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Work *and* *Its Discontents*

The Cult of Efficiency in America

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I *The New Calculus of Time*

For about twenty years of his busy life, Jeremy Bentham, the patriarch of modern reform, devoted much of his energies to the elaboration in minutest detail of plans for a perfectly efficient prison. This was the famous *panopticon,* a star-shaped building so intricately constructed "that every convict would pass his life in perpetual solitude, while remaining perpetually under the surveillance of a warder posted at the center."

Bentham, the leader of the philosophical radicals, had gotten the idea of the *panopticon* from his ingenious brother, Sir Samuel Bentham, a famous naval architect who, while employed by Catherine the Great to build ships for Russia, had designed a factory along just those lines. For many years, in fact, Jeremy Bentham sought money from Parliament to build a "five-storied" *panopticon,* one half of which would be a prison, the other half a factory. The *panopticon,* he said, would be a cure for laziness, a "mill for grinding rogues honest and idle men industrious." (In 1813 he finally received £23,000 as conpensation for money he had expended in his efforts to construct a model.)

This identification of factory and prison was, perhaps, quite natural for Bentham. Prison and factory were united in his philosophical mind by the utilitarian conceptions of tidiness and efficiency. The root of utilitarianism—this new mode of conduct which Bentham elaborated—is a passion for order, and the elaboration of a calculus of incentives which, if administered in exact measures, would stimulate the individual to the correct degree of rectitude and work. Utilitarianism provided a new definition of rationality: not the rule of reason, but the rule of measurement. With it, man himself could now be regulated. When the rule was applied by the engineer—the utilitarian *par*

excellence—not only was work broken down in detail, but it was measured by detail, and paid for in time units defined in metric quantities.

With this new rationality came a unique and abrupt break from the rhythm of work in the past. With it came a new role of time. In the various ways it has been expressed, two modes of time have been dominant: time as a function of space, and time as *durée*. Time as a function of space follows the rhythm of the movement of the earth: a year is the curving ellipse around the sun; a day, the spin of the earth on its axis. The clock itself is round; and the hour, the sweep of a line in 360 degrees of space.[1] But time, as the philosophers and novelists—and ordinary people—know it, is also artless. These are the psychological modes which encompass the differing perceptions: the dull moments and the swift moments, the bleak moments and the moments of bliss, the agony of time prolonged and of time eclipsed, of time recalled and time anticipated—in short, time not as a chronological function of space, but time felt as a function of experience.

Utilitarian rationality knows little of time as *durée*. For it, and for modern industrial life, time and effort are hitched only to the clock-like, regular "metric" beat. The modern factory is fundamentally a place of order in which stimulus and response, the rhythms of work, derive from a mechanically imposed sense of time and pace.[2] No

[1] For a discussion of time as a function of space, see C. F. von Weizäcker, *The History of Nature* (University of Chicago Press, 1949), pp. 12-13, 48-50.

[2] "Order," said Freud, "is a kind of repetition compulsion by which it is ordained once for all when, where and how a thing shall be done so that on every similar occasion doubt and hesitation shall be avoided. The benefits of order are incontestable: it enables us to use space and time to the best advantage, while saving expenditures of mental energy. One would be justified in expecting that it would have ingrained itself from the start and without opposition into all human activities; and one may well wonder that this has not happened, and that, on the contrary, human beings manifest an inborn tendency to negligence, irregularity and untrustworthiness in their

spend an hour or more in getting to the plant. (There seems to be a law, as Bertrand Russell has noted, that improvements in transportation do not cut down traveling time but merely increase the area over which people have to travel.)

Although this is the most obvious fact about modern work, few writers have concerned themselves with it, or with the underlying assumption: that large masses of human labor should be brought to a common place of work. The engineer believes that concentration is technologically efficient: under one roof there can be brought together the source of power, the raw materials, the parts and the assembly lines. So we find such huge megaliths as Willow Run, now used by General Motors, a sprawling shed spanning an area two-thirds of a mile long and a quarter of a mile wide; or such roofed-over, mile-long pavements as the Boeing plant in Wichita, Kansas.

This belief in the efficacy of size was conditioned by the type of energy first used—the limited amount of power available through the use of steam. Since steam dissipates quickly, the engineer tended to crowd as many productive units as possible along the same shaft, or within the range of steam pressure that could be carried by pipes without losses due to excessive condensation. These considerations led, too, to the bunching of workers in the layout of work, since the machines had to be located along a straight-line shafting.

The introduction of electric power and electric motors opened the way to greater flexibility; and within the plant these opportunities were taken. Newer work-flow designs have avoided the antiquated straight-line shafts and aisles of the older factory. Yet the outward size of the factory remained unchallenged. Why? In part because the engineer conceives of efficiency in technological terms alone; and he is able to do so because a major cost—the travel time of the worker—can be discounted. But the question can be

posed: should large masses of persons be brought to a common place of work? Which is cheaper to transport: working men twice daily, or materials and mechanical parts, let us say, twice a week? As Percival and Paul Goodman so pertinently note in their book, *Communities*: "The time of life of a piece of metal is not consumed while it waits for its truck; a piece of metal does not mind being compressed like a sardine." What the Goodmans propose is production in "bits and pieces" rather than integrated assembly. If the plants were located near workers' communities, the men would not have to travel; the processed materials would be brought to several places for manufacture, and the parts would then be collected for assembly. Yet the question is rarely considered, for few industries pay directly for their workers' travel time. Calculations in terms of market costs alone do not force the enterprise to take into account such factors as the time used in going to and from work, or the costs of roads and other transport to the factory site, which are paid for by the employee or by the community as a whole out of taxes.

In his travel to and from work the worker is chained by time. Time rules the work economy, its very rhythms and motions. (After consulting Gulliver on the functions of his watch, the Lilliputians came to the belief that it was his God.)

One of the prophets of modern work was Frederick W. Taylor, and the stop watch was his bible. If any such social upheaval can ever be attributed to one man, the logic of efficiency as a mode of life is due to him. With "scientific management," as enunciated by Taylor, we pass far beyond the old rough computations of the division of labor; we go into the division of time itself.

Frederick W. Taylor was born in 1856, the same year as Freud. As a boy and man, his biographer Roger Burlingame writes, Taylor split his world into its minutest

parts. Playing croquet, he worried his fellows by plotting the angles of his strokes. When he walked, he counted his steps to learn the most efficient stride. Nervous, high-strung, although he neither smoked nor drank, not even coffee or tea, he was a victim all his life of insomnia and nightmares; and, fearing to lie on his back, he could sleep in peace only when bolstered upright in a bed or in a chair. He couldn't stand to see an idle lathe or an idle man. He never loafed, and he'd be damned if anybody else would.

This compulsive character Taylor stamped onto a civilization. In the shop where he first went to work, a machinist performed his operation by "rule of thumb." Machine speeds, choice of tools, methods of work were decided by whim or hunch. Taylor set out to prove that these lazy rhythms, inherited from artisan days, should yield to the superior rationality of fractionated time.

The stop watch itself was not new. Before Taylor, work had been timed; but only for the entire job. What Taylor did was to split each job into its component operations and take the time of each. This, in essence, is the whole of scientific management: the systematic analysis and breakdown of work into the smallest mechanical component and the rearrangement of these elements into the most efficient combination. Taylor gave his first lectures to American engineers in 1895 (the year, one might note wryly, that Freud and Breuer published their *Studies in Hysteria,* the "breakthrough" of psychoanalysis). But it was in 1899 that Taylor achieved fame when he taught a Dutchman named Schmidt to shovel 47 tons instead of 12½ tons of pig iron a day. Every detail of the man's job was specified: the size of the shovel, the bite into the pile, the weight of the scoop, the distance to walk, the arc of the swing and the rest periods that Schmidt should take. By systematically varying each factor, Taylor got the

Taylor felt, there could be no disputes about how hard one should work or the pay one should receive for labor. "As reasonably might we insist on bargaining about the time and place of the rising and setting sun," he once said. For a managerial class which at the turn of the century had witnessed the erosion of its old justificatory mystique of "natural rights," the science of administration *per se* provided a new foundation for its moral authority.

While Taylor analyzed the relations of work to time, another engineer, Frank Gilbreth (1868-1924), carried the process one step further: he detached human movement from the person and made of it an abstract visualization. Not only could the pattern of machine work be broken down into elements, but human motion, too, could be "functionalized," and the natural movements of arms and legs could be ordered into a "one best way" of usage.

Gilbreth (whose contemporary fame rests, ironically, on the movie story of the frenetically organized domesticity of his large family, *Cheaper by the Dozen*) isolated eighteen basic patterns of kinetic units or motions, e.g. reach, move, grasp, which he modestly called *therbligs* (or Gilbreth spelled backwards). And, from the analysis of therblig combinations, Gilbreth came to his principles of "motion economy." For example: two hands should not be idle at the same instant except during rest periods; motions of the arms should be in opposite and symmetrical directions, and so on. The penalty for violating these rules is waste.

There was one further step in the inexorable logic of rationalization. While Taylor systematized factory operations and Gilbreth sought to reduce waste motion, Charles Bedeaux sought to combine these into a unit measurement of human power, not unsurprisingly called a "B," which would correspond to the "dyn," or the unit in physics of mechanical power. So defined, "a B is a fraction of a minute of work plus a fraction of a minute of rest always

aggregating unity but varying in proportion according to the nature of the strain." Using this detailed calculus, Bedeaux formulated a complicated but mathematically neat system of wage payments which took into account not only the work done but the varying fractions of non-work or rest required in different operations, and increased or decreased payments correspondingly.[3]

The fragmentation of work, although atomizing the worker, also created a dependency and a hierarchy in work, for inherent in the division of labor is what Marx called "the iron law of proportionality." Thus, in the manufacturing process, the ratios between different numbers of workers required in different work processes are ordered by technological complexities. Marx cited an example in type manufacture: One founder could cast 2,000 type an hour, the breaker could break up 4,000 and the polisher could finish 8,000 in the same time; thus to keep one polisher busy the enterprise needed two breakers and four founders, and units were hired or discharged, therefore, in multiples of seven. In many other operations, notably an assembly line, similar inflexible ratios are established, and the hiring and firing of numbers of workers is dictated by the multiples of those ratios. But such dependency presupposes coordination, and with such coordination the multiplication of hierarchies.

The logic of hierarchy, the third of the logics created by modern industry, is, thus, not merely the sociological fact of increased supervision which every complex enterprise demands, but a peculiarly technological imperative. In a simple division of labor, for example, the worker had

[3] At the height of its use the Bedeaux system was used in the United States by 720 corporations, employing 675,000 workers. During World War II, charges against Bedeaux of collaboration with Vichy, plus the bitter hostility of the unions to this method of mechanical wage calculations, brought the system into disuse here.

a large measure of control over his own working conditions, i.e., the set-up and make-ready, the cleaning and repairing of machines, obtaining his own materials, and so on. Under a complex division of labor, these tasks pass out of his control and he must rely on management to see that they are properly done. This dependence extends along the entire process of production. As a result, modern industry has had to devise an entire new managerial superstructure which organizes and directs production. This superstructure draws in all possible brain work away from the shop; everything is centered in the planning and schedule and design departments. And in this new hierarchy there stands a figure known neither to the handicrafts nor to industry in its infancy—the technical employee. With him, the separation of functions becomes complete. The worker at the bottom, attending only to a detail, is divorced from any decision or modification about the product he is working on.

These three logics of size, time and hierarchy converge in that great achievement of industrial technology, the assembly line: the long parallel lines require huge shed space; the detailed breakdown of work imposes a set of mechanically paced and specified motions; the degree of coordination creates new technical, as well as social, hierarchies.[4]

[4] It is remarkable how recent is the assembly line, both as a mode of operation and as a linguistic term. Oliver Evans developed a continuous production line for milling grain in 1800, and the packinghouse industry in the 1870's had adopted the use of overhead conveyors for the processing of slaughtered animals. But the assembly line as a modern achievement owes its success largely to Henry Ford and the establishment of an auto line at Highland Park, Michigan, in 1914. And only in 1933 did the Oxford English Dictionary legitimatize the term when its supplement in that year added the contemporary meaning of the word. See Siegfried Giedion, *Mechanization Takes Command.*

a tired working class. In many machine plants, as sociologist Donald Roy describes it, workers play the "make-out" game, i.e. working at a breakneck pace to fulfill one's piecework quota so that one can be free for the rest of the day. Piecework is often preferred to "day work" or a flat payment of an hourly rate. On day work, an operator has only the pause at lunch time to break up the meaningless flow of time, like sand in an hourglass. On piecework, by racing the clock, one can mark time in intervals; a worker then has an hour-by-hour series of completions to mark his position in terms of the larger frame of the day's work. By "making out" early, one achieves a victory over the despised time-study man; and the greater the ease, the more vaunted the victory. By "making out" early, one flaunts one's freedom, too, in the face of the foreman: "Since worker inactivity, even after the completion of a fair day's work, seemed to violate a traditional supervisory precept of keeping the appearances of being busy even if there is nothing to do," writes sociologist Roy, "making out in four or five hours [is] used as a way of getting even with the foremen for the pressures that they applied when the quota was unattainable."

But even such games as "making out" have their quick and obvious limitations, and sometimes the constraints of work explode with geyser suddenness. A striking instance was the spontaneous walkout at River Rouge in July 1949, in resentment over the speed-up of the Ford assembly lines. Since in crises one often uncovers the source of tensions, the River Rouge episode is worth exploring in some detail.

The dispute arose over the admitted fact that at various times of the day the Ford Company was running the assembly lines at a speed higher than the stipulated rate. On six of the assembly lines in the "B" building at River Rouge, the speed was 3 to 5 per cent higher than normal; at the Lincoln Plant at Highland Park, it was running 10 per

in the work of Adam Abruzzi (in his book *Work Measurement*) and that of William Gomberg, the industrial engineering director of the I.L.G.W.U. (in *A Trade Union Analysis of Time Study*). Abruzzi sweepingly challenges the "standard data" procedures developed by engineers. In standard data, it will be recalled, a work cycle on a job is broken down into its basic elements, each is timed, and standards are then developed for a whole host of comparable operations. Abruzzi sought to discover whether each of the elements was indeed statistically independent—that is, whether the time assignment for each operation could be assessed atomistically, or whether each element was dependent on those preceding or following. He concluded that statistical independence could not be established; nor was there any constancy in the relations among operations. Variations in the timing of elements from worker to worker were so great as to cast doubt on the objectivity of the standard data.

Questioning of standard data led to the questioning, too, of the "one best way" of doing work, established by Gilbreth (now included in every textbook on the subject). As Abruzzi pointed out, one cannot add "bits of motion" and claim that the mechanical total of the bits adds up to the most efficient motion; in any unified motion, as in any *Gestalt,* the whole is greater than the sum of the parts.

This point is underscored in a recent volume by James Gillespie, one of the foremost British industrial engineers. "Motion study," he writes, "has become micromotionism and with its motion cameras, therbligs, micromotion clocks . . . and its useless time charts, it has become a complex, unwieldy technique. Worse still, with its . . . publication of principles such as that of minimum movement, it has divorced itself from practical, humanitarian knowledge." And that "practical, humanitarian knowledge" is the finding that a man's characteristic or "natural rhythms" of use

ments traced on a photographic plate—caught the abstract curves of motion divorced from the human mover, so Kandinsky's volatile color bursts or Klee's caressing arcs detached themselves from recognizable objects and became pure abstract visualization.[1] Marcel Duchamp's "Nude Descending the Staircase," the painting that symbolized the revolt against academicism, captured in its spastic oscillations the sense of movement, but lost the human form.

If in art there has been the loss of the human scale, and, in architecture, the epigones of Mies and Gropius create an aseptic and sterile form without function, the literary protest, too, has become exhausted. The fascination with the machine, so fashionable in the twenties and thirties, is dulled. Such biting satire as Chaplin's *Modern Times* or René Clair's *A Nous la Liberté,* with their common motifs of factory and prison, is gone. Hart Crane in *The Bridge* sought to come to terms with the machine in order to express its rhythms in verse. But the poets have fled. The factory is now the province of the sociologist and the psychologist. But their interest is not in work, either.

V *Drops in the Social River*

By and large the sociologist, like the engineer, has written off any effort to readjust the work process; the worker, like the mythical figure of Ixion, is chained forever to the endlessly revolving wheel. But the spectacle has its unnerving aspect, and the sense of dehumanization is oppressive. Industry has been told, therefore, that production may suffer when only the mechanical aspects of production are considered. Hence the vogue in recent years of "human relations." Its rationale is stated by Cornell sociologist Wil-

[1] The relation between the mode of visualization by the engineer and the forms of expression of modern art have been compared vividly by Siegfried Giedion in his *Mechanization Takes Command.*

liam F. Whyte. The "satisfactions of craftsmanship are gone, and we can never call them back," he writes. "If these were the only satisfactions men could get out of their immediate work, their work would certainly be a barren experience. There are other important satisfactions today: the satisfactions of human association and the satisfactions of solving technical and human problems of work."

The statement summarizes the dominant school of thought which has grown out of the work of the late Elton Mayo of the Harvard Business School and his followers. For Mayo, following the French sociologist Emile Durkheim, the characteristic fact about the modern scene is the presence of constant, disruptive change. The family, the primal group of social cohesion, breaks up as a work and educational unit; neighborhood roots are torn up, and social solidarity, the key to human satisfactions, gives way to *anomie*. If solidarity is to be re-established, it will have to be done within the corporation and factory. "The manager," writes Fritz Roethlisberger, Mayo's chief disciple at the Harvard Business School, "is neither managing men nor managing work. . . . he is administering a social system."

In this, as in many instances, social engineering imitates art. Twenty years ago the first "solidarity hymn" was penned by Aldous Huxley, in his *Brave New World,* and the refrain voiced by the Alphas and Betas could be the school song for industrial sociology:

> Ford, we are twelve; oh make us one
> Like drops within the social river.
> Oh, make us now together run
> As swiftly as thy shining flivver.

This is not the place to recapitulate the many criticisms that have been made of the Mayo school. The fundamental point, as it affects the worker in his own work environment, is that the ends of production are taken as "given"

without lunches, the same illumination as when the experiment began. Yet output kept rising. It then became clear that the workers were responding, not to any of the physiological or physical variables, but to the interest and attention centered on them. The experiment itself, not any outside factor, was the missing link, the unknown determinant.

This led to the second phase of the Hawthorne experiment: the introduction of ambulatory confessors, or walking counselors, ready at any moment to stop and listen to a harassed worker air his woes. Counseling for Mayo was meant to be "a new method of human control." But of this, as of all such objectives, one can ask: Control of whom for what purposes? The answer has been given by Roethlisberger: in counseling, one seeks to shift "the frame of reference," so that the worker sees his grievance in a new light. As one Hawthorne counselor described this process: "In the case of the down-graded employee . . . her focus of attention shifts from alleged inequities, transfer and down-grading grievances, etc. . . . to her unhappy home life; then, when she returns to her original grievance, things do not look so bad." [1]

While "human relations," as a result of the tremendous publicity given to the Hawthorne findings and of Mayo's further work, became a great vogue, personnel counseling in the broader sense did not spread widely for a while, even within the Bell Telephone System where it originated. The reason, in large measure, was that management itself did not fully understand its function. There seemed to be no

[1] The explanation recalls an old folk tale: A peasant complains to his priest that his little hut is horribly overcrowded. The priest advises him to move his cow into the house, the next week to take in his sheep, and the next week his horse. The peasant now complains even more bitterly about his lot. Then the priest advises him to let out the cow, the next week the sheep, and the next week the horse. At the end the peasant gratefully thanks the priest for lightening his burdensome life.

ful at knowing a secret, quickly spread the information to others. The result was that thousands of workers eagerly rushed to listen to hortatory talks which at other times might have been received with utter indifference.

There are two points to be noted about the vogue of "human relations." One is that, in the evident concern with understanding, communication and participation, we find a change in the outlook of management, parallel to that which is occurring in the culture as a whole, from authority to manipulation as a means of exercising dominion. The ends of the enterprise remain, but the methods have shifted, and the older modes of overt coercion are now replaced by psychological persuasion. The tough brutal foreman, raucously giving orders, gives way to the mellowed voice of the "human-relations oriented" supervisor. The worker doubtless regards this change as an improvement, and his sense of constraint is correspondingly assuaged. In industrial relations, as in large areas of American society, accommodation of a sort has replaced conflict. The second point is that these human-relations approaches become a substitute for thinking about the work process itself. All satisfactions are to be obtained in extracurricular areas: in the group, in leisure pursuits. Thus the problems of work are projected outward and swathed in psychological batting.

This tyranny of psychology has led management into a curious discounting of the "economic man." We are told that what the worker really wants is security, recognition, rewarding personal relations, and that he is more concerned with these than with other "larger, out-of-plant, off-the-job issues." "Labor disputes," writes a Harvard Business School authority, "are often stated in terms of wages, hours of work and physical conditions. Is it not possible that these demands are disguising, or in part are symptomatic expression of, much more deeply rooted human situations which we have not learned to recognize?"

Such a statement suggests more about Harvard Business School than about the workers; it suggests that the academic doesn't know how to talk to a man in the shop. "Now the operators in my shop," reports a sociologist who went into one, "made noises like economic men. Their talk indicated that they were canny calculators and that the dollar sign fluttered at the masthead of every machine."

To say, in fact, that the American worker is not really or primarily interested in money contradicts, in a deep sense, the very motive power of the economic system. Why else would people submit themselves to such a work environment?

VI *The Grinding Mill*

Why do people work? More particularly, why do people accept the harsh, monotonous repetitive jobs that tie them to Ixion's wheel? A conventional answer, by now, is the Protestant Ethic. In that respect, Max Weber, with his hypnotic view of man endlessly working, accepting deprivation, minimizing his creature comforts and driving hard against the environment because of his need to prove himself before God, has exercised a beguiling influence in social science.

Perhaps the bourgeois entrepreneur was of this mold. It is doubtful whether the worker was. Certainly the workers in Hogarth's Gin Alley, or the people whom Melville's Redburn saw in the Liverpool slums, were little concerned with the scourging hand of God. What drove them to work was hunger, and much of the early movements of social protest can only be understood with that fact in mind.

Hunger itself was not always the goad. From the time of Elizabeth I, the English poor, and those unable to get work, could live on public relief. In 1795, the government extended this system by passing the famed Speenhamland

law, a measure which Canning and other English statesmen felt would stave off the revolution that had already swept France and that now threatened England. As Karl Polanyi points out, the law, in effect, excluded labor from the market economy. If wages fell below a minimum point, the government would make up the difference. In this way a minimum subsistence was guaranteed to each worker. In practice all wages soon fell below the minimum, since the employer expected the government to make up the wage; and no worker had any interest in satisfying the employer. Speenhamland had put a premium on shirking, and thereby increased the attraction of pauperism.

To the Protestant divines (and to the merchant class) the Speenhamland law was a curse. The moralists opened their fire. William Townsend openly extolled the virtues of hunger. "Hunger will tame the fiercest animals, it will teach decency and civility, obedience and subjection to the most perverse. . . . it is only hunger which can spur and goad [the poor] on to labor; yet our laws have said they shall never hunger . . ."

Perhaps the most powerful voice at the time was that of Thomas Malthus. Against the optimism of Godwin and other utopians, he argued that a society could exist only if held under powerful restraints and checks. Without such restraints, licentiousness would reign, populations increase, misery fester. The poor laws, thundered Malthus, simply encouraged vice. "If our benevolence be indiscriminate . . . we shall raise the worthless above the worthy; we shall encourage indolence and check industry; and in the most marked manner subtract from the sum of human happiness. . . . the laws of nature say with St. Paul, 'If a man will not work, neither shall he eat.'" Jeremy Bentham added his voice with such schemes as the *panopticon*. To the question, "What can the law do to raise subsistence?" Bentham answered, "Nothing, directly."

As a result of these many pressures the Speenhamland

canus has been tightened to the most excruciating pitch. The American citizen, as *Fortune* once noted, lives in a state of siege, from dawn until bedtime. "Nearly everything he sees, hears, touches, tastes, and smells is an attempt to sell him something. . . . to break through his protective shell the advertisers must continuously shock, tease, tickle or irritate him, or wear him down by the drip-drip-drip or Chinese water torture method of endless repetition. Advertising is the handwriting on the wall, the sign in the sky, the bush that burns regularly every night."

If the American worker has been "tamed" it has not been through the discipline of the machine, but by the "consumption society," by the possibility of a better living which his wage, the second income of his working wife, and easy credit all allow. Nowhere is this more evident than in Detroit. In American radical folklore, the auto worker was considered the seedling of the indigenous class-conscious radical—if there was ever to be one in America. Uninhibited, rootless (many were recruited from the Ozark hills), with his almost nihilistic temper he was the raw stuff for revolutionary sentiment—once he realized (or so the Marxists thought) that he was trapped by his job. Few auto workers today have a future beyond their job. Few have a chance of social advancement. But they are not radical. What has happened is that old goals have been displaced, and the American Dream has been given a new gloss. Success at one's job becomes less important than success in one's style of life. A worker sees himself "getting ahead," as Eli Chinoy points out in a recent study, not by promotion in the plant—he knows that *that* ladder has vanished, even though Henry Ford and Walter P. Chrysler began from the mechanics' bench[1]—but because he is working towards a "nice little modern house." These changes in values are reflected most sharply among younger workers. The desire for immediate gratifications—a car, spending money, a girl—burn strong. Rather than spend hard years at study, a man goes immediately into a plant at its attractive starting wage. Once in the plant, he may realize, sickeningly, that he has made a devil's bargain. His advancement depends upon educational training; but this he has foregone. He becomes restless. But dissatisfactions on the job lead not to militancy, despite occasional sporadic outbursts, but to escapist fantasies—of having a mechanic's shop, a turkey farm, a gas station, of "owning a small business of one's own." An idle dream.

[1] So compelling was the old American myth that Chrysler, who built the third largest auto empire in the United States, entitled his autobiography the *Life of an American Workman*. Would a European tycoon ever do likewise?

VII *Bootstraps*

This essay has talked by and large about "the" factory worker and the constraints imposed upon him. Certainly any large-scale generalizations become fuzzy if matched against complex and protean reality. And factory work, after all, comprises only a fraction of the kinds of work done in the United States. Other occupational groups have their own work psychology and problems. A skilled worker may find his job monotonous, and a chambermaid in a bustling metropolitan hotel may not. Nothing may be more deadly, perhaps, than the isolated, hermetic life of the bank teller in his cage or the elevator operator in his sealed jack-in-the-box. Longshoremen swear by their occupation, gaining satisfactions in the free use of muscle and the varieties of excitement on a big city pier, while scorning those who are tied down to the bench or lathe. Musicians, typographers, miners, seamen, loggers, construction workers all have their special cast of work. Yet the factory is archetypical because its rhythms, in subtle fashion, affect the general character of work the way a dye suffuses a cloth.

And, equally, because the rhythms of mechanization spill over into once individualized modes of work. Coal mining, once spoken of as "underground farming," now with mechanization of the cutting and conveying takes on much of the aspects of factory work. In offices the installation of rapid high-speed calculators, tabulators and billing machines turns the white-collar workers into mechanically paced drones. The spread of mechanization into "materials handling" (i.e. warehouses and super-markets) has introduced mechanical rhythms into the distributive sector of the economy.

These changes accentuate, too, the tendencies toward the evasion of work which are so characteristic of the American factory worker and which today obsess all workers. The big lure of escape remains the hope of "being one's own boss." The creed of "the 'individual enterprise' has become by and large a working-class preoccupation," sociologists Reinhard Bendix and S. M. Lipset report. "Though it may have animated both working class and middle class in the past, it is no longer a middle-class ideal today. Instead, people in the middle class aspire to become professionals and, as a second choice, upper-white-collar workers." Of course fewer people actually try to go into business than those who think of it as a goal, "but here again the manual workers report more such efforts than the white-collar group."

How realistic are these aspirations? We know that the labor force of the economy is being transformed. Colin Clark, in his *Conditions of Economic Progress,* long ago pointed out that, as incomes rose and the quantity and quality of goods produced increased, large sections of the economy would shift to service and other "tertiary" occupations. Since 1910, the proportion of farmers, farm owners and unskilled workers in the labor force has decreased sharply as an aggregate; skilled workers have held their own; service workers have increased slightly; professional

Yet some serious social critics see in the development of leisure time the potentialities of achieving a spontaneity of spirit, free of the restraints of work and of the older moral injunctions which frowned upon undisciplined expression. David Riesman mocks those who would seek to introduce "joy and meaning" into modern industrialism. "In a fallacy of misplaced participation," he says, they would like to "personalize, emotionalize and moralize the factory and white collar worlds." But "it makes more sense," he argues, "to work with rather than against the grain of impersonality in modern industry: to increase automatization in work—but for the sake of pleasure and consumption and not for the sake of work itself."

What Riesman wants is "freedom in play." "Far from having to be the residue sphere left over from work-time and work-feeling, [play] can increasingly become the sphere for the development of skill and competence in the art of living. Play may prove to be the sphere in which there is still room left for the would-be autonomous man to reclaim his individual character from the pervasive demands of his social character."

Few can quarrel with the ideal, perhaps because it is so amorphous. ("Admittedly we know very little about play," writes Riesman. ". . . research has been concerned mainly with the 'social character' of the producer.") But can "play" be divorced from work? Play, it should be pointed out, is not leisure—at least not in the classical image as it has come down from Plato to T. S. Eliot. A leisure civilization is one with the fixed task of exploring and extending a specific cultural heritage. Leisure is not, as Josef Pieper points out, a dalliance or wanton play, but a full-time cultivation of the gentle arts, a "working at" pursuits which make up the calling of the gentleman. Nor is relaxation play. Relaxation, whether it be puttering or daydreaming, is an interstice between efforts, a trough between peaks. It is not "free time," as any man who takes a

dle forever; it ruled all our ideas and gave form to all our ambitions."

This drive toward ending muddle, toward introducing social discipline, was characteristic of Lenin's temper as well. It is rather interesting that Lenin was deeply attracted to the work of Frederick W. Taylor. When he was faced near the end of the Civil War with the tasks of organizing industrial production, Lenin's solution, as he outlined it in a notable address in June 1919, was to introduce piecework and Taylorism. "The possibility of socialism," Lenin wrote, "will be determined by our success in combining Soviet rule and Soviet organization or management with the latest progressive measures of capitalism. We must introduce in Russia the study and teaching of the Taylor system and its systematic trial and adoption." [1]

Even at its humane best, modern socialist thinking has hardly emancipated itself from the heritage of market costs and efficiency thinking. One of the most concerned of English socialists, Austen Albu, worries over the problem in these terms: if only workers could be given a "sense of participation in the making of decisions"; if only they had "a sense of partnership in, and responsibility for the industry in which they work" . . . But he knows that the "old slogans of industrial democracy or workers' control by themselves offer no solution" for large-scale bureaucratic organizations.

X *The Mollusk and the Man*

Are there no solutions for the problem of drudging work —apart from the grandiose schemes of "breaking up" the factories and placing small units in garden towns, or the

[1] From a speech by Lenin in June 1919, entitled "Scientific Management and the Dictatorship of the Proletariat," reprinted in J. R. Commons, *Trade Unionism and Labor Problems,* Second Series, 1921; also in Lenin's *Collected Works,* Vol. 7.

this problem. In this fashion, as in so many other ways (the enforcement of discipline, the "disengaging" of worker control over output, and so on) the unions have become part of "the control system of management" itself.

XI *Arcadia and Utopia*

In the history of human hopes and longing the polar images of *arcadia* and *utopia* meet at some point in the curving universe. Men have always looked past to some golden age or forward to some golden idyl. Two thousand years ago a Greek poet of Cicero's day acclaimed the invention of the water wheel for grinding corn as giving freedom to female slaves: "Sleep late even if the crowing cocks announce the dawn. . . . the Nymphs perform the work of your hands . . . turn the heavy concave Nisyrian millstones." Aristotle predicted that slavery would disappear when looms would weave by themselves, for then the chief workmen would not need helpers, nor masters slaves. The romantics would have none of these visions. In Samuel Butler's *Erewhon,* inventions were prohibited; Bellamy's *Looking Backward,* with its conscript industrial army, was called by William Morris a "horrible cockney dream." In the Gothic revival, it was the primitive that was ennobled: to shoot, to trap, to chop trees, to hold a plow, to prospect a seam—these were the virtues of work.

Today we stand at a point where those hopes and longings seem to converge. While the assembly line brought the work to the workers, tending to grip them bodily to the rhythm of the line, the vast development of automatic controls and the continuous flow creates the possibility of eliminating the workers from production completely. On its present scale and complexity, the continuous-flow innovation dates back only to 1939, when Standard Oil of New Jersey and M. W. Kellogg Company erected the first of the

oil industry's great fluid-catalytic crackers. In these new plants, the raw material, fluid or gas, flows continuously in at one end, passes through intricate processing stages and debouches in a 24-hour stream of products at the other. The whole plant is run from central control rooms by a few men at the control panels, while mobile maintenance crews take care of any breakdowns. The new Ford engine plant in Cleveland, opened in 1952, provides almost a continuous operation from the original pouring of sand and the casting of molds to the flow of molten iron and the shaking out of fully cast engine blocks, with few human hands involved in the operation other than to speed the flow of work by checking empty gauges, and to operate the high overhead cranes which lift the mass of metals. Thus foundry work, the grimiest of human denigration, has given way to the machine.

This new industrial revolution is symbolized in the word "automation." The term itself was coined in 1948 by the engineering division of the Ford Motor Company to describe the operations of some new "transfer machines" which mechanically unload the stampings from the body presses and position them before machine tools that automatically drill and bore the holes for other parts to be inserted. The purists among the engineers dismiss the Ford process as "advanced mechanization," or grudgingly call it "Detroit automation." For them the term "automation" is reserved for processes in which high-speed, self-correcting (i.e. feedback) instruments control the operations of other machines.[1] Automatic devices, they point out, are quite ancient. The Romans had an hydraulic float valve to regulate the water level in their storage tanks. The Dutch used such devices to keep

[1] A toaster is automatic, but it follows a "pre-set" cycle of operations, and cannot adjust for variations, whereas an "automated" machine, by feedback, corrects itself for variations.

counts a day. It accepts "stop" payments and "hold" orders, catches overdrawn accounts and prints monthly statements at a speed of 600 lines a minute.

(3) Self-correcting control devices which "instruct" machines, through punched tapes, very much like the ones in old piano players. An automatic lathe developed by the Arma Corporation, through punched tape instructions, machined a workpiece in four minutes, to tolerances of 0.0003 of an inch, which normally was machined in thirty minutes by a skilled machinist working with drawings. A concrete-mixing plant, in use by the Cleveland Builders Supply Company, loads onto ready-mix trucks any one of 1,500 different mixing formulas. A punched card, coded for the formula, is inserted into an electronic control panel, and the desired mixture is delivered by conveyors onto the waiting truck; the control mechanisms even measure and compensate for any deficiency or excess of water in the sand, coarse rock and slag that go into the mixture.

(4) Automatic assembly. Admiral Corporation and several other major electrical manufacturing companies have machines that can "spit out" completely assembled radios. A machine called Autofab, produced by General Mills, will put together in one minute the number of electronic units that previously took a worker a full day to assemble.

While some of these plants resemble the image of the "robot factory" which science-fiction writers have conjured up for decades, they are still one step away from "true" automation. Today, fully automatic assembly is possible only when a large output of a single product is called for. But such inflexible, single-purpose machinery is too costly for medium or short production runs, and consequently the adoption of such machines tends to "freeze" the design and the technological stage of the product. True automation, as envisaged by Eric Leaver and John J.

Brown, would design products in terms of a multi-purpose machine, rather than a machine for each product. If such machines ever were produced they would create a revolution not only in technology but in aesthetics as well. The concept of what a radio or a stove should look like, for example, might have to change drastically. In the first industrial revolution, fixed aesthetic habit dominated the design of a machine. When, in the famous Crystal Palace Exhibit of 1851, iron was introduced for the first time into construction as well as machinery, the first structures and artifacts, true to the predominant imagination, were ornamental and baroque rather than utilitarian. Only gradually did the "modern" emphasis that the form should express, rather than hide, the function gain the upper hand. Yet, although the designer is no longer conservative, the engineer still is. It is easier for him to create single-purpose automatic machinery that can produce quick, spectacular results. But the adoption of these expensive machines will only delay the coming of the flexible automatic machines, capable of turning out a wide variety of products, and producing a true machine revolution.

Americans, with their tendency to exaggerate new innovations, have conjured up wild fears about changes that automation may bring. Norbert Wiener, whose book on "cybernetics" was responsible in part for the vogue of "communication theory," has pictured a dismal world of unattended factories turning out mountains of goods which a jobless population will be unable to buy. Such projections are silly. Even if automatic controls were suddenly introduced, regardless of cost considerations, into all the factories that could use them, only about 8 per cent of the labor force would be directly affected.

It is evident that automation will produce disruptions; and many workers, particularly older ones, may find it difficult ever again to find suitable jobs. It is also likely that small geographical pockets of the United States may

cal, and sales personnel, increased by 50 per cent. In 1947, the ratio of production workers to non-production workers was 3:1. In 1954, in a seven-year period, the ratio had dropped to 2:1.

In its most important consequence, the advent of automation means that a corporation no longer has to worry about a large labor supply. This means that new plants can be located away from major cities, and closer to markets or to sources of raw materials and fuels. Sylvania, for example, which has forty-three plants, has built its most recent ones in such out-of-the-way places as Nelsonville, Ohio; Burlington, Iowa; and Shawnee, Oklahoma. The company has also insisted that its plants be smaller, and it placed a limit of 700 persons to be employed in a plant. In this way, the corporation can exercise new social controls. The works manager can know all the men personally, and the social divisions of the small town will recapitulate the social gradations in the plant. Under these conditions a new manorial society may be in the making.

The decentralization of industry may equally revolutionize the social topography of the United States as a whole. As new plants are built on the outskirts of towns and workers live along the radial fringes of the spreading city, the distinction of the urban and the surburban becomes increasingly obliterated. In its place may appear one scenery, standard for town, suburb, countryside and wild. An environment, as William James has noted, is an extension of ego. In the new topography we may arrive at what the editors of the British *Architectural Review* have called "Subutopia."

But more than topographical changes are involved. The very matutinal patterns will change as well. The major economic fact is that, under automation, depreciation rather than labor becomes the major cost. And when labor is relatively cheap, it becomes uneconomical to keep an enormously expensive machine idle. To write off

ing, almost organically, to their commands and adding new dexterity and power to their own muscle skills. As a machine tender, a man now stands outside work, and whatever control once existed by "setting a bogey" (i.e. restricting output) is finally shattered. As one steelworker said, "You can't slow down the continuous annealer in order to get some respite." With the new dial-sets, too, muscular fatigue is replaced by mental tension, the interminable watching, the endless concentration. (In the puritan morality, the devil could always find work for "idle hands," and the factory kept a man's hands busy. But that morality ignored the existence of the fantasy life, and its effects. Now, with machine watching, there will be idle hands, but no "idle minds." An advance in morality?)

Yet there is a gain for the worker in these new processes. Automation requires workers who can think of the plant as a whole. If there is less craft, less specialization, there is the need to know more than one job, to link boiler and turbine, to know the press and the borer and to relate their jobs to each other.

Most important, perhaps, there may be an end, too, to the measurement of work. Modern industry began not with the factory but with the measurement of work. When the worth of the product was defined in production units, the worth of the worker was similarly gauged. Under the unit concept, the time-study engineers calculated that a worker would produce more units for more money. This was the assumption of the wage-incentive schemes (which actually are output-incentive schemes), and the engineering morality of a "fair day's pay for a fair day's work."

But under automation, with continuous flow, a worker's worth can no longer be evaluated in production units.[2]

[2] Although some engineers never give up. The long Westinghouse strike of 1955-56 was precipitated when the company began time studies of so-called "day-rate" workers (i.e. material handlers, repairmen, sweepers) in an effort to set performance standards for these men. This was, in effect, the first "automation" strike in U. S. industrial

Hence output-incentive plans, with their involved measurement techniques, may vanish. In their place, as Adam Abruzzi foretells, may arise a new work morality. Worth will be defined not in terms of a "one best way," not by the slide rule and stop watch, not in terms of fractioned time or units of production, but on the basis of planning and organizing and the continuously smooth functioning of the operation. Here the team, not the individual worker, will assume a new importance; and the social engineer will come into his own. And work itself?

XII *Ananke and Thanatos*

In western civilization, work, whether seen as curse or as blessing, has always stood at the center of moral consciousness. "In the sweat of thy brow," says Genesis, "shalt thou eat bread." The early Church fathers were intrigued as to what Adam did before the fall; in the variety of speculations, none assumed he was idle. He devoted himself to gardening, "the agreeable occupation of agriculture," said St. Augustine.

In the Protestant conception, all work was endowed with virtue. "A housemaid who does her work is no farther away from God than the priest in the pulpit," said Luther. Every man is "called," not just a few, and every place, not just a church, is invested with godliness. With Zwingli, even with dour Calvin, work was connected with the joy of creating and with exploring even the wonders of creation.

In the nineteenth century, beginning with Carlyle, man was conceived as *homo faber,* and human intelligence was

history. Automation changes the "mix" in the industrial labor force, reducing the number of direct production workers, and increasing the number of indirect production workers. In an effort to control the rising costs of this latter group, Westinghouse began measurement studies of jobs that hitherto had been considered unmeasurable.

defined as the capacity for inventing and using tools. If man in the Marxist sense was "alienated" from himself, the self was understood as a man's potential for "making" things, rather than alienation as man being broken into a thing itself. (Man will be free when "nature is his work and his reality" and he "recognizes himself in a world he has himself made," said Marx in his early Philosophical-Economic manuscripts, adopting an image that A. E. Housman later turned into a lament.) In the same vein, John Dewey argued that a man "learned by doing," but the phrase, now a progressive-school charade, meant simply that men would grow not by accepting prefigured experiences but by seeking problems that called for new solutions. ("Unlike the handling of a tool," said Dewey, "the regulation of a machine does not challenge man or teach him anything; therefore he cannot grow through it.")

All these are normative conceptions. In western history, however, work has had a deeper "moral unconscious." It was a way, along with religion, of confronting the absurdity of existence and beyond. Religion, the most pervasive of human institutions, played a singular symbolic role in society because it faced for the individual the problem of death. Where death was but a prelude to eternal life, hell and heaven could be themes of serious discourse and domination on earth had a reduced quality of importance. But with the decline in religious belief went a decline in the power of belief in eternal life. In its place arose the stark prospect that death meant the total annihilation of the self.[1] (Hamlet, as Max Horkheimer points out, "is

[1] In the last century and more, with the decline of religious faith, this belief in death as total annihilation has probably increased. One may argue, parenthetically, that here is a cause of the breakthrough of the irrational which is such a marked feature of the changed moral temper of our times. Fanaticism, violence and cruelty are not, of course, unique in human history. But such frenzies and mass emotions were displaced, symbolized, drained away and dispersed through the religious sphere. But now there is only this life, and with it the realization that domination on earth means an assertion of self.