussed unfavourably. Topics which rank low in urgency also vary widely in tone. Although

topics having a high favourable or unfavourable ratio vary in urgency, it may be said that as a rule most topics which are talked about either extremely favourably or unfavourably are not discussed frequently.

(5) Although there is no correlation between urgency and tone, there is a relation between tone and the kind of subject mentioned. All subjects having an extremely unfavourable tone are chiefly concerned with plant conditions, whereas all subjects having an extremely favourable tone are, with one exception (interest), concerned with employee relations activities such as benefit plans, thrift, and club activities.

(6) Among those topics having a neutral tone are found a number of controversial subjects such as supervision, advancement, hours of work, and employment. Fatigue also appears in this list and the debatable subjects of dirt, light and ventilation. In short, this group includes most of those topics in terms of which human problems in industry are usually stated, both by employees and by management.

. . . . .

Did women differ significantly from men in respect to the urgency and tone of the topics they discussed? *Figure 9* shows the same data for women that *Figure 8* shows for men. It is apparent that in general all the remarks made about the distribution of topics for men apply equally well for women. No subject was of such paramount importance that it was discussed by every woman. The subjects talked about quite frequently by women are varied in type. There is no correlation between urgency and tone. However, there is a relation between tone and type of subject mentioned. Items connected with plant conditions tend to be unfavourable in tone; items connected with employee relations activities tend to be favourable. Topics with a neutral tone include more or less the same topics discussed in that manner by men.

There are, however, some interesting differences in the distribution of topics for men and for women; these differences are shown in *Table III*. This shows those subjects both more

and less urgent for women than for men, those subjects on which women are more and less favourable than men, and those subjects on which women and men roughly agree in both urgency and tone. What arbitrarily has been taken to mean ' more,' or ' less,' or ' equal ' is defined in the Table.

It can be seen that the outstanding difference between comments by men and by women is in the urgency rather than in the tone of the topics discussed. The tone of 77 of the 80 subjects is about the same for women as for men. On only three subjects (employment, personnel, and floor) are women appreciably more favourable than men. On no subjects are men appreciably more favourable than women.

From the standpoint of urgency, on the other hand, only 53 of the 80 topics are the same for women as for men. On 21 subjects women make twice as many comments as men, and on 6 of the topics men make twice as many comments as women. Women comment more than men about thrift, welfare, overtime, rest periods, fatigue, bogey, social contacts, furniture and fixtures. Men comment more than women about tools, trucks, advancement, education, life insurance, and pensions.

Some of these differences in urgency, of course, can be explained in terms of the extent to which men and women participated in the activities concerned. For example, the fact that men talked more about trucks and tools may be explained on the ground that the women did not operate trucks and had much less to do with tools than the men did. The remaining differences, however, seem to be fairly closely related to the differences between attitudes of men and of women toward the economic and social functions of work. Life insurance, pensions, and employment are closely associated with economic security, for which man, as head of the family, is traditionally responsible. Man's social status in the community is affected in no small part by the kind of work he does, and advancement and education are closely allied with this pre-occupation. Woman, on the other hand, is not by tradition the breadwinner of the family, nor is her social status so dependent on her job. It would be natural, therefore, not to expect these considerations to dominate her pre-occupations as much as they do those of men.

TABLE III

Differences between Men and Women in Urgency and Tone of Subjects Discussed
OPERATING BRANCH, 1929

Differences in Tone	Differences in Urgency		
	Subjects twice or more "urgent" for women as for men, i.e. where $(Sw/TIw \div Sm/TIm) \geq 2$	Subjects of about equal "urgency," i.e. where $2 > (Sw/TIw \div Sm/TIm) > \frac{1}{2}$	Subjects half or less as "urgent" for women as for men, i.e. where $(Sw/TIw \div Sm/TIm) \leq \frac{1}{2}$
Subjects on which women are more favourable than men $(Swf/Sw - Smf/Sm) > .33$	Employment	Personnel organisation Floor	No subjects
Subjects on which women have about the same tone as men	Entertainment Hospital Transportation Christmas welfare Welfare in general Restaurant Ready money plan Thrift in general Rest periods Fatigue Club store Overtime Interest Quality of material Bogey Social contacts Fans Chairs Elevators Spitting	The 51 remaining subjects not mentioned elsewhere in this table	Tools Trucks Advancement Education Life insurance Pensions
Subjects on which women are less favourable than men $(Smf/Sm - Swf/Sw \geq .33$	No subjects	No subjects	No subjects

TIm — Total number of men's interviews (6,800).
TIw — Total number of women's interviews (3,500).
Sm — Total men's comments on any one subject.
Sw — Total women's comments on any one subject.
Smf — Total men's favourable comments on any one subject.
Swf — Total women's favourable comments on any one subject.

An easy job, not too fatiguing, in pleasant surroundings, sufficiently well paid to support herself or to contribute something to the income of her parents or husband, and congenial hours which allow her to take part in the activities of the home seem, from *Table III*, to be the woman's main interests."

[1] *As a matter of interest the detailed notes on the interview procedure and the instructions governing the conduct of the interview are attached to this Chapter as Appendices I and II.*

[2] *See Chapter VII.*

[3] "*The extension of the programme* (1928–9) *necessitated a larger number of interviewers to undertake the work. For the most part, these additional interviewers were taken from those organisations in which interviewing was in progress. They were either of supervisory status or were recognised as potential supervisors and were assigned temporarily to interviewing work for a period of about a year. It was thought that they could do adequate interviewing with a certain amount of preliminary training and that the interviewing experience in itself would be excellent training for them as supervisors. For the latter reason, it was decided to give as many shop supervisors as possible the opportunity of participating, and consequently interviewers were kept on for a limited time and were then replaced by others. All the personnel in the interviewing department, however, was not of this temporary order. A permanent staff was gradually being built up to take care of the work as a research activity.*" (*C.*)

[4] *Roethlisberger* (*C*) *has suggested that the basis of the analysis of the comments could be summarised in the following four questions*:

(1) *What subjects did employees talk about in discussing their work situation?*

(2) *How were the total comments distributed among these subjects? Which topics were the most emphasised and which were the least emphasised?*

(3) *What was the distribution of favourable and unfavourable comments on these topics and what significance, if any, could be attached to it?*

(4) *How did men's and women's comments compare*: (*a*) *as to relative emphasis of subject discussed?* (*b*) *as to distribution of favourable and unfavourable comments?*

[5] *A detailed summary of the number of comments on each subject in these interviews is set out in Table XXI on pages 232–5 of the Roethlisberger and Dickson report. The summary and interpretation of the distribution of urgency and tone has been added as Appendix III to this chapter.*

[6] "*It is obvious that too many factors enter into the determination of the tone or urgency of an industrial topic to allow any simple conclusions to be drawn about conditions at Hawthorne or about their relative importance to employees. From the relative tone of these industrial topics little can be concluded about the comparative state of different working conditions at Hawthorne. The tone of an industrial topic is affected by such factors as*: (1) *the nature of the topic discussed,* (2) *differences in working conditions in different departments at Hawthorne, and* (3) *differences of sentiments among employees about the subjects mentioned. Likewise, only in a limited sense can it be said that the relative urgency of industrial topics reflects their relative importance for the workers. Urgency is affected by such factors as*: (1) *how widespread the conditions are,* (2) *the number of employees coming in contact with the subject talked about, and* (3) *the degree to which the topics lend themselves to the elaboration of social sentiments.*"

[7] *Proper understanding of the lines along which the investigators analysed this problem necessitates understanding of the function of words in social relations. Chapter XII in the Roethlisberger and Dickson report is largely devoted to this purpose. The following quotation from page 258 is of particular relevance in this direction*: "*For some time the investigators were baffled by the problem of analysing the interviews. What were these interviews telling them about the Company, its supervisors and employees? What uniformities were being revealed? They soon found that a mere statistical cataloguing of likes and dislikes was not the answer to their problem. They realised that they had been naive at first with regard to the phenomena of verbal behaviour, and that the understanding of interview material, or verbal behaviour, presents difficult problems which are frequently ignored. The search for uniformities among the statements made in an interview presupposed some simple conceptual framework in terms of which the interviewer could operate upon the statements made. Without such a framework, confusion is inevitable.*"

[8] *A detailed description of the personnel counselling programme is given in the Roethlisberger and Dickson report, Chapter XXVI, entitled*: "*Implications for Personnel Practice.*" *The formal statement of objectives of the programme has been set out as follows*:

"(1) *To study and obtain correction of problems pertaining to the individual.*

1.1. *Where the problem is psychological, to attempt to secure an adjustment by skilled interviewing.*

1.2. *Where the problem arises from a defective relationship between*

supervisor and employee, to counsel the supervisor indirectly regarding his supervisory methods.

(2) *To study and obtain correction of problems pertaining to the work group.*

2.1. *To study the effect of management policies and practices at the work level.*

2.2. *To communicate general observations, material which does not reflect upon any identifiable person, to management.*

(3) *To conduct intensive studies of problems unearthed by the personnel counselling activity which seem worthy of research and development.*" (F.)

VII

ANALYSING THE SUPERVISORS

THE outstanding feature of the investigations as so far described is the contribution that they made to the development of supervisory staffs. This was nowhere more true than in the Interview Programme, which, it could be argued, was above all else a means of securing material for the training of supervisors. The supervisors themselves readily accepted the Programme, collaborated actively in it and seemed imbued with a high sense of its importance. In fact, from quite an early stage in the interview activities, and long before any formulated results became available, it seemed that supervisors were already drawing, in some uncanny way, definite benefits from this particular phase of the investigations. "The opinion of the management was that supervision improved almost simultaneously with the beginning of interviewing. This improvement was not the result of fear on the part of the supervisors that their methods would be exposed and shown to be faulty. There was apparently no such fear. It was the result rather of increased knowledge of, and interest in, workers as individuals and an increased interest in the method of supervision, which came from the knowledge that it was being made a subject for research. The records of the interviews were used as illustrative material for the training of supervisors and for conferences on supervision. An effort was made to see that as many supervisors as possible should have temporary experience as interviewers. Those who took part felt that they had acquired a new understanding of the human problems of industry and, not less important, a new understanding of themselves. In fact, two must go together in any study of human behaviour. A man can carry his analysis of other men no further than he has carried his analysis of himself." (F.)

That the supervisors themselves should be included in the Interview Programme was a natural corollary of the interest that they displayed in its progress. Many requests had been received from them for their own inclusion in the scheme, and eventually, in February, 1931, the Superintendent of the Operating Branch formally asked all supervisors in the Branch: "Do you think supervisors should be interviewed on the same basis as employees?" The answers were given anonymously and about three-quarters of the replies were in the affirmative. Suitable arrangements were made and on May 15th, 1931, interviewing began for the supervisory staffs of the Operating Branch. Some 500 were eventually included, distributed in the following groups:[1]

Assistant Superintendents	6
General Foremen	5
Foremen	47
Assistant Foremen	49
Section Chiefs	166
Group Chiefs	219

In the main, the interviewing of supervisors was conducted on the same basis as in the case of employees, with one or two specific variations. Interviews were arranged by appointment in advance, and as the supervisors were mostly already well acquainted with the programme, no introductory disquisitions were necessary. The greatest change was that "in order to make sure that there would be no possibility of misusing the information obtained, it was decided to have the interviewing done by two men outside the Western Electric Company's organisation. Moreover, in fairness to those supervisors who discussed a great variety of problems involving both personal and Company matters, it was decided to have the original data kept by the Industrial Research Department of the Harvard Business School of which the two interviewers were members. From this body of data the interviewers were asked only to prepare reports showing major points of satisfaction and dissatisfaction and to indicate, in their opinion, what the sources

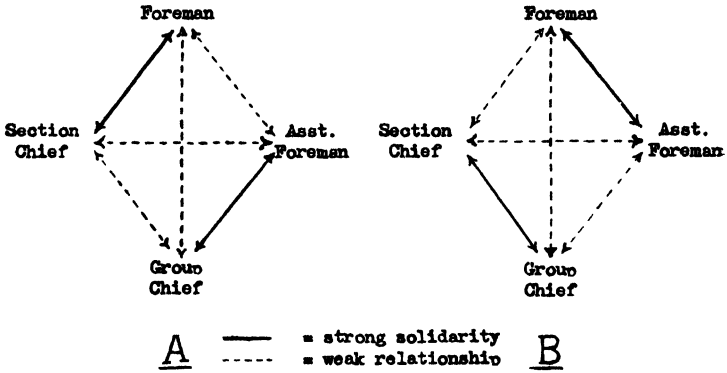


Figure 13. TWO COMMON CONFIGURATIONS OF SUPERVISORY RELATIONSHIPS

of dissatisfaction might be, without in any way revealing the identity of the individual supervisors." A final difference lay in the purpose of the programme. In the case of the supervisors it was no part of the object of the interviews to secure improved conditions or other purely factual developments. The programme was more in the nature of a research to find out the attitude of the supervisors themselves towards their working environment and what meanings could be attributed to these attitudes.

The findings were analysed under five main headings, namely :

" (1) Attitudes toward visible authority ;
(2) Attitudes toward invisible authority (i.e. the policies and practices of the Company) ;
(3) The supervisor's conception of his job and his attitude toward subordinates ;
(4) Attitudes toward personal advancement and progress in the Company ;
(5) Attitudes toward the interview itself.

(The term ' attitude ' is used in a very general sense to include beliefs and feelings of expectancy towards the objects or practices discussed.)" (C.)

The findings are briefly described under each of these major headings and the investigators' interpretations are added by way of a summary.

(1) *Organisation Relations*

The supervisors' attitudes toward visible authority were determined very largely by their status and position in the organisation. A good deal of the findings were pertinent only to the specific structure and responsibility of the supervisory staffs, though certain general comments may be of interest. In the first place there tended to be marked differentiations between junior supervisors (Group Chiefs and Section Chiefs) and those at the foreman level. The latter seemed to feel themselves more especially as seniors. Relations between these groups nowhere form a single pattern, although the two general tendencies were noted, as illustrated in *Figure 13*: either a strong bond between two Foremen grades on the one hand and the two junior grades on the other, or alternatively a strong bond between the two subordinate grades in each group on the one hand and again between senior grades in the two groups on the other.

The problem of advancement naturally occupied the attention of the individual supervisors, and at no level was this more pronounced than among the Assistant Foremen. "No group than they felt more keenly that their advancement was dependent upon the particular relation that they had with their immediate superiors." Another related subject of comment was the means by which the more senior men had attained their positions, though there were few personal criticisms about the individual "big bugs" concerned.

"The attitude of a first-line supervisor toward such men was generally one of curiosity as to how they had achieved their success. Some of the younger supervisors expressed grave doubts as to the alleged merits by means of which certain 'big shots' had arisen to their positions. There was a tendency on the part of junior supervisors to fabricate myths, little substantiated in fact, about some of the higher executives. These myths related to the spectacular methods used or the 'accidental

strokes of good fortune' which had entered into the rise to prominence of some person. Many of the old-timers spoke with pride of some men who were now 'big shots' but who in the old days had been their immediate supervisors or perhaps had worked alongside them at the bench." A curious point frequently made among the Group Chiefs was a somewhat bitter attitude towards their Foremen but favourable comment on the "big bosses," who, they said, acted "like gentlemen"; it was rare for the "big shots" to be spoken of unfavourably in contrast to more immediate bosses.

(2) *Company Policies*:

Comments and findings in regard to the supervisors' views on the policies and practices of the Company were in the main determined by the economic conditions of the times. By the summer of 1931 American industry was "bumping along the bottom of a long and deep depression" which was already beginning to exercise considerable influence on even so well established an organisation as the Western Electric Company. In consequence, the supervisors had most to say about those activities of the Company which concerned dismissals or lay-offs, retrenchments, reductions in pay and the like. In the main, the comments had to be interpreted in the light of the individual's own position, both as regards status in the organisation and liability to be affected by the prevailing cuts. The majority of complaints about the Company's practice in this direction came from first level and second level supervisors and in all the complaints "there was a faint trace of resentment against being treated like the operators."

Three other main items were the subject of frequent comment in the course of the interviews, namely:

(*a*) The Company's system of supervision;
(*b*) The system of industrial relations activities;
(*c*) Plant conditions.

Supervisory opinion in regard to supervision appears, in general, to have been favourable, most agreeing that "supervision had improved greatly since earlier days when they had

first started work. The consensus of opinion seemed to be that a new type of leadership had arrived. Supervisors of today, they claimed, were as different from those of former years as day is from night. They were no longer so hard boiled as they had been in the old days." In passing, it might be noted that one change in the method of supervision was regarded with disfavour by most of the longer service men, in the frequently heard comment " there is too much paper work and red tape nowadays."

In regard to the Company's industrial relations activities, attitudes in the main were also favourable. The supervisors appeared to approve quite wholeheartedly not only the general interviewing programme of employees, but also their own conference arrangements, the thrift and benefit plans, the pensions scheme, and similar activities. Unfavourable comment came in any quantity only in regard to the Company's personnel activities, a curious thing in view of the high level of policy that the Company maintained. Such comments came, however, largely from the lower supervisor ranks and may be traceable to a feeling on the part of the junior supervisors that the Personnel Department was closely " in league with the Foremen, siding always with them against themselves and the operators. (It is to be regretted that this aspect of the supervisory attitudes was not more thoroughly explored in the course of the interpretation of the interview material.)

As far as plant conditions were concerned there were a few complaints, but in the main the supervisors' attitude was one of indifference, and those above the rank of Assistant Foreman hardly mentioned the topic at all. This feeling provided, in fact, one of the most striking differences between the attitudes displayed by supervisors and employees in the interviews.

(3) *Supervisory Responsibilities* :

With the questions concerning the supervisor's conception of his job and his attitude toward subordinates the most important aspect of the findings was reached. " How and to what extent did supervisors differentiate their functions and what relative degrees of importance did they attach to them?

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Did they talk as if their duties were connected primarily with maintaining low costs? Were they primarily concerned with maintaining authority and discipline? Were they concerned with the efficiency of the employees at the bench, or were they more concerned with keeping their subordinates happy and contented?" Information on these points was readily obtained in the course of the interviews and, whereas the lower rank supervisors gave a variety of different answers, "from the higher ranking supervisors these questions invariably brought forth one type of response—their chief problem, they said, was connected with matters of personnel administration, of handling subordinates, or handling people."

Another interesting point was that authority tended to be localised in certain grades of the supervisory hierarchy, others being regarded as specialised assistants or technicians, not carrying authority in the executive sense: the position is illustrated by the chart in *Figure 14*.

Among junior ranking supervisors, most Group Chiefs and Section Chiefs felt that "their main job was to keep certain records, to see that the workers were supplied with materials, to attend to the machines when they were out of order, and to know more than the operators about the job being performed. . . . Most of them felt that their chief job was to help the workers in their group to earn as much money as possible by keeping them supplied with piece parts and seeing that their machines were in good working condition. In other words, their chief function was to facilitate the task of technical production. By so doing they achieved their own economic purposes as well as those of their subordinates. Otherwise their function seemed to be a protective one, that is, to resist any changes in technical production which might affect themselves or the operators." (C.)

Among these junior grades, some were also concerned with the problem of whether they should be "a Company man or an employees' man," but for the majority this type of conflict was apparently far below the level of verbal discrimination.

As far as attitudes towards people in their jurisdiction was concerned, most supervisors tended to advocate a humane

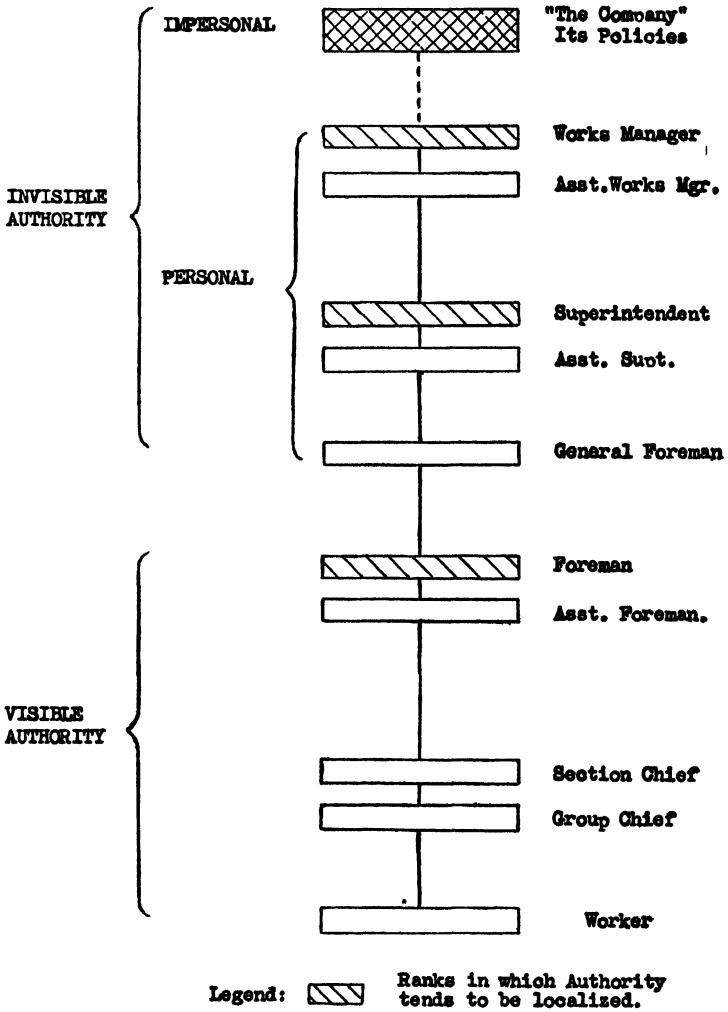


Figure 14. THE INFORMAL SUPERVISORY ORGANISATION

policy, the consensus of opinion being that the day of the bully and the slave-driver had gone. There was general agreement also on the fact that women had to be handled differently from men, although opinion differed as to which sex was the easier to supervise. The main difference in approach seemed to consist in the fact that you "could not talk to women in the same fashion as you could talk to men. You had to approach a woman and give her orders more indirectly. Moreover, you had to be more careful about the language in which you couched your instructions." Despite these abilities to think in broad terms about these human problems, the supervisors appeared to show very little curiosity as to the reason why people felt or acted in certain ways or as to the significance of certain types of behaviour. They tended, in other words, to accept individuals with all their idiosyncrasies simply as given factors in the situation and were not concerned to reason about the why's and wherefore's.

The Assistant Foremen as a group were far more concerned with their subordinates, a fact that lines up well with their pre-occupation about advancement and their particular assessment of chances of promotion depending upon personal relations with the "big bosses." It was interesting to note that the Assistant Foremen were almost the only grade of supervisors who were at all concerned with the problem of restriction of output.

In the higher supervisory ranks, this attitude was reversed and the main interests lay in relations with subordinates rather than with superiors. In fact, "the further removed a supervisor was from the worker the more interest he seemed to show in matters of personnel administration"; similarly, the less distinction he drew between the different levels of rank below him, tending rather to group all those below him as subordinates and discuss them together.

Taking the supervisory staffs as a whole, it became quite clear that there was within the Western Electric Company a definite consensus of opinion that "subordinates could not be forced into co-operation. Strategy (for some), psychology (for others), and understanding (for a few), had to be substituted for force in human relations. Satisfied and contented employees were a necessary rerequisite for effective collaboration." (C.)

(4) *Promotion and Progress*:

The supervisors' attitudes toward their own advancement in the Company varied with a number of factors, partly those of personal character and outlook, partly of position in the organisation. "There was no evidence that dissatisfaction increased the lower the rank held in the supervisory organisation. Nor did satisfaction increase the higher the position. . . . It is also evident that a supervisor's satisfaction or dissatisfaction with his position in the Company was not unrelated to factors outside the immediate working environment—to the kind of relation he had with the wider society, to the demands he was making of his work and the opportunities which were afforded for their fulfilment. Recognition through advancement was only one, and frequently not the chief, demand that he was making." (C.)

(5) *The Interview Programme*:

The supervisors' attitudes towards their own Interview Programme varied all the way from, on the one hand, that of the man who arrived early and sat for a long time, obviously welcoming the opportunity of being interviewed, to that, on the other hand, of the one who "thought the whole idea was a lot of bunk," or the one who "arrived ten minutes late, refused to smoke a proffered cigarette only to pull out a packet of the same brand a few minutes later, and made it clear that he would leave as soon as his idea of politeness allowed him to." A few, chiefly among the Assistant Foremen, Group Chiefs and Section Chiefs, seemed to be worried, and were glad of a chance to unburden themselves in the interview. A frequent comment indicated that while interviewing was good for employees because they had no one to go to with complaints, the supervisor had always got his Foreman to go to if he had a kick. But in the main the supervisors' attitude towards their interviewing was neutral and if they expressed an opinion at all it was in general terms favourable to the Programme as a whole. This attitude was displayed by supervisors from all ranks.

. . . . .

In analysing their findings, the investigators very quickly became alive to the fact that " the supervisors expressed or implied a number of distinctions in terms of which they evaluated their problems. In discussions of problems connected with advancement, payment, layoff, shorter hours, how to handle people, pensions, vacations, and so on, these distinctions occurred over and over again and were expressed in innumerable ways. They were distinctions with regard to differences of rank in the supervisory organisation, distinction between office and shop, distinctions with regard to length of service, and distinctions between men and women." Such distinctions, in fact, formed the background or even the foundation from which the various supervisors built up their conception of their own task and position within the organisation, and consequently largely determined their attitude towards the policy and activities of the Company and the duties and problems with which they were confronted.

The analysis of these distinctions, or at least of the manifestations in which they were exhibited, showed interesting variations between grade and grade. For example, social distance was greater between the two contiguous grades of Section Chief and Assistant Foreman than between other pairs of contiguous grades such as Group Chief and Section Chief or Assistant Foreman and Foreman. In fact, the distance or cleavage between the Foreman and the General Foreman was more marked than between any other two consecutive grades in the organisation. It was interesting also that these gradations influenced the behaviour of supervisors when discussing or dealing with problems in the presence of others; so, for instance, a Group Chief would act towards his workers in the presence of his Section Chief quite differently from the way in which he would behave were his Assistant Foreman or Foreman present. Or again, a Foreman did not treat his Assistant Foreman in the same way as he treated his first line supervisors nor could he say to them things that he could easily say to his Assistant.

The distinctions between office and shop are too common an occurrence to need further comment here. On the whole, in the Western Electric Company " a worker in an office

department had a higher social status than a worker in a shop department; this distinction was carried on through the first few ranks of the supervisory organisation in a similar way and thus the Section Chief in an office department had a higher social status than a Section Chief in a shop department."

The main point to be noted in regard to these distinctions is that they are not matters of fact but of sentiment. They belong, in other words, to the " informal organisation " of the groups concerned and are not in any factual way associated with the formal structure of the Company. Thus, the analysis of the supervisors confirmed one of the major findings of the general Interview Programme—the distinction of " fact versus sentiment." Once again this principle operated to give far greater significance and emphasis to sentiment than to facts in the determination of attitudes and behaviour: a person's attitudes and actions in a given situation are determined by what he feels about that situation rather than by what the facts really are. This was illustrated, for example, by the way in which the distinctions between supervisory grades appeared to the different levels of supervisors themselves. " Their significance for any individual supervisor depended upon his position, as defined by his particular rank, length of service, sex, and on whether he worked in one Branch or another. The social distance between a Section Chief and an Assistant Foreman was expressed by a Section Chief in one way and by an Assistant Foreman in another. The social distance between men and women had a different significance for men from that which it had for women. Length of service was more important to the lower ranks of supervision than to the higher. The office or shop distinction was not important to the General Foreman. The social distance between a Group Chief and his operators had a more important significance to the Group Chief than it had to the General Foreman."

" Such distinctions are implied in the social organisation; they arise because the Company is not merely an organisation for the manufacture of telephones in the most efficient manner —it is also a human organisation in which the needs, hopes and desires of human beings are trying to find expression. These

distinctions form a system of sentiments which expresses the value and significances residing in the social organisation of the Company. This system of sentiments refers to the different ways in which persons and groups of persons are differentiated from one another, as well as the manner in which they are ordered and integrated. The status of each individual in the Company is determined in terms of this system (i.e. in his own eyes and in those of his colleagues—*authors*): status depends not only on rank but also on such things as sex, length of service, and on whether or not the individual is in an office or a shop organisation." (C.)

. . . . .

In the light of the general sentiments of the various supervisory members interviewed, perhaps one of the most important aspects of the investigations was the interpretation offered by the supervisors to some of their own problems. In all, some eight or nine points were taken up along these lines and were analysed in terms of the following questions (C):

"(1) What does a supervisor mean when he calls a policy of the Company unfair?
(2) What does a supervisor mean when he calls his superior a slave-driver or bully?
(3) What does the insistence of all supervisors on "leadership versus driving" mean?
(4) Why is a supervisor's attitude toward the Company different from his attitude toward its visible representatives?
(5) Why is the foreman the butt of the first-line supervisors' criticisms about supervision?
(6) Why are the preoccupations of the group chiefs and section chiefs so similar to those of the worker?
(7) Why are assistant foremen more preoccupied with their personal relations to their immediate superiors than are supervisors of other ranks?
(8) Why are some supervisors more disturbed than are

others of the same rank about questions of unfairness in matters of Company policy ?

(9) On what factors does satisfaction or dissatisfaction with progress in the Company depend ? "

Certain comments in respect of a number of these questions are illuminating as answers to the general problem. Take, for instance, the first question regarding the fairness of Company policy. Quite clearly in nearly all the interviews fairness seemed to be a subject of considerable interest and a major consideration in all assessments of the Company's policy. But on closer examination it turned out that " when a supervisor says that a policy of the Company is just or unjust, fair or unfair, what he means is that the policy is either acceptable or offensive to his sentiments, as his sentiments stand either in relation to the actual existing social equilibrium to which he has become accustomed or in relation to an ideal equilibrium which he desired. . . . Any move on the part of the Company, such as cutting hours of work, tends to disrupt the social equilibrium. Immediately this disruption is manifested in expressions of sentiments of resistance to the real or imagined alterations in the social equilibrium."

The answers to the second and third questions lay primarily in the significance of social prestige to the supervisors. From his own point of view, any one supervisor could rise and gain social prestige and dominance by means of the supervisory organisation, and according as he tended to emphasise the social distinctions between himself and his subordinates he would become unpopular with subordinates, and so be labelled the slave-driver or bully. This sprang from a sentiment so common among subordinates as to be almost a principle, namely " the superior is not to maintain authority and discipline by emphasising the social distance between himself and his subordinates."

Similarly, the next three or four questions can all be answered in terms of the sentiments of the supervisors regarding their own sense of social equilibrium in the supervisory organisation. Their greater loyalty to the Company as such sprang from the

fact that, for them, the Company, by the very fairness of its policies, represented a principle of justice and stability; it stood for them as an "abstract system of practices and principles which represented the values of the human organisation . . . by means of which the social organisation is maintained in a steady state of equilibrium." Again, the position of the Foreman as the butt of subordinate criticism sprang in the main from the very fact of his visible presence. He, more than any other of the higher supervisory grades, "is responsible for maintaining discipline in his Department and for upholding the rules of the technical organisation by means of which efficiency is maintained. More than any other of his subordinate supervisors, he has to think in terms of cost, efficiency and output. In spite of his best intentions, he is always in a position to violate the feelings of personal integrity of his subordinates. He is, in short, an ideal scapegoat for the expression of any disturbances in the social equilibrium." And moreover he is physically always present.

The last question could be held in a sense to go to the root of the supervisor's attitude towards his responsibilities and his position. The analysis of the findings of the supervisor interviews makes it evident that "all the factors determining satisfaction or dissatisfaction at work do not arise within the walls of the factory. The attitude which the supervisor brings with him to work and the basic demands which he is making of his job are the extra-occupational factors; and these demands are a product of his relations outside of the plant and of his previous life story. . . . The more impoverished the social reality is for the supervisor, the greater are his feelings of insecurity and the greater are his demands for recognition and security, giving rise to the tendency to substitute the Company for the missing social reality." In such circumstances any action by the Company can easily be misconstrued and give rise to sentiments of resistance to the alterations implied. On the other hand, the more a supervisor has "lines of loyalty extending outside the plant, the less are his feelings of insecurity and the less excessive are the demands he projects on the Company." It could perhaps be said that one of the major

findings from the interviews was this personal basis on which the supervisor's attitude towards his function and position in the organisation is built up. It was, in fact, by almost this alone, as the report shows in another connection, that the average supervisor tended to judge the fairness of Company policy and activities; and hence are explained the differences between the supervisors' attitude towards practices which must in fact have affected them in very much the same way whatever their department or position.[2]

. . . . .

To summarise the findings of the supervisory Interview Programme would very largely repeat those of the general Programme. The major findings were concerned with the importance of the informal organisation as a means of preserving the security and social equilibrium of the supervisory groups as well as of determining their outlook and behaviour on matters concerned with the Company. There was further emphasis on the importance of social prestige as a determining factor in human behaviour; also on the vital distinction between "fact versus sentiment" in any interpretation of personnel relations or individual attitudes. In fact, every situation within a Company organisation or working group in industry is saturated with personal and social factors, without which the activities themselves cannot be understood. "It is not possible to treat material goods, physical events, wages and hours or work as things in themselves, subject to their own laws. Instead, they must be interpreted as carriers of social value. For the employee in industry the whole working environment must be looked upon as being permeated with social significance. Apart from the social values inherent in his environment the meaning to the employee of certain objects or events cannot be understood." (C.) In all this the supervisor appeared to differ not a whit from the rank and file employee.

One point of difference with the supervisors was the comparatively little significance or interest attached to plant conditions. This can again be explained in social terms, for plant conditions serve largely to define an individual's position in

the social organisation of the Company. "Inasmuch as the lower status of the shop employee was indicated by the kind of plant conditions he enjoyed he may have been somewhat more conscious of them—which would account for the fact that the shop employees in their interviews commented a great deal about plant conditions, whereas the supervisors mentioned them relatively little."

In their emphasis on the significance of personal and social factors as determinants of attitudes and behaviour, the supervisor interviews provided an interesting parallel with the Bank Wiring observation group, and a confirmation of Elton Mayo's earlier comment that "Supervision had shown itself to be another word which meant so many things that it meant nothing. In every department there was a human situation: these situations were never identical—and in every different situation the supervisor played a different part."

APPENDIX

Extracts from *Management and the Worker* (C), pages 370–371

"(8) Why are some supervisors more disturbed than are others of the same rank about questions of unfairness in matters of Company policy?

The attitude of an individual toward his job in the Company plays an important part in determining his attitude toward such questions. To a Group Chief who is only trying to conserve the position he has achieved and has no desire for further advancement, changes introduced by the Company mean something quite different from what they mean to a Group Chief who sees himself some day as a Foreman or higher. For the former, all changes which in any way seem to be altering his status adversely are viewed with feelings of apprehension and insecurity. He is envisaging an ideal social equilibrium in which there will be no alteration in those factors which differentiate supervisors from

non-supervisors. For the latter, however, similar changes do not have the same significance, or do not arouse the same pre-occupations. Distinctions which separate him from those above are not a source of irritation. In fact, they are a necessary prerequisite for his desire for recognition and rise to social dominance. He is envisaging an ideal social equilibrium in which there is always room at the top.

It is apparent, therefore, that dissatisfaction arises not only from changes in the actual existing social equilibrium to which an individual has become accustomed, but also from alterations occurring, or thought to be occurring, in an ideal social equilibrium which he is contemplating and desiring. The ideal equilibrium which an individual is envisaging depends on the fundamental demands he is making of his work. For a supervisor of any rank whose demand for recognition is still unsatisfied, the ideal equilibrium is envisaged as one which gives full scope for the expression of this demand. The policies of the Company are judged good or bad in terms of this configuration. For a supervisor of any rank whose chief demand is only to retain and hold the position he has achieved, the ideal social equilibrium is envisaged as one in which at least those factors differentiating him from those less privileged are strictly maintained. He judges the policies of the Company in terms of this configuration.

"In these terms the preoccupations of many supervisors about personality, education, loyalty, and length of service can be understood. The supervisor expresses in such preoccupations those values of the social organisation on which his own personal integrity and position depend. For the middle-aged Group Chief with grammar school education, long service, and a number of dependents, any actions on the part of the Company which seem to him to depreciate those values by means of which the security of his position is assured violate his feelings of personal integrity. Naturally, he talks about the importance of service, experience, and loyalty. For the young Group Chief with high school education and short service, who is unmarried and ambitious, the ideal type of social organisation is one in which advancement is dependent on factors other than time, age, and experience. He stresses the importance of education

and personality; these are the vehicles of rapid vertical social mobility. Any action on the part of the Company which tends to depreciate those values by means of which rapid advancement can be assured are viewed by him with disillusionment and frustration.' "

[1] *See Chapter V, for some descriptive notes on the relative positions of these supervisory grades.*

[2] *A further illustration of this point is seen in the detailed answer given in the report to the eighth question in the list quoted above: the relevant paragraphs are extracted as an Appendix to this Chapter.*

VIII

SOCIAL RELATIONS IN THE WORKING GROUP

WHILE there was no particular section of the Hawthorne Investigations which could have been called a study of social relations to the exclusion of other questions, practically every aspect of the work carried out was vitally and actively concerned with the social inter-relations, social motives and social purposes of those employed in the organisation. This was true whether the term " social relations " is used in its broad interpretation or more literally in the sense of inter-personal relationships within a limited group.

Illustrations are readily forthcoming in the behaviour of the Relay Assembly test room girls, the influence that their personal inter-relationships exercised on the trend of output, and their general sense of social solidarity and good fellowship. They became accustomed to sharing their enjoyment and leisure as well as their work, and developed an interest in marking socially occasions which were primarily personal in their content, such as birthdays or other events in family life. In contrast are the illustrations from the Bank Wiring observation group, indicating absence of social integration—a social structure comprised of a series of cliques developed for specific purposes, rather than a single group unified by the pursuit of a common objective.

All the findings and conclusions along these lines emphasised the significance of the social factor in industrial management, demonstrating its character as the leadership or motivation of a working group. The affairs of any such group cannot be conducted solely by reference to economic, physiological or even psychological forces and factors. In addition, there is the fundamental fact that man is by nature a gregarious animal. Of his very essence he develops social links with his fellows. In the pursuit of any activity in which he is associated with

others these links acquire importance in relation to his own individual motives and so in relation to his interest and effort at work. No management is adequate or can be effective which fails to understand these social influences on individual conduct or to appreciate on the one hand the negative consequences of handling them without insight or, on the other, the immense positive gains which are possible if they can be mobilised to the full in support of the general objective.

A detailed study of these social aspects, as seen in the Relay Assembly team, was made by T. N. Whitehead in his volume called *The Industrial Worker* (B), "a statistical study of human relations in a group of manual workers." This microscopic scrutiny of five years of research investigations reveals clearly how, from about the end of the first year or eighteen months, the social factors assumed a much greater importance than the others, physical and psychological, which had initially been the chief preoccupation of the investigators.

"The Hawthorne researchers," Roethlisberger wrote (D), "became more and more interested in the informal employee groups which tend to form within the formal organisation of the Company, and which are not likely to be represented in the organisation chart. They became interested in the beliefs and creeds which have the effect of making each individual feel an integral part of the group and which make the group appear as a single unit, in the social codes and norms of behaviour by means of which employees automatically work together in a group without any conscious choice as to whether they will or will not co-operate. They studied the important social functions these groups perform for their members, the histories of these informal work groups, how they spontaneously appear, how they tend to perpetuate themselves, multiply, and disappear, how they are in constant jeopardy from technical change, and hence how they tend to resist innovation.

In particular, they became interested in those groups whose norms and codes of behaviour are at variance with the technical and economic objectives of the Company as a whole. They examined the social conditions under which it is more likely for the employee group to separate itself out in opposition to

the remainder of the groups which make up the total organisation. In such phenomena they felt that they had at last arrived at the heart of the problem of effective collaboration, and obtained a new enlightenment of the present industrial scene."

Against the popular view that the size of the pay envelope is the major demand which the employee is making of his job, most people could testify from their own personal experience the satisfaction that comes from being accepted and recognised by friends and work associates. Money is only a small part of this social recognition. Being greeted by a boss, being asked to help a newcomer, asked to keep an eye on a difficult operation, or given a job requiring special skill—these are acts of social recognition which point to one's standing in a group and are evidence of social standing or possession of a skill that is socially recognised as useful. This, in turn, promotes a feeling of security.

Does not this analysis provide a clue to labour unrest and disputes? Granted that these disputes are often stated in terms of wages, hours of work, and physical conditions of work, is it not possible that these demands are disguising, or in part are the symptomatic expression of, much more deeply-rooted human situations?[1]

What might be regarded as the authoritative review of the social findings of the Hawthorne Investigations is Whitehead's second study, *Leadership in a Free Society* (E), with the sub-title *A Study in Human Relations Based on an Analysis of Present day Industrial Civilisation.* Its purpose is wider than the Hawthorne work but is none the less an analytical sociological interpretation of the findings, built round a thesis best indicated by the author's own words from his concluding chapter:

"Economic science and the practice of business, like every other discipline and activity, are based on the assumption of other things remaining substantially unaffected. In particular, both economics and business have tacitly assumed that the general run of human behaviour in the mass will remain sufficiently unaffected by commercial and industrial procedures. This assumption was perhaps reasonable when the developed techniques of business affected only a small part of any society,

but it has been my purpose to illustrate the inadequacy of this assumption today. It appears that business activity is very substantially affecting social organisation in industrial communities, and that this organisation is showing signs of diminished vigour in consequence. So business finds itself in the position of an engineer building bridges, who with every successive bridge weakens the stability of them all.

A vital factor, the run of orderly human association, has been neglected; and the only satisfactory solution is to recall this factor from the universe of things that can be neglected, and to include it as one of the relevant considerations in guiding human society. We live within the organisation, and it is difficult to perceive the shape and extent of the wood when standing at the centre. . . . The observable facts are that human beings do re-act to one another in such a manner as to direct their actions to common ends, and the means taken to achieve a common end habitually involve a high degree of collaboration associated with these activities, individuals are found to entertain sentiments about each other, their common ends, their collaboration, and about groups as such. In general, people are found to place a high value upon social activities and upon societies." (E.)[2]

From this general social doctrine Whitehead draws out certain basic arguments relating to the significance of social living in a modern community, with particular reference to the industrial aspects of the community's life. He finds that contemporary industrial society displays "a poverty of social activities, which, however, is by no means peculiar to this age but has received an impetus owing to the rate of change of technological processes and consequently of social procedures. People can get together only on the basis of understood routines and customs which guide each to play his part in the joint activity. And the rate at which society has had to accommodate itself to changing conditions has so reduced the number and the value of these routines and customs that an insufficient basis remains for social organisation."

The significance of this basic social principle he then proceeds to illustrate by reference back to the experience of the Hawthorne Investigations. "It was found," he argues, "that every

industrial group examined was performing two distinguishable, but mutually dependent, functions. On the one hand, the group was performing its technological, or economic, function; on the other hand, the activities of the group were being so modified and controlled as to heighten the social solidarity of the group within itself, and also to stabilise its relations with other groups.

"As time went on, the interplay between the economic and the social functions of industrial groups became the central subject of the Western Electric researches. In the case of an industrial group the broad lines of activity are, of course, determined by its economic function; though, even so, customs and routines spring up which owe their origin directly to the social situation. But the mode, or style of this economic activity was found to be profoundly affected by the position of the group within its wider setting."[3]

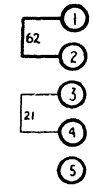
Perhaps nowhere does the significance of social purposes come out more clearly than in the later phases of the Relay Assembly test room, at any time from period X to XIII on, when the opportunity for the influence of social forces to exert themselves first became really ripe. By this time the girls had got to know each other well and had become accustomed to working as a team in their new environment; their participation in the planning and control of the investigation had enabled them to build up a sense of social solidarity and mutual responsibility for its success.

This is very clearly borne out by the experience of period XII, when in the interests of scientific experiment, they willingly agreed to forego all of the privileges which had so far been accorded to them as part of the developments to date. They were in no uncertain mind at all as to the losses they would personally suffer by the withdrawal of the amenities, but as a social group (and however much they grumbled as individuals) they recognised that the importance of the investigations was paramount and that the need to determine the influence on output of a reversion to old conditions overrode any personal considerations that might have been entailed. Naturally, the expectation was that this revision to the former conditions would mean a

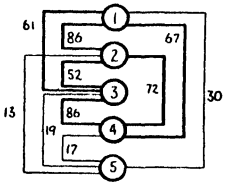
fall back in output, but it would be very difficult to argue that the girls were exhibiting a deliberate effort to falsify expectations; in fact the records of conversation during the period indicate that nothing was further from the truth. What was happening was simply that the common social purpose which they were jointly serving stimulated morale; and so output rose, contrary to all expectations, to levels so far unprecedented.

The influence of the social situation can also be seen in a rather specialised form from a study of the Relay Assemblers' output situation at different periods. (This has been investigated in very great detail in Whitehead's first analysis referred to above.) A particular instance of social influence appears in the concurrence of irregularities in output which manifested themselves from time to time. The detailed analysis indicated how, frequently, such irregularities followed a common pattern, but it failed to bring to light any correlation between such irregularities and changes in physical circumstances. "This applied equally whether we considered experimental changes, irregular changes of natural circumstances, or cyclical changes involved in the passage of time. Further analysis revealed that the only correlation that links up with these irregularities in output was that of social relations."

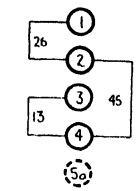
The position is usefully summarised by Whitehead in the eight diagrams illustrating correspondence in output fluctuations (*Figure 15*). The numerals quoted on the lines of correspondence represent the squares of the correlations and are called "determinations.") In the first diagram there have not yet been established any really effective social relations within the group; there are pair relations between four of the girls, but in no other way is there a determination of output. Then some fourteen or fifteen months later, as the second diagram shows the social situation had improved out of all recognition, and among practically all of the five girls in the group there was a marked correlation of output fluctuation. An interesting feature at this stage is the low correlation between Operator 5 and the rest, borne out by her tendency to be somewhat more withdrawn than the others, partly a matter of disposition and partly due to her difficulty in speaking English.



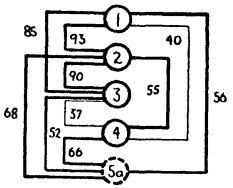
(I) April, 1938



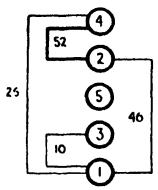
(II) July, 1929



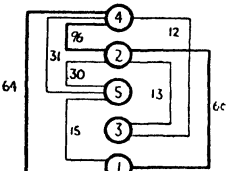
(III) October, 1929



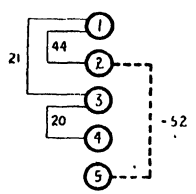
(IV) January, 1930



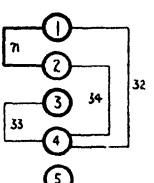
(V) June, 1930



(VI) September, 1930



(VII) March, 1931



(VIII) January, 1932

Figure 15. CORRESPONDENCE IN OUTPUT FLUCTUATIONS

The third diagram displays the position again a few months later when a change in the group had taken place, namely the replacing of Operator 5 by 5A. Although the new girl was more congenial than her predecessor, she had not yet had an opportunity of becoming integrated with the others, and accordingly stands apart from output correlations, indirectly reducing the correlations amongst other members of the team. By January, 1930, the next chart shows, the earlier position had been re-established and even heightened; the greater popularity of Operator 5A as against her predecessor had meant that she shared the high level of correlation with the other four.

The remaining four diagrams show similar positions at other periods of the investigation, related to other developments in the situation. *Figure 15* (v) for instance, gives the position at a point shortly after a change in the seating order was made. Another more important change had also taken place, namely, that Operator 5 had returned to become again a member of the group and 5A had left. For certain reasons associated with the personalities of the two girls, the change was not popular with the rest and accordingly the disturbance caused by the change of seating was further enhanced by the new social situation created by the change of persons. Output correlation virtually disappeared except as between two or three of the girls, and even there it was low. It will be noted that Operator 5 is completely isolated.

Another aspect of the output situation as determined by social forces is seen in the influence which the dynamic personality of Operator 2A exercised on the group as a whole and on one or two of its more laggard members in particular. It was she more than all the others who brought to the foreground as an active motive the need for the improvement of output. Admittedly she had a personal interest in this as well, but there is little doubt that she had a very sincere faith in the aims of the experiment and so brought home to her colleagues a high sense of social purpose in their daily activity. The response she evoked stands in marked contrast to, say, the Bank Wiring observation group, which had no sense of social purpose or

social solidarity, and in consequence no team influence in a positive direction on the output situation or on the behaviour of the operators themselves.[4]

What general guiding lines emerge from a study of these social inter-relationships? The first is an underlining of the principle stated above, that people serve two ends, the one economic and the other social. They seek in the course of their daily life and tasks satisfying social contacts which "must provide for activities performed in common which lead to an immediate rise in the exercise of social skills and sentiments and which are also logically ordered in terms of an ultimate purpose. . . . Satisfying social life consists in a stream of human activities of which the two aspects of immediate social ends and means to further social ends are developed and blended together in every action." When such social purposes and opportunities are afforded to the members of an organisation, that organisation, Whitehead argues, is likely to be stable; otherwise it is more likely to be unstable. Translated into practical terms in relation to an industrial group, this means that where a group of people do not find in the course of their daily activities the satisfying social purpose that they seek, they will consciously or unconsciously develop other activities among themselves which do provide for the social satisfactions, but which may be inimical to output and even to the economic interests of the workers themselves.

. . . . .

Instability in any organisation is inherently probable if social satisfactions are inhibited by fears of change. The daily experiences of a working group in modern industry lead them to realise that the main threat to their own social activity and social solidarity comes from change. "Any executive from his own experience can cite instances where some needed change in routine has been patiently and clearly explained to a group, only to find in the end that the group has ruined its chances by resisting the change. At first, the group seems to acquiesce, impressed by the logic, but soon resentment or some similar sentiment indicates a reversal of attitude. Neither

management nor the workers themselves can usually explain what has happened; but the fact is, nothing in the workers' daily experience has indicated the need for change; it presents itself not as a sensible adaptation to a visible situation, but as a blow from management wrapped up in a tissue of unanswerable logic. The better the logic the more irritating is the blow." By contrast, a change for which the need is quite clearly visible is readily accepted and agreed to. "No society or organisation is averse to change, provided the initiative for that change takes place at the relevant level—at that level where the daily activities have shown the need. Under those conditions, change will present itself not as an interruption, but as the natural flow of social living; . . . change, to be acceptable to a group, must come from within and must appear as the visible need of its present activities." (E.)

This offers to management a first practical line of guidance in dealing with any situation calling for change for technological or efficiency reasons. The underlying principle must be a full and frank consultation, framed on lines that will not only enable all concerned to appreciate the logic supporting the proposals from the standpoint of efficiency, but will also show equally clearly the pertinence of the changes to the group's own needs. They must recognise the contribution of the change to the social solidarity of the group if they are not to see it as a threat. Merely "informing" the groups is of little avail; they need to be integrated with the purpose of the change and share both in its inauguration and in responsibility for its success.

Another practical conclusion may also be drawn. The "care of personnel in industry" is not merely a matter of setting up suitable physiological and psychological routines. Setting out, as Whitehead does, a list of the activities conducted by the more progressive Personnel Departments affords a very striking array of items covering the various kinds of attention that managements give to the well-being of their employees. "Such activities have arisen in response to a real demand, and there can be no question as to their utility in the majority of cases. But it is no criticism of what is being accomplished to point out that not one of these activities has any direct connection with

the development of social living during working hours so far as the average worker is concerned." (E.)

It is perhaps this thought that makes Whitehead so insistent on the basic principle referred to in the opening paragraphs. "Satisfactory living for human beings is always social; and social living consists in activities performed in common, each member acting with due concern for his neighbours or colleagues . . . the real problem is in restoring to industrial workers the necessary minimum of social living, without which happiness and stability in society at large cannot be expected. Increase of social living is the major problem for all those who wish to avoid a collapse of the present type of industrial civilisation. The present poverty in social living is largely a product of the industrial revolution. The social poverty and its recognition are both recent; consequently, it is no matter for surprise that the care of personnel in industry has not addressed itself to this problem. But the consideration of this factor cannot safely be delayed any longer. The most urgent need is not to arrange the individual's circumstances for his own economic or physical good; but to let him exercise his personal initiative in conjunction with others and so, within reasonable limits, to place the individual in a position of immediate control over his own circumstances. He will do it much better than anyone else, and will develop a really effective loyalty to the purposes of his group's activity. . . .

"Unless the individual has the freedom to choose the form of his contribution there can be no self-expression, and equally unless the group has, for the individual, a high value, it can be of no interest to contribute to it. Thus it is of the essence of this satisfaction that the individual shall be acting with a respect for the continuing importance of his group. Social responsibility is required for satisfying self-expression. This enables an individual's experience to become a part of something larger and, in his thinking, more important than the single person." (E.)

These considerations of group participation raise the important question of size. Is there any limit to the number of members in a group, if intimate personal association with it is to be maintained? Once the group becomes really large it is not easy,

if at all possible, for the average individual member to make any noticeable impression on it. This will readily be recognised from any experience in large scale industrial organisation. But even in the larger organisations the personnel are broken down for actual working purposes into smaller units, thus providing for the more intimate personal participation and the attainment of an ultimate social satisfaction. Here is a question on which, as yet, no sufficient factual knowledge is available, but perhaps the Hawthorne experiences being mostly on the small group basis may be a pointer to possible lines of criterion.

Any reference to the needs of personal and social self-expression must involve very deeply the question of motives for work. It may be agreed that, in the first instance, people seek to follow an occupation with a view to earning an income which will provide for their physical needs. But occupations vary in the social prestige that they carry and, moreover, a level of income can have a social significance apart from its purchasing power. Distinct from economic motives there are many other factors that will determine the average individual in normal circumstances in selecting an occupation.

Many people " will not work cheerfully and well for an adequate income if the work itself is judged by them to be useless. The test of a useful occupation is not very clearly expressed, but it seems generally to involve two factors. The first is that the service rendered, or the product made, should generally be wanted by somebody, and the second factor is that the service or product and its demand should have the sanction of social approval. The last point does not imply that society formally states its approval; in fact the activity may even be illegal, but the society must act as though it found the activity to be not unworthy. Every practical manager knows the added satisfaction shown by employees in a firm with a deservedly high reputation for the quality of its products. Even if an employee is engaged in an unskilled occupation, he has a pride in his association with so worth-while an organisation. The need to be associated with a group which plays an important part in its society is very real, for the contribution which an individual makes to society depends not only upon his own

efforts but also upon the importance of his immediate group." (E.)

Again, the significance of a job for many people, if not for most, has also a social aspect distinct from prestige and purpose in the mere fact that it entails working in a group and becoming a participant in the inter-personal relations that the group activity sets up. This has been amply illustrated in the course of the recent war by the experience of many women who, after some years of household duties in their isolated homes in the typical British suburbs, have found themselves once more in the more congenial atmosphere of a working group when directed to wartime employment. Many of the studies of life and work in the war factories, as well as on the gun sites and battlefields, have borne testimony to the unity of effort and strength of *esprit-de-corps* that sprang from mutual personal sympathy and friendship. Similarly, a diversity of background appears to make little difference in the enjoyment of such association. It was equally apparent, for instance, among the Relay Assemblers who were a fairly homogeneous group in terms of age, marital status, education and work experience, as in the Mica Splitting group where disparities of background were as marked as were the similarities of the others. " That any social solidarity did develop in this heterogeneous group," wrote Roethlisberger and Dickson (C), " was astonishing, and showed what could be accomplished through segregating workers into small compact groups."[5]

Yet another motive for job selection can be found in seemingly personal preferences for a type of work or a kind of material. Job preferences may often appear to be associated with physical factors, but are found on analysis to have a social reference rather than a factual one. " A cursory examination of any large-scale industrial establishment will reveal that the jobs within it are socially ordered. Some of them carry more prestige and social significance than others. This ordering of significance, it will be found, is reflected in a number of different ways ; in methods of payment, in hours of work, and in working conditions. Wages, for example, vary with occupations, and these wage differentials frequently serve to reinforce occupational

stratification. Much evidence could be cited to show that the worker is quite as much concerned with these differentials—that is, the relation of his wages to the wages of the other workmen —as with the absolute amount of his wages. In short, the job and all those factors connected with it serve to define the position of the person performing that job in the social organisation of the Company of which he is a member. That jobs are socially ordered is a fact of the greatest importance. For it will be seen that, in so far as this holds true, any change in the job is likely to alter the existing routine relations between the person whose job it is and other people within the plant. But changes in the social significance of work are not confined to changes in the job alone. The physical task may remain the same, but its social significance may be altered by changes in working conditions. When it is perceived that many such conditions are symbolic of the status of the job, it is easy to understand why this is so. If the only visible difference in two levels of supervision is the size or arrangement of the desk, the colour of the carpet, or the kind of calendar pad each supervisor has, that difference, as anyone who has lived in such situations knows, assumes considerable significance, not only to the executives but to the people reporting to them." (D.)

The enumeration of these social values in a work situation provides a further part of the explanation of the powerful resistance of any group to change. Change represents an alteration in the established order of things and consequently a disruption or disturbance of the customs, traditions and sentiments that have been developed in the existing order, and a loss or a lowering of the highly important social values. In so far as the group play no part at all in the initiation of the change, they have no means of directing its course, to ensure that such social values are not impaired. The natural consequence is to resist the change itself: the Bank Wiring observation group provided ample evidence of the lengths to which a group will go, consciously and unconsciously, to protect themselves against the impact of changes which they do not initiate.

"New techniques or details of procedure can usually be introduced into a society, without causing disruption, to the

degree to which they can be subsumed under old understandings. It is these old understandings which form the values of living and in terms of which the individual can show wisdom in action, and he is consequently more tenacious of his codes, theories and schemes than of the detailed experiences from which he derived them. . . . It was partly on these grounds that we considered the unwisdom of introducing routines involving violent changes in social, economic and political doctrines. Wise social evolution must satisfy the logical test of improving the efficiency of activity whilst not disrupting customs or routines." (E.)

. . . . .

From the standpoint of practical application to industrial organisation, the social dangers arising from changes underline the significance of consultation as a technique in management or in industrial relations. Outstanding among the single lessons of the Relay Assembly test room was the part played in building morale by the fact that the girls were themselves consulted on the experimental changes to be introduced. This was tantamount to initiating the changes inasmuch as they could ward off threats to established social traditions. In the same way, in the everyday activity of an industrial organisation, consultation can provide the channel through which any alleged threat to the group is warded off, and in consequence the group is found readier to acquiesce in the changes required by the logic of efficiency.

The practical problem that arises is whether consultation through a delegate organisation, e.g. a representative committee or formal negotiating machinery, gets to a sufficiently low level; or whether on the contrary consultation, to be effective, ought not to be directly with all of the persons forming the group immediately concerned. Contemporary illustrations of the possible inadequacy of representative negotiating mechanisms can be seen in the attitude of dissatisfied groups figuring in the many recent unofficial strikes.

This line of thought has a direct pertinence to the training of managers and supervisors. In all the Hawthorne analyses of social relations in the working group, the central thesis was that " in no industrial society do large masses of the people

believe themselves to be so led as to achieve a sufficient spread of personal initiative and responsibility. People do not find that they experience adequate social activities . . . and the cause of this poverty in social living has not been found in a dearth of suitable material for leadership, but in an unduly narrow conception of their responsibilities and interests on the part of the leaders themselves." (E.) In the course of the Interview Programme, it was found that—" *The employees showed a complete trust in the integrity and general decency of the Company as such, as distinct from their opinions as to particular executives.* If an employee disliked an executive, then in the former's eyes the latter was not faithfully carrying out the Company's policies. . . . What is feared of senior management is not its lack of good intentions but its distance, *its inadequate understanding of the real non-logical situation among its men*, and therefore its liability to 'strike out blindly' from well-meaning ignorance. *The management is respected but feared as a disturber of social living*, apt to reason logically and justly from an *a priori* and inadequate point of view." (C.)

The influence of management on the social pattern was found to be at its highest in the lower levels: " *the most important single factor determining the employee's satisfaction in work was his relation to his first-line supervisors.*" This points unmistakably to a primary need in the furtherance of industrial relations—the need to train managers and supervisors to an understanding of social relations and of the social forces operating within a working group. The group has a social as well as an economic purpose. Contrary to the popular assumption, as was stressed above, the latter is not always the dominant. This question has already been discussed at length from the standpoint of its applicability to incentive schemes: in terms of the analysis that Whitehead has made of the social purposes and social values of a working group, the relative insignificance of the economic motive seems to be indisputable. This is one of the lessons that managers and supervisors have now to learn, in reversal of their previous habitual assumption.

Again, the Hawthorne studies of social relations indicate that any approach to an industrial organisation or problem

which starts from the assumption that a group is merely the sum of a given number of individuals with identical outlook and requirements rests on an entirely false foundation. In consequence, the important factors in the industrial environment are not those pertaining to physical working conditions or the psychological needs of the individual employee, but those that bear on the maintenance and improvement of *social* relations within the groups, as well as between the groups, which, collectively, form the organisation. In turn, this implies a somewhat different conception of management and supervision and, in particular, a broader interpretation of " the personnel function of management." This is to be understood as an integral element in all management and supervision wherever found, and it turns primarily upon the processes of communication and consultation, between the groups and their leaders. It is intimately bound up with the fact that " *leadership* " *is not a psychological aptitude but a social process.*

In terms of practical working, socially sound management or supervision requires a fundamental principle of mutual consultation at the group level. This should apply to all aspects of the working situation and would involve, *before any decision or action is initiated*, the preliminary discussion of the impending changes with the members of the groups concerned, to ensure that they can appreciate and contribute to the needs of efficiency, while at the same time conserving the values of importance in their group situation. (" Change, to be acceptable to a group, must come from within, and must appear as the visible need of its present activities.")

Consultation, in other words, would be the means by which regulations and terms or conditions of employment are determined, or physical conditions of work altered, improved or amplified, or general standards of discipline set up and maintained—implying that these are matters that the working groups understand and to which they can make a worth-while contribution. Such a process of consultation would lead to a greater degree of responsibility on the part of the members of the group themselves and so mean a closer approach to the true conception of " democracy in industry." " Democracy is

not and can never be a condition of personal irresponsibi
it is, on the contrary, characteristic of a genuine democ
society that there is a wide diffusion of personal responsibi
. . . The essence of democratic leadership is that it shall be
exercised as to promote opportunities for the fitting initiative
of those within the society and in the manner which these latter
desire." (E.)

No violence is being done to the customary conception of the functions of the manager or supervisor: the executive in charge is still to be an expert in the practice of efficient management and the leader of the group. But he is called on now to recognise that from the methods by which his expert knowledge and his leadership are applied, changes emanate. Whereas in contemporary practice his management or supervision may be such as to assume that his team bear no responsibility and have no concern in the changes, social awareness will reveal how truly the team-spirit is made or marred by the impact of change and by the emergence or frustration of social responsibility.

What is required of the "new" manager and supervisor is the acceptance of social principles, which may be found fittingly summarised in Roethlisberger's five points (D):

"(1) Without misunderstanding, no particular economic activity can be torn apart from its surrounding social fabric and treated as a thing in itself.

(2) Modern management tends to subsume the problems of group collaboration under the technical problems of production and efficiency. As a result, collaboration is conceived of as a logical contrivance for getting people to work together by appealing primarily to their individual economic interests.

(3) However, modern industry is built up of a number of small working groups. Between the individuals within these groups and between individuals of different groups, there exist patterns of behaviour which are expressing differences in social relationship. Each job has its own social values and its rank in the social scale.

(4) Each industrial concern has a social as well as a physical structure. Each employee not only has a physical place but he also has a social place in the factory. Any technical change on the part of management may therefore affect not only the physical but also the social location of an individual or group of employees. This fear of social dislocation is likely to be a constant threat to the social security of different individuals and groups of individuals within the industry.

(5) The failure on the part of management to understand explicitly its social structure means that it often mistakes logical co-ordination for social integration. This confusion interferes with successful communication up and down the lines as well as between different groups within the industry."

On this basis it is easy to understand Roethlisberger's contention that " many industrial problems need to be re-defined in terms of social structure. We have to understand better the particular social structures of industry. Industrial organisations make for socially ordered, if not logical, living. In terms of social routines they control and regulate the behaviour and the attitudes of the individuals within them. Not only do such organisations make for efficient social living; they also make for stability. Any serious disruption of them arouses feelings of insecurity among their members." (D.)

" Perhaps the main conclusion to be drawn from this type of analysis is the vital importance of human relationship as a factor in the morale of an industrial group and in its ultimate stability. The logical motive in economic activity is financial; and endless ingenuity has been expended in devising schemes of payment designed to secure the maximum of employment satisfaction and efficiency. But, in the last analysis, buying power is largely a means for satisfying social sentiments; and money incentives will never secure a full measure of activity and contentment until firms are organised with greater regard for the social stability of their own working groups at the working level." (E.)

APPENDIX

A Note on the Practical Working of the Social Resistance to Change

The National Research Council's Report on *Fatigue of Workers* (F), contains an interesting commentary on the way in which the social tendency of the group to resist change is built up and worked out in practice. Quoting in part from Roethlisberger and Dickson, the Report states :

" ' Management is constantly making mechanical improvements and instituting changes designed to reduce costs or improve the quality of the product. It is constantly seeking new ways and new combinations for increasing efficiency, whether in designing a new machine, instituting a new method of control, or logically organising itself in a new way.' The assumption has often been made that these changes are designed to force the employee to do more work for less money. As a matter of fact, many of them have just the opposite purpose : to improve the conditions of work and enable the employee to earn higher wages. The important point here, however, is not the purpose of the changes but the way in which they are carried out and accepted.

Once the responsible officer has decided that a certain change ought to be made, he gives an order, and this order is transmitted ' down the line,' appropriate action being taken at every level. The question in which the investigators were interested was this : What happens when the order reaches the men who are actually doing the manual work ? Roethlisberger and Dickson make the following observations : ' The worker occupies a unique position on the social organisation. He is at the bottom of a highly stratified organisation. He is always in the position of having to accommodate himself to changes which he does not originate. Although he participates least in the technical organisation, he bears the brunt of most of its activities.' It is he, more than anyone, who is affected by the decisions of management, yet in the nature of things he is unable to share management's preoccupations, and management does little to convince him that what he considers important is being treated

as important at the top—a fact which is not surprising since there is no adequate way of transmitting to management an understanding of the considerations which seem important at the work level. There is something like a failure of communication in both directions—upward and downward.

The worker is not only 'asked to accommodate himself to changes which he does not initiate, but also many of the changes deprive him of those very things which give meaning and significance to his work.' The modern industrial worker is not the handicraftsman of the medieval guild. Nevertheless the two have much in common. The industrial worker develops his own ways of doing his job, his own traditions of skill, his own satisfactions in living up to his standards. The spirit in which he adopts his own innovations is quite different from that in which he adopts those of management. Furthermore, he does not do his work as an isolated human being, but always as a member of a group, united either through actual co-co-operation on the job or through association in friendship. One of the most important general findings of the Western Electric researches is the fact that such groups are continually being formed among industrial workers, and that the groups develop codes and loyalties which govern the relations of the members to one another. Though these codes can be quickly destroyed, they are not formed in a moment. They are the product of continued, routine interaction between men. Constant interference with such codes is bound to lead to feelings of frustration, to an irrational exasperation with technical change in any form, and ultimately to the formation of a type of employee organisation such as we have described —a system of practices and beliefs in opposition to the technical organisation.'

The Bank Wiring observation room seemed to show that action taken in accordance with the technical organisation tended to break up, through continual change, the routines and human associations which gave work its value. The behaviour of the employees could be described as an effort to protect themselves against such changes, to give management the least possible opportunity of interfering with them. When they said

that if they increased their output, 'something' was likely to happen, a process of this sort was going on in their minds. But the process was not a conscious one. It is important to point out that the protective function of informal organisation was not a product of deliberate planning. It was more in the nature of an automatic response. The curious thing is that, as Professor Mayo pointed out to the Committee, these informal organisations much resembled formally organised labour unions, although the employees would not have recognised the fact.

Roethlisberger and Dickson summarise as follows the results of the intensive study of small groups of employees: 'According to our analysis the uniformity of behaviour manifested by these groups was the outcome of a disparity in the rates of change possible in the technical organisation, on the one hand, and in the social organisation, on the other. The social sentiments and customs of work of the employees were unable to accommodate themselves to the rapid technical innovations introduced. The result was to incite a blind resistance to all innovations and to provoke the formation of a social organisation at a lower level in opposition to the technical organisation.'

It is curious how, at all points, the Relay Assembly test room and the Bank Wiring observation room form a contrast. In the former, the girls said that they felt free from the pressure of supervision, although as a matter of fact they were far more thoroughly supervised than they ever had been in their regular department. In the latter, the men were afraid of supervision and acted so as to nullify it. The Bank Wiremen were in the position of having to respond to technical changes which they did not originate. The Relay Assemblers had periodic conferences with the superintendent. They were told what experimental changes were contemplated; their views were canvassed, and in some instances they were allowed to veto what had been proposed. They were part of an experiment which they felt was interesting and important. Both groups developed an informal social organisation, but while the Bank Wiremen were organised in opposition to management, the Relay Assemblers were organised in co-operation with management in the pursuit of a common purpose. Finally, the responses

of the two groups to their industrial situation were, on the one hand, restriction of output and, on the other, steady and welcome increase of output. These contrasts carry their own lesson."

[1] F. Roethlisberger's comments: "*It has been said there is an irresistible urge on the part of workers to tell the boss off, to tell the boss to go to hell. For some workers this generalisation may hold, and I have no reason to believe it does not. But, in those situations where it does, it is telling us something very important about these particular workers and their work situations. Workers who want to tell their boss to go to hell sound to me like people whose feelings of personal integrity have been seriously injured. What in their work situations has shattered their feelings of personal integrity? Until we understand better the answer to this question, we cannot handle effectively people who manifest such sentiments. Without such understanding we are dealing only with words and not with human situations.*" (*D.*)

[2] *T. N. Whitehead presented a very brief study of the more important social aspects of the Relay Assembly Test Room as a paper to Section J (Psychology) of the British Association meeting in Norwich in September, 1935. This paper has been preserved as an article in Volume IX, Number 11 (November, 1935) of "The Human Factor"; its substance was drawn from Parts III and IV of "The Industrial Worker" referred to above.*

[3] *Cf. also Roethlisberger (D): "The primitive leader assumes that if he maintains the discipline imposed by tradition there will be few economic problems. Today we make the contrary assumption. We assume that if we understand intelligently the conditions necessary for the getting of raw materials and the technical production and distribution of goods, we need to give but little attention to the problems involved in collaborative effort; that is, the human problems of effective and meaningful association at work will take care of themselves.*"

[4] *It is interesting to note in passing that the significance of social factors in the behaviour of a working group has been recognised in a recently published Report of the Industrial Health Research Board (No. 88) on "Women on War Work in Four Factories." "This Report, the preface states, draws attention to the problems created by the tendency in industry to form increasingly large units, and to extend the process of mechanisation. As the inherent interest of work diminishes, the worker's enjoyment of his or her work comes to depend more and more upon other factors, of which the social life of the factory is one of the most potent. Yet in vast organisations, employing thousands of persons, it is difficult for the individual to*

feel that he or she is a member of an integrated social group. In this as in previous enquiries it seemed clear that an individual worker's feelings about many aspects of work are strongly affected by the social background. Dissatisfaction with wages, for instance, among both men and women, appears to depend not so much on the amount of money earned—provided this does not fall below accepted standards—as on inequalities in the rates or amount of payment between different individuals within the group. This inquiry also draws attention to the lack of social unity between different levels of the factory society, and to the remote or non-existent contact between workers and other groups, such as supervisors, and in particular, managers. The social psychology of industry has hitherto been a comparatively neglected field, and if this report should stimulate further research, or lead to an increased awareness of its problems it will have served a useful purpose."

[5] *I.H.R.B. Report No.* 88 *presents similar findings*:

(1) *A high proportion of the women appear to be satisfied with their fellow workers, despite "a bit of bother now and then." "'I'm in on one of the nicest benches,' commented one woman, 'and I've often struggled in when feeling ill for fear of losing my place and the pal I'm sitting next to. We don't often talk much at work but just the feeling of having your friends around you makes all the difference. You feel, somehow, safe and comfortable.' This attitude, though seldom expressed so vividly, is undoubtedly very widespread and is one of the chief causes of the resentment shown by most women when they are moved from their usual place of work. Such transfers not only disrupt the social unit but necessitate adjustment to a strange group.*"

(2) "*The presence of others doing the same kind of work is not only comforting but helps to divert attention from the monotonous and irritating features of work. It is accordingly all the more necessary that neighbours at the bench or machine should have compatible tasks and temperaments, so that they can work together without undue friction. The grouping of workers on this basis is an important factor in promoting efficiency and pleasure in work.*"

IX

A NEW CONCEPTION OF PERSONNEL MANAGEMENT

"MANY plans and systems of personnel management seem to me to be adequate in general but inadequate in particular. They address themselves to human nature in general but not to human beings in particular. They tend to be concerned with somebody and anybody, but with nobody in particular. My plea, therefore, will be for a personnel programme that addresses itself to the concrete human situations in a particular plant."

It is in these words that F. J. Roethlisberger presents his case for interpreting the findings of the Hawthorne Investigations as a new conception of the personnel function in management.[1]

"There are, of course, certain individuals throughout the field of modern business who are giving attention to problems of human collaboration. It might even be argued that there are distinct groups of people—personnel organisations—who give their entire time to this problem. And yet, if one looks carefully at these individuals or personnel organisations, one is apt *to find a strong tendency to separate the strictly technical problems of production and distribution from the human problems connected with work associations. It would not be an exaggeration to say that the activities of most personnel organisations are largely based upon this very sharp separation of technical or economic matters from matters of human concern.* Very seldom do such organisations act in an advisory capacity regarding technical practices of the company. *From the economic viewpoint most personnel people are considered supernumeraries. Most of their duties are concerned with the routine carrying out of policies that have been settled by other groups or with settling as best they can human problems that have already been created.* There is a tendency in modern industrial

organisation to separate the economic function from all the social interrelations and to believe that in the settlement of economic problems it is not necessary to consider any other aspect of human organisation."

"The human problems of a business organisation can be conceived of in a number of different ways. Customarily we think of them in terms of the development of personnel functions. (1) There are problems of employment and placement: how to select the right people and how to place them in the right jobs. (2) There are problems of training: how to instruct new workers in the techniques of their job and in their responsibilities. (3) There are problems relating to working conditions, safety and health: how to maintain reasonable hours of work and congenial and healthful conditions of work, and how to prevent accidents and lost time due to illness. (4) There are problems relating to payment: how to pay workers adequately for the work they do. (5) There are problems relating to promotion: how to advance people in accordance with their abilities. (6) There are problems relating to the welfare of employees: how to help them in times of need and at retirement, as well as to provide recreational and social activities during their period of employment. (7) There are problems of collective bargaining: how to give employees their opportunity of saying and doing something with regard to the conditions of their employment."

Such a method of classifying human problems is undoubtedly useful and practical for certain purposes, but the Hawthorne Investigations have revealed another and probably better basis of classification. Whether or not it will supplant the former method it affords a fuller appreciation of the true character of the personnel responsibility of the managers and supervisors in charge of the line of operations.

"The first human problem of any business organisation is how to secure the co-operation of people in attaining its collective purpose." Such purpose is primarily the economic aim of the organisation, but in its attainment by truly co-operative effort, the social needs of the employees are also fulfilled. Unless inter-personal relationships and social satisfactions are generated

by the working activity, there cannot be any real co-operation within the group, nor any real stimulus of the workers' will-to-work."

Roethlisberger's analysis suggests that there are three sets of human problems involved in attaining genuine co-operation and social will-to-work :—

"(1) *Problems of Communication.* How can the people at the top of the organisation—that is, those who are responsible for making decisions and originating action—be kept in touch with what is happening at the work level? This seems to me to be one of the major human problems of large-scale industry, where there exists considerable separation, both spatial and social, between the top and the bottom of the organisation. Under such conditions, it is difficult for top management to have the intimate, firsthand acquaintance with the working force that can be obtained in a smaller enterprise.

"How can the bottom of the organisation be kept informed with regard to the economic purposes of the people at the top? How can information be transmitted downwards through the supervisory organisation without distortion? This is also an important problem, although not quite so serious as the first, because more attention has been paid to it and because the nature of the relevant information going down is more easily communicable than the nature of the relevant information going up. Although this is not entirely true, as a first rough generalisation it can be said that the communications going down are more likely to be concerned with tangible matters, that can be seen and touched, whereas the communications going up are more likely to be concerned with more intangible matters—feelings and sentiments that can be heard but not directly seen.

"(2) *Problems of Social Balance within the Organisation.* How can a plant be organised so as to fulfil its technical objective of manufacturing a product at a minimum cost and at the same time fulfil a social function of providing for its employees a socially significant way of life? How can a comfortable

working equilibrium be maintained between the various social groups in an industrial enterprise such that no one group in the organisation will separate itself out in opposition to the remainder? How can technical changes be introduced without disrupting too severely the social organisation of the plant? How can people be transferred, promoted, upgraded, downgraded, in a manner that will not impair the morale of the groups in which the movements of people occur? Here is another group of important human problems in modern industry.

"(3) *Problems of Individual Work Effectiveness.* How can employees be kept satisfactorily orientated to their jobs? This question implies more than job placement, as it is ordinarily understood. It means trying to understand the particular demands which an individual is making of his job and how his total situation is meeting or failing to meet these demands.

"In modern industry more attention must be given to these problems of individual work effectiveness. Their solution requires an understanding of two complementary processes. One is the process of trying to arrange the work situation so that the satisfactions from the job do not fall too far short of the demands that are being made of it. The other is the process of helping individual workers to modify the excessive and impossible demands which they may be making of the job. Many times these latter demands arise from experiences outside the work situation."

It is from this standpoint that the contemporary and widely approved pattern of personnel management reveals its deficiencies. However well designed and applied the techniques of selection, induction, training and record-keeping, it cannot be *assumed* that the problems of communication, of maintaining balance, and of effecting personal adjustments are being taken care of. "The right person for a particular job may be selected, but he may become discontented if continuously or conspicuously mishandled. He may be well paid in relation to the standards of the community for such work, but his pay may

not express his rightful position in the informal group of which he is a member and, as a result, it may be a source of irritation. His work may be surrounded with all the modern safeguards for his safety and health and yet fail to conform to his standards of conventional social living. He may be given an opportunity to express himself, but what he says not be listened to or correctly interpreted. He may be given a ladder on which to climb, but this ladder may express certain values which have little or no meaning in his present situation. Opportunity may be knocking on his door, but there may be no one who can give him sufficient time and attention so that he can see it. For him there seems to be as little opportunity as in a graveyard or an old ladies' home—expressions which are commonly heard when interviewing workers.

"It is apparent that if these problems are to be adequately dealt with there must be in a business organisation some group who can not only give to them their complete and uninterrupted attention, but who can also develop explicit skills requisite for their solution. Our modern large corporations need more than the intuitive and below-the-belt insight of a few gifted people. They need to introduce in their organisations a skill in human relations comparable to the skill which they introduce when they hire an engineer. And as a very large part of this skill, there is required on the part of the group charged with this responsibility a sense of the whole, a concept of the interrelatedness of the phenomena with which they are trying to deal."

There is a possible argument here that the smaller organisation may have an advantage over the larger. The manager of the smaller unit has closer and more intimate daily association with the real human situation, and so can take the human problems in his stride. As the unit grows he meets the need to delegate responsibilities to specialist subordinates, and ere long he reaches the point at which he delegates the human tasks too. A suitable mechanism may be created, but by becoming absorbed in the relatively superficial issues, it begins to neglect the real fundamentals of communication and social integration, and thus gives rise to a personnel function that is in Roethlisberger's meaning "inadequate".

"The personnel management of a particular business organisation is adequate when—
(1) it introduces in its own organisation a skill of diagnosing human situations—not some pious platitudes or 'wheezes' on how to treat employees in general;
(2) by means of this skill, it commits itself to the continuous process of studying the human situations—both individual and group—within its own organisation;
(3) it tries to secure the collaboration of its employees by running its human affairs in terms of what it learns and discovers about its own organisation;
(4) it learns that what is important to particular employees exists in its own back-yard—not in university libraries or in the minds of university professors."

The application of adequate personnel management requires, in the executives responsible for it, three skills—
"(*a*) The evaluation of the behaviour of an individual in terms of certain abstract logics and standards relating to performance and efficiency. This kind of 'individual' evaluation is very common in business organisations.
(*b*) The evaluation of the behaviour of an individual in terms of certain socially accepted codes and norms of conduct. This kind of 'social' evaluation is very common and is going on all the time in the community as well as in business organisations. It goes on among equals as well as between superiors and subordinates.
(*c*) The evaluation which is trying to understand why a person behaves the way he does in terms of his total situation. This kind of 'situation' evaluation, welcomed by most people, is rare in the community or in business. It is probably trite to point out that people usually want to be 'understood' instead of always being 'judged' by their superiors."

In the successful application of these skills, directed towards the integration of the dual economic and social purposes confronting the working group, the individual or personal strains that hinder collaboration are dealt with equally with those which spring from faults of association. The essential character of personnel management is also clearly revealed—

less a group of self-contained activities dispensed by a separate department and a specialist staff than an element in the total process of management and supervision, carried by the "line" executives responsible for the planning, conduct and control of the operations of the organisation.

It does not follow from this argument that a specialist personnel manager is not required. Apart from his "educational" function, he serves as the means of keeping his executive colleagues abreast of contemporary thought in relation to the personnel function. Necessarily, he will also have to direct the procedures and activities by which personnel policy is expressed, carrying out on behalf of the managers and supervisors tasks which his specialist knowledge, training and experience, make him better able to perform.

A partial illustration of this new conception in operation was afforded by the "personnel counselling" plan at the Hawthorne Plant. In particular, it provided a channel of communication, an opportunity to discuss with a trusted and independent interviewer any and every aspect of their working environment, of the relations developed in the working group, and of the impact of management and supervision. It thus offered, just as the Interview Programme did, an important safety valve for morbid preoccupations and frustrations, and a sense of participation. To the interviewers and to the Company it afforded first-hand knowledge of the human situation in the organisation.

The success of personnel counselling probably rested in the first place on the guarantee of confidence; this was not only a formal pronouncement, but was personally felt by the employees because they knew that the interviewer was not identified with the Company or its management. The interview was held on the initiative of the employee and, through the skill of the interviewer, went along lines that the employee's own personal feelings dictated. To the individual who found his or her mind perplexed by troubles outside the plant, the interview with the counsellor provided an opportunity for unburdening troublesome problems and relieving the mind of

the sense of stress and strain. To the individual who laboured under a feeling of grievance and a sense of disappointment owing to weaknesses in organisation or supervision, the opportunity was provided of bringing the deficiencies to light, without fear of victimisation and without feelings of disloyalty. In brief, it provided a focus for the human problems of the organisation, explicitly devoted to the social purposes of co-operation.

This feature differentiates the process from the parallel one of "joint consultation" in this country. Bringing managers and employees into discussion on the activities of production, on policy or on plans for removing bottlenecks, is another method of creating a sense of participation and of providing an outlet for possible feelings of frustration or grievance. But whereas personnel counselling is devoted explicitly to social purposes, joint consultation is centred chiefly round the economic purposes, the social aim being a derivative.

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In the years of the Second World War, Great Britain witnessed the unfolding of a new chapter in her story of the human factor in industry. Its chief contents have been concerned with employment and welfare procedures in many industries and factories where before none had existed.[2] Yet, in the course of the narrative there have been glimpses of deeper trends, among them a clearer conception of what the process of personnel management entails. It is interesting to note that the most forward-looking thought has been evolving along lines strikingly parallel to Roethlisberger's conception, drawn from the Hawthorne studies. Witness, for instance, a definition prepared by a mixed study group of managers from a variety of industries and functions.

"Personnel management is that part of the process of management specifically concerned with the people employed in an organisation. Its purpose is to establish and maintain sound personal relations at all levels of the organisation and to secure the effective use of personnel, by ensuring such conditions of employment as will enable all persons in the enterprise to

contribute most effectively to its purposes in the performance of their duties, as well as to attain those personal and social satisfactions which they tend naturally to seek within their working environment. (This entails giving adequate consideration to psychological as well as physical factors.)"[3]

This parallel with Hawthorne thought has been continued in the many and varied activities devoted to the training of managers and supervisors. Among the programmes of the lecture courses, the discussion groups and the foremen's associations, no subjects have appeared more commonly than those concerned with the human element in the workshop. Whatever the title, whatever the aspect, the emphasis in the wartime and post-war training of supervisors has lain in the theme "What makes the worker like to work?" To this there may be many answers in terms of the motive or incentive of the individual worker, but all are ultimately summed up in the attitude and impact of management. It is the major responsibility of management to guide and inspire the team to promote participation and a sense of social purpose—to apply, in Roethlisberger's sense, the new conception of personnel management.

[1]*The quotation is from F. J. Roethlisberger's "Management and Morale" (D). All other extracts in this chapter come from the same source, unless otherwise stated.*

[2]*In relation to official developments see the tribute to Sir Wilfred Garrett, published under the title "The Second Decade of the Second Century"*, INDUSTRY ILLUSTRATED, *April*, 1946.

[3] *"A Study of the Administrative and Executive Problems in the Industrial Transition from War to Peace"—Institute of Industrial Administration, London, June*, 1944.

X

"WHAT MAKES THE WORKER LIKE TO WORK?"

AS though responding to F. W. Taylor's plea for a study of "the motives that influence men", the Hawthorne Investigations could best be described as a systematic and factual study of men and women at work. It was not just a single scientist at work nor solely an investigating team, but a large body of people associated with a far-seeing Company. Managers, supervisors, inspectors, workers at the bench were all represented, and while in the major experimental groups the numbers were small, in the Interview Programme the total persons separately and individually covered attained the vast figure of over twenty thousand. It fell to the scientists—psychologists and sociologists—co-operating for investigation purposes, to direct this impressive team into a single integrated activity having as its common purpose the pursuit of knowledge. "It has been asked whether all this effort and time were really justified, seeing that, in brief, all that resulted was a re-affirmation of the simple truth that employees should be treated as human beings. Such an interpretation of the Western Electric researches completely misses two very important points and has added impetus to the over-simple approach to the human factor in industry. The first of these points is that the management of the Western Electric Company abandoned hypothetical assertions as to the basis of shop supervision and put their theories to the acid test of impartial observation. The second point lies in one of the main findings, namely, that the real unhappiness of workers was found to arise from some quality inherent in quite good supervision, sometimes irritated by personal difficulties".[1] The Investigations were no less than a textbook on the practice of management, not indeed from the standpoint

of technical or administrative responsibilities, but in regard to the essential human process that is inherent in the responsibility of every manager and foreman. His jurisdiction may extend over a manufacturing or other department or an office in which complex technical operations are conducted or intricate equipment employed. These are but incidental to the human activities of the department: it is the men and women who carry out the operations or make their automatic performance possible. It is the guidance, the inspiration, the leadership of these men and women that constitute the real core of the responsibilities of management.

The true value of the Hawthorne findings lies not in their re-affirmation of this human element, but in the systematic demonstration of its character and content. They revealed the personal and social factors that motivate men and women at work or at home, that govern attitude towards job, towards environment, towards supervisor, towards instructions, towards regulations—towards everything associated with work. They underlined, too, the essential unity of the human mind. A man is not one person at home and another at work; he does not leave at the factory gate the strains or tribulations that beset him at home. Nor does he strip off zeal for vigorous effort born of contented living unless the working environment of itself generates the dampening frustration.

One finds here an interesting parallel with the teaching of Mary Follett—the emphasis on the emotional factor in the make-up of the average man and woman and the extent to which personal difficulties can colour attitude to a working environment. "In the interviews, employees frequently stated grievances about which they had brooded for many years. Not only was it astonishing to find how far back in the past the worker could go in stating his dissatisfactions, but also it was astonishing to find that he could speak about them with all the feeling and emotion of things that had just recently occurred. Through such experiences as these, the interviewers began to understand the relation of repetitive work to personal pre-occupation."

The same emotional force revealed itself in the difference

between "fact" and "sentiment" in the allegation of grievances or complaints. Men and women do not behave in accordance with the dictates of logic: their first reaction is determined by emotional considerations, according to the things that matter most to them—security or insecurity, fear, threats of change, loss of prestige, opportunities for advancement. The more closely an individual works as a member of a group, the stronger is the force of the sentiment determining action and behaviour; thus the primarily emotional reaction acquires social significance. In the words of the investigators:

"(*i*) The attitudes of employees are regulated and controlled by a certain system of sentiment.
(*ii*) This system of sentiment expresses the social organisation of the employees, supervisors and higher executives within the company.
(*iii*) Every factor and event in the working environment becomes an object of this system of emotion.
(*iv*) Therefore, in order to understand the employee's satisfactions or dissatisfactions with certain features or events in his working environment, it is necessary to understand these features or events in relation to their interaction with and influence upon:

(*a*) his position in the social organisation of the Company;
(*b*) the social organisation to which he has grown accustomed, i.e. the system of sentiment by means of which his position is differentiated and ordered from other positions;
(*c*) the demands which he is making of his work as determined by his temperament and position socially or by the kind of relation he has to the wider community." (C)

The employer does not hire brain or brawn; he employs a total person, whose make-up is a function of a whole pattern of life. That person brings with him of necessity his own outlook, sentiments and attitude on the industrial system, on security, on industrial relations, on the firm to which he is about to belong, on the particular job that is to be undertaken, on management in general or supervisors in particular. In association with fellow-workers, he becomes absorbed in a group, and contributes to the social effort—directed either to

the economic ends of the enterprise or to the self-defence of the group. In the one case, the example of the Relay Assembly girls showed the strength that social purpose and social motive can develop in the promotion of output. On the other hand equally compelling and more widespread evidence revealed social groupings powerful in preventing the individual from wanting to work at more than a restricted pace. "In the course of the Investigations, from time to time, the interviewers discovered here and there in the plant evidence of a type of behaviour which strongly suggested that the workers were banding together informally in order to protect themselves against practices which they interpreted as a menace to their welfare. This type of behaviour manifested itself in:

(*a*) straight line output—i.e. the operatives had decided a standard of what they felt to be a proper day's work and none of them exceeded it by very much;
(*b*) a resentment of the wage incentive system under which they worked (in most cases some form of group piece work);
(*c*) expressions which implied that group piece-work as a wage incentive plan was not working satisfactorily:
(*d*) informal practices by which persons who exceeded the accepted standard (i.e. rate killers) could be punished and brought into line;
(*e*) informal leadership on the part of individuals who undertook to keep the working group together and enforce its rules;
(*f*) pre-occupations of futility with regard to promotion;
(*g*) extreme likes and dislikes towards immediate supervisors, according to their attitude towards the behaviour of the operators." (F.)

No situation could be of greater interest to management. Here was evidence, not of incidental behaviour by a few individuals, but of a systematic effort aimed at defeating the purposes of management. The investigators were able to establish that there existed a definite and even elaborate informal organisation for carrying out the protective practices: "the group had developed leadership. Whenever an outsider—engineer, inspector or supervisor—came into the room, one

man always dealt with him. Whenever any technical question was raised about the work this employee answered it. For other purposes the group had developed a second leader. Whenever a new man came into the group or a member of the group boosted output beyond what was considered the appropriate level, this second leader took charge of the situation.

"The group had, so to speak, one leader for dealing with foreign and one for dealing with domestic affairs. The different supervisors were largely aware of the situation which had developed, but they did not try to do anything about it, because in fact they were powerless. Whenever necessary, they themselves dealt with the recognised leaders of the group.

"The group was by no means happy about what it was doing; its members felt a vague dissatisfaction or unrest, which showed itself in a demand for advancement or transfers or in complaints about their hard luck in being kept on the job. These expressions of personal futility can be explained as a result of divided loyalties—divided between the group and the Company."[2] (F.)

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The challenge to management stands clearly set—the code by which it is applied in practice must have a foundation in human terms. Questions of planning and control, or administrative methods, are of the utmost importance in the attainment of effectiveness. These, the tools of the executive, have their rightful place. But in its essence management is a human or social process. From the Hawthorne Investigations there are contributions to a human code which may be usefully summarised in the following points:—

(1) The greatest need is for a recognition by all those concerned with the higher responsibilities of industry that management has this large human element in it, that it is primarily a social skill. Two consequences follow—the one, the essential role in management of principles and techniques that provide adequately for the motivation and well-being of the working teams; the other, the importance of a sound human approach by every individual

manager and supervisor in the exercise of his authority in day to day activities. "Industrial relations" is the high-sounding label for the success or failure of employer-employee co-operation, but the stuff of which it is made is the everyday contact at the individual manager-worker level and the attitude of the manager may be the chief determinant of that success or failure.

(2) Supervision: "Both the Test Rooms and the Interviewing Programme showed the importance to morale of good first-line supervision. The fact that one man has been set in control of others has usually been taken to imply that he is expected to give orders and have them obeyed. So supervision has frequently come to mean 'ordering people about'. . . . Where a good supervisor listens and becomes acquainted with the personal eccentricities of attitude, and the cause of such eccentricity, the usual supervisor does not; he prefers to talk and give futile orders." (C.) Practically everything in the Hawthorne findings underlined the importance of supervision, and that in a company which prided itself on its level of supervision and had long maintained supervisory training programmes as part of a very highly developed personnel policy. Despite this, many of the malpractices of the employee groups and of the personal grievances and dissatisfactions suffered by employees over long periods were attributed to unsatisfactory supervisory relations.

Admittedly, this is only another way of saying that supervision means the leadership of a human group, and that leadership cannot be practised effectively without understanding. The good supervisor has a high morale among the employees within his jurisdiction; he can attain this because the methods that he uses in the exercise of his supervision are such as to call the best out of his men and women, rather than turning a great part of their mental and physical energy into seeking ways and means of defending themselves against him. The simplicity of a comment of the Relay Assembly girls is very pertinent in this connection, when reference was made on one

occasion to their "boss" (the observer); their reply was—"He ain't no boss—he's our supervisor".[3]

(3) Personnel management: the true conception of the personnel function is as the practical means of carrying the human responsibility of management into effect. However important the techniques and procedures of a Personnel Department may be, they are secondary to maintaining an effective two-way channel of communication throughout the organisation. To secure this is the chief task of the Personnel Officer. One suggestion—akin to the Hawthorne personnel counselling plan—may be a continuous form of "interview programme" on a departmental scale which provides a ready means of keeping management informed of what employees are thinking, fearing, hoping, and equally of keeping employees informed of what management is thinking or proposing to do.

(4) Employee consultation: the desire of the employees to know about the development of the Company and to have a chance to make their own contributions to its advancement must be recognised. The abundant evidence culled from the Interview Programme and the readiness with which employees came forward to express their views, has been paralleled in Britain's own recent history in the working of joint production committees. One of the key factors in the success of the Relay Assembly test room, it will be recalled, lay in the basic principle of consultation in the conduct of the experimental stages—the girls had a definite voice in the determination of their own working conditions.

Britain's recent experiences in joint production committees and suggestion schemes have, admittedly, been of a more formal type, operating through an organised mechanism and bringing actively into consultation only a limited number of persons who serve as delegates or representatives. From the standpoint of improving industrial relations these committees have undoubtedly been of the greatest importance, but the extent to which

they can serve as a stimulus to interest and morale among employees in general is probably limited.

For consultation to serve its full purpose it must be so organised as to bring in actively and personally all of the employees concerned. In other words, all the members of a department, or of any other suitable unit, must be made to feel that they are of sufficient consequence to the manager or supervisor, that, as a matter of regular practice, he is keen to keep them informed of developments affecting their department and to welcome from them the expression of views in relation to its management or supervision.

To attain this end does not entail an elaborate formal mechanism. It requires, first, an appreciation by the managers and supervisors of what is at issue, and then its translation into practice in such a way that they habitually include among their responsibilities keeping continuously in contact with the men and women under them, ready at all times to listen and explain when the affairs of the department are in question. The addition of the formal committee mechanism would serve a different—best described perhaps as supplementary—purpose, especially valuable in relation to the wider affairs of the organisation as a whole, and to matters that concern any one department in co-ordination with the rest. The principle of consultation as a fundamental in the practice of management and supervision is, of course, equally pertinent to the small firms as to the large.

(5) Incentives: the traditional belief that economic incentive is the main stimulus that influences workers needs now to be considered with greater caution. All the evidence from the Hawthorne Investigations points in the opposite direction, that the economic is far less powerful than the personal or social incentives. Restriction of output is an obvious argument against the primary importance of an economic motive, for the employees are deliberately acting against their own financial advantage by refusing to earn the full piece-work levels available.

An equally striking illustration is found in the closing stages of the Relay Assembly test room. At a time when, for the girls, money had a very great significance, they were, on their own showing unable to put into their work the boost and interest that would have enabled them, not only to increase, but even maintain earnings at the levels previously obtained. Ability and will to work had disappeared, though the monetary need and incentive was still there, and perhaps stronger than at any other time during the history of the test room.

In the framing of policy and the introduction of methods for piece-work and incentive purposes, managers need also to bear in mind the influence of such methods on the social solidarity—or otherwise—of the working group.[4] The sound incentive scheme is one that integrates the group, not dissipates its energy in individual competitions.

(6) The organisation of production: if the social relation of a group can have such powerful influence on the effectiveness of the work of its members, and if its solidarity can so influence their behaviour in respect of time-keeping, attendance, and the like, then is it not of the highest importance that the organisation of production and work should be such as to give full play to the social forces that characterise the "informal organisation" of employees? Yet, this "informal organisation" is something known only to the groups of employees themselves or to those few supervisors and managers who have taken the trouble really to study and understand the attitudes and activities of the men and women working for them.

To organise production along lines which respect the social groups and integrate their activities may mean a considerable departure from traditional methods of lay-out or operation. It would be natural for a manager or supervisor, brought up on methods customary hitherto, to look adversely on so revolutionary a suggestion, but if the influence on effectiveness can be as great as has

been disclosed by the Hawthorne Investigations, then a sound approach to management must admit that the re-orientation of the flow of work and the arrangement of operations along these lines would be worth while, however marked a departure from traditional methods they may incur.

(7) Employee motives: will to work is a derivative of a complex of factors emanating from the employees' whole back-ground to date. Morale correlates with personal contentment and social satisfaction, though the object of the work is also of importance. While such contentment and satisfaction depend to a large extent on the makeup of the individual men and women in the group, they are also affected by the practice of management as it bears upon the individuals. This is perhaps only another way of saying that the development and maintenance of the morale of a working team depends largely on the leadership and social motivation shown by their captain.[5] How much a worthy object of work can mean has been well demonstrated in this country during the war years, when "working for the war effort" became the slogan—a stimulus for countless men and women in factories up and down the country. In fact, recognition of this response to a national purpose gave rise to a new technique, labelled "works relations". Whether such a technique is necessary is very much open to question, because the "motivation" of the working group is indisputably an integral part of the process of management and supervision, an element that cannot effectively be delegated. On the other hand, realisation of the purpose is important, and managers and supervisors thus acquire responsibility for a propaganda task which, as such, could be delegated, at least in the larger organisations.

(8) Employee behaviour: an important point in the practice of supervision, especially the first line, is the need to distinguish between symptom and underlying cause in individual behaviour. When employees are suffering from a sense of grievance or dissatisfaction, they have one

obvious way of showing it, namely, by lowering the effectiveness with which they work. This may take the form of restricted output, of bad quality work, of failure to follow instructions; or, it may come out in requests for transfer to other jobs or other departments; or, as frequent absence and lost time or generally bad time-keeping; it may even be manifested through physical factors such as chronic sickness or general debility.

The Hawthorne findings in this connection suggest that, for the normal individuals in a working group, bad behaviour is not something that they willingly exhibit: it must usually be recognised rather as an expression of underlying discontent or malaise with the working situation in which they are placed. Accordingly good management and supervision would require, not that the individuals should be summarily reprimanded for the mal-practice or bad behaviour displayed, but that the first action on the part of the responsible superior should be to obtain a true picture of the situation, with a view to finding out what are the *facts*, what are the latent causes of the bad behaviour.

(9) Training for management and supervision: all the foregoing suggestions for the better practice of management point unmistakably to the significance of a human element in training. The Western Electric Company made use of the investigation material for the training of their managers and supervisors, a practice that could usefully be recommended for adoption elsewhere—the published evidence of the Hawthorne Investigations provides almost the best textbook of supervision that has yet been published.

. . . . .

There have been critics who, while admitting the general value of the Hawthorne Investigations, have argued that they were not a truly scientific enquiry, and that, in view of the limited numbers of people under observation, their findings are not of statistical significance. Both criticisms are valid, at

least in the sense that they contain a measure of truth; but neither of them invalidates the importance of the conclusions as a contribution to the advancement of management. The various groups of employees of the Western Electric Company covered by the Investigations were not in any sense of the term exceptional; they were the average men and women working in an industrial environment (with possibly this one difference from their British counterpart that, because of the racial complexity of the United States population, they represented a mixed gathering of nationalities and national temperaments). Whatever the minor criticisms put forward, the main value of the Investigations remains—a factual revelation for the first time of how management bears on these average men and women, and how it influences their attitude, their will to work.

Within the past quarter of a century there have been considerable advances in the techniques of management, particularly those applied to the planning and control of production. These have been important contributions to the making of scientific management, but it is seldom that any special attention has been paid by their inventors or practitioners to their impact on the men and women at work. Everyday experience of the industrial system reveals numerous instances of frustrations caused among operatives by unsatisfactory planning or control schemes, by routines that are set to govern the flow of production without appreciation of the human basis on which alone that production can effectively rest. More than twenty years ago Mary Follett remarked that "the study of human relations in business and the study of the techniques of operating are bound up together." A more recent observer has made the same point in expressing the view that "it is probably in the area of shop administration that scientific management has most frequently broken down."[6] The Bank Wiring group is indeed the obvious illustration of this tendency, but the thousands of interviews spread over all sections of the Company brought a flood of parallel instances to light. Neglect of the human situation inevitably leads to the breakdown of the most scientifically devised management scheme.

Some realisation of this basic truth has been spreading

gradually among the industrial managers of Britain in recent years, but it is still too early to speak of anything like its acceptance. The contemporary shortage of manpower is likely to play a big part in bringing home its reality, because of the inevitable emphasis on higher man-hour productivity and so on the quest for the factors that promote will to work. Improved methods of process planning, progress control and cost control undoubtedly have a part to play, but it will be a costly mistake if they are regarded as the only real substance of management—if, in other words, the tools are confused with the process. Equally mistaken is the attempt to find a solution in external ameliorations on political grounds. " The necessary revolution in management which would improve labour relations, is not in the extra-factory field of profit sharing and material amenities, in which industrial philanthropists so often get bogged, but in the internal factory area of workshop routine ". Nor is the question one capable of solution along the lines of changes in the ownership of industry. " Whoever owns industry, the problem is administrative and has to be solved equally in public and privately owned concerns. State or corporation ownership does not so far seem to have brought about the adjustment in the status of the industrial worker which is required, but large corporation organisations still suffer from labour trouble, as do public transport companies and state-run factories. The necessary revolution is not one of share-holder ownership, but in the treatment of the individual worker by his ' boss '. This is primarily the responsibility of the industrial manager."[7]

This line of thought, interpreted from the conclusions of the Hawthorne Investigations, links up closely with contemporary discussions in this country and elsewhere on the working of democracy in industry, and helps to make clear what is really at issue.

The fundamental principles of democracy in operation may be quite easily summarised along the following lines: in the first place the citizens of the community or members of the organisation or group are governed with their own consent and, through their delegates or representatives, have a share

in the framing of policy; but this does not exclude them from any further interest in the decisions of government and so they require to be kept currently informed about and to be consulted as to the application of policy, as well as its initial formulation; in the third place, they require freedom in the expression of opinion in regard to both the policy and its application—the right to express their views openly, with a sense of responsibility, and without fear of victimisation in any shape or form; again of fundamental importance is the fourth principle, that the citizens or members of the group must feel that, in the eyes of the democratic governing body, they matter, and that they are not just relegated to being servants or hirelings of the governing group; finally, the institution of democracy does not in the slightest way detract from the importance of leadership, for among the tasks of those placed in authority by the group is that of giving to the group the kind of leadership that they want and will accept.

Because of the analogy with Parliamentary procedure, it has long been habitual to think of democracy in the industrial system as the organised machinery of collective negotiation between "the sides", the employers and the workers. Throughout all institutions in this country, for instance, the principle of equal representation has been faithfully followed. In the programme of national industrial control planned for postwar Britain, the application has been almost monotonously recurrent—on the Control Boards, the Development Councils, the National Advisory Committees, as well as the Joint Consultative Committees in the individual organisations. Without belittling the value of joint consultation, it must be recognised as but one element in the democratic process. The organised mechanism for the formulation of policy and general conditions of work needs to be supplemented by the closer personal contact of the governing and the governed at the working level. More is needed even than the Works Committee or Conference—communication and contact between workers and their individual foremen or managers. No representative or delegate discussions can replace the personal participation that is of the essence of democracy.

Without these personal contacts, true democracy does not exist. The more the democratic principle is worked out for application to industry, the higher is the responsibility placed upon those selected for the offices of management and supervision—a responsibility for real leadership of the group to ensure that all its members willingly give of their best in the pursuit of the common aims of the enterprise.

"What makes the worker like to work?" Perhaps the simplest answer can be given in the contrast between the Relay Assembly test room and the Bank Wiring observation room. In the one, human nature by the unfettered force of its own inherent interest and enthusiasm, and without any supplementary aid from technological factors, raised productivity by 30 per cent.—40 per cent. above an already high level, and held it there for years. In the other, the deliberate fettering of human energy—the application of ca' canny—held productivity persistently a third below its admittedly reasonable level.

This contrast has a special pertinence to the immediate needs of British industry. On every side there is insistence on the importance of increasing productivity. There is admittedly a powerful contribution to be made by improvements in the technical equipment of many plants. There are gains to be had from financial adjustments in capital and taxation. But throughout all industry the main force of improvements in output and reductions in cost must—and will—come from more effective management. In part from the better techniques of planning and control, but very much more from the human management of the team—from the motivation of the men and women that will inspire them and help them to work—in the spirit of the Relay Assemblers. The popular idiom talks in terms of "hard work": it is *effective work* that really matters, effort properly directed by sound planning and based on scientifically developed methods. To the sickened body of British industry, the infusion of the vitamin of the spirit of the Assembly girls could mean all the difference between a revival in the truest sense of the term, and a long-drawn-out convalescence never ending in the renewed vigour of real health.

In the decades of the past century, Britain was the mentor of the world—she taught the arts of science applied as the technology of industry. Can she now turn student, to learn the essential principles of another science, the human social science of the management of men? No less than this is the summary of the efforts of the Hawthorne pioneers.

[1]*From "Scientific Management and Shop Discipline" by Miss Pat Mayo* —INDUSTRY ILLUSTRATED, *March*, 1945.

[2]*A great deal of further evidence along these lines came to light in the course of the later Interview Programme, when employees were being re-interviewed as often as they felt necessary. The story of one of these groups is characteristic of the findings*: "*The work of the employees was adjustment of small parts which went into the construction of telephone equipment. The management thought that the adjustment was a complicated piece of work. The interviewer found that it was really quite simple*; *he felt that anyone could learn it*; *but the operators had conspired to put a fence around the job. They took pride in telling the interviewer how parts that no one could make work properly were sent in from the field for adjustment, and then telephone engineers would come in, to find out from the operators how repairs were made.*

The latter would fool around, doing all sorts of wrong things and taking about two hours to adjust the apparatus, and in this way prevented people outside from finding out what they really did. They gloated in telling the interviewer how they were pulling the wool over everybody's eyes. It followed that they were keeping the management in ignorance as to the amount of work they could do. The output of the group, when plotted, was practically a straight line." (F).

[3]*An interesting comment can be cited in this connection from Report No.* 88 *of the Industrial Health Research Board* (*London*). "*The figures showed that* 68 *per cent. of the women were satisfied with their supervisor*; *but the proportion varied from* 34 *per cent. to* 90 *per cent. in the different factory groups. The remainder seemed to have very little contact with supervisors and were scarcely aware of their existence.*

An attempt was made to ascertain the general attitude of the women to shop managers and it became increasingly evident that only a small minority had any real knowledge of such persons and that ranks higher than foremen meant very little to the average woman worker. This lack of contact between the shop managers and women on production was doubtless due largely to the shop managers' preoccupation with other matters, which, especially in war time, were both numerous and varied.

Yet the personal interest of the shop manager in the workers' progress and welfare is a matter of some importance and it should be possible for even the busiest manager to visit different sections of his works each week. Such contacts as do exist are usually connected with grievances or disciplinary action, when the atmosphere is likely to be strained or hostile. Thus the worker usually sees only one, and often not the most co-operative and healthy aspect of management. It is accordingly not surprising that many workers regard the shop manager as an aloof and superior being, whose function is to blame and not to praise. It is almost equally evident that shop managers are unaware of this attitude as otherwise they might make a greater effort to counter it."

[4]*The I.H.R.B. Report No.* 88 *already referred to provides parallel evidence on this point. Comments from the employees who were interviewed in connection with the enquiry which was the subject of the Report suggest that " the group method of payment was liked by some workers because it appealed to the social qualities of co-operation and mutual help . . . although friction may arise when the group output is impaired by lack of effort on the part of its members". This Report also brings out evidence (p.* 13) *of the importance to employees of the differential aspect of rates and the fear of rate cutting. In regard to the employees' opinion concerning piece-work prices, the Report states that " the general cause of dissatisfaction was inequality in the rates of payment for similar types of work, the effects of which were more apparent on individual than on group piece-work ".*

[5]*It is interesting to note that the observations of many managers and supervisors in this country in recent years are confirming the validity of this interpretation. The subject has been given fuller recognition in Report No.* 88 *by the Industrial Health Research Board, entitled " The Study of Women on War Work in Four Factories," and also in the popular version of this Report published by H.M.S.O. under the title " Why is She Away ? "*

[6]*From " Scientific Management and Shop Discipline " by Miss Pat Mayo*— INDUSTRY ILLUSTRATED, *March,* 1945.

[7]*Miss Pat Mayo : loc. cit.*

XI

CONCLUSION—THE SOCIAL PROBLEMS OF AN INDUSTRIAL CIVILISATION

Authors' note: This Chapter is a postscript. It is concerned less with the immediate findings of the Hawthorne Investigations than with the outcome of other inquiries inspired by them but concerned with their projection into wider fields. The justification for its inclusion will be apparent from its content. It also serves the further purpose of a tribute to one of the minds that guided the work at the Hawthorne plant. The publication of the second of Elton Mayo's full-length studies "THE SOCIAL PROBLEMS OF AN INDUSTRIAL CIVILISATION" occurred just as the present volume was in the press. Elton Mayo has resigned his Professorship at the Harvard School of Business Administration and has returned to this country. His tenure of that appointment has added another name to the true pioneers of scientific management.

IF our social skills (that is, our ability to secure co-operation between people) had advanced step by step with our technical skills, there would not have been another European War."[1]

This is the thought roused in the mind of one of the investigators by reflection on the knowledge brought to light by the years of work at the Hawthorne Plant. Closer analysis of the human problems uncovered has made clear that, far from being just a series of difficulties pertinent to a particular industrial environment, they point to a deep-seated malady in the contemporary social situation. That is a failure to realise that the world of the 1940's is living in a social milieu radically different from that of, say, one hundred years previously. Western civilisation has changed the form of its society from an "established" to an "adaptive" pattern. But so far this

change has occurred chiefly in technological procedures. Men have failed to appreciate that, to match such changes, corresponding adaptations in the pattern of social life and behaviour were called for.

"We have in fact passed beyond that stage of human organisation in which effective communication and collaboration were secured by established routines of relationship. For this change, physico-chemical and technical development are responsible. It is no longer possible for an industrial society to assume that the technical processes of manufacture will exist unchanged for long in any type of work. On the contrary, every industry is constantly seeking to change, not only its methods, but the very materials it uses; this development has been stimulated by the war." To illustrate the nature of the changes and their bearing on industry, Mayo reminds us of the traditional methods by which industrial employees were built up into fully skilled artisans. They had a long session of learning. They lived in a social group relatively stable, and thus in the course of the learning period they were able also to develop the social skills of communication and co-operation. In fact, it would appear that part of the reason for the length of the training or apprenticeship periods lay in the need to develop the co-operative element inherent in the established pattern of industrial life. But today, with the de-skilling of operations, with the decreased length of the training period due to simpler technical requirements, and, further, with the more variable bases upon which industrial life is founded, the need for social learning has been forgotten.

The important point is not so much that contemporary methods of training do not provide for the learning of the social skills of communication and co-operation, but that *in the contemporary philosophy of industry the need for these social skills is not recognised.* "This radical change—the passage from an established to an adaptive social order—has brought into being a host of new and unanticipated problems for management and for the individual worker." The technical progress goes on its inexorable way, following in the wake of man's advancing scientific knowledge. It impinges on human life at every turn

and disrupts the ordered pattern of social living. But it cannot alter the fundamental human needs.

The problem reappears, though in somewhat different form, as deficiencies in our educational equipment. The only faculties devoted, for instance in the universities, to the study of social relations or social skills are those of economics, psychology and sociology. Yet the pattern of learning customary within these faculties is out of touch with the reality of the social layout and the life of the community. This for two reasons. In the first place, the individuals taking up the professional study of these subjects tend in the main to be drawn from a background in which they have no first-hand contact or experience of the normal group pattern of the industrial system. For instance, the embryo psychologist is often himself maladjusted and has become attracted to the study of psychology because of the abnormalities of his own personality. On the other hand, the economist and sociologist have frequently had an upbringing remote from the social realities of an industrial system, and the character of their subsequent professional career keeps them apart from first-hand association with the industrial milieu.

Secondly, so far as the studies themselves are concerned, their theories in the main have been developed *a priori*, without reference to clinical procedure. Accordingly they have tended to develop assumptions which the first-hand findings of the Hawthorne Investigations and similar studies have proved to be untrue. "The statements of academic psychology often seem to imply that logical thinking is a continuous function of the mature person—that the sufficiently normal infant develops from syncretism and nonlogic to logic and skilled performance. . . . If one examines the facts with care, either in industry or in the clinic, one finds immediately that this implication, so flattering to the civilised adult, possesses only a modicum of truth. Indeed, one may go further and say that it is positively misleading." Or again, in relation to the principles of economics the findings of the clinical studies of the working group in industry prove that "the economists' pre-supposition of individual self-preservation as motive, and

logic as instrument, is not characteristic of the industrial facts ordinarily encountered. The desire to stand well with one's fellows, the so-called human instinct of association, easily outweighs the merely individual interest and the logical reasoning upon which so many spurious principles of management are based."

The assurance born of the investigations in the Hawthorne factory made possible the pursuit of further studies in the realm of human motive. Profiting from its earlier work the Department of Industrial Research of the Harvard Graduate School of Business Administration, was able to undertake the analysis of some of the human problems of war-time industry. This time the road to be traversed was known—human behaviour was deliberately under review, and no surprise was evinced when the findings revealed causes or motives closely parallel to those of the Hawthorne pattern.

The first case was study of absenteeism in the casting shops of three American factories engaged on vital production. However interesting and important to immediate needs was the analysis of the absentee problem in itself and the detection of causes which could be specifically remedied, the more significant research findings lay in the comparison of the different absence experience of the three departments, despite their close external and physical similarity. "If we recall that we are looking at the absence record for the same department in each of these companies; that all are making the same product; that the three are of long standing in the community; that they share the same labour market and environment of housing, transportation, and shopping difficulties—if we take account of these factors, then we must attach some significance, for absenteeism, to our findings with regard to differences in administration as between Companies A and C. Whether we looked at the records of the whole casting shop or of the more regular attendants in it—in either event it was borne in upon us that some difference of method, and of internal organisation must be, at least in part, responsible for the remarkable difference".

With the background of Hawthorne in mind, the answer was not far to seek:

(1) "For twenty years foremen had been carefully instructed in Company C that the supervisors' duty had two parts—the one, technical competence; the other, capacity to handle human situations."
(2) To give the foreman time and opportunity to put this training effectively into operation, "Management had arranged that foremen should have the aid of certain qualified technical assistants. These assistants took over many of the routine technical responsibilities of the foreman, thus giving him the time he required for the human responsibilities involved in team leadership."
(3) "The management of Company C thus took definite steps to assure itself that the individual was content with his work and that there should also be mutual responsibility and teamwork."

Put briefly, Company C had found that investment in human values paid high dividends in terms of co-operation and efficiency.

Much the same theme, stressing the significance of supervision, was illustrated by another wartime study in Southern California. Here, in an analysis of group stability as evidenced by absence and labour turnover, one small group of workers stood out among others even in the same plant. On all counts, they stood high, and had a reputation for "working like beavers"—a persistent output level 25 per cent. above the average of the rest of the plant. Truly, another Relay Assembly group! "This situation had not occurred by chance. The persons directly responsible are the senior assistant foreman and a "leading hand". The foreman himself highly approves the work of these two but is himself much occupied with technical and organisational details. The assistant foreman and the leading hand both believe, and clearly state, that the achievement of group solidarity is of first importance in a plant, and is actually necessary for sustained production. Their interest, however, is by no means limited to sustained production. On the contrary, both expressed frequently to us pride in the human aspect of their administration. They were alike confident that absenteeism and labour turnover would not become problems in their group.

" This fortunate situation has come into being largely as a result of the activities of the leading hand, supported always by the assistant foreman. The leading hand says that he does ' odd jobs ', and it is evident that he gives most of his time to facilitating the work of others. His chief activities are, first, helping individual workers ; second, the adjustment of technical difficulties ; and, third, acting as a medium of relationship for the group with the outside world. For this group the ' outside world ' means inspectors, time-study men, and even the departmental foreman.

" The latter two activities," Mayo continues, " I need not discuss in this place, but the kind of aid the leadman gives the individual worker is of great importance. He begins by listening to a new employee, introduces him to his new companions, and tries to get him congenial work associates. After the newcomer has worked for several days, the leadman gets him a pass and takes him down to the assembly line to see what he has made, installed in the complete machine. In addition to this, he listens to any personal problems that may be pre-occupying a worker, new or old. He says that line supervision, and probably top management, is not in these days sufficiently aware of the new demands that changing industrial conditions are making of management in respect of the human problems of administration. In these days, he says, people have ' many more things on their minds ' than they used to have, and that ' strong-arm methods don't work '. He gave many examples taken from his own group to illustrate it. And it is remarkable that many members of his group were dissatisfied elsewhere in the plant and would have become labour turnover if some company official had not induced them to try working in the department under discussion. It is also remarkable that workers in this department, when conversing with us, tended to say ' we ', whereas workers elsewhere in the plant always said ' I '."

Once again, the lesson is the significance of human values, the power of personal and social contentment as an incentive to work.

The task of management in an industrial organisation may be summarised in three phases :

" (1) The application of science and technical skill to some material good or product.
" (2) The systematic ordering of operations.
" (3) The organisation of teamwork—that is, of sustained co-operation."

To the first and second of these tasks intellect and energy are devoted in abundance. Every organisation has its teams of experts to experiment, to analyse, to develop. But the third phase elicits no enthusiasm, little interest, and hardly any effort to imagine even its existence, let alone the essentials for understanding it. " The enthusiasm of the efficiency engineer for the organisation of operations is excellent; his attempt to resume problems of co-operation under this heading is not. At the moment, he attempts to solve the many human difficulties involved in wholehearted co-operation by organising the organisation of organisation without any reference whatever to workers themselves. This procedure inevitably blocks communication and defeats his own admirable purpose". The latent human force of co-operation remains unharnessed because he has failed to invite its contribution. The major experimental change in the Relay Assembly test room was made before the Investigation started—it lay in the simple assumption of the research team that they could hold the human situation steady by deliberately seeking the co-operation of the workers. Unwittingly, they had revealed the hidden third task of management—" the organisation of working teams and the free participation of such teams in the task and purpose of the organisation as it directly affects them in their daily round."[2]

The bearing of this aspect of management on the needs of an " adaptive " society is the main thesis of Mayo's study, the central theme in " the social problems of an industrial civilisation ". This radical change—the passage from an established to an adaptive order—has brought into being a host of new and unanticipated problems for management and for the individual workers. The management problem appears at its acutest in the work of the supervisor. No longer does the supervisor work with a team of persons that he has known for many years or perhaps a lifetime; he is leader of a group

of individuals that forms and disappears almost as he watches it. Now it is difficult, if not impossible, to relate oneself to a working group one by one; it is relatively easy to do so if they are already a fully constituted team. A communication from the supervisor, for example, in the latter instance has to be made to one person only with the appropriate instructions; the individual will pass it on and work it out with the team. In the former instances, it has to be repeated to every individual and may often by misunderstood.

"But for the individual worker the problem is really much more serious. He has suffered a profound loss of security and certainty in his actual living and in the background of his thinking. For all of us the feeling of security and certainty derives always from assured membership of a group. If this is lost, no monetary gain, no job guarantee, can be sufficient compensation. Where groups change ceaselessly as jobs and mechanical processes change, the individual inevitably experiences a sense of void, of emptiness, where his fathers knew the joy of comradeship and security. And in such situation, his anxieties—many, no doubt, irrational or ill-founded—increase and he becomes more difficult both to fellow workers and to supervisor. The extreme of this is perhaps rarely encountered as yet, but increasingly we move in this direction as the tempo of industrial change is speeded by scientific and technical discovery. . . . The age-old human desire for persistence of human association will seriously complicate the development of an adaptive society if we cannot devise systematic methods of easing individuals from one group of associates into another."

"The important fact brought to the attention of the research division was that the ordinary conception of management-worker relation as existing between company officials, on the one hand, and an unspecified number of individuals, on the other, is utterly mistaken. Management, in any continuously successful plant, is not related to single workers but always to working groups. In every department that continues to operate, the workers have—whether aware of it or not—formed themselves into a group with appropriate customs, duties, routines, even rituals; and management succeeds (or

fails) in proportion as it is accepted without reservation by the group as authority and leader."

. . . . .

To fulfil their third task—the organisation of teamwork—managers need an appropriate skill. It is a skill that enables them to see beyond the physical working environment to the human content of their responsibilities, and of the many daily problems that emerge; a skill in the understanding of the latent content of a grumble or a grievance, the possible underlying social disturbance that the imperfectly trained manager and supervisor will miss, or will light on only by chance. It is a skill of patient listening, of diagnosis, of communication, of sympathetic contact, of winning confidence. It has no bearing on the technologies of the trade, though operating in the midst of them; it has no relation to the routines of the executive procedures, though intimately bound up with their operation. It is a skill inherent in the process of management itself. No hunch or personal aptitude will of itself replace this skill; no amount of technical qualification or blustering efficiency will make good its absence. The advance of modern industrial methods has made its application more pertinent by enhancing " the gravity of the problems created by the change from an established to an adaptive society. But the fact that the eager human desire for co-operative activity still persists in the ordinary person and can be utilised by intelligent and straightforward management means that these problems can be faced directly and hopefully."

This is a problem that goes far beyond industry, even if most pertinent to industry. The age-old human desire for persistence of human association meets similar obstruction in other directions of modern life, due to the dictates of technological change. An industry moves—new settlements spring up, to which people flock from many other quarters. Old ties are severed, and a new " community " is made in which there is no tradition, no social pattern, no focal points of purposive human association. The Dagenhams, the Becontree's, or the middle-class suburbs stand as the far too numerous witnesses

of the contemporary trend. Only in the factory is there a basis for social living, a fact which emphasises most poignantly both the degree of social responsibility resting on management and the seriousness of its persistent neglect of human values. "It is far easier for an industrialist to assume the overwhelming importance of material and technical factors and to neglect, or shrug off, the need for active and spontaneous participation in the effort by the workers. Yet it is true that the larger the industrial organisation the more dependent is it, not only upon technical advance, but also upon the spontaneous human co-operation of every least member of the group.

"F. J. Roethlisberger is of the opinion that our industrial civilisation of the present is improvidently living on its capital, upon the store of human goodwill and self-abnegation that many centuries of established routines of living have left us. In a recent paper in the *Harvard Business Review*, he points out that in the industrial situations we have studied we have constantly found, often in the lower levels of administration, 'men of extraordinary skill in the direction of securing co-operative effort'. The importance of this administrative function 'is too little recognised'. Indeed 'a greater proportion' of such men remain at the lower levels of management because technical competence wins recognition and promotion whereas skill in handling human relations does not. Yet were it not for these men, he claims, 'the unleashed forces of modern technology would spin themselves out to doom and destruction'. So these men go unnoticed and unrewarded; no provision is made for their replacement when the supply shall fail. And no university calls attention to the fact that material provision is only one of the duties of civilisation, the other being the maintenance of co-operative living. Of these two duties it may be said that in any society at a given time the neglected factor becomes the more important. This is our situation now; our theory of civilisation acts on the assumption that if technical and material advancement is maintained, human co-operation will somehow be inevitable."

In this a vast national problem lies, even a world-wide problem. "We have failed to train students in the study of

social situations; we have thought that first-class technical training was sufficient in a modern and mechanical age. *As a consequence we are technically competent as no other age in history has been; and we combine this with utter social incompetence.*

"*This defect of education and administration has of recent years become a menace to the whole future of civilisation. For, just as the will to co-operate is deep-seated in humanity, so also is the readiness to fear and hate an alien or merely another group*".

A far cry this from the pleasantly-flowing life of the Relay Assembly test room, but still in the direct line of logical succession. To the extent that management can solve its small problems of co-operation and stability at the level of the working group, it is contributing vitally to the major world problem that is vaguely labelled "international relations". There is a parallel here with the technology of industry—the small advances of many factory laboratories have made their contributions to the major scientific event of the splitting of the atom.

"And, if it were necessary, the atomic bomb arrives at this moment to call attention both to our achievement and to our failure. We have learned how to destroy scores of thousands of human beings in a moment of time: we do not know how systematically to set about the task of inducing various groups and nations to collaborate in the tasks of civilisation.

"It is not the atomic bomb that will destroy civilisation. But civilised society can destroy itself—finally, no doubt, with bombs—if it fails to understand intelligently and to control the aids and deterrents to co-operation."

"*If our social skills (that is, our ability to secure co-operation between people) had advanced step by step with our technical skills, there would not have been another European war.*"

[1] *All quotations in the present chapter are from this source.*

[2] *A very interesting and instructive study of the relation of technical efficiency and development to the human aspects of management is to be found in "Management Labour and Technological Change" by J. W. Riegel, University of Michigan Press,* 1942.