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*REST BREAKS AND
THE RIGHT TO URINATE
ON COMPANY TIME*

Marc Linder and Ingrid Nygaard

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From Taylorism to Ergonomics: A Managerial Basis for Rest Periods

One of the most important studies now occupying the attention of industrial engineers is the investigation of fatigue. . . . This is not a humanitarian movement any more than the elimination of friction in a machine is actuated by any benevolent regard for the mechanism. But it is found to pay as a good, hard business proposition to prevent weariness and exhaustion.

"A Chair for the Workers," *Scientific American* (1917)

The superintendent of a large machinery plant claimed that male labor was in an unsettled frame of mind, ready to find fault and formulate demands, and that rest periods offered an interruption which gave a chance for the expression of such tendencies. He attributed the only strike in the history of his establishment to rest periods. He held that pauses gave an opportunity to put pressure on non-union men. . . . A disposition to start disagreements during rest periods is not limited to men, however, as the president of a laundry company reported that "all or nearly all quarrels start in rest room. We would not recommend such periods unless in presence of overseer."

National Industrial Conference Board, *Rest Periods for Industrial Workers* (1919)

The confused and contradictory evolution of rest periods was in large part a function of the two contrary tendencies that characterized the shorter hours movement in the years before and after World War I: "One is to divide the working day into several parts by inserting rest periods and lengthening the lunch hour, and the other is to compress the working day into fewer hours by eliminating rest periods." Thus just at the same time as many European countries and U.S. states were enacting gendered and ungendered meal- and rest-period statutes, the struggle for a shorter

workday, which was frequently conceded by industries and employers that had succeeded in reorganizing their capital so as to transform the shorter day into a much more intensive workday, was, ironically, accompanied by the reduction or elimination of meal and rest periods. Unsurprisingly, then, with the advent of a shorter but more intensive working day, workers “greeted the passing of the old long but porous workday with ambiguity.” The price that workers perceived themselves as paying for the shorter working day was nicely captured by a union carpenter in late-nineteenth-century Chicago. Of the new eight-hour day he noted: “yes; but if we won seven hours, half of us would be dead.”¹

This chapter traces the evolution of managerial attitudes toward rest periods as shaped by changes in the dominant paradigms of fatigue research. Whereas the early twentieth century witnessed the rise of the “science of work” as a burgeoning field of study, focusing largely on how to increase productivity, during the second half of the century ergonomics sought to meld physiology, psychology, and biomechanics in the study of the human-machine relationship.

Shorter Hours, More Intensive Labor, and Rest Periods

No sane management would think of forbidding its employees to take an occasional “breather.”

Morris Viteles, *The Science of Work* (1934)

While it certainly cannot be denied that breaks are most welcome and relaxing to an employee . . . these breaks were primarily provided to increase the workers' efficiency.

Brock v. Claridge Hotel and Casino, 664 F. Supp. 899, 907 (3d Cir. 1987)

Long hours and prisonlike working conditions characterized early capitalism, for it was no more necessary for employers to be economical with low-wage labor than with any other cheap commodity. To channel capital that could have been used to buy more machines and labor into facilities for making work life easier and more sanitary for workers whom an inexhaustible reserve could readily replace would have been wasteful. The flaw was therefore obvious in this timeless objection to shorter-hours laws posed by a laissez-faire economist in 1871: “It is as much for the interest of the employer to avoid an excessive strain upon the operative as it is to avoid running his machinery at such a high rate of speed as to make excessive and costly repairs necessary.”² In a regime that imposed no social wage costs on employers to “repair” damaged labor power, firms' incentives to maintain machinery did not apply to discardable workers.

Later in the nineteenth century, when the state compelled owners to comply with certain hygiene and safety standards, employers regarded such innovations not as measures designed to increase production but as burdens in a zero-sum game, imposed on production for the benefit of workers. During the first third of the twentieth century, a coalescing group of physiologists, psychologists, and industrial organization experts began to convince management in the most advanced sectors of assembly-line industry that improved physical, psychological, and organizational conditions would enable workers to produce more and more intensively in less time. Only gradually, however, did these new techniques spread from the automobile, electro-technical, and machine industries, in which engineers had gained powerful positions, to industries in which the traditional and more primitive methods of extensive exploitation of the workforce prevailed.³

At a relatively undeveloped stage of the division of labor and prior to the rise of factory assembly-line production, breaks in work occurred spontaneously; artisans, who proudly controlled their own time, and later even machine workers had to interrupt their work to fetch, assemble, prepare, and check materials and tools. The different muscles required to perform these tasks provided the kind of variety that enabled workers to relax the muscles and nerves used in their principal activity. The transitions between these various activities also permitted workers to rest. The deepening division of labor and emergence of conveyor-belt drive systems deprived workers of the variety and interruptions that had helped combat fatigue. In the pre-World War I British metalworking industry, for example, a skilled craftsman “could move more or less at will” from concentrated skilled operations to “more relaxing” unskilled work; but in the course of the wartime drive for efficiency and rationalization, the easier tasks were segregated out, leaving the skilled worker to perform only the most tiring ones “without respite.”⁴ Perhaps the most extreme illustration of this process was Henry Ford’s introduction of interchangeable parts and continuous-flow assembly lines, which reduced workers’ task cycle from eight hours to one minute:

The skilled fitter in Ford’s craft-production plant of 1908 had gathered all the necessary parts, obtained tools from the tool room, repaired them if necessary, performed the complex fitting and assembly job for the entire vehicle, then checked over his work before sending the completed vehicle to the shipping department.

In stark contrast, the assembler on Ford’s mass-production line [in 1913–

14] had only one task—to put two nuts on two bolts or perhaps to attach one wheel to each car. He didn't order parts, or procure his tools, repair his equipment, inspect for quality.⁵

This advanced system of extreme division of labor thus subordinated “the natural rhythms of the human body and mind—work and rest, alimentation and elimination— . . . to the mechanical rhythms of the line controlled by capital.”⁶

In a farcical reinvention of the wheel, some early-twentieth-century industrial managers required employees to use their rest periods to “get their own materials instead of having them supplied by unskilled helpers. While the latter procedure seems logically more efficient in order to let the skilled workers continue on their production, nevertheless the rest derived from getting the materials plus the saving in personnel . . . puts the concern ahead.” Decades later a leading ergonomist was even more emphatic: “It is clearly a mistake to think that the provision of conveyor belts, service girls and so on, which will make it unnecessary for an operative to leave her work place during the whole of a morning or afternoon's work, will necessarily increase output. On the contrary it is more likely to have the opposite effect.” Indeed, some researchers claimed that, at least for monotonous as opposed to physically arduous work, a change of tasks was superior to a rest period with respect to reducing mental fatigue—especially for workers who resented the employer's imposition of a scheduled break.⁷

The new, monotonous, much faster, and more intensive labor processes that compelled workers to repeat the same few motions thousands of times daily created physical and psychological strains requiring a confluence of significant changes in the temporal structure of the working day. In the United States especially, as the U.S. Division of Labor Standards observed in 1941, “speeding-up [was] probably . . . a much more important” cause of fatigue than long hours. Firms could effect such speedups either by requiring workers to perform individual motions more quickly or by abbreviating the pauses between two steps of a process.⁸ Already at the turn of the century social reformers were insisting that “Increased Speed Calls for Leisure.” Using the example of a stitched muslin underwear factory, Florence Kelley of the National Consumers' League observed that

the speed of the sewing-machines has been increased so that they set, in 1905, twice as many stitches in a minute as in 1899. Machines which formerly carried one needle now carry from two to ten, sewing parallel seams. . . .

Thus a girl using one of these machines is now responsible for twice as many stitches at the least and for twenty times as many stitches at most. . . . Those who continue in the trade are required to feed twice as many garments to the machine as . . . five years ago. The strain upon their eyes is, however, far more than twice what it was. . . . But the girls who stitch underwear are not only working the same number of hours as in 1899; they are wearing themselves out at a rate of speed such that the term of their whole working-life must inevitably be greatly shortened. The nervous energy required from day to day is more than can be supplied by the free time between one day's work and the next.⁹

This intensification of labor, which was tantamount to a squeezing or condensation of more labor during the same period of time, was, to be sure, possible only within a shorter working day. But as a labor historian of mid-nineteenth-century New England textile mills noted, "The old hours were appallingly long, but they were borne with better grace because the discipline was slack. When speeding up and driving became common . . . a change toward a shorter day became inevitable. The gain through shorter hours was a real gain, but it was not a net gain." By the 1920s, observers of industrial production asserted that even the eight-hour day could not compensate for the increased intensity. If, they speculated, employers' response to demands for a shorter workday was intensification, it was possible that the previous longer but less intense workday had been less destructive of workers' health.¹⁰

The world's most spectacular example of a shorter but less porous workday was, again, Ford's conversion of his Highland Park, Michigan, plant from two nine-hour shifts to three eight-hour shifts in 1914 in connection with his introduction of the \$5 daily wage.¹¹ By permitting lunch wagons to enter the factory, Ford was able to reduce the meal period to "10 minutes gift"—including the time for washing hands and fetching food—just long enough for "a pick-up sandwich," which workers ate at "their places."¹² By the 1920s, workers complained that only by applying Fordist methods to eating would it have been possible to gulp down lunch in the few minutes before they had to return to the line—often with an all-too-predictable "Ford stomach." (Like their predecessors in the 1920s, many automobile workers in the 1960s, still complaining of the lack of chairs or tables, had to eat "in the middle of the grease, dirt, spit, and debris.") Reduced to its most basic biological functions, eating served "only . . . the quick refueling of the human machine."¹³

The assembly lines "relentlessly disciplined" the workers, sustaining a

“repressive” panopticon-like rule that enabled foremen to identify “immediately any slacking off.” Ford, for example, “hired ‘spotters’ to report workers who seemed to be stealing time. . . . A man who had spent seventeen years on the production line was dismissed one day because a few seconds before the quitting bell rang he took a piece of waste and wiped the grease from his arms.” Ford’s plan was driven largely by the need for uninterrupted operation of his huge capital apparatus: “Expensive tools cannot remain idle. They ought to work twenty-four hours a day, but here the human element comes in.” Although Ford recognized that workers’ efficiency was not maximized at night, he “made no concessions whatever,” requiring all workers to rotate shifts every two weeks so that “a hand hardly got adjusted to one schedule of work and sleep before he was thrust into another.”¹⁴

The same goal of maximum utilization and faster turnover of capital actuated Lord Leverhulme to propose a six-hour shift (excluding a fifteen-minute meal break) at Lever Brothers’ Port Sunlight soap plant; he also urged other British capital-intensive manufacturers to adopt short multi-shift continuous operations at the close of World War I, even if various objections by trade unions, workers, and the Board of Trade deterred Leverhulme from introducing the change. But because, as two officials of the Metropolitan Life Insurance Company noted in 1920, “fatigue accumulates rapidly during the third and fourth hour of work,” even the breakless six-hour day could not eliminate “fatigue . . . as a cause of accidents, ill health, and underproduction.” That the leading German theoretician of labor management during Weimar characterized Ford’s working conditions as approximating the hypothetical limit at which workers were worn out and replaced by fresh recruits suggests that intensification-induced stress made rest periods even more necessary than before; by no means were they redundant.¹⁵

Less well known but perhaps more interesting than Ford’s conversion to the breakless eight-hour three-shift day was Kellogg’s experiment with the six-hour four-shift day at its Battle Creek, Michigan, plant as a measure to relieve unemployment, sustain purchasing power, and increase productivity and profits. In moving from three eight-hour shifts to four six-hour shifts in 1930, Kellogg eliminated the thirty-minute stop for meals. Under the eight-hour day, workers had tended to “slow down before mealtime . . . and the pick-up after mealtime [wa]s always slow”; they also became “careless” toward the end of the shift. Consequently, the firm “had to adjust the speed of [its] processes and machines to this human factor.” Under the new regime, according to the breathless, athlete-inspired

account of the company's president, Lester J. Brown, "each shift works straight through without a break. . . . It's much like a relay race. . . . If a man started out to run a mile himself he would realize that he could not run at full speed all the way. . . . But if this same man were one of four in a mile relay race, each running a quarter of a mile, he could let himself go, as could his three teammates, and the over-all time for the mile run would be much shorter." Workers, "knowing that the working time is short, and that it 'won't be long now' until the whistle will blow," could work at full capacity during the entire shift. The increased line speed not only enabled the firm to increase its return on investment but was, Brown insisted, also "a benefit to the workers, for it keeps their minds alertly intent upon their work and makes the time pass more swiftly and pleasantly."¹⁶

Although Kellogg liberated itself from the "waste" of having to stop production to refuel its human machines, the company was constrained by the workers' continued need to void that calorific intake: "No rest period is provided. However, employees are provided with relief by foremen and foreladies, and other available help, for personal care. In determining our wage incentive standards, an allowance is made for personal attention amounting to 30 minutes per day for woman workers and 18 minutes for male employees." A survey conducted by the U.S. Women's Bureau during the second year of the experiment only partially confirmed the company's claim that a six-hour day without a meal break was less fatiguing than the eight-hour day with a meal period. Whereas 25 percent of female workers who had experienced both regimes found the shorter breakless day less fatiguing, 19 percent were more fatigued; the majority saw no difference. Compulsory fasting was another matter: between half and almost two-thirds of the women, depending on their shift, reported that they felt the need for food. The first union agreement, in 1937, created gender-neutral rest periods totaling fifteen or twenty minutes in various departments, a negotiated pattern that lasted for decades.¹⁷

The length of the working day could not be extended indefinitely without interfering with the intensity of work and had at some point to be sacrificed to the drive for greater speed; the establishment of fixed industrial rest periods thus marked the transition from the struggle over the length of the working day to that over the intensity of work. Before World War I, only women and children, "as a rule," received rest periods, which were "considered in their social rather than in their industrial aspects. . . . Their relation to production [was] little emphasized." Pauses were much more common in "occupations involving great nervous strain, such as that of

the telephone operator, or in the monotonous work of the typist, and the elevator man, or in the hot work of a foundry man” than in typical factory settings. Yet even among telephone operators, a federal government study concluded in 1910, “in some places the relief period is regarded by the managers as a privilege rather than as a right; hence only the girls who ask for it are given relief, and only when they ask for it. Where this system obtains, girls feel a reluctance to ask for relief; sometimes they feel that to do so is to jeopardize promotions.”¹⁸

Some examples of prewar sporadic experiments with production-oriented rest breaks, however, are recorded. A large midwestern printing house, for example, turned to rest periods when it sought to increase output in a department in which neither the machinery nor the means of handling material could be improved and the female piece-rate feeders were already “highly efficient.” From a study of the daily output curve, managers discovered that it fell off during the middle of the morning and afternoon and reverted to maximum efficiency before the forty-five-minute lunch break and the end of the nine-hour workday. Because the workers, whose work was monotonous rather than physically tiring, did increase their output “when they knew a period of rest was before them,” the firm “decided that if the operator could have a rest period to look forward to at some time during the period of decreased output . . . this decrease would be less marked.” By turning the power off twice daily for five minutes—that is, by reducing actual work time by 1.9 percent—at the times when efficiency was lowest, the firm was able to increase output by 8 percent.¹⁹

Such employer-initiated rest breaks, based on observations of increased output, formed an important analogy to the enactment of shorter hours legislation, which many employers resisted. As the German-American industrial psychologist, Hugo Münsterberg, predicted on the eve of World War I, progress toward the eight-hour day in the United States would not be possible if it did not also serve “capitalist interests”—that is, if it were not the case that work performed beyond a certain number of hours was economically unproductive.²⁰

The “Science of Work” and Taylorism

Daily assured leisure serves a purpose of the highest social value by enabling the wage-earner to husband that resource of nervous energy which is required to continue active working-life after the passing of youth. In the garment trades, men are old at forty and women are superannuated at thirty, largely by reason of the alternations of overwork and enforced idleness.

Florence Kelley, *Some Ethical Gains Through Legislation* (1905)

No one can question the desirability of avoiding a working day of such length that it excludes opportunity for proper relaxation and rest.

But it is more important that we rear a strong and virile race, capable of working beyond the average requirement rather than to adjust the environment and working requirement so that they shall conform to the necessities of a working population physically below par and encouraged by such measures to remain below par.

Committee on Elimination of Waste in Industry of the Federated American Engineering Societies, *Waste in Industry* (1921)

By the late nineteenth century, Germany had developed the discipline of *Arbeitswissenschaft* (science of work), which eventually came to encompass *Arbeitsphysiologie*, *Arbeitspsychologie*, and *industrielle Betriebslehre* (industrial organization). Embedded in the material context of the transition to electricity-driven production, which increased both the speed and the steadiness of the work process, the ideology of the science of work reflected capitalism’s reconceptualization of labor’s chief mode of resistance, now seen not as idleness but fatigue.²¹ Under the leadership of the prominent psychiatrist Emil Kraepelin, work scientists initially investigated the experimental impact of pauses on such mental activities as arithmetical operations in abstraction from economic motivations. But once the economic aspect of rest periods became paramount, practitioners of labor psychology sought to identify “the most worthwhile work pauses.”²² The not-so-hidden assumption underlying rest pauses was their capacity to instrumentalize workers’ physiological well-being in order to enhance profitability. In order to give pauses an economic purpose, their length, number, and scheduling had to be chosen so that the additional output associated with the renewed vigor attributable to the break at the very least compensated for the loss of time; when the “net profit” was greatest, the pause was “the most worthwhile.”²³

The focus of the science of work on the relationship between hours and intensity of labor was driven by the conflict between the intensification of work processes caused by mechanization and labor’s demands for a shorter

working day. Politically engaged social scientists like Max Weber, who was convinced that the working class “in some sense” would always be socialistic, expressly operated with Marx’s categories of the extensity and intensity of labor as they studied the impact of pauses on labor efficiency.²⁴

Even at the height of the industrial rationalization movement in Weimar Germany, leading pro-capitalist work-science advocates of rest periods never ceased to wonder and complain that the chief practical obstacle to implementing their proposed measures was the “strange” opposition by employers and, secondarily, workers. Even large employers’ organizations that approved of pauses fell victim to “mass-psychological influences” as they acceded to the doubts of individual entrepreneurs, who took the principled yet irrational position that they could pay only for work and not for pauses despite injuring their own economic interests by doing so. Work scientists displayed somewhat more sympathy for the equally obstinate resistance of workers, who feared that employers would sooner or later prescribe the faster pace of work made possible by rest periods as the standard for all workdays, including those without pauses.²⁵

European *Arbeitswissenschaft* rejected American scientific management’s claim that mechanics and physiology could prescribe the one best way for workers to perform any task. But Frederick Taylor believed that science alone could predict the laborer’s most efficient response to capitalism’s call. Beginning in the late 1870s he sought to overcome management’s ignorance of its own workers’ knowledge and skills. He saw himself as having an advantage over other foremen: because he “happened not to be of working parents, the owners of the company believed that he had the interest of the works more at heart than the other workmen.” Ignoring the long-term impact of his regime on workers’ mental and physical well-being, this onetime steel plant supervisor and manager studied the most effective way to control and harness alienated workers’ energies. The difference between the European and U.S. approaches was also captured anecdotally by a visitor from the United States, who was impressed that in Germany on the eve of World War I railway maintenance shops provided couches for older workers to rest on, while Ford and General Motors were firing workers for sitting or even leaning against a machine when not working.²⁶

This American industrial attitude was mirrored in mercantile managers’ insistence that saleswomen “counterfeit attentiveness by constantly standing”—a posture that brought on “needless physical weariness.” Although a rested saleswoman would be “so much the more valuable to her employer,” in whose interest it would therefore be to provide seats, the *New-*

York Tribune editorialized in 1885, stores violated their legal obligation to women “lest they should abuse the privilege of resting themselves.” Consequently, “pale faces . . . and other signs of exhaustion . . . strike every observer . . . among the poor girls who are on foot from morning to night without rest.”²⁷ Managerial vigilance ensured, as a sociologist who briefly became a department store clerk in Chicago in 1899 found out, “that the stolen rests were few.” When saleswomen in turn-of-the-century New York City occasionally fainted, “they were stretched out on the concrete floor of the retiring room, and if they did not recover rapidly, they were sent home and their pay envelopes suffered in consequence.” One owner candidly declared: “My store is not a hospital.” In Britain, too, as the *Lancet*, the leading medical journal, noted in 1880, “if the shop-walkers saw any of their staff resting—even leaning against the counters,—they would be reprimanded, and even threatened with a fine or dismissal, because they did not, at the expense of health and the cost of life-long disease and misery, help to keep up the semblance of ceaseless toil.”²⁸

Taylor’s system of scientific management, which had emerged at the turn of the century, was driven by the interrelated goals of wresting from workers in ever-larger firms substantive control over the process of production and of making the workday less porous. A shorter but more intensive workday generally proved to be more efficient from capital’s perspective. Although it had “long been known to employers that pauses are helpful in warding off fatigue” and facilitating the “regular intensity” required by modern industry, the discovery that workers who “soldiered” on the job were unconsciously or intentionally and systematically working more slowly than Taylorites deemed rational prompted scientific managers to regulate this aspect of labor relations.²⁹ Time and motion and output studies were designed to secure the requisite data: by identifying the times of the day when efficiency dropped off, managers could insert pauses in order to alleviate fatigue before it accumulated. Taylor has been called the “father of the modern work pause” because he also devised methods to halt workers’ inefficient interruptions of the production process.³⁰

Scientific management’s goal was purportedly not to extract a greater expenditure of energy from workers in order to speed up work or even to increase productivity. Rather it aimed to prevent them from misapplying energy in wasted motions, in part by introducing “compulsory periods of rest, even, which the workman will ordinarily not take for himself.” But since the elimination of unnecessary motions, as a physiologist pointed out in 1920, merely means that a worker performs more of the remaining motions daily, “without rest periods, the probability of speeding-up . . .

becomes a moral certainty.” Taylor denied “trying to find the maximum work that a man could do on a short spurt”; instead, he sought to discover “what really constituted a full day’s work . . . that a man could properly do, year in and year out, and still thrive.” Starting from the belief that “every single act of every workman can be reduced to a science,” Taylor was “convinced . . . that some definite, clear-cut law existed as to what constitutes a full day’s work.”³¹

Taylor and his pupils ignored the fact that a “full day’s work” results from a political struggle between the class of sellers and class of buyers of labor power over the length and intensity of the working day. In claiming that the definition could be reduced to physiological laws, Taylor’s analysis of group motivation and behavior, as well as the dynamics of group setting and the enforcement of norms of output, was primitive; he never understood that “the standards of the engineer and employer have no more claim to absolute validity than the standards of those who are alleged to be doing the restricting.” It is highly ironic that the one contemporary who contributed even more to intensifying the extraction of labor, Henry Ford, punctured Taylor’s pseudo-harmonizing doctrine: “Economics has never yet devised a sinking fund for the replacement of the strength of a worker. [Not even] pensions . . . take care of all of life’s overhead, of all physical losses, and of the inevitable deterioration of the manual worker.”³²

Oblivious to such considerations and contemptuous of the objects of his experiments, who could be replaced by “an intelligent gorilla,” Taylor asserted that with regard to heavy laboring, for example, “the law governing the tiring effect” determined that depending on the weight of the load, the worker had to rest a predefined proportion of the time in order that his blood restore to their normal state the tissues in the muscles subject to degeneration. The worker performing heavy labor is incapable of devising this method on his own, for, according to Taylor, he is “so stupid and so phlegmatic that he more nearly resembles in his mental make-up the ox than any other type. . . . He is so stupid that the word ‘percentage’ has no meaning to him, and he must consequently be trained by a man more intelligent than himself into the habit of working in accordance with the laws of science.”³³

Taylor’s greatest claim to fame in systematizing the practice of rest breaks grew out of his efforts to develop “the science of handling pig iron” at the Bethlehem Steel Company at the time of the Spanish-American War. The lesson he had learned twenty years earlier, as gang boss at the Midvale Steel Company—that management’s struggle to “get a fair day’s work out of the lathes . . . immediately started a war” with the workers—still stood

him in good stead. In this 1899 pig-iron loading demonstration, Taylor later claimed, a man with a stopwatch stood over the worker and ordered him periodically to “sit down and rest”—but this literary reconstruction was fabricated. Scholars have discovered that the only rest Taylor permitted his pig-iron carrier was walking back empty-handed from the car onto which he had loaded the pig iron. Even a contemporary, while “marveling at the increase in . . . capacity for handling pig iron” that Taylor’s most famous worker (“Schmidt”) achieved, “also wonder[ed] how well he lasted.”³⁴ Despite the subsequent debunking, fatigue researchers, like Taylor’s contemporaries, continue to praise his pig-iron experiment for having demonstrated the “importance of work-rest cycles,” even as they concede that no one has yet specified a rest policy based on analytic methods.³⁵ But a scholarly account of scientific management in action, free from Taylor’s self-interest, demonstrates vividly how far was his approach from pure science and how fraught with arbitrariness and necessary compromises with workers’ own norms.³⁶

Applying the same approach to other kinds of work, Taylor observed that quality inspectors spent too much of the day in idleness because their “working period was too long.” The solution was “to plan working hours so that the workers can really ‘work while they work’ and ‘play while they play,’ and not mix the two.” To this end, Taylor shortened the day from 10.5 to 8.5 hours. Although the point of this exercise must, presumably, have been to increase the intensity of work, Taylor expressed surprise that even following the reduction in hours, “after about an hour and one-half of consecutive work they began to get nervous. They evidently needed a rest. It is wise to stop short of the point at which overstrain begins.” The intensity must have been ratcheted up considerably, for Taylor found it necessary to compel the workers to rest ten minutes every hour and a quarter, thus making it “possible for them to really work steadily instead of pretending to do so.” Despite Taylor’s self-congratulatory evaluation of the laws of rest that he had discovered, initially his clients failed to welcome them. By the time of his death in 1915, a study of firms operating under scientific management revealed that “managers, in general, apparently d[id] not even entertain the idea of” instituting rest periods. Yet the very next year Frederic Lee, a founder of industrial physiology in the United States, asserted that rest periods had become a “custom, not uncommon since the striking demonstration of the late Mr. Frederick Taylor in the lifting of heavy pig irons, of giving workers occasional brief intervals of freedom from their tasks.”³⁷

Frank Gilbreth and Lillian Gilbreth were apostate Taylorites, breaking

with him in part by subordinating time studies to motion studies, conducted with the help of motion pictures. They responded to the movement for shorter hours for female workers by focusing on the fatigue-overcoming qualities of rest periods in a study they published in two editions during and shortly after World War I. Subtitled *The Elimination of Humanity's Greatest Unnecessary Waste*, the book canvassed possibilities for dealing with industrial fatigue. While recognizing the powerful contribution that a shorter working day could make, the Gilbreths worried about its effect "upon the entire industry in the vicinity," since "in the long run maximum prosperity is dependent upon largest outputs." Rest periods, on the other hand, could be used "immediately"; and it had already been "proved . . . that more output can be achieved by applying one's self steadily for short periods, and then resting, than by applying one's self less steadily and having no rest periods." The Gilbreths aspired to educate workers to become interested in the fatigue and recovery processes so that they would recognize fatigue as the common enemy of individual workers and management and would "fight[] it together for our best interests, severally and collectively. . . . The worker now comes to realize that he hurts the management *and* himself when he gets too tired."³⁸

Class harmony and universal contentment seemed to flow quasi-automatically: "The rest periods allow time for development of the social spirit. . . . 'I like every one whom I know.'" Thus Taylorites and other Progressive Era advocates of industrial efficiency argued against Marx's conclusion that class struggle in large part determined the length of the working day, insisting instead that management-imposed fatigue-reducing rest periods based on physiological laws were a key element, enabling firms to shorten hours and increase productivity and profits without undermining workers' health. Nevertheless, even some who eschewed class struggle recognized that shortening the workday could be a zero-sum game. The most prominent mid-Victorian factory inspector, for example, observed as early as 1841 that not even by working "more intensely" would factory workers be able to make up for a reduction in working hours from twelve to ten because their labor was already "as severe as they can bear for any continuance."³⁹

Other advocates, too, made it clear that rest pauses were not merely a concession to humans' weak bodies, in order to stave off drops in output, but an affirmative measure to determine "whether, even with the present length of working day, production can be increased." Scientific management's approach to fatigue and rest was not, however, monolithic. One of its leading exponents, Henry Gantt, another renegade Taylorite busi-

ness consultant, argued that “doing absolutely nothing is quite as tiring as working very hard, so that it is only quite reasonable that a worker may often increase his speed materially and be less tired at the end of the day.” On this account, there would be no need to enforce pauses to compensate for now-eliminated delays or voluntary rests that used to benefit the worker—and British rest-period investigators criticized Gantt for this reason.⁴⁰

World War I and Its Aftermath

It is a poorly organized industry indeed that will not voluntarily install sufficient rest periods during each working day to offset the monotony of highly specialized work or to so regulate the speeding-up process as to give due consideration for human conservation which calls for seats for persons wherever and whenever they are needed.

Merica Hoagland, “Labor Legislation for Women,” in U.S. Women’s Bureau, *Proceedings of the Women’s Industrial Conference* (1923) (Mutual Service Director, Diamond Chain & Mfg. Co., Indianapolis)

The advent of world war brought about “an unprecedented effort to maintain production at its highest point.” In Britain, the long hours, diminished productivity, disciplinary problems, and labor unrest that followed prompted studies reporting positive results from the introduction of rest periods, which, under the prodding of the state, took the form of fifteen-minute afternoon tea breaks. These findings, in turn, attracted the interest of U.S. researchers and employers.⁴¹ As the United States entered the war in 1917,

conditions and hours of industrial employment were recognized as no longer matters of private contract between workers and employers, but were newly envisaged as problems of national scope and concern. To attain maximum production without prejudice to national vigor—this was the new and enlarging demand of the time. But . . . the instant need of supplies awoke the instinct to . . . put on pressure, which has always been associated with the desire for quick returns. In many quarters the lessons of history and experience went for nought, and the demand was raised for immediately lengthened hours of labor.⁴²

Crucial for the study of fatigue in war manufacturing in the United States and Europe was what Frederic Lee called “The New Science of Industrial Physiology,” which between 1917 and 1920 was said to have

made more progress than in the previous half century.⁴³ It instrumentally studied

the industrial worker . . . as bringing to the general physical equipment of the factory his own bodily machine, the most intricate of all the machines used in the plant. This machine must be understood, it must be constantly watched. . . . Like other industrial machines it can be worked at different speeds, but unlike other industrial machines it can not be worked for an indefinite period, because it is subject to the limitation of fatigue. Fatigue delays work, diminishes output, spoils goods, causes accidents and sickness, keeps workers at home. . . . How . . . the working power of the individual can be maintained from day to day and from week to week and be made to yield a maximum output without detriment to itself and to others—in other words how the human machine can be used so as to obtain from it the most profit—constitutes one of the great industrial problems of the day.⁴⁴

The initial wartime impetus to grant rest periods was driven by this physiological model of fatigue and rest and their impact on output. To be sure, even this model recognized such purely (Pavlovian) “unconscious” psychological incentive effects as “a higher rate of working . . . when a pause is expected; work improves for some time before the moment to rest comes.”⁴⁵ Moreover, the British fatigue-rest researchers also argued that pauses served different ends for different types of work: in light repetitive, boredom- and monotony-engendering work, “the beneficial effects of rest pauses . . . depended on change from the main operation rather than on the complete cessation of work”; in heavy muscular work, rests literally “serve as recovery periods from the effects of physiological fatigue.” Since repetitive industrial work was the wave of the future, researchers confidently predicted that “the value of rests as a means of alleviating the effects of monotony will become increasingly important.”⁴⁶

A major study conducted in 1917–18 in two large war-related plants by the U.S. Public Health Service, together with the Committee on Industrial Fatigue of the Council of National Defense and the Committee on Fatigue in Industrial Pursuits of the National Research Council, provided the first extensive body of information on the efficacy of rest periods in U.S. industry. The results “prove[d] more conclusively than ha[d] been proved before that with the long workday the interruption of work is on average more than compensated by the recuperation afforded by the recess.” Although the report was the first in a series, titled *Studies in Industrial Physiology: Fatigue in Relation to Working Capacity*, its senior author,

Josephine Goldmark — who was a close collaborator with Felix Frankfurter and her brother-in-law, Louis Brandeis, in the struggle for laws mandating shorter hours — made certain to highlight the workers' spontaneous non-economic reaction to the introduction of rest periods: "As the machinery stops, or as hand tools are laid down, the whole room appears to take a deep breath; talk and laughter break out; there is general movement, running to get drinks of water, reading of newspapers by the older women, sometimes dancing by the younger; there is, in a word, genuine relaxation."⁴⁷

The possible galvanizing impact of such a "startling metamorphosis from dull, quiet, sedate working creatures to gay, unrestrained social creatures" may have contributed to some firms' resistance to conceding rest periods. Florence Kelley documented the extent of fatigue that such recalcitrance caused among wartime women textile workers. In a New Jersey mill whose "toilets surpassed in degradation anything that could be imagined" but that lacked any room for dressing or rest, "the women's only refuge from the crashing machinery and endless blinding rows of revolving bobbins was the toilet rooms." Consequently, the workers were reduced to "trying to steal a few minutes rest by sitting over a narrow board, in which holes were set over a common trough" — conditions that management excused on the grounds that it was "useless to provide decent toilets for that class of workers."⁴⁸

Employers' wartime recognition, especially in munition plants, "that a rest period, breaking the monotony of repetitive operations, counteracted production-line fatigue and actually resulted in a higher volume and total daily output and in reducing spoilage" prompted investigators to conclude that "regular rest periods ought to be adopted very widely in industries." Such wartime successes led to wider acceptance of rest periods after the war; yet despite the convincing evidence of their positive effect on productivity, only a small proportion of employers adopted them. Some management-oriented researchers sought to persuade those employers who believed that close supervision and incentive wages sufficed to "force or induce their employees to spend every available moment of their working time on the job" that "everywhere men and women engaged in monotonous occupations steal their rests in case authorized rests are not allowed." To many managers and supervisors, however, the mere sight of a worker sitting down when he was paid to be working, even if such a rest "would secure a bigger day's work for the company than the usual day of unbroken, but extremely low-speed effort," was anathema. They found

it “hard . . . to believe that more work can be accomplished in a shorter time . . . with respect both to length of work week and to rest pauses.”⁴⁹

Management experts warned these skeptics that since workers who “felt that they would go crazy if they could not stop for a while” would “sneak to the toilet” or engage in other “time stealing” that would nevertheless fail to provide them with the “complete relaxation of physical or mental tension” they required, an “employer who does not authorize rests will pay for those authorized by his competitor.” A “judicious use of rest pauses,” according to a later variant of Anglo-American industrial psychology, would make a more “contented worker, who is . . . usually willing to work.” In a less ambitious version, rest pauses were touted to employers by using an analogy—“the old . . . tale about a car that had been going at 100 m.p.h., and when the driver slowed to 20 the mechanic thought they had stopped and got out.” The Industrial psychologists who were more conscientious in their science were nevertheless constrained to admit, “Unfortunately, more rest pause experiments . . . have been complicated by other factors such as improved routing, refreshment, etc., which only allow of deduction and surmises as to the part played by the rest itself.”⁵⁰

One such speculation that soon arose was that short rest periods might ease the tensions of long work spells more than a shorter workday itself. By the same token, the experimental discovery that workers had to become re-injured daily to the monotony of their tasks prompted some industrial psychologists to caution that the disadvantages of frequent short pauses also had to be weighed very carefully: “Every continuous activity of a repeating nature,” warned Münsterberg, “secures a certain adjustment of mind and brain by which the actions can be performed with less effort. The worker becomes adapted to the task and . . . this adaptation is lost or at least decreased by a pause. . . . Interruption . . . injures the perfect adjustment which has been reached.”⁵¹

The British Health of Munition Workers Committee, charged with investigating industrial fatigue, observed that determining “the proper length and distribution of pauses” was “one of the most important aspects of ‘scientific management’” in the United States. The committee concluded that the British experience had “proved that . . . many women and young persons cannot profitably be employed for the full spell of five hours on continuous work as allowed by the Factory Act, and even where the spell is somewhat less than five hours, there is a general tendency amongst employers to allow short intervals for refreshment . . . and a period of rest and recovery from fatigue.” An American professor of mechanical engi-

neering, writing in the leading journal of management-oriented industrial psychology in the 1920s, proposed a process of *tâtonnement* by which employers could feel their way toward that proportion of rest to work that would maximize output: they should start with the minimum, defined as “the least on which industrial workers could produce their maximum output; that is, any diminution of rest below this proportion would certainly result in a decrease of output.” Using the minimum rest as a starting point offered the advantage of ensuring that managers would not cause unrest by later shortening or withdrawing rest periods they determined to be superfluous from capital’s perspective.⁵²

Since studies revealed that “no worker will, or can, work continuously for several hours without taking occasional rests” and that men and women on average “stop work spontaneously for about eight minutes per hour,” British experts concluded that “it is evidently better to control these pauses to some extent for the workers . . . than to leave them to their uncontrolled and haphazard initiative.” More than fifty years later, the authoritative *Production Handbook* for U.S. manufacturing still formulated “the basic question [a]s whether or not formally authorized rest periods are better than indiscriminate and unauthorized rest.”⁵³

Although the British government, through its Industrial Fatigue Research Board (later renamed the Industrial Health Research Board), studied the impact of industrial rest periods much more intensively than did its counterparts in the United States, already by the mid-1920s the board was noting that rest periods had become a much more common practice in the United States. P. Sargant Florence, an economist who created a personal link between U.S. and U.K. fatigue-rest studies, published numerous studies reporting that rest periods not only increased efficiency but raised output in excess of that which was lost as a result of the reduced working time. Many other practitioners of industrial psychology confirmed the same relationship. By 1927 the board observed that in Britain “The opinion is often held that an unbroken spell of 4½ or five hours is detrimental to efficiency and the well-being of the worker, and that one or more pauses should be introduced within the spell of work.” Within a few years, the board could report that “In the one-break day common to most industries, 4½ hours is a usual spell, but it is now common practice to break it up with rest pauses.”⁵⁴

The introduction of work breaks was, however, by no means universal in Britain. So convinced were some employers that the loss of working time associated with breaks led to a decline in productivity that they insisted on any such time being tacked back on at the end of the

day. In another approach, workers at a Philips radio factory in the 1930s were given an unpaid ten-minute break, following which management increased the speed of the assembly line and forced them to “make up the time by working even faster.”⁵⁵ Moreover, as the British board itself conceded, “in strictly automatic processes, where production depends upon the machine alone, there must necessarily be a loss in output corresponding with the time spent in resting, and in such cases the beneficial effects will be limited to the well-being of the worker.” Even in those cases in which the introduction of rest periods brought about a higher rate of hourly production deriving from “an increase in the rate of working and . . . a reduction in the number and duration of unauthorised rests,” some firms remained unimpressed: “From the practical standpoint . . . an increase in the rate of working is not sufficient to warrant the continuation of rests . . . ; the employer is primarily concerned with the effect on *total* output.” Finally, some firms’ rejection of demands for rest periods that promised to enhance productivity may have stemmed from their viewing the length of the workday as a question of power on which they were unwilling to compromise.⁵⁶

To those employers who found the trade-off between efficiency and total output unattractive, fatigue researchers, shifting from physiological to psychological grounds, suggested that “it is probable that the increase in contentment alone is sufficient to justify the system. Very few workers can look forward with interest and enthusiasm to an unbroken work-period of 4½ or 5 hours, but the knowledge of an expected rest about half-way through the spell makes the task appear less overwhelming and creates a more buoyant attitude towards the work.” This attitudinal effect was said to manifest itself, experimentally, in increased output even preceding the rest periods, as workers anticipated the expected pause—a phenomenon that a German work pauseologist regarded as “contrary to every natural-science experience according to which effect follows cause.”⁵⁷ But despite repeated findings of this nature, Columbia University professor Frederic Lee, the president of the American Physiological Society and a leading wartime fatigue researcher for the Public Health Service, was reporting by the end of the war: “Industry accept[ed] the luncheon period, often shortening it . . . by one-quarter, one-half, and sometimes two-thirds of the conventional hour; but it [wa]s loath to believe that additional resting periods [might] be advantageous.”⁵⁸

What may have been the first survey of U.S. firms’ rest-period practices was conducted by the U.S. Bureau of Labor Statistics (BLS) in 1916–17. Motivated by the desire to help employers become familiar with and stan-

dardize “welfare work for employees,” the study covered 431 establishments with 1.6 million employees. The BLS found that fewer than one-quarter of all firms (only 106) “granted” rest periods. Echoing the statutory gender differential already noted, the study found that rest periods were given to 87 percent of the women but only 31 percent of the men. The data for women were skewed by the predominance of the telephone industry among the firms surveyed. Because “the nervous strain of the work is very great, . . . it is the uniform practice for this reason to provide relief periods usually of 15 minutes duration twice during the working hours”; thus virtually all female employees received breaks. In general, employers confined rest periods to those in “especially monotonous or fatiguing occupations” such as dictaphonists and stenographers, denying them to female textile workers, who allegedly had “frequent opportunities . . . to rest while at their machines.” A 2,000-employee machine factory, however, did shut off the power twice a day for ten minutes “so that employees [we]re obliged to relax even though they might prefer to remain at work.”⁵⁹

As early as 1919, the National Industrial Conference Board (NICB), a big-business research organization, published a study based on a survey of several hundred employers’ practices regarding rest-periods, “a primary purpose” of which was “to raise the efficiency of workers.” Although the firms were selected from a list of those purportedly using rest periods, more than half of even these had not implemented rest periods: the NICB concluded that “the use of such pauses in American establishments is the exception rather than the rule.” Nevertheless, among the more than 100 firms that had used pauses, fewer than 15 percent had discontinued them; fewer than one-third had introduced them before the war. Of the firms providing data on the issue, one-quarter granted rest periods to all their employees; among those providing rest periods selectively, 95 percent of the employees receiving them were women. Even some of the proponents of rest periods used them merely “to diminish loss of time resulting from unregulated pauses” taken at the workers’ own discretion. Firms also expressly stated that rest periods were neither necessary nor desirable for men—a view that the NICB rejected—although men frequently received them because their work was linked to women’s.⁶⁰

Despite the NICB’s muted report, the *New York Times* reported in 1919 that “The question of rest periods has become such an established feature in the large majority of industrial and commercial organizations that their rest rooms serve in a fair way to give the employes an idea of how a room can be made beautifully comfortable.” Yet there seemed to be more fantasy than fact in this characterization: a survey of working-class mothers

in Philadelphia conducted immediately following World War I confirmed how little headway rest periods had made even for women. Only 16 percent of the workers reported receiving any rest beyond their lunch period. Moreover, not only did many of the women performing the most exhausting tasks receive no rest at all, but half of those who did have breaks obtained little relaxation from them because they had to spend the time in the workroom or toilet room. Employers reported to the Illinois Industrial Survey in 1917–18 that 35 percent of their female factory employees received rest periods—39 percent of those in Chicago but only 14 percent of women workers elsewhere in the state. Similarly, in only “a few of the larger establishments” studied in Cincinnati in 1918 did women receive rest periods.⁶¹

The rarity of rest periods during the pre-World War II period is also mirrored in their failure to have made it across the threshold of scholars’ awareness: for example, in a major history of firm-level “welfare capitalism” from 1880 to 1940 they are not mentioned among the programs—such as housing, education, recreation, medical care, pensions, and stock ownership—that management developed to combat unions, militancy, strikes, insobriety, absenteeism, turnover, fatigue, inefficiency, disloyalty, sabotage, and bolshevism. At that time, “welfare capitalists lacked sympathy for a shorter work week.” Such employer resistance may have been stiffened by what the NICB called the “danger . . . that the acquisition of privileges often whets the appetite,” prompting “the recipients of these benefits . . . to turn to demands that are unreasonable.”⁶²

From Scientific Management to Human Relations

The right to leisure is a human right in process of recognition as a statutory right. . . . Where . . . courts have held that the right cannot be . . . established by statute, a ground of incessant contention is set up. In such communities, peace may be enjoyed . . . when . . . the inequality between the parties . . . renders a demand for regular leisure utterly hopeless, as in the sweated-trades or trades in which children and women are present in large numbers, e.g., the Southern cotton mills. Or peace may temporarily exist when both parties are so equally powerful that both fear warfare. . . . This peace, however, is always in danger of coming to an abrupt end by the introduction of some new machine, or by the immigration of some new and especially adaptable body of laborers.

Florence Kelley, *Some Ethical Gains Through Legislation* (1905)

Although by the mid-1920s “most of the intricate programs of . . . rest . . . appear[ed] to owe their existence to the stimulus of scientific management,” unilateral managerial rest-period policy received additional

ideological support from the burgeoning human relations approach to the mitigation of class conflict. Under the leadership of Elton Mayo, a professor at the Harvard Business School whose work was underwritten by the Rockefeller interests, the human relations school aspired to habituate workers to production processes over which they exercised less and less control. In the early 1920s, Mayo investigated the reasons for high labor turnover in the spinning department of a textile mill. In addition to various work-related physical ailments, Mayo discovered that the workers' "reveries were apparently monotonously and uniformly pessimistic." The institution of two or three ten-minute rest periods in the morning and afternoon, during which the workers were permitted to lie down and were taught how to relax their muscles, brought "immediate" relief: the "symptoms of melancholy preoccupation disappeared" while turnover ceased. Mayo was chiefly concerned with whether a particular set of working conditions alleviated or intensified "any preexisting tendency to pessimistic or paranoid meditation," which was always latent since "everyone, worker or executive, probably carries with him a private grief or discontent." Having concluded that "the most fertile cause of industrial and social unrest lies" in the fact "that a person of average ability is continuously employed upon a job of extremely repetitive type after the advent of fatigue," Mayo touted rest pauses as "greatly increas[ing] production by (a) restoring normal circulation and relieving postural fatigue, and (b) effectively interrupting pessimistic revery." Although the president of the mill confirmed that as a result of the introduction of rest periods, the workers "thought happier thoughts, and were generally better disposed to his company," archival research revealed that the effects of the rest pauses were not always to capital's advantage: when breaks were discontinued, production sometimes increased, whereas their reintroduction failed to increase output.⁶³

Mayo and his associates conducted the famous Hawthorne experiments at a large Western Electric plant in the latter part of the 1920s. Their results made clear the ideological power of rest breaks. Waxing philosophical, the investigators stressed that such pauses—"the most important" of their experiments—and other changes in working conditions "proved to be carriers of social meaning rather than mere changes in physical circumstances." The turn away from studying industrial fatigue and physiology to emphasize industrial psychology's credo that "an understanding supervisor would do more for production than rests or shorter hours" was effected during the Depression.⁶⁴ At the same time, the social meaning of changes in the environment became visible to subjects and students because

the introduction of rest pauses reflected an interest on the part of management in the health and well-being of its workers. Moreover, rest pauses allowed the workers to get together and to converse. . . . For the time being, at least, the “logic of efficiency” was in abeyance and the workers were permitted normal social interaction. Unlike many of the changes which are introduced to improve efficiency, rest pauses, if properly assigned and administered, appeal to the employees’ sentiments of individual integrity. . . . According to this interpretation, the meaning of rest pauses rather than the rest pauses in themselves is of chief importance. If the employee thinks the rest pauses have been introduced as a disguised form of “speeding up” work, he will meet the innovation with apprehension and resistance.⁶⁵

Western Electric’s management was sufficiently convinced by the concomitant rise in production that by 1930 it had granted rest periods to 5,000 employees.⁶⁶

By World War II some firms, which had begun to argue that neither monetary rewards nor compulsion sufficed to generate the “reasonable efficiency” they sought, recognized that “suitability of working conditions is one of the factors required for personal satisfaction which, in turn, means a reasonable performance.”⁶⁷ Relying on surveys and experiments that he had conducted since 1943 at the Aluminum Company of Canada and E. I. Du Pont de Nemours, a physician, Lucien Brouha, revealed the physiological underpinnings of this effort to increase morale. He criticized both industry’s paradoxical failure to use its knowledge of human physiology in explaining how modern society uses its human capital and the limitations of the Taylorist school:

An engineer would not use a machine without knowing its characteristics: power, optimum speed, efficiency of production. Strangely enough when the problem is the use of the human machine as a source of mechanical energy, the attitude changes. In modern industry occupations usually are classified by studies of . . . time and motion. The task is defined, but the question of the physiological expenditure of the worker is not considered. . . . It would not be logical to ask an engineer to evaluate the functional characteristics of a machine on the exclusive basis of a stop watch reading and a time study. It is just as illogical to try to evaluate the functional capacity of the human being by these methods. Physiological energy expenditure must be measured because it is the only accurate means of evaluating the effort of the worker and of estimating the degree of his fatigue.⁶⁸

Brouha intended to improve job organization by making management aware of its employees' "physiological capabilities," focusing on the "physiological cost of work plus the physiological cost of recovery." In particular, because workers "who cannot recover to a satisfactory level between work cycles will present increasingly higher physiological reactions as additional work cycles are performed and fatigue will accumulate as the shift progresses," it became "essential to evaluate with reasonable accuracy the recovery time or 'physiological rest allowance' for specific industrial operations." Job scheduling that permitted workers to take at preestablished intervals rest periods long enough to make possible a complete recovery enabled them to avoid "excessive fatigue and to remain in good physical condition throughout the shift."⁶⁹

The vast increase in U.S. industrial production under the aegis of the federal government brought on by World War II created the possibility of the spread of formalized rest periods. The agency of such development would have been the National War Labor Board (NWLB), which President Roosevelt established in January 1942 in order to resolve labor disputes that interfered with war production. The tripartite board (with equal public, labor, and management representation) was "instrumental in . . . fixing a system of 'industrial jurisprudence' on the shop floor, and . . . nationalizing a conception of routine and bureaucratic industrial relations" that neither the Wagner Act nor the National Labor Relations Board had fully implemented. In fact, however, the NWLB "established no definite criteria for judging requests for paid rest periods." Its case-by-case approach led to ordering paid breaks "when the shifts were excessively long or the work was burdensome, or on the basis of industry and area practice. On the other hand, the Board denied rest periods . . . when the character of the work did not appear to warrant it or there was a critical need for uninterrupted wartime production."⁷⁰

The board's tentativeness and instrumental stress on output was nicely captured in a 1943 decision involving a small firm that manufactured mattress covers. To support its demand for an afternoon rest period, the union both cited industrial efficiency studies showing that such rest increased workers' efficiency and speed and pointed to their use at comparable plants. The cost impact was crucial because the parties were subject to the federal wage stabilization program: "If such periods had a tendency to increase costs of production, it seems probable that Board members would regard them as disguised wage increases for the number of weekly hours would be reduced without a corresponding reduction in weekly wage rates." Although the New York Regional War Labor Board gave credence to

the studies and workers' experience at similar firms, it also acknowledged that "Tests conducted by industrial engineers are not always convincing from the businessman's point of view unless . . . the tests were conducted in an industry precisely the same as his own." And even then, "The probable behavior of employees in response to a concession of this sort cannot be calculated solely on a basis of the experience of other plants." Nor, finally, could the employer himself know how his own employees would react "until the change is tried." Consequently, "If the change is considered desirable by the workers, the burden of proof that it is also advantageous to the employer rests with them." The board therefore directed that the employees be given a ten-minute afternoon rest period for approximately a month during which they, "knowing that, if they abuse the privilege, the employer will be disinclined to extend it or to accede to it when the contract is renewed, will be expected to prove their contention that rest periods are advantageous to the employer as well as the employee."⁷¹

In Britain, too, the advantages of rest periods were widely recognized by the time of World War II. An influential textbook on industrial medicine for practicing company doctors, for example, concluded "that an unbroken spell of 4½ hours of work is physiologically undesirable wherever it can be avoided and that, so far as possible, a rest-pause should be introduced when the spell of work exceeds three continuous hours. Experience suggests that the optimum length of the rest-pause is about 10 minutes." One reason that formal rest periods were not more common in Britain was that management favored the Bedaux system, which criticized Taylorism for failing to factor fatigue and rest into its calculations; by notionally integrating a rest or relaxation allowance into each time-unit of work, Bedaux "enabled employers to eliminate all rest breaks."⁷²

An unusually comprehensive survey of rest-break practices in Britain in 1938 conducted by the National Institute of Industrial Psychology revealed important details. Of more than 1,000 British factories employing more than 300,000 workers, 53 percent offered official rest pauses, 15 percent unofficial pauses, and 32 percent no rest breaks. Only about half of the plants with rest periods provided them in the morning and afternoon; ten and fifteen minutes were by far the most common durations. Although it was even then quite widely recognized that workers gained the greatest benefit from rest that they took away from their actual work-site, workers in as many as three-fourths of the plants spent their rest periods in their work rooms. Surprising even to the investigators were the chief reasons that employers named for introducing rest periods: to enable employees—especially "large numbers of young girls [who] rush to work

without adequate breakfasts” — to take refreshments, to comply with Factory Act requirements, and to regularize unofficial breaks. Nevertheless, the vast majority of firms commented favorably on the effects of pauses; only a minuscule proportion abolished rest periods, with a mere nineteen specifying “abuse” as their reason.⁷³

By 1942 the positive evaluation of rest periods had become so widespread that a study published by Zurich General Accident and Liability Insurance Company in Chicago protested defensively, “Contrary to popular belief, we do not find unanimity of opinion on the value of the rest pause. . . . Certain industrial engineers believe that organized rest pauses . . . often hinder the even flow of production.” Yet by the late 1950s, the belief that “nothing is lost by the use of regular rest periods” because workers would otherwise appropriate less efficient unauthorized rest had been accepted even by the authoritative handbook for manufacturing management.⁷⁴

If, as managerial advisers observe, “non-productive time (such as rest periods, dinner breaks, clean-up and clothes-changing time) can cost the company money” and consequently pay for it “should be kept to a minimum,” why did breaks “become an accepted part of industrial life” at all? One reason, as the U.S. Department of Labor attested at midcentury, is that “Many employers have found that total daily output may be increased by allowing brief rest periods to break the monotony of repetitive operations.” Employers may also have been impelled to grant rest periods to workers who periodically exhaust their “physiological capital” by workers’ determination to take rests one way or the other; researchers found that a rest pause “does not really add to the amount of time ordinarily taken by the worker away from work.” Moreover, studies showed “that definite rest periods sanctioned by management have a greater recuperative effect than those which must be taken surreptitiously” precisely because workers are in “fear of being caught in the act.” When breaks are taken “in the form of ‘soldiering’ . . . such hit or miss rests may have as little as one-fifth the value of prescribed rests in relieving fatigue.”⁷⁵ By routinizing rest periods, management retains greater control of the production process while making the labor force “more contented.” A final reason was profit. As late as 1948, a leading industrial psychology textbook made clear that breaks were designed to sustain otherwise unattainable levels of labor intensity: “The employee carrying on his work at the rate usually desired in business and industry cannot continue that rate without periods of rest.”⁷⁶

Ergonomics: Taylorism Revisited?

The problem of how much work a man should be called upon to do and how much rest he should take has been an ever-present problem since "scientific management" was introduced by Taylor in the closing years of the nineteenth century.

K. Murrell, *Human Performance in Industry* (1965)

Fatigue ought to be avoided like poison, because, in reality, it is poison.

N.Y. State Dept. of Labor, Bureau of Women in Industry,
Industrial Posture and Seating (1921)

Ergonomics, the science of the relationship between a human and his or her work, seeks to synthesize the physiological, psychological, anatomical, and mechanical principles that govern the efficient expenditure of energy and explain fatigue. Considerable information exists about the basic science of the optimal duration and intensity of work. However, as yet, the relevance of this basic science background to the actual modern workplace has not been clearly demonstrated.

In ergonomic studies, largely done in the laboratory, data about the intensity and duration of dynamic work (that is, work, such as chicken processing, that requires the use of large muscle groups) are combined with data about a person's lung and heart capacity. Thus, a person's work capacity is measured by determining how much oxygen she uses for a specific task as well as the change in her heart rate during that task. One purpose of short rest breaks during heavy labor is to prevent lactic acid accumulation in the muscles; with considerably less lactic acid buildup, it is possible to work longer than if uninterrupted work is done at the same level. The relationship between temperature and humidity and the optimal duration of a certain continuous task has also been well studied in the laboratory setting. As humidity and temperature rise, the amount of time that a worker is able to perform even light work decreases significantly.⁷⁷

Unlike the physical fatigue of muscular work, fatigue from light work is harder to quantify. Subjective tiredness varies and is highly task dependent. Someone performing mentally demanding work often suffers disorganization and deterioration of performance sooner than another not doing such work. Mentally demanding work may impair short-term memory, which causes inefficient work patterns. Furthermore, new technology, such as video display terminals, places new demands on a worker's body, causing eye strain as well as musculoskeletal fatigue. One study concluded that even "two rest breaks in addition to the lunch break ap-

pear not to be sufficient to adequately reduce musculoskeletal and visual stress in continuous VDT work characterized by high data acquisition and processing demands." Visual fatigue, by making it difficult for workers to focus on their work, decreases productivity as the shift progresses. Performance decrements can also be caused by motivational problems such as boredom, which can be addressed by introducing short rest breaks into the workday; such breaks thus may increase the output per shift on light assembly tasks.⁷⁸

A plethora of books and journals are filled with formulas and graphs about the effects of temperature, humidity, and muscle loading on physiological, measurable aspects of fatigue such as heart rate or oxygen consumption. But there is very little information about the effect of rest breaks on fatigue. According to a scientist at the University of Michigan Center for Ergonomics, there have been no epidemiologic studies of ergonomics following up on the numerous basic science studies because industrial plant managers "don't see it as a reasonable thing to do." Instead, these issues are negotiated rather than studied scientifically. Similarly, a group of authors examining supermarket checker motion and discussing ways to prevent cumulative trauma such as carpal tunnel syndrome noted that "preventive interventions directed at control of postural factors may be more economically acceptable than repetition cycle charges to employers." Paradoxically, other investigators have found that firms refused to authorize on-site rest-period experiments because they were unwilling "to permit the higher earnings which might follow the increased production we predicted."⁷⁹

Although a leading ergonomist could state after decades of research that "virtually nothing seems to be known about" the optimum duration of rest periods, the few studies that have evaluated rest periods in actual workplace settings (as opposed to the laboratory) support the conventional wisdom that "short, frequent breaks are preferable to longer, more infrequent breaks." Several contemporary studies support frequent breaks: in one, production workers increased their productivity even more with ten-minute hourly breaks than with less frequent fifteen-minute breaks. Similar results were reported for video display terminal workers.⁸⁰ Thus the evidence to date indicates that one long midshift break such as the meal period is insufficient to provide adequate rest for an entire day's work.

In modern science, randomized trials are considered the "truth" about the efficacy of an intervention such as rest breaks. In such trials, similar workers would be randomly assigned to work with or without rest breaks, and researchers would objectively assess outcome measures such

as physiological fatigue, productivity, and psychological well-being. Although ergonomists studying the effect of rest pauses have for decades stressed the need for “carefully controlled field research,” such trials are not currently available. An ergonomist at the National Institute for Occupational Safety and Health notes that his group has begun to redress this deficit by conducting several randomized studies in the workplace on rest breaks.⁸¹

The correlation between job satisfaction and general well-being is also infrequently studied. One study of 780 men in a variety of white- and blue-collar jobs not unexpectedly found that general well-being was correlated with more positive attitudes toward work. The job variables related to increased overall well-being were largely psychological rather than physical. The most important variables were the degree to which the jobs overlapped with family life (that is, interrole conflict) as well as the prestige attached to the job, a self-esteem variable. The hours worked also influenced physical well-being. In this study and others like it, however, rest periods were not examined as factors that might affect psychological well-being.⁸²

In the 1950s and 1960s, effective time utilization was considered the key to economic success, yet studies soon indicated that most managers did not use their time efficiently (a finding that helped foster the promotion of time management in the 1980s and 1990s). In the 1970s and 1980s the focus continued to be on maximizing productivity, but more studies began to evaluate how to improve and maintain health and well-being in the workforce. Most of this research has also been driven by economic motivations. Workers who are ill or disabled use up a company’s resources with their absenteeism, medical visits, hospitalization, and disability pay. Thus work medicine has largely been concerned with identifying common health problems such as obesity, smoking, and hypertension and beginning treatment in the workplace. Such “organizational health promotion” is a buzzword of the 1990s in corporate management; however, very little attention has been paid to whether in fact workplace practices (including the lack of rest breaks) cause some of these very health problems. Perhaps rest breaks could decrease physical or mental illness. If such causality were demonstrated, the employers who instituted such breaks might lower their overall costs, for against a possible drop in productivity would be set a decrease in major health care expenditures.

In the last decade, claims for work-related mental injury appear to be growing. According to an official of a risk management program in a large insurance company, this growth “represents a fundamental change in the work place,” for it suggests that employers are “responsible not only for

providing a physically safe environment, but for providing an environment that is psychologically safe” as well. Even more common are claims for back injuries, the most common workplace safety hazard in the United States. It is estimated that one million workers suffer from compensable back injuries every year. Although little scientific study has been done on preventing back injuries, and many factors are involved, it is generally recognized that “properly scheduled breaks and avoidance of prolonged sitting or standing, repetitive motion, and rushed work can increase worker comfort.”⁸³

The question of what defines a properly scheduled break is, as noted, now being studied. Some ergonomists teach that at least for those employees who are self-paced and work independently of others, “it is probably better . . . to self-select the time and duration of the break.” Interestingly, although management may reject even this modicum of autonomy, fearing “administrative difficulties as workers tend to stretch breaks,” studies have found the opposite problem: when breaks were self-regulated, workers tended to work longer than physiologically advisable, or to return to work before recovery was complete. In explaining this phenomenon, ergonomists refer to the finding that although work should cease at the point at which lactic acid begins to accumulate, “This point cannot . . . be determined subjectively because it will take some time for sufficient lactic acid to accumulate to give a subjective sense of ‘fatigue’—by then work will have continued too long and a relatively much longer rest will be required.” Because this point is not “necessarily evident” to the worker, “he would work for longer spells than he should, and end the day unduly fatigued.”⁸⁴

For employers, incorporating formal pauses into collective bargaining agreements has the additional advantage of placing “some responsibility upon union officials to prevent abuses.” One of the largest U.S. chicken processors, for example, succeeded in extracting an agreement that “the Union will work with the Company to see that the emergency breaks are not abused.” The military precision and discipline with which workers have historically been required to comply with rest-period rules—including “pay deductions for exceeding the designated time allowance . . . amounting to slightly more . . . than the amount of pay for the length of the rest period”—seem almost designed to subject them to further anxiety and nervousness rather than to relax them.⁸⁵ Nevertheless, a typical collective bargaining agreement clause, which might have been lifted verbatim from nineteenth-century Krupp works rules, provides that

Employees shall be given a 10-minute rest period . . . commencing at 9:30 A.M. . . . Employees will stay on their jobs until a signal is sounded. . . . A signal shall be sounded 2 minutes prior to the expiration of the period and employees shall be at their places of work when the final signal is sounded. . . . If such privilege is abused by the employees to such extent that the same cannot be enforced by individual discipline the Company will call the matter to the attention of the Union, and if such abuses continue after the Union has received such notice the Company may discontinue rest periods.⁸⁶

Pauses like these seem designed purely to enable workers to engage in the arduous reproductive labor of restoring their labor power so that fixed capital can be maximally utilized. To that end many firms do not so much oppose rest periods as strive to limit them to the physiologically necessary minimum.⁸⁷

The continuing refusal of some employers, despite the apparent advantages of rest periods, to authorize their workers to take the pause needed to refresh their physiological capital may lend credence to Marx's notion that, after all, "Capital . . . has a single life drive, the drive to valorize itself . . . to suck in the greatest possible mass of surplus labor." Alternatively, companies or industries that continue to drive their workers relentlessly beyond what would seem rational even from capital's perspective may be reacting to and, in turn, reinforcing very high turnover rates. As Josephine Goldmark, who wrote extensively on industrial fatigue, noted at the beginning of the century, "the 'system of drive' . . . merely keeps replacing its workers as they are used up or worn out by overwork and unrelieved intensity of effort." Thus if today's meatpacking plants or clothing sweatshops, which have given a new meaning to post-Fordism by eliminating high-consumption wages from the Fordist program, have made 100 percent annual turnover rates "a corporate profit center," firms need not worry that they may be extracting from workers a greater quantum of their labor power than the workers can replace: the premature loss of the substance of their labor can be avoided by introducing the next contingent of desperate workers.⁸⁸