Elton Mayo, an Enthusiastical Managerial Philosopher

Gh. Gh. IONESCU[1]
Adina Letiția NEGRUȘA

Abstract

Mayo's ideal was a society (in the plant and in the world at large) in which there was an absence of conflict and a feeling of security – both mental and economic – among its members and he felt that the mental security, at least, had been achieved in an earlier day when every one knew his place. While he realized that any return to the exact practices of the past was both impossible and undesirable, he thought that the spirit of belonging formarly enjoied could be recreated if managers would aquire and exercise the proper social skills.

Our paper is dedicated to his philosophical ideas which serve to „light the way" for human relations research that was to follow. In addition must to say that in 2014 will be 65 years from his demise, and of course his researches still are active in our management practices.

Keywords: *test illumination, human situation, group, psychology, Hawthorne Plant, interviewing program, Industrial Psychology*

JEL classification: L21, L23, L25

1. Elton Mayo – the scientist

The importance of Elton Mayo as a pioneer and philosopher of scientific management lies in his approach to employee cooperation. He was the first person to reveal the inadequacy at studying the individual in isolation and of only taking into account the purely physical aspects of an industrial environment. His work indicated the importance of the primary, informal groups in every industrial context: he studied the worker as part of a group, saw how the group affected each of its members, and how it was related to the formal structure of its particular industrial organization.

George Elton Mayo was born in Australia in 1880 and was trained in psychology at Adelaide University before he went to the United States. He was one of the earliest and most significant contributors for another field, in which interest began to grow this was the psychology, who thought ethics, philosophy and logic at the Queensland University and later studied medicine in Edinburg, Scotland. While in Edinburg he became a research associate in the study of psychopathology. Then under a grant from Laura Spelman Rockefeller Fund, he came to America,

[1] **Gh. Gh. IONESCU,** The West University, Timișoara, E-mail: ghghionescu@yahoo.com
Adina Letiția NEGRUȘA, The "Babeș – Bolay" University, Cluj-Napoca,
E-mail: anegrusa@yahoo.com

joining the faculty of the Wharton School of Finance and Commerce of the University of Pennsylvania. In 1926, he joined the Harvard Faculty as associate professor of industrial research, remaining in that position until he retired in 1947. He died in September 1949(in 2014 will be 65 years from his death).

Though Mayo is now considered responsible for the general approach to much of modern sociological and psychological industrial research, up to the present day, his own first researches were developed along orthodox "work study" lines. In 1923, for example, his treatment of the problem of high labour turnover in one section of a Philadelphia textile mill reflected the techniques of F.W. Taylor. Mayo introduced rest pauses to a labouring task, and explained the eventual success of these pauses as due to the relief of postural fatigue and impaired circulation. Further he assumed, at that time, that the monotony of the task had led to "pessimistic reveries", which the rest periods had managed to eliminate.

1.1 Mayo mule[2] spinning inquiry

Mayo's most famous early experiment took place in a Philadelphia textile mill in 1923 to 1924. The purpose of the study was to identify the cause of high labour turnover in the mule spinning department. While turnover in the company's other departments was between five and six per cent a year, in the mule spinning department it was up to 250 per cent. Efficiency engineers had experimented with financial incentive schemes, but these had proved fruitless. The president then called in Mayo and his associates. An initial investigations by the researchers revealed that working conditions in this department were basically the same as elsewhere in the mill. However, after talking to the men, the research team realized that certain other conditions were different, especially the fact that the mule spinners had a low opinion of their work. In addition, the job proved to be very solitary in nature, and the men appeared to have no communication with each other.

1.2 The Rest Periods

Mayo decided to make some changes in the work pattern to see if this would improve the situation. After securing management's permission, he introduced two ten – minute rest in the morning and two more in the afternoon for one of the groups in the department. During these periods the men were encouraged to lie down and, if possible, go to sleep. The results were astounding. Morale improved, labour turnover ended and production, despite the work breaks, remained the same. Soon the entire department was included in the rest – period experiment, and output increased tremendously. Monthly productivity, which had never been above 70 per cent, rose over the next five months to an overall average of 80 per cent, and with it came bonus pay (bonuses were paid on productivity over 75 per cent).

[2] Mule = a type of spinning machine that makes thread or yard from fibers also called "mulejeny"

Then, suddenly, in response to a great demand for goods, the rest periods were terminated by the supervisor, who felt the company could not afford to lose this time. Output immediately declined, and the workers again became pessimistic and gloomy. Although the work breaks were restored and productivity increased, the men remained melancholy, believing that the rest periods would again be rescinded. However, the company president stepped in and announced that the work pauses would indeed remain. At the same time, the president placed control of these rest periods squarely in the hands of the men; they would determine when to take the breaks. Output reached an all – time high over the next six months, and labor turnover was virtually eliminated.

1.3 The analysis of the result

What led to the high morale, high productivity and virtual elimination of labour turnover? Mayo felt it was the systematic introduction of the rest periods, which not only helped overcome physical fatigue but reduced "pessimistic revery" (By revery Mayo meant day – dreaming). There were thus two factors involved, fatigue and monotony. The first of these is physiological and quite easy to understand. The second is psychological and reflected Mayo's philosophy and training. For some time prior to this textile mill study, he had been writing about the importance of understanding the worker's psychological make-up. Everyone, Mayo felt, has mental eccentricities or minor irrationalities. Most people are capable of suppressing them to the degree that they are harmless. They do not lead to, for example, a nervous breakdown. However, Mayo believed that:

What social and industrial research has not sufficiently realised as yet is that these minor irrationalities of the "average normal" person are cumulative in their effect. They may not cause "breakdown" in the individual but they do cause "breakdown" in the industry.(Elton Mayo, "Irrationalty and Revery", *Journal of Personnel Research,* March 1933,p.482).

There was, however, more here than Mayo and his associates realized. They had come up with some interesting physiological – psychological conclusions, but time and further research would be necessary before the experiment could be intelligently re-examined and additional, and far more substantial, findings obtained. The Hawthorne studies, which followed shortly there- after, proved very useful in this regard.

A complete reversal of these conclusions is to be found in his last book *The Social Problems of an Industrial Civilization*, written over twenty years later. It is now appropriate to trace the gradual evolution of his new approach to industrial problems which was to invalidate his original, orthodox conclusions on the textile mill developments.

2. The Hawthorne Experiments

Mayo's major research was associated with the Hawthorne plant of the Western Electric Company. It was during his years of work at the plant that doubt grew about the adequacy of the "technical", "mechanical" approach of Taylor and

other pioneers to all human industrial problems, and eventually he consolidated an entirely revolutionary attitude to the difficulties of men at work.

2.1 Organizing the research

In 1924, at first, the researchers, in an one very orthodox experiment at the Hawthorne plant, tired to answer a very modest question: What was the effect workplace illumination on worker productivity? Prior research had shown that improved lighting led to improved performance (Charles D. Wrege, Michael Gill and Jacqueline Mundy, "Who Were Elton Mayo's Many Hands?" Academy of Management Proceedings, 1981, pp. 116-120). The spirit of further inquiry led the Council on Industrial Lighting an element of the National Research Council of the National Academy of Science, to conduct a "scientific study" of the relation between factory illumination and employee performances. The group chosen to do the research was from the Massachusetts Institute of Technology and was headed by Douglad C. Jackson, a professor of Electrical Engineering. In the winter of 1924 the researchers observed existing lighting condition and performance records in Western Electric's punch press, coil winding and relay assembly departments to establish a base line for the level of worker performance. Then the level of illumination was varied in all groups with the result that "output bobbed up and down without direct relation to illumination"!

In the summer 1925 the researchers selected two groups of coil winding operators, equal in experience and performance, and designated on the "variable" group (that is, the level of lighting was to be varied), and one the "control group" (no changes in lighting were to be made). The groups were placed in different buildings, separate from the other workers. The outcome of this experiment was that output went up in both groups regardless of the level of illumination. Later this experiment was repeated and again efficiency was maintained even under conditions of insufficient lighting. In one instance, Homer Hibarger, a Western Electric employee and one of the researchers, studied two operators and gradually lowered the lighting down to the level of moon light. Again, output went up.

"This test resulted in very appreciable production increases in both groups and of almost identical magnitude. The difference in efficiency of the two groups was so small as to be less than the probable error of the values. Consequently, we were again unable to determine what definite part of the improvement in performance should be ascribed to improved illumination." (C.E. Snow, "A Discussion of the Relations of Illumination Intensity to Productive Efficiency", *Tech Engineering News*, November 1927).

In April of 1927, the illumination tests were abandoned. C.E. Snow who was one of the experimenters and an Instructor in Electrical Engineering at MIT concluded in his report that illumination was not the answer to the research problem. There were too many variables and, of these, Snow stated that the most important could be "the psychology at the human individual". At this point, it would have been easy for the whole project to be dropped. Fortunately, Homer

Hibarger proposed to George Pennock, the Assistant Works Manager that the experiments should continue. Pennock agreed that supervision was a better explanation than lighting for the rise in productivity. With the go ahead of the Works Manager, Clarince Stoll, Hibarger designed and ran a series of experiments in *Relay Assembly Test Room.*

Departing from tradition, Mayo set up the Relay Assembly Test Room to inquire in to the "total human situation". Initially there was no closely defined sequence established – only the overall desire to resolve the earlier inconsistencies.

The Relay Assembly Test Room was a small section of the main department partitioned off from the rest, and six girls occupied the room, seated at a long bench. Their actual work was the assembly of telephone relays, which involved the intricate task of fitting together the forty separate pieces which made up the small part. Production levels were recorded throughout the experiment which lasted five years. During this entire period, an observer sat with the girls, giving them information and noting everything that went on. The Test Room was frequently visited by senior company officials and others interested in the progress of the experiment.

In the experiment were five relay assemblers, one layout operator and observer – experimenter, Homer Hiberger. The operators were invited to Pennock's office "where the plan and objectives of the study were explained . . . (and) they readily consented to take part in the study" (C.E. Turner, "Test Room Studies in Employee Effectiveness", *American Journal of Public Health*, Vol. 23, June 1933, pp 577 – 584). The assemblers were observed for two weeks in their regular department before being placed in a special test room with their observer. After about six weeks they were placed as an incentive plan that tied their pay to the performance of their small group other than on the group payment plan that applied to all other assemblers. Those chosen for the test were told that they would not suffer financially but had the chance to make more money than under the large group payment plan. Thus the experimenters reported that "we were able to easily convince the operators that any gains in output would be returned entirely to them and we were thus reasonably assured of their cooperation (Western Electric Company, "An Investigation of Rest Pauses Working Conditions and Industrial Efficiency" Supplementary Program Report as of May 11.1929 p. 144). Output went up; then two five minute rest pauses were introduced followed by two 10 minute rests, and then six 5 minute rest. After about eight months, two of the assemblers were replaced with two new ones. Further experiments were tried with a five, instead of a five – and – a – half day work week, with a short day, and with lunch and refreshments provided. Then in period twelve over a year after the experiments started, the rest pauses was removed, the work day and work week were returned to the original conditions and operators had to furnish their own lunches. Despite all of this manipulations output had bobbed up and down but the overall trend was for greater output than ever before.

For Pennock, Hibarger and others was clear that something unusual was happening, so Pennock visited his Alma Mater MIT, in winter 1927 to seek

professional advice. The President of the MIT recommended that Pennock seek out Clair E. Turner a professor of Biology and Public Health at MIT. Turner become a consultant in the relay test room and initiated the study of fatigue, health habits and mental attitudes as potential explanations of the increasing output among operators (C.E. Turner, *I Remember*, New York, Vontage Press, 1974). Turner was able to establish that reduced fatigue due to the rest pauses was not the cause of the interested output. However, the rest pauses gave the workers more opportunities for social interrelation and mental attitudes, more than anything else explained the higher performance. In order of importance, Turner attributed the rise in output to: (1) the small group, (2) the type of supervision, (3) earnings, (4) the novelty of the experiment, and (5) the attention given to the test room operators by company officials and other investigators (Turner "Test Room Studies", p.583).

At the Hawthorne plant were others experiments these are present in figure no.1, and also were involved many researchers and managers, as: Claire Turner; Fritz J. Roiethlisberger (1898-1974); William J. Dickson; W. Lloid Warner; Don Chipman; George A. Pennock; Homer Hibarger.

2.2 The Interviewing Program.

Mayo's first visit to the Hawthorne plant was for two days in 1928, then four days in 1929 and then even for a deeper involvement beginning in 1930. The 1929 visit, however was critical for the interviewing program. Mayo felt that "a remarkable change of mental attitudes in the group", was the key factor in explaining the Hawthorne mystery. In his opinion, the test room workers become a social unit, enjoyed the increased attention of the experimenters, and developed a sense of participation in the project, "The most significant change that the Western Electric Company introduced into its "test room" bore only a casual relation to the experimental changes. What the Company actually did for the group was to reconstruct entirely its whole industrial situation" (Elton Mayo, "The Basis of Industrial Psychology", *Bulletin of the Taylor Society*, December 1934- reprinted in Donald Delmer and Roger Collons (eds) *Classics in Scientific Management*, University, Alabama University of Alabama Press, 1976, pp. 264 – 277).

About the Really Assembly Test Room must to say that, during the experiment a series of changes was introduced, such as work, rest pauses shorter working hours. With most changes the output increased. One of the final changes reverted the original condition – i.e. long hours, no rest pauses; only the group piece – work scheme was retained. However, during the period of twelve weeks when this change was in operation, the output rose to a record level.

The idea of those directing the experiment was that if an output curve was studied for a long enough time under various changes in working conditions, it would be possible to determine which conditions; it would be possible to determine which conditions were the most satisfactory. Accordingly a number of so - called experimental periods were arranged. For two weeks before the operators were placed in the test room, a record was kept of the production of each one without her knowledge. In this way the investigators secured a measure of her productive

ability while working in the regular department under the usual conditions. This constituted the first experimental period. And for five weeks after the girls entered the test room no change was made in working conditions. Hours remained what they had been before. The investigators felt that this period would be long enough to reveal any changes in output incidental merely to the transfer. This constituted the second experimental period.

The third period involved a change in the method of payment. In the regular department, the girls had been paid according to a scheme of group piecework the group consisting of a hundred or more employees. Under these circumstances variations in an individual's total output would not be immediately reflected in her pay, since such variations tended to cancel one another in a large group. In the test room the six operators were made a group by themselves. In this way each girl received an amount more nearly in proportion to her individual effort, and her interests became more closely centered on the experiment.

Eight weeks later the directly experimental changes began. An outline will reveal their general character. Period IV: two rest pauses, each five minutes in length, was established, one occurring in midmorning and the other in the early afternoon. Period V: these rest pauses were lengthened to ten minutes each .Period VI: six – five minute rests were established. Period VII: the company provided each member of the group with a light lunch in the midmorning and another in midafternoon accompanied by rest pauses. This arrangement became standard for subsequent Periods VIII through XI. Period VIII: work stopped a half – hour earlier every day – at 4:30 P.M. Period IX: work stopped at 4 P.M. Period X: conditions returned to what they were in period VII. Period XI: a five – day work week was established. Each of these experimental periods lasted several weeks.

Period XI ran through the summer of 1928, a year after the beginning of the experiment. Already the results were not what had been expected. The output curve which had risen on the whole slowly and steadily throughout the year was obviously reflecting something other than the responses of the group to the imposed experimental conditions. Even when the total weekly output had fallen off, as it could hardly fail to do in such a period as period XI, when the group was working only five days a week, daily output continued to rise.

Therefore in accordance with a sound experimental procedure, as a control on what had been done, it was agreed with the consent of the operators that in experimental. Period XII a return should be made to the original conditions of work, with no rest pauses, no special lunches and a full – length working week. This period lasted for twelve weeks. Both daily and weekly output rose to a higher point than ever before: the working day and the working week were both longer. The hourly output rate declined somewhat but it did not approach the level of Period III, when similar conditions were in effect.

The conclusions reached after Period XII may be expressed in terms of another observation. Identical conditions of work were repeated in three different experimental periods: Periods VII, X, and XII. If the assumptions on which the study was based had been correct, that is to say, if the output rate were directly related to the physical conditions of work, the expectation would be that in these three experimental periods there would be some similarity in output.

Fig.no.1. An overview of the Hawthorne experiments. (Based on Appendix A of Greenwood, Bolton, and Greenwod, pp.229-230. One experiment involving a typewriting group has been omitted because no report was issued) Ronald G. Greenwood, Charles D. Wrege, and Regina A. Greenwod, "Newly Discovered Gilbreth Manuscript," K.H.Chung(ed), *Academy of Management Proceedings*, Dallas, Texas, August, 1983, p.111.

Such was not the case. The only apparent uniformity was that in each experimental period output was higher than in the preceding one. In the Relay Assembly Test Room, as in the previous illuminations experiments, something was happening which could not be explained by the experimentally controlled conditions of work.

Finally, the group developed leadership and a common purpose. The leader self – appointed, was an ambitious young Italian girl who entered the test room as a replacement after two of the original members had left. She saw in the experiment a chance for personal distinction and advancement the common purpose was an increase in the output rate. The girls had been in the beginning and repeatedly thereafter that they were to work without straining without trying to make a race of the test, and all the evidence shows that they kept this rule. In fact they fill that they were working under less pressure than in the regular department.

Nevertheless, they knew that the output record was considered the most important of the records of the experiment and was always closely scrutinized. Before long they had committed themselves to a continuous increase in productions. In the long run, of course, this ideal was an impossible one, and when the girls found out that it was, the realizations was an important element of the change of tone which was noticeable in the second half of the experiment. But for a time they felt that they could achieve the impossible. In brief, the increase in the output rate of the girls in the Relay Assembly Test Room could not be related to any changes in their physical conditions of work, whether experimentally induced or not. It could, however, be related to what can only be spoken of as the development of an organized social group in a peculiar and effective relation with its supervisors.

Many of these conclusions were not worked out in detail until long after the investigators at Hawthorne had lost interest in the Relay Assembly Test Room, but the general meaning of the experiment was clear at least as early as Period XII. A continuous increase in productivity had taken place irrespective of changing physical conditions of work. In the words of a company report made in January, 1931, on all the research which had been done up to that date:

Upon analysis, only one thing seemed to show a continuous relationship with this improved output. This was the mental attitude of the operators. From their conversations with each other and their comments to the test observers, it was not only clear that their attitudes were improving but it was evident that this area of employee reactions and feelings was a fruitful field for industrial research.

The significance of the experiment was made clear in 1933 in Mayo's book on the Hawthorne experiments, *The Human Problems of an Industrial Civilisation*: "The records of the 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 attitude and effectiveness indicated that . . . we could more logically attribute the increase of efficiency to a betterment of morale than to any of the alterations made in the course of the experiments".

It becomes evident that production had risen because of a charge in the girls' attitudes to their situation. Their attitude to authority changed.

By Period XIII, however, their apprehension of authority was almost entirely dissipated. In this period the girls expressed full confidence toward those in charge of the experiment. They were no longer afraid that they would be the losers from the experimental changes. This increased confidence was expressed not merely by the absence of obsessive doubts and qualms, but also by verbal expressions of satisfaction with the test room situation . . . Over and ever again the girls expressed their contentment with the test room and its pleasanter, freer and happier working condition . . . In their eyes their first line supervisor ceased to be one who "bawled them out" in case things went wrong: instead he come to be regarded as a friendly representative of management. This was what Operator 2 meant when she said referring to the observer, "Say, he's no boss. We don't have any boss" (F.J. Roethlisberger, William J. Dickson and Harold A. Wright, *Management and the Worker*, Harvard University Press, 1956, pp.85 – 86).

They were responding to the interest shown in their work and the apparent importance of it. The discipline necessary to achieve the higher production come from within the group: "A change in morale had also been observed. No longer were the girls isolated individuals, working together only in the sense of an actual physical proximity. They had become participating members of a working group with all the psychological and social implications peculiar to such a group. In Period X a growing amount of social activity developed among the test room girls outside of working hours and outside of the plant. The conversation in the test room became more socialized. In Period XIII the girls began to help one another out for the common good of the group. They had become bound together by common sentiments and feelings of loyalty" (F.J. Roethlisberger, William J. Dickson and Harold A. Wright, *Management and the Worker*, Harvard University Press, 1956, p.86).

The conclusions drawn from the Relay Assembly Test Room results were to guide the approach for all further research at the Hawthorne plant. Emphasis now switched from study of the individual worker in isolation and the straightforward adjustment of his physical environment, to concentration on the informal groups of workers, their social norms end attitudes.

3. The informal group a very strong task force

The enquiry known as the Bank Wiring Observation Group constituted a further major piece of research, this time specifically designed to investigate the social pattern of a group of workers: "The investigators 'attention had been drawn to the fact that social groups in shop departments were capable of exercising very strong control over to work behaviour of their individual members", The chief feature which the investigation revealed was the restriction of output throughout the group, which was effectively maintained by various forms of social pressure applied to all members of the group. The studies were carried out between November 1931 and July 1932.

In contrast to the Relay Assembly Group, there was no increase in production by the members of the Bank Wiring Observation Group. The group consisted of fourteen men, engagement in three different jobs – nine were wiremen – three solder men, and two were inspectors. The men were paid on a group basis. Production remained steady from week to week, and it becomes obvious that the workers were operating well within their capabilities. The researchers 'conclusions included the following points:

1 Each individual in the group was restricting his output

2. Restriction of output manifested itself in two ways: (a) the group had a standard of a day's work which was considerably lower than the "bogey" and which fixed an upper limit to each person's output. This standard was not imposed upon them, but apparently had been formulated by the workmen themselves. Furthermore, it was indirect opposition to the ideas underlying their system of financial incentive, which countenanced no upper limit to performance other than physical capacity, (b) In each individual case it manifested itself in an output rate which remained fairly constant from week to week. The departmental output curves were devoid of individuality and approximated a horizontal line in shape.

3. 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 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" (F.J. Roethlisberger, William J. Dickson and Harold A. Wright, *Management and the Worker*, Harvard University Press, 1956, pp. 445 – 446).

Such was the strength of their informal group standards that no single member attempted to reach official production targets or to vary from the informal norm. Many methods were used by members of the group to ensure that everyone conformed to the limitations on output. These methods included "binging "– punching on the upper arm. "In addition to its use as a penalty and as a means of settling disputes, binging was used to regulate the output of some of the faster workers. This was one of its most significant applications and is well illustrated in the following entry:

w (worker) 8 (to w 6): why don't you quit work? Let's see, this is your thirty – fifth row today. What are you going to do with them all?

w 6: What do you care? It's to your advantage if I work, isn't it?

w 8: Yeah, but the way you're working you'll get stuck with them.

w 6: Don't worry about that. I'll take care of it. You're getting paid by the sets I turn out. That's all you should worry about.

w 8: If you don't quit work. I'll bing you (w8 struck w6 and finally chased him around the room)

Obs (ever) (a few minutes later): What's the matter, w6, won't he let you work?

w 6: No. I'm all through. I've got enough done (he then went over and helped another wireman) (F.J. Roethlisberger, William J. Dickson and Harold A. Wright, *Management and the Worker*, Harvard University Press, 1956, pp. 422-423).

Here was a coherent, informal, social group, with its natural leaders, complete in attitudes to work, management, and level of production – i.e. with its own full group culture. The clash between the aims of the company and the aims of the group became obvious as did the ineffectiveness of purely financial incentive to maximize production. For one reason or another, the group had established its rates of work. The chief function of the informal organization was to resist all changes to its standards; it vas, therefore necessarily at variance with the company's aims.

Differences in status and prestige within the group were complex, and, though based on subjective, often erroneous, views, the personal interrelations were of major importance to all members of the group. "The man had elaborated spontaneously and quite unconsciously an intricate social organization, around their collective beliefs and sentiments". The Bank Wiring Observation Group inquiry consolidated Mayo's discovery of the importance of the informal group in employee behaviour.

Mayo's research upon work situations at the Hawthorne plant was backed by an interview programme. This ran for more than two years and covered over 20,000 employees. It provided important additional information in the main ways. Firstly it corroborated the findings of the other research projects: secondly, it helped the management of the company by revealing some of the actual kinds of problems which they faced; and thirdly, it enabled the management to revise their schemes for supervisory training.

The first references to the Hawthorne experiments are in Mayo's book *"The Human Problems of an Industrial Civilisation"* published in 1933. In one section of the book he deals with the Relay Assembly Room and the Interview Programme. The rest of it reproduces a number of his lectures on fatigue monotony, morale and social relations. Other writings based on the Hawthorne experiments are by associates, Roethlisherger, Dickson and Whitehead. Mayo's last book, *The Social Problems of on Industrial Civilisation* published in 1945 has a further chapter on three experiments.

The Mayo's idea was that logical factors were for less important than emotional factors in determining productive efficiency. Furthermore, of all the human factors influencing employee behaviour the most powerful were these emanating from the worker's participation in social groups. Thus Mayo concluded that work arrangements in addition to meeting the objective requirements of production must at the same time satisfy the employee's subjective requirement of social satisfaction at his work place. With this new emphasis on human relations

the factory assumed a social dimension in addition to its economic aspects. This concept was embodied in Mayo's book, *The Human Problems of on Industrial Civilisation* published in 1933.

Findings and implication of Hawthorne

There is no doubt than the Hawthorne studies constituted the single most important foundation for the behavioural approach to management. The conclusions drawn were many and varied.

Elimination of Mental Revery. In Mayo's opinion, one of the major explanations of the results rested with the elimination of what he earlier called "pessimistic revery". However, based on the findings of the Hawthorne studies, he now realized that rest pauses or changes in the work environment did not, of themselves, overcome this problem. Rather, the key was to be found in the reorganization of the workers. In the case of the textile mill, for example, when the president gave the men control over the rest pauses, he transformed a group of "solitaries" into a well – knit unit by restructuring the social network. Likewise, in the case of Hawthorne, in Mayo's own words:

. . . What the company actually did for the group was to reconstruct entirely its whole industrial situation . . . The consequence was that there was a period during which the individual workers and the group had to re-adapt themselves to a new industrial milieu, a milieu in which their own self – determination and their social well – being ranked first and work was incidental. . .

. . . The Western Electric experiment was primarily directed not to the external condition but to the inner organization. By strengthening the "temperamental" inner equilibrium of the workers, the company enabled them to achieve a mental "steady state" which offered a high resistance to a variety of external condition (Elton Mayo, *The Human Problems of an Industrial Civilization*, New York: McGraw – Hill Book Company, 1973, p. 29).

Thus Mayo realized that the results were caused not by scientific management practices (rest periods) but by socio – psychological phenomena (restructuring of social networks).

Hawthorne Effect. A second finding, and probably the most widely cited, is that of the "Hawthorne effect". By this is meant that novelty or interest in a new situation leads, at least initially, to positive results. Applying this concept to the increase in productivity in the relay room, many modern psychologists contend that it was not the changes in the rest pauses that led to increased output but the fact that the girls liked the new situation in which they were considered to be important. The attention lavished on them led them to increase their output. The Hawthorne effect seemed to lead to the decline in revery, but when investigated further, it appears not to have been the only factor involved.

Supervisory Climate. Luthans points out that not all groups in the study evidenced productivity increases (Fred Luthans, *Organizational Behavior*, New York: McGraw – Hill Book Company, 1973, p.30). The girls in the relay assembly test room did more work than ever before, but the men in the bank wiring room restricted their output. Thus, there must be more than a mere Hawthorne effect and

the resulting decline in pessimistic revery. In fact, when the girls were asked why they liked working in the test room better than the regular department, they gave the following reasons:

1. The small group
2. The type of supervision
3. Earnings
4. Novelty of the situation
5. Interest in the experiment
6. Attention given by officials and investigators (C.E. Turner, Test Room Studies in Employee Effectiveness, *American Journal of Public Health,* June 1933, p. 583)

The last three of these reasons represent what might be called Hawthorne effect results; the first three do not.

What, then, accounted for the difference in output between the two rooms? Applying the first three responses of the girls to the relay and bank wiring room, it should be recalled that both were small, cohesive units working on an incentive basis. Thus, the major difference may well have been the type of supervision. In the relay room the observer took over some of the supervisory functions, but in a very lenient manner. In the bank wiring room, however, the regular supervisors were used to maintain order and control. The observer was relegated to a minor role, having none of the authority of his relay room counterpart.

This particular finding downplays the "Hawthorne effect", which has probably been overemphasized for far too long. As C.E. Turner, a consultant to the studies has stated:

We at first thought than the novelty of test room conditions might be partly responsible for increased output but the continuing increase in production over a 4-year period suggests than it was not of great importance.(ibid)

This same basic finding was substantiated by Mayo himself who, in his original analysis of supervision and productivity in the relay room, noted:

. . . getting closer supervision than ever before, the change is in the quality of the supervision. This – the change in quality of supervision – is by no means the whole change, but it is an important part of it.(Mayo op.cit.)

The Light From Hawthorne. The illumination experiment at Hawthorne served to "light the way" for the human relations research that was to follow. Mayo and his colleagues from Harvard, as well as representatives of the company who participated in the studies, deserve a great deal of credit. There were times when the results were so baffling that the average researcher would have thrown up his hands in disgust and walked away. There were other times, such as in the illumination and relay room experiments, when test were recon ducted because some independent variable had not been considered in the initial design. It was difficult for the investigators, in the early days of the human relations movement, but they persevered and, as a result, two important milestones were reached.

First important insights into individual and group behaviour were uncovered. The researchers had no illusions about the amount of work to be done.

There was still much more to do, but a start had been made. Second, attention was focused on the supervisory climate, providing an impetus for later research on leadership style.

4. The Mayo's great ideas

Within ten years, every practitioner in personnel management or human relations pointed to Mayo's work to support the contention that each individual's problems were so important to the effective operation of a firm that any manager worthy of the name must be concerned with personnel – human relations.

The conclusions to be drawn from Mayo's researches can best be summarized in three main philosophical theses:

1. *The importance of the work group.* The studies at the Hawthorne plant show that work is a group activity, and the informal primary group has important effects upon work performance. A group will tend to develop its own norms, values and attitudes, and exert strong social control upon the individual members of the group and their behaviour at work. Group collaboration with management's objectives is important and must be planned for rather than expected.

2. *The importance of recognition and security*. Physical conditions were shown to have little influence upon worker's performance and attitudes to work in comparison with their need for security recognition and belonging.

3. *Complaints as symptoms of disturbance.* The interview programme showed that comments and criticisms made workers were often best regarded as manifestations of other deeper or more basic dissatisfactions about their changing status or lack of recognition.

5. The Mayo's principal limitations

Mayo's contributions to the understanding of people at work is impressive, and are cannot really doubt his importance in the development of scientific management. The main ideas of his research, as set out above, continue to be valid and relevant today, and have provided a basis for many further developments. There are, however, a number of criticisms which may be made of Mayo's work and ideas, and these are discussed below.

One of Mayo's limitations derives from his approach to his industrial research, which was that of a social psychologist rather than a sociologist. He omitted detailed study both of the wider social context and its relation to work behaviour, and the total social situation within the workplace. He was at least partially aware of the first inadequacy in his writings, but by ignoring the total social situation within an organization he reduced the value of his work. An industrial organization may be seen as a plural society, in which organization chart does not mirror the true pattern of social relationships. Because of the variety of group cultures and aims within any organization there will always be lateral pulls against any attempt to give the vertical (i.e. formal) organization a social meaning.

Since he studied only single groups as a social psychologist, Mayo underestimated the value and importance of the broader, inclusive approach of the sociologist.

It was not until he came to write last book, in 1945 *The Social Problems of an Industrial Civilization*, that Mayo attempted to relate his work to a wider social context. Unfortunately his final book which might have given a satisfying completeness to his work serves only to clarify his limitations. Parts of the book are effective, such as his destruction of the "rabble hypothesis". He demonstrates the falsity of that part of economic theory derived, from Ricardo (David Ricardo, 1772-1823, economist Britannic) which considers natural society as a horde of unorganized individuals, who think and act logically in their own self – interest. In reference to his first researches in a Philadelphia textile mill, Mayo commented: "The expert assumptions of rabble hypotheses and individual self interest as a basis for diagnosis led nowhere. On the other hand, careful and pedestrian consideration of the worker's situation taken as part of a clinical diagnosis led us to results so surprising that we could at the time only partly explain them" (Elton Mayo, *The Social Problems of an Industrial Civilisation*, Routledge & Kegan Paul, 1952, p. 59).

In this book, Mayo reveals an attitude of extreme empiricism to social science research. He assumes the superiority of the physical over social sciences, and sees this as a limiting factor upon the effective use of theory in the social sciences. His conclusion is that the much greater use of theory in politics, economics on sociology has restricted their development and limited their effectiveness. He emphasises the primary importance of observations and collection of facts and gravely underestimates the importance of theory as a framework and guidance for research. His recurrent theme "If our social skills had advanced step by step with our technical skills, there would not have been another European war" – is unfortunately coupled with a naivety regarding the nature and relationships of different areas of knowledge.

Another of Mayo's limitations is his management bias: he puts forward a business case for treating workers better, but ignores the ethical grounds. This does not, of course, affect the value of his research discoveries – but means, simply, that he was an industrial psychologist who saw his role as primarily providing assistance to management. His emphasis upon social skill as a means for aligning all groups to the aims of the organization, though relevant to a large extent, led him to ignore the necessity of conflict of interests within an organization. He postulated a static industrial society where management, by use of social skills, fully co-ordinated the aims of every group. Mayo's static co-ordinated, industrial society would seem to have only limited relevance to the majority of industrial communities. His solutions might have had more relevance if resolved within the industrial framework of a dynamic society with continuing conflicts of interest.

All these limitations however must be put into perspective, in order not to diminish the tremendous contribution Mayo has actually made to the development of modern scientific management. His faults mainly occur in generalization and summary. As an empiricist, his strength lay much more in the actual research he carried out, and it is the importance of this by which he should be judged.

6. The final conclusions

The twenty – year research study that Mayo and his colleagues conducted was the most comprehensive study ever undertaken to evaluate the attitudes and reactions of a group of workers under shop conditions. He found that workers in a factory constituted a culture of their own that could be observed and analysed. He found that to be effective management must recognize that the work performed by individuals must satisfy their personal, subjective requirement of social satisfaction, as well as the company's requirement of productive output. This Mayo emphasised, meant that management must assume a new role in its dealings with employees, it must develop a new concept of authority and right to command; and it must help faster a new social order based on the individual's cooperative attitude and the system of coordinative organization and communication developed by management. Henceforth, management would base on the sociological concept of group endeavour.

The Hawthorne researches must be regarded as a milestone and a major turning point in the study of man at work. The specific conclusions, summarized earlier which Mayo drew from his work remain valid, and form an impressive testimony to his enduring importance. His work has formed the basis for a large part of research since the Hawthorne experiments. Equally important, de achievements of Mayo and his associates have led to a revised approach to personnel problems in many organizations. By demonstrating that industrial man is a social animal, Mayo has revealed the advantages of treating him as a human being, and this new approach is perhaps the greatest single development in the study of man at work.

As a result of Mayo's work, the industrial woods abound today with behavioural scientists personnel counsellors, industrial chaplains, and sensitivity trainers, group dynamics, sociogram analysts nondirective interviewers, role – playing instructors, critical incident teachers, and industrial psychologists – each trying to satisfy management's demand for the creation of a work situation conductive to a maximum long run productivity.

References

1. Bartol, K., and David C. Martin, D., (1994) "*Management*" (Second Edition), McGRAW-HILL, Inc, New York.
2. Bryant, K., Jr., Dethloff, H., (1983) "*A History of American Business*", Prentice – Hall, Inc. Englewood Cliffs, New Jersey.
3. Clair, C., Turner, E., (1974), I Remember, New York: Vantage Press,
4. Claude S. George, Jr., "*The History of Management Thought*", Prentice – Hall, Inc. Englewood Cliffs, New Jersey, 1972.
5. Greenwood, R., Alfred Bolton, A., (1983), "Hawthorne a Half Century Later: Relay Assembly Participants Remember," *Journal of Management*, Vol. 9 (Fall).
6. Ionescu, Gh., Gh., (1997), *"Cultura afacerilor: Modelul american*", Editura Economică, Bucureşti.
7. Ionescu, Gh., Gh., Cazan, E., Negruşa, A., L., (2001)*"Management Organizaţional*", Ed. Tribuna Economică, Bucureşti.
8. Pennock, G., (1929) "Test Studies in Industrial Research at Hawthorne," in Western Electric Company, *Research Studies in Employee Effectiveness and Industrial Relations*,
9. Roethlisberger, F., Dickson, W., (1939) *Management and the Worker*, Cambridge, MA: Harvard University Press, p. 269.
10. Schermerhorn, Jr., J., (1999), "*Management*", John Wiley & Sons, Inc, New York.
11. Turner, C.E., (1933) "Test Room Studies in Employee Effectiveness," *American Journal of Public Health*, Vol.23 (June).
12. Wrege, Ch., Gill, M., Mundy, J., (1981), "Who Were Elton Mayo's 'Many Hands'?" *Academy of Management Proceedings*.