Governning by carrot and stick: A genealogy of the incentive
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Mechanical engineers were the first to turn the practice of management into a science of governing employees. Because they worked closely with the workers and foremen and, at the same time, had access to the higher echelons of management, the engineers held a unique position in the industrial landscape of the late nineteenth century. Situated between the hierarchical layers of the modern, large-scale factory, they could extract detailed information from the shop floor and turn it into a systematic body of knowledge. As consultants, they subsequently sold the management techniques they developed on the basis of this knowledge to executives and managers.

One of the early attempts to shift the debate over incentives in a new direction came from within the ranks of the mechanical engineers. In 1918, Robert Wolf, a manager of the Spanish River Pulp and Paper Mills in Ontario, Canada, set up an experiment with his own workers and found a way to increase their productivity using techniques that resembled Henry Gantt’s fact-making charts. Though they had a similar purpose, there was one crucial difference between Wolf’s approach and previous techniques of charting the output of individuals and departments. The close connection between the productivity of the workers and the wages they received was absent (Commons 1921, 309–310).
The first step in Wolf’s experiment was to educate the operators of the different paper mills through sheets attached to the machines. On a machine in which pulp was digested, for instance, a worker could read about the chemical transformation of the pulp and about the right temperatures and pressures inside the vats during different phases of the chemical process. With workers well informed, Wolf’s next step was to evaluate each individual by calculating the extent to which the actual temperature and pressure in the vats approximated the standardized temperature and pressure curves. As a third and final step, the result of these calculations was communicated to the workers by way of a Progress Record. The Progress Record was, like Gantt’s Man Record Chart, a sheet on public display that allowed each worker to assess his or her own performance over time vis-à-vis the other workers in his department (figure 4).

![Figure 4. An example of a Progress Record showing how well individual employees maintained the moisture standards for their machines (from Wolf 1918a, 11).](image)

Although there were no ‘long-line’ or ‘short-line’ designations on the Progress Record, it was a similar device for introducing standards of performance on the shop floor and ranking individuals according to their ability to reach such standards. Neither the fact that a worker progressed over time nor the fact that he occupied a high place on the ranking afforded him any material benefit. For the worker in question the sole inducement came from the “desire to produce actuated by internal motives” (Wolf 1918b, 925). And so it did. Even in the absence of a wage incentive, the productivity of the paper workers rose significantly during the research period. Thus Wolf concluded that creativity and individual initiative should become the cornerstones of future management systems. The creative worker had no need for additional rewards; “non-financial incentives” would be sufficient (Wolf 1918b).
The move from the material to the creative desires of employees fits well with a tendency in the interwar period to loosen the tie between work and wages. Despite Wolf’s novel vision of releasing workers’ innate desire to produce, however, dissenting engineers were not the main figures in the development of new incentive systems. The authority of the mechanical engineers to define industrial problems and management solutions became contested after the First World War. From then onward, researchers with a background in the social and behavioral sciences began to criticize the engineers for their narrow focus on the material or monetary preferences of the laborers. Alternatively, the researchers introduced a broader view on the motivation of industrial workers. Labor economists, industrial psychologists and organizational sociologists developed new practices of knowledge production within and about industrial organizations. Bit by bit, a distinct perspective on worker subjectivity emerged that was wholly different from that of the engineers. This new formation of the incentivizable subject as an object of knowledge was closely related to a set of new techniques of power. In this chapter, I will show how the engineering of incentives gave way to the idea that inducements to produce came from the adequate ‘adjustment’ of workers to the prevailing industrial conditions.

British and American economists were the first to challenge the engineers in the interwar period. They countered the narrow perspective of wage incentives as the key to increased production with a broader conception of incentives that could speak to the creativity, initiative and intelligence of the workers (section 4.1). These economists brought the role of human motivation in the production process to the fore, but they failed to stipulate what a successor management system might look like. For an intermediary step in that direction, I turn to the development of industrial research on the worker, which began in the late 1920s and early 1930s. Some of the most influential experimental and ethnographic studies at the time sprang from a research network in which Elton Mayo and the Harvard Business School were key nodes (section 4.2). The investigations of Mayo and his colleagues took place in a number of research sites where new facets of worker subjectivity became intertwined with new ways to govern. In these studies employees were first recognized as individuals with distinct personalities, cares and concerns. The inner turmoil of employees was addressed with therapeutic techniques to relieve them of the tensions built up while working in the factory (section 4.3). Second, the worker was now conceived as a social being; thus, managers needed techniques they could use to target conspiring and discord on the shop floor (section 4.4). Finally, the perception that there were huge distances
between the hierarchical layers of large factories meant that new techniques were needed to ensure good communication between management and workers such that workers received clear orders, and managers were kept informed about the ins and outs of their subordinates (section 4.5)?

4.1 Incentives in interwar economics

Interwar economists had doubts about the wider consequences of scientific management and were particularly hesitant when it came to the separation of mental and physical labor advocated by Taylor. Their qualms about the division of labor for the sake of efficiency go back as far as Adam Smith’s *Wealth of Nations*:

The man whose whole life is spent in performing a few simple operations, of which the effects are, perhaps, always the same, or very nearly the same, has no occasion to exert his understanding, or to exercise his invention in finding out expediens for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become. (2000 [1776], 840)

Echoes of Smith’s ambivalent position with regard to the division of labor—praising its economic effects while lamenting its human ones—were particularly strong in the work of British economist Alfred Marshall and his students (Arthur Pigou, Dennis Robertson and Philip Sargant Florence). They insisted that a comprehensive evaluation of Taylor’s system should take into account the effects on both laborers and the economy at large. According to Marshall, the key idea of scientific management was to “increas[e] aggregate efficiency by narrowing the range of responsibility of most of its employees” (1932 [1919], 368–369). Although Marshall acknowledged the economic benefits of such restrictions with regard to the short-term increase of industrial output, he was not sure whether the long-term consequences would be that positive. The economic profession on the other side of the Atlantic had a similar ambivalent position with regard to Frederick Taylor’s work. American institutional economists countered the engineers’ narrow conception of what drove the worker to exert himself with the claim that the relationship between human motivation and work was more complex than Taylor and colleagues imagined (Yonay 1998, 102–106)\(^8\). Accordingly, the interwar
economists paved the way for a new rationalization of government along three different lines\textsuperscript{19}. First, they stressed that the role of the employee in (industrial) organizations was too narrowly conceived of in scientific management. Second, they argued that the engineers’ perspective on motivation was too materialistic, and they subsequently tried to develop a broader conception of people’s motives to work. Third, the economists developed some tentative ideas about the place of incentives in a new version of industrial government.

The first doubt articulated by the economists concerned the effects of scientific management on the workers. Was scientific management blind to the ‘human factor’ in industry? Alfred Marshall’s extensive evaluation of Taylorism suggests that it was (1932, 365–394). Even when the complete standardization of work resulted in higher efficiency “the effects of taking away from the operative any duty, save that of carrying out his instructions carefully, are not likely to be altogether good” (1932, 388). Taylor and his disciples were preoccupied with the ability of workers to accomplish a given task. This fixation on strict obedience ignored the loss of higher human capacities, such as independence and creativity and the ability to solve problems, that came with it. The trade unions of the time may have had a point in saying that the protagonists of scientific management treated the worker “as a mere instrument of production” and monopolized “the initiative of the worker in connection with the work” (Marshall 1932, 390). Arthur Pigou, Marshall’s successor as Professor of Political Economy at the University of Cambridge shared these misgivings. In \textit{The Economics of Welfare}, Pigou discussed the organizational structure of small and large enterprises in terms of their “educative ladder” (Pigou 1921, 183). In a small firm, it was easy to get hands-on experience with all facets of industrial production. Thereby, such firms enabled the smart worker to acquire all of the knowledge and skills necessary for promotion or for setting up a business of his own. In larger firms, on the contrary, the gap between the shop floor and the higher echelons of management was often so great that it was difficult for employees to bridge it. The opportunities to show or develop leadership skills were few, and there was far less concern for the laborer’s potential. The complete standardization of the production process under scientific management only aggravated these problems. Although its effects did not show immediately, the strict adherence to a combination of tasks and instruction cards eventually eliminated anything but the willingness of the worker to obey orders. Pigou claimed that “by the removal of opportunities for the exercise of initiative, capacity for initiative may be destroyed, and the quality of the laboring force may in this way be subtly lowered” (1921, 188)\textsuperscript{20}.

Pigou’s comment regarding the potential decrease in the quality of
laborers shows that the worries of Marshall and Pigou went well beyond the complaint that, under scientific management, the worker was not treated as a full-fledged human being. Indeed, they insisted that the innovation of industrial techniques and working methods often came from bottom-up initiatives and not (only) from above. This meant that organizations could flourish with employees who were endowed with higher capacities, such as leadership skills. Furthermore, they claimed that the concentration of economic activity and the high degree of standardization also affected the ability of large firms to adjust to changes in the economic environment. In the long run, the decline in elasticity of such firms vis-à-vis the exogenous changes in the economy hindered their ability to adapt to new circumstances. These concerns regarding the consequences of scientific management were thus inspired by a more comprehensive perspective on the requirements of a dynamic economy. The increase in scale and the standardization that were fostered by scientific managerial practices were mixed blessings, in light of the fact that economic progress depended on the creative capacities of individuals and the flexibility of organizations (Caldari 2007, 68–72).

The emphasis on the worker characteristics that were necessary for firms to thrive marks a first difference between the perspectives of the interwar economists and the mechanical engineers. The second issue the economists put forward was linked to the materialist assumption that underpinned the debate over wage incentive systems. Was the engineers’ conception of human motivation broad enough to cover the motives people actually had? When earlier economists discussed the motivation to work, they usually stressed the longing for money and material welfare. For what was labor if not a commodity exchanged for a wage on the market? In the nineteenth century, political economist Nassau William Senior regarded the desire “to obtain additional wealth with as little sacrifice as possible” as an “ultimate fact beyond which reasoning cannot go” (as cited in Douglas 1924, 153). He subsequently made this proposition “the cornerstone of the doctrine of wages and profit” (as cited in Douglas 1924, 153). Similarly, British economist John Neville Keynes (father of John Maynard Keynes, the namesake of Keynesian economics) was convinced that economists of the twentieth century should stick to pecuniary motives as the sole governor of man. When it came to labor and its reward, Keynes claimed that there was no need to complicate the image of the worker (Douglas 1924, 154).

In response to this conviction, shared by the proponents of scientific management, several economists challenged the view that work was a burden that people tried to avoid as much as possible. Wesley Mitchell, for one, thought of the
production process as a “set of human activities in which the workers are being cramped or being developed” (1924, 33). For Mitchell, the true interest of the laborer was not restricted to the wage received; he also cared for the attractiveness of his work and wanted to “share in the management of industry to secure satisfactory working conditions, and to gratify his craving for power” (1924, 32). Another institutional economist, John Maurice Clark, further elaborated the idea that the quality of work was at least as important an issue for workers as their wage. In an elaborate study of the value of labor, Clark extended the discussion on worker motivation toward the issue of a suitable ethics for contemporary society. The preceding and outdated “hedonistic ethics” had considered the passive reception of pleasurable sensations to be the individual’s ultimate goal. Instead, in a “more modern ethics”, the “well rounded development and use of human faculties” became the highest purpose of mankind (Clark 1924, 89). Again, the transformation from the ethics of pleasure to that of personal growth put the worker’s quest for an interesting and satisfying job center stage. Philip Sargent Florence, a third economist concerned with employee motivation, lamented the fact that in the current industrial setting, the diversity of motives people have for working was being made subservient to one specific motive. In his view this was detrimental because “the so-called economic motive is not the only incentive to work and deficiency in output may be the manifestation of that lack of non-financial incentive in modern industry to which attention has already been called” (Florence 1924, 257). Florence also claimed that the social environment of modern industry was hostile to everything but remuneration as an incentive for production. The cash nexus predominated and with the exclusion of other motives—such as the sense of responsibility, the quest for fame and the pleasure in the activity itself—the laborer was made into a “thorough economic man” (1924, 73–74).

The third and final difference between the economists and the mechanical engineers concerned the nature of industrial government. On the basis of their reflections on the motives to work, interwar economists were convinced that “the search for new incentives must focus on other things than wage scales” (Clark 1924, 89)\(^2\). Material reward was no longer considered to be the prime inducement for giving one’s best; therefore, management should look for a different kind of incentive for the industrial worker. In the search for a new management style, economists explored a range of nonmonetary incentives\(^2\). The first step in that direction was a better understanding of the actual conditions in industry: “It is becoming increasingly plain that the actual ‘factory condition’ of the worker—the extent to
which a given degree of physical strength and skill and effort translates itself into terms of effective output—depends far more on other factors than on the rate of wages” (Robertson 1921, 244). The translation from the effort of workers to the actual output delivered was mediated by both physical and psychological factors. Examples of physical conditions in the factory included the type of lighting and the frequency of breaks, whereas the psychological makeup of factory life included the organization of rhythm and routine as well as the mood of the foremen responsible for instructing and supervising the workforce (Robertson 1921, 244).

These conditions were the subject of Florence’s *Economics of Fatigue and Unrest* (1924) in which he developed a model for the relations between various industrial and non-industrial conditions on the one hand and a series of variations in the cost of production on the other. In this model, he placed incentives in the category of “physical and social working environment” (1924, 113–115). The first thing Florence noted was the sheer lack of data available in the existing literature for assessing the relative merits of rival wage incentive systems. In textbooks on management and personnel administration, different wage methods were described in detail, yet it was extremely difficult to determine the success of each in increasing productivity “because there [was] little in the way of published statistics to establish the differential effect of the various incentives” (Florence 1924, 253). This lacuna in the available empirical evidence on incentives allowed for a broader view of motivation. Indeed, Florence added several examples in which noneconomic incentives affected the productivity of workers. In a British steel factory, for instance, workers were offered a series of lectures on steel production and invited to join the discussion over more efficient working methods, while an American company organized guided tours through the plant for all employees and their relatives. In both cases, the attempts to interest the workers in the entire production process led to significant increases in output (Florence 1924, 258).

Although Robertson and Florence called attention to the fact that people respond to different kinds of incentives, the question of management in light of the nonmaterialistic motives of the workers was most extensively addressed by John R. Commons, one of the most well-known institutional economists of the interwar period. Commons visited a number of factories in Philadelphia with a small team of researchers around 1920. One of these factories was part of the Link-Belt Company, which was among the first of the firms to hire Frederick Taylor as a consultant and, consequently, to introduce scientific management. According to Commons, one could discern a considerable shift in attention twenty years after Taylor had set foot there. Over time, executives had become aware of the human factor, as was
corroborated by the “conscious development from pure scientific management to humanism in management; from figures to feelings as the instrument of control” (Commons 1921, 26). The transformation was most visible in the appointment of a superintendent who was endowed with “evident human sympathy”. He called the workers by their first names but was also capable of correcting a worker if circumstances required him to do so. The result of appointing an expert in handling people proved highly beneficial to the company: “And the result? Over eight hundred workers steadily on the job—at increased wages to be sure—but also with increased output. The turnover is low” (Commons 1921, 31). From success stories such as these, Commons and colleagues generalized to the nature of the industrial worker and the type of government that would best suit that nature. The worker was a human being with “likes and dislikes, sensitive or dull, generous or selfish, open-minded or prejudiced, any number of combinations and variations of these and other qualities—he is governed by emotions” (Commons 1921, 286).

From the observation that the workers were governed by emotions, it was a small step to the idea that these emotions were central to their government. Managerial incentives would be effective only if they addressed the feelings of the worker in exactly the right way: “It is necessary then to use the various inducements as approaches to emotions, or motives. Motives are the handles by which men may be taken hold of and guided” (Commons 1921, 292). The professional group most in need of a thorough understanding of these motivational ‘handles’ was that of the foremen. They stood in direct contact with the workers and, given their general lack of patience and tolerance, needed to be reeducated. Therefore, under the guidance of the superintendent, all foremen were required to participate in meetings where they could discuss the difficult situations they encountered on the shop floor. With the help of this “committee method”, they became better qualified to guide their workers properly. The conversation with colleagues over management problems thus enabled each foreman to become a “human nature expert” instead of a driver of men (Commons 1921, 307).

### 4.2 Human relations in industry

The main contribution of the interwar economists to the formation of a new governmentality can be found in their suggestion that the worker was a more complex figure than the engineers imagined him to be:
As an engineering proposition there is no question of the success of scientific management. [...] But beyond this its claims are either outside the ken of science or have not a sufficiently scientific foundation. The economic world and the human factor are more complex than is dreamt of in the philosophy of scientific management. (Florence 1924, 95)

In the wage incentive system developed by Taylor and others there was no place for the ‘human factor’ in industry. Despite the subtlety and reach of their criticism, the neoclassical and institutional economists who problematized the perspective of mechanical engineers on industrial organization and individual motivation left two major governmental issues unaddressed. First, their attempts to endow the worker with new characteristics were still rudimentary, as evidenced by the lack of detail with which they delimited human subjectivity. Saying that there are sensitive and dull workers or open-minded and prejudiced workers is not the same as developing a detailed categorization of employees. Moreover, the interwar economists failed to articulate a concrete program for handling the ‘new’ worker. That is to say, they were unable to translate their problematization of the engineering of incentives into an alternative method to induce individuals and groups. Even the most explicit account of industrial government by Commons and coauthors failed to make concrete what properly educated foremen should do when confronted with the emotions of workers. How could they use motives as the handles to guide workers or target feelings as the instrument of control? The elaboration on the human factor in industry was not yet connected to a set of new techniques of power.

This is not to say that the economists’ criticisms of the engineering of incentives had no effect; however, their contribution to a full rationalization of industrial government was actually mediated by another group of researchers who were working more closely with industry. At the time, there was a lively exchange of ideas between labor economists and management theorists and practitioners. Thus, knowledge from the field entered economic theorizing. Robert Wolf’s papers on nonfinancial incentives, for instance, were well received by those who studied organization from an economic perspective. Economists also paid tribute to the progressive management practices of Henry Dennison, owner and manager of the Dennison Manufacture Company (Bruce 2007, 404). Likewise, the ideas of labor economists such as Commons and Douglas found their way into management theory and practice (Kaufman 2002, 966–967). Given this intellectual exchange between economics and the science of management, it comes as no surprise that
the allegation of neglecting ‘the human factor’ found its way into management circles. More so than academic economists, management theorists set out to turn this criticism of the engineering of incentives into an alternative set of techniques that could be used to transform the habits of the workers and foremen. Moreover, these techniques of power were informed by—and resulted in—more fine-grained characterizations and categorizations of the worker’s subjectivity.

One particular research network stands out in the formation of an incentive system with a human touch. The members of this network combined training in the social and behavioral sciences with positions in academic and business communities. One of the central nodes in this network was the Australian psychologist Elton Mayo. Mayo was hired as a professor of industrial research by the Harvard Business School (HBS) in the mid-1920s. At that time, the position of the HBS was fragile because it had yet to secure scientific legitimacy and financial support. Thus, there was considerable hesitancy in the academic and business worlds as to its usefulness. Was it really possible to acquire entrepreneurial skills in the classroom? Wallace Donham, second dean of the HBS, faced the difficult tasks of turning the business school into an obligatory rite de passage for the future executive elite, while also making it an academically respected institution. One of his strategies was to hire personnel with credentials that could appeal to both audiences and Elton Mayo was considered an ideal candidate. He was trained in psychology and psychoanalysis and was also versed in the recent sociological and anthropological work of the period. In addition, a decade earlier he had switched from psychological experiments with traumatized soldiers of the First World War to researching problems of industrial society. Therefore, Mayo had academic credentials but also addressed problems that were of interest to the business community (O’Conner 1999, 121–123).

Mayo came to Harvard with a distinct perspective on the human psyche. He was deeply convinced that subconscious instincts and dispositions were more important determinants of human behavior than were conscious deliberations. This conviction was evident in his study of what Mayo regarded as the most pressing problem of Western civilization: the returning discontent among the working classes over contemporary labor conditions. According to Mayo, industrial unrest was caused not so much by class conflicts or the nature of industrial work but by “the hidden fires of mental uncontrol” (as cited in O’Connor 1999, 126). His psychopathological take on labor problems was most explicit in an early paper on labor leaders. In “The Mind of the Agitator”, Mayo portrayed the unruly laborers—and particularly those taking the lead—as disturbed individuals who projected
their inner turmoil on the political and industrial world. To prevent this mental
disorder from becoming a political problem, it was of the utmost importance
to channel the anger of the workers and their leaders. Because the problem of
discontent was a psychological one, so was the solution. Only when industrial
managers behaved like a therapist toward their workers would the workers’ rage
really cool down. Mayo found evidence for the effectiveness of such a therapeutic
management style in the results of the Hawthorne experiments. In the mid-1920s
executives of Western Electric decided to start a series of experiments at the
Hawthorne Works in Cicero, Illinois. The purpose of these experiments was to
investigate the correlation between industrial conditions and worker productivity.
Although Mayo’s name is now intimately connected to the Hawthorne experiments,
he operated from a distance and was never directly involved in conducting them.
But even though he did not participate in the daily experimental routine, Mayo
did play a very important role in shaping the interpretation of the results. Three
things attest to his influence.

After research had been underway for four years, the experimenters began
to struggle with the sheer amount and complexity of the data. Mayo was invited
as an academic consultant to see whether he could reach any coherent conclusions
on the basis of the results (Gillespie 1993, 69–74). From then on, he remained
in close contact with the Hawthorne researchers. He sent Fritz Roethlisberger,
his assistant at the Harvard Business School, to Hawthorne in 1930. It was
Roethlisberger’s job to introduce the psychological perspective of workers into
the large-scale interview program developed there. Anthropologist William Lloyd
Warner, another Harvard colleague, was made responsible for the ethnographic
research on the social norms maintained by the operators on the shop floor. Lastly,
William Dickson, a full-time Hawthorne employee in the Industrial Research
Division, was invited to work on articles and books at Harvard (Gillespie 1993,
137).

Mayo and coworkers were thus influential in steering the research at
Hawthorne in new directions, but they also contributed to an authoritative
interpretation of the experimental results. In the years after the experiments
had ended, Mayo and his collaborators came to the conclusion that the research
conducted at Hawthorne showed that the general rise seen in productivity was
due mainly to the gentle relations between the experimenters and their subjects.
They determined that what mattered most was the attention given to the workers
and the interest shown in their daily activities. This insight into the importance of
human relations in industry became the house doctrine in subsequent textbooks.
of industrial management. Managers should be on good relations with their subordinates in order to attain higher levels of productivity and a harmonious atmosphere at the shop floor (Gillespie 1993, 90–91).

With the central doctrine of what became known as the Human Relations School formed, the Hawthorne researchers focused on spreading the gospel. Their positions at the HBS enabled them to disseminate their ideas to the business community through writings and speeches. Via a number of management books that were written by Mayo and other members of his research network, their interpretation of the Hawthorne experiments found its way to a much wider audience. Each of these books had a different outlook and purpose. At one extreme, Mayo published the most accessible and speculative account of the Hawthorne experiments in *The Human Problems of an Industrial Civilization* (1933). In this book he moves from a description of the experiments to social disintegration and juvenile delinquency as major problems of an industrial society to the role of elites in restoring social equilibrium. At the other extreme, Thomas North Whitehead published the most dry and technical expose of the experimental results. In two thick volumes titled *The Industrial Worker* (1938), Whitehead buried his readers under statistical analyses of the correlations between changes in the experimental variables and changes in output. The subsequent years saw the publication of several major management textbooks with a comprehensive account of the experiments and the way managers should behave. These ranged from Roethlisberger and Dickson’s classic, *Management and the Worker* (1939) and Gardner and Moore’s *Human Relation in Industry* (1945) to Hoslett’s volume on *Human Factors in Management* (1946), which included contributions from many of the key Hawthorne figures (Gillespie 1993, 175–209).

Verbal communication was just as important for spreading the word as were these official writings. The research at HBS was communicated directly to the business community via meetings where upcoming business leaders exchanged ideas with members from Mayo’s network. In these monthly “Cabot weekends”, organized by Mayo’s colleague Philip Cabot over a period of six years, young executives would meet with Mayo, Roethlisberger or Whitehead to discuss possible managerial solutions to current industrial problems (Bruce and Nyland 2011, 399–400). Chester Barnard—a close friend of Donham and Cabot—attended one such meeting and was immediately enthusiastic about the research conducted at Hawthorne (Hoopes 2002, 1013). Barnard’s profile resembled that of Frederick Taylor in combining a long career in business with the publication of systematic reflections on management practices: He was president of the
New Jersey Bell Telephone Company between 1927 and 1948 and published *The Functions of the Executive* in 1938. Yet the conclusions reached by Barnard differed considerably from those reached by Taylor. The disparity was due not just to the difference in practical experience but also to a distinct intellectual profile. As an amateur scholar, Barnard read widely—if somewhat haphazardly—in the social sciences. From this eclectic social scientific background, Barnard set himself the task of analyzing the formal organization as a complex system of cooperative and goal-oriented individuals. From Barnard’s point of view, an organization was akin to an organism engaged in a struggle to survive in a “continuously fluctuating environment of physical, biological, and social materials, elements, and forces, which calls for readjustment of processes internal to organization”. The basic function of the executive of a large-scale company, a government agency or a church was to adapt to these environmental changes so as to ensure the “survival of cooperation” (Barnard 1968, 6–7). To maintain a healthy and flexible relationship with the surrounding environment, it was crucial to keep a balanced internal milieu. That is where incentives came in. The executive had to afford adequate inducements for employees to cooperate with one another in pursuit of a common goal, otherwise the organization would eventually fall apart. Successful organizations would always find a way to adjust to new conditions. This process of readjustment, in turn, would succeed only if the individual employees were properly adjusted to the organization. Just like the organization had to adapt to external circumstances, so the individual factory worker had to find a balance between his inner struggles and the requirements that came from without.

In more abstract and evolutionary language, Barnard addressed the topic of worker adjustment, which was also central to the more down-to-earth industrial research discussed in subsequent three sections:

Adjustment, that is to say, required the successful resolution of conflicting instinctual forces and their harnessing to the particular requirements of social and industrial life. And the corollary was that social and industrial inefficiency and unhappiness were the outcomes of failures of adjustment of the internal life of the individual to the external reality in which he or she lived and worked — in short, they were the outcome of maladjustment (Rose 1999, 68).

This new theme led to questions not previously addressed by management experts: What if the workers’ current lack of motivation and contentment had to do with their chronic maladjustment to the conditions of modern industry?
What if the adjustment of the individuals to the organization not only increased their contentment but also their output levels? Thus the industrial researchers translated the general problem of internal and external (mal)adjustment into specific questions that could be answered with the help of interviews and experiments. The research results could then be used to build up a new repertoire of skills that would be indispensable to contemporary management. According to Roethlisberger, “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 organizations a skill in human relations comparable to the skill which they introduce when they hire an engineer” (1949, 115). Whether intended or not, Roethlisberger’s implicit message to corporate management was to not hire engineers for questions they were incapable of answering. The expertise in human relations was to be found elsewhere. Human relations experts could acquire managerial skills with the help of the research on incentives that was taking place on the shop floors of several industrial firms. At these research sites industrial psychologists, organizational sociologists and anthropologists of work endowed the worker with new character traits. These features then found their way into new types of managerial intervention. First, the social and behavioral scientists stressed the importance of mental attitudes on the work floor. They created categorizations of worker mentality that were accompanied by elaborations on the suitable techniques for changing that mentality. Second, they brought small-group dynamics to the fore as a novel object of knowledge. Ethnographic research revealed that workers had their own cultures and fixed role patterns. Once again, these insights into the social relations between the workers came with new instruments for changing workers’ social interactions. Scientific inquiry led, finally, to the issue of communication between management and workers. Some of the problems in industry were a product of malfunctioning communicative practices. Therefore, improving the channels of communication could help to prevent the emergence of complaints and grievances that often resulted from misunderstandings. Worker maladjustment was the common denominator of these three elements of industrial research and action. If management were able to adjust the workers more fully to their work environment, it would increase worker contentment while simultaneously bringing about a significant increase in output. Adjustment thereby became a new incentive for use in the enhancement of human productivity.
4.3 **Addressing the mind of the worker**

Elton Mayo’s engagement with industrial research did not start with the Hawthorne experiments. Already in 1923, a large Philadelphia-based textile company hired him as a management consultant to find a solution for its high labor turnover. The spinning department was particularly problematic in this regard as workers left en masse after short periods of time. Although the nature of the problem was as yet unclear, Mayo could exclude the hypothesis that the absence of a wage incentive system was to blame. The spinners received a fixed monthly wage and could earn a group bonus when they produced 75 percent or more of the 100 percent man-hour efficiency established by management. When the level of efficiency rose above 80 percent, the bonus was even a full 5 percent of their fixed wage. Out of the four financial incentive schemes that were used at the factory, this one “‘worked’ satisfactorily elsewhere in the factory but failed completely in the spinning department” (Mayo 1946 [1933], 43). Despite the fact that the incentive system had been in operation for quite a while, the group had never managed to reach even the lowest efficiency level needed for a bonus. Their failing to do so, however, did not induce the spinners to speed up. Instead, it led them to accuse management of setting the standard so high that it was impossible to meet. This suspicion on the part of the workers vis-à-vis management “increased rather than diminished their irritation” (Mayo 1946, 44). Mayo’s hypothesis was that the workers’ irritation was the effect of a broader state of mind of the group in question. To determine whether his hypothesis was correct, Mayo appointed a nurse who was to look after the thoughts and feelings of the spinners. After she had won their confidence, the nurse found that “the reflections or reveries of the workers in the spinning department were uniformly pessimistic” and that they even suffered from “morbid preoccupations” (Mayo 1946, 45).

The inquiry at the spinning department not only provided Mayo with detailed information about the mental state of the workers but also gave him insight into the effects of their friendly conversations with the nurse. It seemed that the personal attention she gave them had helped to decrease their irritation. As a result of ‘counseling’ the emotions of the workers, the initial grievances with regard to management had disappeared and “the problem of an emotional labor turnover ceased to exist” (Mayo 1946, 48). This in turn had its effect on the way the group responded to the bonus they had always considered beyond their reach: “Whereas the financial incentive of the bonus had not previously operated to stimulate production, the men now began to be pleased by the fact that they
were working less time, earning bonuses as never before and feeling less tired and irritated” (Mayo 1946, 48). Indeed, figure 5 shows that the spinners failed to earn their bonus only once during the two years of Mayo’s presence as a consultant. Although he did not label the whole of the spinning department as ‘mentally disturbed’—as he had done with the labor leaders—the terms with which Mayo defined the mood of the spinners still reveals his disciplinary background: ‘irritation’, ‘pessimistic reveries’ and ‘morbid preoccupations’ are all terms with profound psychopathological connotations. And indeed, Mayo called upon Pierre Janet’s inquiry into obsessive thinking and Sigmund Freud’s theory of neurosis and repression in later chapters to give a scientific underpinning to his analysis (Mayo 1946, 103–109, 125–128).

The second major opportunity for Mayo to corroborate his hypothesis about the importance of workers’ attitudes arose at the end of the 1920s. This time it was the experimental setting at Hawthorne that enabled him to assess the effects of human relations on worker morale and productivity. Five female laborers were selected from the Relay Assembly Department of the Hawthorne factory and set apart from the rest of the laborers working there. In subsequent experimental periods, spanning nine years in total, the working conditions of these relay assemblers were changed so as to measure the effect on their daily output. The experiment started with a number of independent variables, such as levels of

![Figure 5. The man-hour-production efficiency of spinners over a twenty-three month period, showing spinners earned their bonus in all but one month (from Mayo 1946, 51).](image-url)
lighting and the length and frequency of breaks—the physical factors, mentioned earlier, that had been identified by economist Dennis Robertson. In the third period the experimenters introduced a monetary incentive—a piece wage for group production so that “each girl was given a strong, though indirect, interest in the achievement of the group” (Mayo 1946, 58). The result of this intervention was a slight increase in output, but this positive result did not convince Mayo of the beneficial effects of monetary incentives. Instead, he agreed with the conclusions of a researcher who was closely involved in the actual experiment and who “considers that the payment incentive of the higher group earnings may play some small part, but proceeds to state his conviction that the results are mainly due to the changes in mental attitude” (Mayo 1946, 67). The superficial correlation between wage incentive and higher output could thus be explained by a more fundamental transformation in the mentality of the worker that was fostered by the experimental setting. Similarly, the emergence and subsequent stability of this mental attitude explained why the output levels first increased and then remained quite constant during the rest of the experiment (see figure 6). Mayo then presents the reader with an analogy from top-class sports to account for this phenomenon. Just as continuous, heavy training makes for the better condition of an athlete as compared to the condition of an ordinary person—creating a new physical equilibrium that is not easily disturbed—the women in the test room first had to adapt to the new circumstances. They then attained a stable mental equilibrium that enabled them to perform at a much higher level than the ordinary workers of the Relay Assembly Department. In light of this explanation, the whole nature of the Hawthorne experiment thus had to be restated: “The Western Electric experiment was primarily directed not to the external conditions 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 conditions” (Mayo 1946, 72). The thing that mattered most in the attainment of the new mental state was the friendly supervision in the test room. The supervisors approached the five relay assemblers in an open and relaxed way, and that was the decisive factor in the establishment of an environment in which they could feel mentally at ease. The psychological effects of establishing such a friendly and open relationship between worker and manager in the relay assembly test room were great: “comment after comment from the girls indicates that they have been relieved of the nervous tensions under which they previously worked” (Mayo 1946, 74–75).

Of course, it was impossible to extend the full experimental treatment these five women received to whole departments. Yet it was possible to develop a supervisory style on the basis of the experimental findings—a style that allowed individual employees an outlet for the ‘nervous tensions’ that hampered their job performance and satisfaction. For only when a worker was able to talk freely with a supervisor could she learn to cope with problems experienced at home or at work. The interview program at Hawthorne provided an excellent opportunity to test the effectiveness of a conversational technique in substituting ‘tension’ for ‘relief’. In 1928, the executive office asked the personnel department to find out how employees experienced their job and labor conditions and the way they were supervised. In the first phase of the program, researchers conducted directed interviews. William Dickson, who was there from the start, questioned workers on a limited number of previously selected subjects. In just two years, more than twenty thousand employees were interviewed (Mayo 1946, 83). As it turned out, however, it was quite difficult to get the worker to stick to the topics on the list. According to Mayo, this difficulty pointed to a basic flaw in the method of interviewing. The whole idea that you could learn something about the organization via the opinion of workers was deeply problematic. As a psychologist by training, Mayo explained that “what a worker thinks on a given subject is a symptom of what he is; his ideas cannot be torn out of their personal context and exhibited as significant” (Mayo 1946, 84). When workers responded to questions about industrial conditions, the answer was more an indication of their own (lack of) well-being than that it was indicative of those conditions themselves. Therefore, the interview could only become a valuable managerial technique if employees were allowed to discuss topics that were important to them. With Mayo’s therapeutic twist the interview program became more open to the concerns workers themselves brought to the fore. The worker could now talk freely about his or her own anxieties and
Mayo’s approach to the mentality of industrial workers was embraced by British industrial researchers. In 1929, the President of the Rowntree factory of the Cocoa Works in York appointed a committee with members from different departments. Their assignment was to study how the cooperative spirit in the factory could be further enhanced. The study was conducted by Patricia Hall, from the Psychological Department, and H.W. Locke, head of the Education Section and was based on a series of interviews with factory workers. According to the researchers, the non-directed interview would encourage the worker to talk about the things that were on his or her mind. With over a thousand men and women interviewed—often more than once—the members of the committee could detect recurring grievances and maladjustments. While conducting the interviews, they discovered a plethora of factors that affected the job satisfaction of the workers. Whether they were content with their jobs depended on the training they had received and the creative opportunities it offered as well as their sense of job security and their fear of ill-health and accidents. Their attitudes toward work, especially toward changes in the work conditions, were also found to depend on the age of the worker. There was a clear difference in attitude between younger and older workers, for instance, with regard to the launching of new incentive schemes on the work floor: “the older workers disliked the introduction of incentives involving competition” and were “amused at the type of incentive employed successfully with the juniors” (Hall and Locke 1938, 67).

Hall and Locke favored the non-directed interview as the most suitable method for industrial research. Yet the spontaneity in the choice of conversational subject allowed for in their study of a British factory was beneficial in another sense. Because the employee could decide what to talk about, the issues raised were important to them and, as Hall and Locke describe, the “discussion of it affords him some emotional release, and he often feels glad, as he puts it, ‘to get the matter of his chest’” (1938, 28–29). In a successful interview an employee would learn something about himself and the relief felt would change his attitude toward work and increase his attachment to the organization and its purpose. The continuous malcontent among two groups of women working in the same department provided an excellent case in point. After a while “the workers had grown tired of suppressing their irritation, and, ready for a grievance, found one...
in the temperature of the room”. The supervisor knew that the room temperature was not the real problem and, by listening carefully and sympathetically to the women, managed to calm them down. By being attentive, the supervisor signaled to the workers “that he [shared] their anxiety, and this relieve[d] the tension” (1938, 79–80). The immediate effect of the interview was positive for the worker, but the interviewer also helped to prevent future troubles for the organization as the worker was given “an opportunity of discovering, perhaps with the help of the interviewer, the true causes of his dissatisfaction which, so long as it is suppressed, tends to become a chronic grievance” (1938, 29)\(^28\). However, there may be instances in which this time-consuming attentiveness is ineffective because of a lack of positive response on the part the worker. When this was the case, Hall and Locke insist, there may be no other option but to fall back on a more unpleasant inducement:

Although the employment of an incentive which appeals to fear is not usually good policy, occasions do arise when a supervisor is justified in using it to discipline a certain type of worker. Certain offences against Works’ rules are punishable by the withdrawal of small privileges. The threat of dismissal may be necessary in the case of continued lateness, bad work or unsatisfactory conduct (1938, 103).

Though a friendly and attentive method to incentivize workers was preferable, the manager or foreman would have to resort to more intimidating measures if the circumstances required him to do so. With too many chronically maladjusted workers, the shop floor would simply become unmanageable.

### 4.4 Toward a Technique of the Social

As an offspring of the experiment with the relay assemblers, the Research Division at Hawthorne started a new project that was supervised by William Lloyd Warner. As an anthropologist Warner was used to working with direct observation and loose conversation as ways to record the social relations in a cultural milieu that was not his own. For the study of workplace culture along anthropological lines, a small group of male operators and a foreman from the bank wiring department were selected and placed apart from the rest of the operators. To simulate a natural industrial setting, the only major intervention was the presence of an observer
and an interviewer, Art Moore and William Dickson, respectively (Gillespie 1993, 160). The bank wirers worked under a so-called bogey system in which wages were dependent on the extent to which the group managed to approach a given standard of output or ‘bogey’. Similar to the Philadelphia spinners, this system failed to motivate the operators, and production always fell short of the standard. The researchers found that “for the majority of the workers in this department the bogey meant nothing” (Roethlisberger and Dickson 1934, 8). They did not consider the bogey to be a standard they should meet and instead strove to reach a lower level of output based on what they conceived of as a fair day’s work. If an individual seemed to transgress the group’s own standard of performance, he was pressed by his colleagues to abide by the norm with the help of sarcastic remarks, nicknames and severe blows to the upper arm (Roethlisberger and Dickson 1934, 9). Ironically, the practice of publicly displaying the performance of individual workers to everyone concerned, Dickson found, helped the group to keep their norm intact: “The ostensible purpose of these charts is to foster competition. As a matter of fact they serve a further function. They inform everyone where each person stands in relation to everyone else and if anyone is out of line he can be checked by the group” (as cited in Gillespie 1993, 164). The existing differences in output between workers were not related to innate abilities or ambitions but to their position in the group. A particularly fast or slow worker was one who did not play along with group rules and was considered a social outcast by the other workers. Dickson concluded that actual production levels were thus dependent on the social behavior of workers rather than on individual effort. In *Management and the Worker* (1939), Dickson and Roethlisberger visualized the social relationships that existed between the bank wirers. In different sociograms, they made clear who played cards with whom, who became close friends and what cliques developed over time.

In the long run, such social norms could only be maintained if the workers shielded them from management. In fear of a future increase in the bogey, the group opted for constant output as a signal that they worked at maximum speed. There were several strategies to keep output levels constant over time. One such strategy had to do with an option explicitly held open by management. Employees were allowed to call for ‘day work’ when unforeseen circumstances beyond the workers’ control had made it impossible to reach the daily target. But these circumstances were pliable and workers also called for day work when not strictly necessary. In that way they could keep particularly unproductive days out of the record. A second strategy was to report a different output to the foreman than
was actually produced. In this way, it was possible to spread the actual production over different days and compensate a productive day with an easygoing pace the next day. On the basis of the observations of and interviews with the bank wirers, Dickson concluded that the faith of management in the current wage incentive system was without foundation:

Given the basic attitudes of this group, it is doubtful if any form of incentive could have succeeded. Wage plans assume that the worker is primarily motivated by economic interest and that he will act in a logical way. This study shows that social considerations outweighed economic ones and that their actions were essentially non-logical (1935, 330).

The bogey system had failed to trigger the right response from individual workers. The reason for this failure was that, although targeted at individuals, the incentive system met with the behavioral norms of a group that had distinct ways of maintaining these norms.

If the dissatisfaction of the worker was due to the fact that he could not meet the “social requirements of the job” and that he found it difficult to “adjust himself to the group”, then the worker’s mental health was not the prime object to be targeted (Roethlisberger 1949, 120). Therefore, along with an individual technique of counseling workers via therapeutic interviews, the process of adjustment also had to be advanced on a social plane. With the relationship between the individual and the group as the focal point of management action, the key purpose became that of substituting cooperation for conflict on the work floor. How could one foster collaboration within the group and avoid industrial disharmony? Though management might read the inquiry into the norms and strategies of the bank wirers as a direct invitation to intervene, Roethlisberger and Dickson, suggest that their findings with regard to worker morale should primarily play a cautionary role in the development of management strategy. The results of the Hawthorne experiment and the bank wiring test room were a reminder for managers to take the human group seriously when making strategic plans for the future of the company: “Successful management of any human enterprise depends largely on the ability to introduce more efficient methods without disrupting in the process the social foundations on which collaboration is based” (1934, 17). Once it is established, the social structure that fosters cooperation within an organization is relatively robust such that “if, in general, changes are not too rapid, the equilibrium remains fairly stable”. Of course, no firm can promise its employees that it will
abstain from (large-scale) reorganizations, but management can slow the pace of organizational changes and, by avoiding brusque ruptures in personnel and work methods, prevent the occurrence of “serious dislocation” in the social structure (Roethlisberger 1949, 125).

Obviously, the managerial strategy of avoiding such dislocation was feasible only if collaboration was the rule in the factory. A cautionary approach was clearly insufficient when there were many conflicts between workers. Even more, the executive who was either ignorant of the petty conflicts between his employees or was unwilling to intervene would, in the end, face the consequences of his inaction, for “their bickering and quarrelling, though over small things, will reduce both their efficiency and their contentment” (Hall and Locke 1938, 86–87). In a section on “the make-up of the working group”, Hall and Locke therefore developed a more interventionist strategy for coping with groups of rank-and-file workers with “long-standing hatreds and antipathies between individuals”. On the basis of their research into the contentment of workers and the incentives that made them either cooperate or fight with one another, Hall and Locke concluded that the vast majority of workers were in fact quite happy with their jobs. However, a small minority were not, and the social malaise was often caused by this small subset of the total population of workers: “Indeed, the presence of even one difficult worker in a section is like a piece of grit in an engine bearing, which not only increases the wear and tear of the engine itself, but also causes a waste of power through unnecessary friction” (Hall and Locke 138, 147). The interviews made the researchers sensitive as to the different types of discontented workers. In fact, they developed a complete new categorization of the difficult worker on the basis of these conversations. Some workers were full of anger toward the others because these angry workers belonged to the group of “chronic failures” or “grudge bearers”; others, such as the “day-dreamer” or “melancholic” worker, suffered from a milder form of mental distortion. And there were complex figures such as the “thwarted would-be leader” and the “older unmarried woman, not happy with her work” (1938, 149–160). Such categorizations could be helpful for managers and foremen because the lack of cooperative spirit in their department was often caused by the attitudes and behaviors of these difficult workers. When there was indeed a small group of individuals who caused havoc, then that “die-hard group would probably have to be gradually broken up by a peaceful method, such as transfer” (1938, 50). In fact, a similar peaceful method of transfer had already been tried in the Hawthorne experiments wherein the creation of a new mental attitude among the five female relay assemblers was explained by the presence
of attentive supervisors. Yet the creation of such a pleasant and productive experimental setting did require some additional manipulation of the group. Two workers were permanently removed from the test room for being moody, engaging in disruptive talking and being uncooperative. This occurred after the experiment had been underway for some years. The workers that replaced them were among the fastest in the relay assembly department, and by now the threat of removal had become very real for the remaining three original workers (Gillespie 1993, 61–63). All in all, techniques of cautionary transformation could assist management in determining the pace of organizational change; while techniques of targeted social intervention could help managers in dealing with several kinds of socially maladjusted individuals.

4.5 Two ways to foster industrial communication

Where the relation of the worker toward himself was the objective of the first technique of adjustment, the second technique sought to foster good relations between the workers. Yet both left the actual relationship between management and factory worker untouched. The third technique of governance, therefore, was concerned with the communication and goodwill between these two groups. But, how could management guarantee the continuous flow of information in both directions while at the same time ensuring that the distortion of information up and down the line was kept to a minimum (see figure 7)? According to Roethlisberger, it was time to find concrete ways of “specifying, diagnosing, and treating many blockages in the channels of communication” (1949, 130).

There were two rather different solutions to the problem of fostering the exchange of information. On the one hand, several management practitioners and theorists proposed a modest form of democracy in industry31. Industrial democracy had become a hot topic after the First World War (Meeker 1920; Dowd 1921; Derber 1967). The executive of the Cocoa Works, the factory studied

Figure 7. A schematic diagram showing the linear flow of information from the worker, up through the levels of management, and back down to the worker (Gardner and Moore 1950, 42).
by Hall and Locke, was highly sympathetic to the participation of employees in decision-making procedures. He encouraged his workers to join the labor union and was willing to negotiate with union representatives over wages and labor conditions (Hall and Locke 1938, 5–6). Within the factory, furthermore, he gave each department and section its own union representative. These shop stewards were expected to investigate any complaint or grievance brought forward by one of their fellow workers. In addition, the executive created Work Councils in which worker representatives and management officials met to discuss daily life at the factory. Based on the positive results obtained, Hall and Locke promoted the introduction of a system of representatives to the wider business community. They advised that by dividing the total labor force into smaller groups, each with its own representative who could negotiate with their manager, the strained relations between workers and management would disappear: they concluded that “this procedure was a distinct factor in bringing about the co-operation that was eventually established” during their study (Hall and Locke 1938, 88).

Contrary to many of his contemporaries, Mayo was highly skeptical about democracy, let alone industrial democracy. He despised any solution to the problems of modern industry that had even a slight democratic edge. How could the participation of the labor force in decision making contribute to dissolving the discontent of workers, if those easily agitated minds were now given even more room to vent their anger? Mayo thought the veritable solution was one of a technical, managerial kind. If the relations between labor and management were strained, they should be restored to their normal level by way of a paternalistic, yet gentle, management style. Thus, Mayo was a proponent of the industrial leader acting as therapist, one who would listen to the worker carefully, but only to place the vague utterances of the employee into his own analytic framework in order to make sense of them: “The illness metaphor is revealing of the medical and psychopathological model that was central to Mayo’s style of human relations; most workers were sick and could be made healthy only through the imposition of an understanding, paternalistic authority” (Gillespie 1993, 150). In opposition to those favoring industrial democracy, Mayo doubted whether workers were able to truly understand what would be in their own interest; he also doubted workers’ abilities to clearly articulate their complaints to the managers in charge. To Mayo, communication would become a difficult process without the mediation of a set of properly educated personnel counselors. The counselor was most able to tune in to a worker’s state of mind and understand the nature of his or her confused remarks about certain persons, events and situations. In addition, the counselor
could inform workers about policy changes, explaining what lay ahead without defending the decision made by management. As a neutral figure who was not responsible for the shifting policies, workers could still turn to the counselor with their own questions, complaints and grievances. In this way, the counselor could also function as the eyes and ears of management, keeping the executive office up-to-date with the mood on the shop floor. The conversations between the counselor and the workers would thus mediate the relations between management and worker.

4.6 Adjustment as incentive

In the previous sections we have seen that the mechanical engineers lost their monopoly on matters of industrial management in the 1920s and 1930s. At that time, social and behavioral scientists challenged the engineers’ authority as experts on worker motivation and productivity. They perceived the work of the American engineers as being based on a narrow conception of human behavior in and therefore sought to develop a new governmentality. In their rationalization of government, the worker was presented as a more complex human figure with characteristics not previously ascribed to it. In Foucauldian terms, the interwar economists, psychologists and anthropologists thereby contributed to the formation of the subject as an object of knowledge. In turn, their novel conception of the human subject led to new possibilities for inducing individuals and groups in industry. The set of techniques of power that emerged from their work redefined the role of the foreman and superintendent with regard to their subordinates.

The criticism of the engineering of incentives became an important theme in the work of British and American economists. They proposed an investigation of incentives beyond wage scales and looked for the presence of non-commercial or non-financial incentives based on something different than the cash-nexus. The reservations of these interwar economists regarding the broader effects of scientific management and their tentative remarks on the importance of human relations in industry were not lost on later management scientists. With their research practices firmly embedded in an industrial setting, Elton Mayo and coworkers set out to develop a radically different conception of worker subjectivity. Although the nature of the incentivizable subject changed with the appearance of social and behavioral scientists as authorities of delimitation, the place where
incentive-related problems appeared remained intact. The factory shop floor was still the primary research site in which to study the characteristics of the worker and to explore the efficacy of incentives in industry. The difference between the respective authorities discussed in chapter 3 and 4 lay not so much in the surface of emergence of the incentivizable subject. Instead, the schism between the mechanical engineers and the interwar social scientists was found in the way they studied the activity of the workers; the methods they thought adequate to reveal the characteristics of the operators; and the things that caught their attention while doing research.

With a background in economics, psychology, anthropology or sociology these new authorities had a rather different grid than did the engineers for the specification of what happened on the shop floor. These disciplinary grids of specification enabled them to delimit the subject that was susceptible to incentives in a new way. Their disciplinary background, for instance, led British neoclassical economists to place the organization in a much wider perspective than would a consulting engineer. Their belief in the interdependency of economic processes and organizational features made it possible to forge a link between task-related incentives and the employee characteristics that were necessary for long-term economic dynamics. Similarly, American institutional economists were notoriously averse to the predominant conception of the homo economicus in their own discipline. They were therefore inclined to set a broader range of human desires against the engineers’ conviction that the desire for material goods governed the behavior of individuals. By training, psychologists were equally predisposed to question the rationalist and materialist assumptions that underpinned the wage incentive systems developed by the engineers. They saw the operation of subconscious drives in the behavior of the worker and in the distortions of the human mind that came with modern industrial conditions. The anthropologists and sociologists, finally, challenged the conception of the working group as a set of individuals. They focused on social relationships on the work floor and tried to grasp the nature of workshop culture by ethnographic means. In one way or another, each of the social and behavioral scientists discussed above added distinct features to the subjectivity of the worker and thereby contributed to a new delimitation of the incentivizable subject. In the end, the worker was no longer a materialistic creature who responded to wage incentives in a mechanical way. Instead, he had become a figure with a mental and social life of his own; a figure, moreover, who could be maladjusted in a variety of ways.

The industrial research at Hawthorne and elsewhere brought a set of
considerations to the fore that were absent from the perspective of mechanical engineers. Even though wage incentives did not disappear as a method to increase production, their efficacy was now shown to depend on a range of mental, social and communicative conditions that should first be met. Moreover, because adjustment was conceived as an incentive in itself, the inquiries discussed in this chapter led to a new set of *techniques of power*. The multifaceted adjustment of those working on the shop floor was more important than methods of remuneration in yielding a contented workforce. Employee contentment, however, was no goal in itself. It was a means to achieve what wage incentives were expected to do before—namely, to increase the overall productivity of the workers.

However, it is one thing to formulate how maladjustment should be understood; it is quite another to stipulate what a personnel counselor working in a large factory should do to enhance contentment and increase output. The major challenge for the interwar social and behavioral scientists was therefore to transform the results of their experimental, observational and conversational studies of the worker into a specific set of managerial techniques of power. The techniques of personnel counseling, for instance, could be used to adjust the worker more fully to modern industrial conditions. A productive worker was happy with him or herself, was sufficiently embedded in the working group and felt that he or she was taken seriously by management. With the aim of giving a proper incentive to labor, it was wise for management to act upon workers who did not match well with their jobs, their colleagues or their superiors. Each form of maladjustment required a slightly different instrument to set things straight. There were three instruments that management could make use of. First of all, the on-the-job interview could be used to increase the contentment of the individual. The worker could be relieved of tensions through an open conversation with a personnel counselor. Second, management could help the worker by providing the right kind of social embeddedness. For that purpose, the counselor had to find a proper balance between honoring the moral codes of the workers and intervening when the interaction within a group went awry. Third, a good counselor could assist in easing the communication between worker and management by relaying messages from one to the other. With these explicit attempts to steer the behavior of workers in certain directions, the final step in the formation of a governmentality of incentives and adjustment was addressed. What was still locally effective in the experimental, observational and conversational study of the working subject was now turned into something universally applicable: a set of techniques of power with which one could intervene on the full scale of the modern factory.