

Re-Considering the Meaning of "Scientific Management" from a Marxist Perspective*

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Frederick Winslow Taylor

The civilization of the will has -- spontaneously -- turned man into a machine, thus coming to be dominated, in a certain sense, by inanimate nature while trying to dominate it. The civilization of the will has denied the power of the spirit in man and transformed matter into a deity

Ethics based on utility will collapse as soon as utility and interest come into conflict. It is impossible to unite the utility of individuals within a group, the utility of groups within a society, the interest of nations within a civilization. The ethics of utility, be it based on egotism or on social interest, is relative, variable, condemned to be temporary.

-- Ülken (1999: 104 and 106.)

Introduction

In the era of anti-essentialism we would like to take on the role of devil's advocate, and focus on the essence of management as genuinely revealed in *The Principles of Scientific Management* by Frederick Winslow Taylor. For Taylor, management as science is a "task" whose sole purpose is to falsify the common belief that the fundamental interests of employers and employees are necessarily antagonistic. The first sentence of the *Principles* reads: "The principal object of management should be to *secure* the maximum prosperity for the employer, coupled with the maximum prosperity for each employee." In this sense, if management as science demonstrates that the principal

objective is realizable, then, the common belief turns out to be an unscientific conviction. In such a case, it can be asserted that science fulfils its function and falsifies a mistaken conjecture. This constitutes a major claim because it means that political economy as science that rests on the presumption of the capital/labor antagonism is a completely misconceived body of knowledge. Yet, as some would argue, if political economy has knowledge claims that correspond to the conditions prevailing in capitalist corporations, then, management as science turns out to be a sham. In this paper we attempt to elaborate on the meaning of science as conceptualized by Taylor in *The Principles of Scientific Management* by drawing first and foremost upon our readings of Marx's *1844 Manuscripts: Political Economy and Philosophy*. In this sense, we offer a reading of *The Principles of Scientific Management* informed by Marx's criticism of classical political economy.

"Whatever is merely subjective must be eliminated"

In May 1935, when the destruction of World War I was still vivid in memories, Edmund Husserl presented a conference paper entitled "Philosophy and the Crisis of European Man". Husserl looked for the causes of the European crisis that started to deepen at the end of the 19th century in the failure of philosophy and the modern sciences, which separated from it and became independent disciplines, and the modern professions organized on the basis of these in solving social problems. At a certain point in his speech, Husserl (1994:83) probed: "It is important for our problem of the crisis to show how it is that the "modern age", that has for centuries been so proud of its successes in theory and practice, has itself finally fallen into a growing dissatisfaction and must even look upon its own situation as distressful". According to Husserl, at the root of the discontent lies objectivistic reason and the objectivistic scientific method formed in the image of this kind of reason:

Objectivistic science holds what it calls the objective world to be the totality of what is, without paying any attention to the fact that no objective science can do justice to the *subjectivity* that achieves science. One who has been trained in the natural sciences finds it self-evident that *whatever is merely subjective must be eliminated* and the method of natural science, formulated according to a subjective mode of representation, is objectively determined. Mathematical science of nature is a technical marvel for the purpose of accomplishing inductions whose fruitfulness, probability, exactitude, and calculability could previously not even be suspected. As an accomplishment it is a triumph of human spirit. With regard to the rationality of its methods and theories, however, it is a thoroughly relative science. It presupposes as data principles that are themselves thoroughly lacking in actual rationality. In so far as the intuitive environing world, purely subjective as it is, is forgotten in scientific thematic, the working subject is also forgotten, and the scientist is not studied (Husserl, 1994:84-85).

To the extent that scientific activity becomes objectivistic, science itself becomes objectified and is transformed into a profession. Naturally, in this process, the scientist himself/herself is objectified and to the extent that (s)he possesses the formalized knowledge of the scientific discipline that (s)he is going to practice, (s)he comes to be regarded as a professional who may be allowed to practice the science in question. This situation is in fact a reflection of the general tendency to institutionalization, to "bureaucratization and rationalization", prevalent in the overall organization of modern societies, within the organization of professions based on science. When bureaucratization is mentioned the first name that comes to mind is of course Max Weber.

Weber (1986:206) argues that the modern world forces people to coexist within an organization that is *impersonal*, that in this world there is ideally speaking no place for love or hate and that the more it becomes flawless, the more it is dehumanized. It is as if Weber were directing an embarrassing question to Husserl: "Why are you so astonished to see the "modern age" being dragged into a great discontent when bureaucratic organization has flourished so much?" When Weber talks about dehumanization he has in mind the elimination of unpredictable emotional ties among people, that is of subjectivity and he also contends that this elimination is a condition in perfect harmony with capitalism (Sayer, 1991; Löwith, 1999). According to Weber, capitalism emerges as a type of organization of social relations which compels the social structure to change in such a manner as to "whatever is merely subjective must be eliminated" from the picture, to borrow Husserl's expression. In such a type of social organization, the need is felt naturally for a dehumanized "objective" expert. Let us now focus our discussion around the concept of capitalism, in order to return later to the question of the objective expert.

The Reproduction of the Subjectivity of Capital

We are claiming that we can conceptualize capitalism as a social system organized on the basis of the principle of the exclusion of all that is purely subjective. On the other hand, we have to stress that capitalism accords the individual the possibility of governing his/her life to an unprecedented degree. For with capitalism, for the first time in history, "the various forms of social connectedness confront the individual as a mere means towards his private purposes" (Marx, 1979:141). The preconditions for the rise of this social system were laid in the 16th century. "Bourgeois society", in Marx's words, takes "giant steps" towards maturity in the 18th century and within the space of two centuries reaches such a level of perfection that all over the face of the globe, no social process can essentially remain immune to the likelihood of commodification (Wallerstein, 1996). The commodification of social processes implies that people come together less and less in "non-market" processes. The tendency towards the commodification of everything has its roots in the fact that the basic urge of capital is self-expansion. In this sense, the dependence of the reproduction of social life on the market, or in other words on inter-commodity relations, is a historical product of the unlimited self-expansion of capital. Hence capitalism, which on the one hand emancipates individuals from relations based on compulsion (such as that of master and slave, craftsman and apprentice, landlord and

serf etc.) and accords them the possibility of enjoying their subjectivity, at the same time largely constrains them to set up relations through the mediation of objects, that is to say commodities. In such a world, the subjective being of individuals gains an abstract quality to the extent that it is transformed into an object. To the degree in which we take into account this paradoxical state of affairs, we can understand how capitalism presupposes the condition of objectification which emerges as a clear tendency in the modern world, how it further deepens this condition and how, as Weber claims, this condition overlaps and coexists in harmony with bureaucratization and rationalization.

In a subsection of part 11 of the *Grundrisse*, where he takes up the processes of the primitive accumulation and the real accumulation of capital and the question of how the presupposition of each is different, Marx (1979:495) writes: "Once developed historically, capital itself creates the conditions of its existence (not as conditions for its arising, but as results of its being)". The real accumulation of capital is the reproduction of the results created by the existence of capital. According to Marx, the historical rise of capital brings about four results, which then turn into the presuppositions of the real accumulation of capital. The first of these presuppositions, which Marx calls the "fundamental systematic conditions", is the emergence of "abstract labour". Abstract labour is "the presence of living labour capacity as a merely subjective existence, separated from the conditions of living labour as well as from the means of existence, the necessary goods, the means of self-preservation of living labour capacity". In other words, capital accumulation is, first and foremost, the reproduction of the existence of labour as a separate *subject*, independent of objective conditions, at a level of absolute abstraction. The second presupposition is "an accumulation of use-values", of a magnitude sufficient not only to satisfy the needs of living labour, but also to make possible the production of surplus-value by living labour. In this sense, the reproduction of living labour as abstract labour is dependent upon the availability in accumulated form of objects to be used for production and consumption. The third presupposition is that the relationship between the sides who engage in exchange be a free relationship, i.e. that the "circulation of money" be in existence. Hence, production must not "directly furnish the producer with his necessaries". Instead it must involve the production relation mediated through exchange, which cannot therefore usurp alien labour directly, but must buy it, exchange it, from the worker himself". The fourth presupposition forms the voluntaristic element of real accumulation. The will in question is the *subjectivity of capital*, which confers social production its capitalist content and manifests itself as the force that transforms the ultimate goal of productive activity "as . . . the positing of value, self-realization, moneymaking . . .". In short, expressed at the most fundamental level, the real accumulation of capital is primarily the social reproduction of the subjectivity of capital through reproducing in the abstract a *labor subject* whose existence relies solely on commodities, i.e. objects or alienated labor. In this sense

Capital . . . is the existence of social labour -- the combination of labour as subject as well as object -- but this existence as itself existing independently opposite its real moments -- hence itself a particular existence apart from them. For its part, capital therefore appears as the predominant subject and owner of alien labour . . . (Marx 1979:504).

In this paper, we conceptualize the subjectivity of capital as the *Subject* of the modern world, independent of individuals but dominating them. And we search for the causes of the sovereignty that objectivistic reason has established in all spheres of social existence in the modern world in the call by the sovereign Subject to other subjects and the response of these other subjects to this call from within their own position. We conceive the *Subject* as confronting other subjects as a being independent of them, as a particular being that emerges alongside them. We see the Subject as virtually omnipresent, as a *gestalt*, a mode of feeling or perceiving that regulates the world for subjects and gives it meaning and thus appears as their "predominant subject and owner".

The Individual of the Modern World: The Human Being as Capital

We have posited a Subject in the modern world, independent of individuals but sovereign over them and we have identified it with the subjectivity of capital. In this way, we have reduced the subjectivity that we could construct in our imagination as representative of the historical specificity of the modern world to an abstract metaphysical being that has devoted its entire life activity to the expansion of its monetary value. This may no doubt be regarded as an extreme absurdity. One may reason that this kind of person or this kind of subject does not and will not exist as a concrete, living person. But on the other hand, this is precisely the prosaic *absurdity* of modern life, which, to use Weber's terms, operates "objectively" on the basis of predictable rules and impersonal principles, which creates a type of individual whose sole end is to obtain "economic (monetary) results", to use the succinct formula of the well-known management guru Peter Drucker. This formula forces an individual to "eliminate" all kinds of incalculable personal, irrational and emotional attributes from his/her human existence in order to be able to take his/her place in modern organizations, which confront the individual with such a problem of choice. In fact, for someone who can respond positively to such a call and can objectify each and every relationship as a monetary relation based on "interest" and utility, this abstract metaphysical being, far from implying an absurd existence, represents the most *rational* mode of existence conceivable. It is clear that such an existence does not bear much resemblance to the rational being depicted by the philosophers of the *Enlightenment*, who, according to Engels, recognizing no sovereignty, having ruthlessly subjected to criticism all categories such as religion, the conception of nature, society, the state, etc. that have an impact on human existence, force them to justify their existence or else cease to exist confronted with the judgment capacity of reason and thus take *critical reason* to be the "sole and unique" yardstick applicable to everything (Marx and Engels, 1997:59-61). However, these two modes of existence, these two forms of subjectivity, that is to say, economic rationalism which takes money as the "sole and unique" measure of all and materialistic rationalism which takes criticism to be the "sole and unique" yardstick of everything, are in a *symbiotic* relationship with each other.

For the entire 18th century, which Marx characterized as the period of infancy of the bourgeoisie, these two forms of subjectivity confronted the world of political, religious and emotional privileges and prerogatives of feudalism, which posed to both a common

threat and was protected by the absolutist states. The former, that is economic rationalism which appears as the subjectivity of capital, posited the eradication of the monopolistic structures of the guilds, corporations and trade monopolies that acted as a powerful barrier against industrial and commercial activity as a precondition for the increase in social wealth and, as the absolute alternative of absolutism, seized political power on the basis of the principle of free trade and free competition.

It must be stressed at this point that the fact that political economy as a science -- which emerged around the time when the English bourgeoisie started to fight for power -- idealized the doctrine of free trade shows that it constitutes the purest and most advanced form of the rationalism of capital. From this vantage point, it is possible to approach the *Homo economicus*, the subject of political economy and modern "economic science" (economics), which to a certain degree is a derivative of the former, as the most refined and, what is but the same thing from a different angle, the most naïve expression of the subjectivity of capital, of what we have earlier characterized as the sovereign Subject of the modern world, of the subjectivity that reduces the manifold relations among human beings to a one-dimensional field of "utility" expressed in terms of a monetary magnitude. It would not be idle speculation to say that the major reason why Marx, the most ruthless critic of the bourgeois way of life, devoted the most important part of his life to the critique of political economy is that there exists a perfect ideological correspondence between the rational individual of political economy and the rationality of capital. In effect, Marx traces the development and advance of political economy as the science belonging to capital itself through the progressively closer approximation of its basic assumptions and concepts to the presuppositions of the real accumulation of capital itself:

A great advance by Ricardo, Mill, etc., on Smith and Say, to declare the existence of the human being -- the greater or lesser human productivity of the commodity -- to be indifferent and even harmful. The real aim of production is not how many workers a particular sum of capital can support, but how much interest it brings in and how much it saves each year. Similarly, English political economy took a big step forward, and a logical one, when -- while acknowledging labor as the sole principle of political economy -- it showed with complete clarity that wages and interest on capital are inversely related and that, as a rule, the capitalist can push up his profits only by forcing down wages, and vice versa. Clearly, the normal relationship is not one in which the customer is cheated, but in which the capitalist and the worker cheat each other (Marx, 1976: 172).

Here Marx sees a great advance in logical terms for political economy in that while, on the one hand, it makes labour the sole principle of wealth, on the other hand, it contradicts itself by contending that at the basis of modern economic life lies the contradiction between capital and labour. This contradiction sets the limits of political economy; it not only shows that this science belongs exclusively to capital, but more importantly it reveals the fact that this science cannot judge capital in the court of *critical reason* which recognizes no sovereign. According to Marx, this contradiction of political

economy is but the expression of the fact that the economists, having accepted "private property" as given, have thereby adopted the subjectivity of capital.

Political economy proceeds from the fact of private property. It does not explain it. It grasps the material process of private property, the process through which it actually passes, in general and abstract formulae which it then takes as laws. It does not comprehend these laws -- i.e., it does not show how they arise from the nature of private property. Political economy fails to explain the reason for the division between labor and capital (Marx, 1976:152).

Not only does political economy become increasingly cynical from Smith through Say to Ricardo, Mill etc., inasmuch as the consequences of industry appeared more developed and more contradictory to the latter; the latter also became more estranged -- consciously estranged -- from man than their predecessors. But this is only because their science develops more logically and more truly. Since they make private property in its active form the subject, thereby making man as a non-being [*Unwesen*] the essence [*Wesen*], the contradiction in reality corresponds entirely to the contradictory essence which they have accepted as their principle. The discordant reality of industry, far from refusing their internally discordant principle, actually confirms it. Their principle is in fact the principle of this discordance (Marx, 1976:182-183).

In short, the contradiction of the principles of classical political economy is but the confirmation of the real contradiction of capital, the sovereign Subject of the modern world. And this confirmation makes it possible for us to see, above all, how capital situates productive labour. Capital confronts labour as human being as an "alien" force and posits itself as "the alien being to whom labor and the product of labor belong, in whose service labor is performed, and for whose enjoyment the product of labor is created . . ." (Marx, 1976:164). Thus the contradiction seems to be solved: Labour, that is to say the human being, which is taken to be source of all value, has no value outside of the use to which it is put by capital. Under these conditions, it is possible to understand how the real productive subject -- now an object, i.e. a commodity -- will position itself in the period of time when it is under the domination of capital:

As capital, the value of the worker rises or falls in accordance with supply and demand, and even in a physical sense his existence, his life, was and is treated as a supply of a commodity, like any other commodity. The worker produces capital and capital produces him, which means that he produces himself; man as a worker, as a commodity, is the product of this entire cycle. The human properties of man as a worker -- man who is nothing more than a worker -- exist only insofar as they exist for a capital which is alien to him. But, because each is alien to the other, and stands in an indifferent, external, and fortuitous relationship to it, this alien character inevitably appears as something real. So, as soon as it occurs to capital --

whether from necessity or choice -- not to exist any longer for the worker, he no longer exists for himself; he has no work, and hence no wages, and since he exists not as a man but as a worker, he might just as well have buried himself, starved to death, etc. *The worker exists as a worker only when he exists for himself as capital*, and he exists as capital only when capital exists for him. *The existence of capital is his existence*, his life, for it determines the content of his life in a manner indifferent to him (Marx, 1976:171).

In this passage, which sums up the argument we have so far put forward, we read that when the human being exists as worker (s)he exists in fact as capital and, on the other hand, when (s)he exists as capital (s)he does not exist as a human being. The basic reason for this is that the human attributes of the human being as capital, i.e. of the worker, can exist only in so far as they exist for capital, which we characterized above as the sovereign Subject of the modern world above. The sovereign Subject, in turn, is *indifferent* to all human attributes of human beings to the extent that these remain outside the domain of its use and *utility*. For this reason, *the human being for capital* cannot be anything but an *object* and thus capital in its relation with the human being operates in the expectation that "Whatever is merely subjective must be eliminated" and that things must be run "objectively according to predictable rules". The person who complies with this expectation is not *a human being for himself/herself*. Something that is not for itself naturally moves away from itself. In other words, the human being, to the extent that it complies with the logic of capital will move away from himself/herself, or in Weber's terms, be dehumanized and become the impersonal individual stipulated by bureaucracy. In that case, the principle of administration independent of individuals (bureaucracy), which emerges as the specific organizational principle of the modern world, becomes the dominant principle of social organization in so far as capital expands and deepens its sovereignty. In such a social formation, as we have already noted, the need arises for the objective, i.e. "scientific", expert.

The Capitalization of the Human Being or "The Principles of Scientific Management": Frederick W. Taylor:

Frederick Winslow Taylor (1856-1917), born in Philadelphia, not only managed to become an "objective" expert, but also achieved the feat of becoming an engineer without the proper schooling. As almost all American middle-class families dream for their children, Taylor's family heartily wanted him to go Harvard Law School. But rumour says that Taylor had "problems with his eyes" and that his doctor recommended him to quit his studies lest he lose his eyesight. Thus, with a law career that ended before it started behind him, Taylor started to look for a job that would not require reading. He served as an apprentice in a small workshop between 1874-78 and became a lathe-operator and leveler. In 1878 he accepted a job offer from Midvale Steel Works corporation and started his adult work career as a modest worker. At this enterprise Taylor constantly climbed up to become respectively time supervisor, machine operator, team leader, foreman, assistant engineer and finally chief engineer. After having pursued

his bright career at Midvale later at Bethlehem Steel Works, he decided to become an independent management consultant. Having gained the title of engineer in the workshop, Taylor, as a consultant, gained a popularity hardly imaginable for many a schooled engineer, which made him a household name in business and academic circles.

Eighteen ninety-five appears as the beginning point of an important period in Taylor's life. That year Taylor presented a paper entitled "A piece rate system" at the annual conference of the American Society of Mechanical Engineers (ASME). The participants took the piece rate part seriously and discussed it, but hardly showed any interest in the part on management techniques. Taylor himself believed that this part of his paper presented a novel and original point of view so that this indifference disillusioned him immensely. Not relenting in the face of failure, Taylor presented a developed version of this first paper under the heading "Shop Management" at the 1903 conference of the same association. The outcome was even worse. This time Taylor's paper was almost totally ignored and shoved aside. According to Person, only certain men "possessing a vision" along with Henry R. Towne, someone who had once acted as ASME president and who was more of an entrepreneur and manager than an engineer seemed to be deeply impressed by Taylor's ideas.

In effect, back in 1886, only one year after Taylor had been inducted into the ASME, at the first ASME conference he was participating, Towne had made a speech entitled "The Engineer as Economist". The young Taylor had been deeply impressed by this speech and tried in later years to put Towne's views to use in developing his own practical management principles. Taylor in fact had Towne write a preface for "Shop Management", to pay Towne his intellectual debt. This preface is of historical interest in that it sheds light on the conception of engineering and engineers that informs the thinking not only of Towne, but perhaps more so of Taylor. In this preface, Towne refers to his speech, "The Engineer as Economist", and contends that the monetary unit, or *the dollar*, should be used as the only appropriate measure in determining the functionality and achievement of engineering. He also asserts that Taylor's work, basing itself on this proposition, is the harbinger of a new "science", the "Science of Industrial Management". According to Towne, from the standpoint of this science engineering is a management function and:

The dollar is the final term in almost every equation which arises in the practice of engineering in any or all of its branches, except qualified as to military and naval engineering, where in some cases cost may be ignored. In other words, the true function of the engineer is, or should be, not only to determine how physical problems may be solved, but also how they may be solved most economically. . . . Therefore the engineer is, by the nature of his vocation, an economist. His function is not only to design, but also to design as to ensure the best economically result. He who designs an unsafe structure or an inoperative machine is a bad engineer; he who designs them so that they are safe and operative, but needlessly expensive, is a poor engineer, and it may be remarked, usually earns poor pay; he who designs good work, which can be executed at a fair cost, is a

sound and usually a successful engineer; he who does the best work at the lowest cost sooner or later stands at the top of his profession, and usually has the reward which this implies (in Taylor, 1947:6-7).

Before elaborating further on Taylor, we have to draw a preliminary conclusion here. Towne and Taylor respond positively to the call of the sovereign Subject of the modern world and assert that the sole and unique measure of engineering (science) is money. The passage quoted is unmistakably clear. In other words, their rationality is the rationality of capital (i.e. economic rationality) and in this sense shows us how capital situates the human being *qua* engineer or manager. Earlier, while trying to identify the meaning of *the human being for capital*, we had pointed out, with reference to Marx, that capital is indifferent to human existence and all human attributes as long as these remain outside the domain of its use and utility. Perhaps not as clearly but in similar terms, Towne himself in describing the successful engineer -- which for him is also a definition of what a successful engineer is -- focuses on engineering oriented to the use and utility of capital. For him, the only contribution of the engineer/manager is to reduce costs, that is to create additional income. If he cannot deliver this, he will be poorly remunerated, impoverished and perhaps laid off one day. In other words, the engineer/manager, in this latter case, will not exist for capital. Then he can have "himself buried, starve to death".

Taylor starts his *Principles of Scientific Management*, the work inseparably associated with his name, by defining the "principal object of management". In his view, this object "should be to secure the maximum prosperity for the employer, coupled with the maximum prosperity for each employee" (Taylor, 1947:9). Although Taylor considers the validity of this goal as a self-evident truth, he believes that in the industrial world this goal is too often ignored and forgotten because neither workers' nor employers' organizations in their majority are convinced that their mutual problems can be solved in conformity with the interest of both sides. As a result of this, in modern industrial societies the view that "the fundamental interests of employees and employers are necessarily antagonistic" is predominant. "Scientific management, on the contrary, has for its very foundation the firm conviction that the true interests of the two are one and the same" (Taylor, 1947:10). In even clearer terms, Taylor maintains that, thanks to scientific management, the worker can receive the high wages that he wants most and, at the same time, the employer can realize production at a his desired lowest labor cost. In short, in his *Principles of Scientific Management*, Taylor is trying to show that the fundamental contradiction of capital, that is, the phenomenon of the capitalist and the worker mutually trying to exploit each other, is nothing but an illusion. Taylor calls thus to engineers and managers by saying:

As engineers and managers, we are more intimately acquainted with these facts than any other class in the community, and are therefore best fitted to lead in a movement to combat this fallacious idea by educating not only the workmen but the whole of the country as to the true facts. And yet we are practically doing nothing in this direction, and are leaving this field entirely in the hands of the labor agitators (many of whom are

misinformed and misguided), and of sentimentalists who are ignorant as to actual working conditions (Taylor, 1947:18).

In contrast to those who act "sentimentally", those who accept Taylor's call take rational action and adopt the basic principle

. . . that in almost all of the mechanic arts the science which underlies each act of each workman is so great and amounts to so much that the workman who is best suited to actually doing the work is incapable of fully understanding this science, without the guidance and help of those who are working with him or over him, either through lack of education or through insufficient mental capacity (Taylor, 1947:26).

Further, in line with this basic principle, in an enterprise that is managed on the basis of "scientific" rules, "those in the management . . . should assume a much larger share of the responsibility for results than under usual conditions is assumed by the management (Taylor, 1947:26). Before we discuss the function and meaning this kind of shift in management style attributes to engineers/managers in the context of the capital-labour relation, we first have to dwell on the sense Taylor imputes to the term science.

Although Taylor's concept of science may be seen to possess a tragicomic naivete when compared with the different conceptions of science that have arisen throughout the arduous and complex debates on the nature of scientific knowledge in the history of science, it represents perhaps the most accurate conception of science when the logic of capitalist production is taken as the yardstick. For Taylor, science is nothing more than the capacity of accomplishing any task (*loading, masonry, shoveling, cutting, etc.*) on the basis of rules, laws and formulae, through the fastest and most appropriate movements and bringing together the most appropriate instruments, *after having eliminated all unnecessary motion*:

In most trades, the science is developed through a comparatively simple analysis and time study of the movements required by the workmen to do some small part of his work, and this study is usually made by a man equipped merely with a stop-watch and a properly ruled notebook (Taylor, 1947:117).

Taylor thus reduces work, that is science, to a function of time and measures time by the rapidity of the movements of working "men". In other words, for Taylor the pace of workers' movements is an object of science as a means of production and because it is an object, it is a *thing* whose motion can be planned independently of its own will. For Taylor, the stages that the development of a science has to go through are the following:

First. Find, say, 10 or 15 different men (preferably in as many separate establishments and different parts of the country) who are especially skillful in doing the particular work to be analyzed.

Second. Study the exact series of elementary operations or motions which each of these men uses in doing the work which is being investigated, as well as the implements each man uses.

Third. Study with a stop-watch the time required to make each of these elementary movements and then select the quickest way of doing each element of the work.

Fourth. Eliminate all false movements, slow movements, and useless movements.

Fifth. After doing away with all unnecessary movements, collect into one series the quickest and best movements as well as the best implements (Taylor, 1947: 117-118).

That science cannot tolerate error is a fundamental premise accepted by nearly all the different epistemological positions within social theory. The conflicts and disagreements between these different epistemological positions derive rather from the way error itself is defined. According to the position called "objectivism", the true knowledge of reality exists independently of the will of the subject, and the fundamental aim of science is to arrive at the knowledge of objective reality. For this position, error comes about in those situations where objective reality does not correspond to *reality as perceived by the subject*. Error then is not in the nature of reality itself, but in the perception of the subject, or to put it better, in the cognition or the comprehension of the subject. In this case, if one is to talk of the utility of science, one can say that this lies in redressing the error of the subject on the basis of the identification of the correct knowledge of objective reality. For this reason, for the objectivistic position, the main function of science for people is in its being an instrument of control that constitutes the *techniques* or *methods* that make possible a more efficacious way of accomplishing their "objectives". The problematic defined as the objective, however, falls outside the scope of science in this approach. In other words, any goal that man can adopt can be considered as the objective.

To return, then, to Taylor's concept of science, it becomes clear that the aim of science is to insure that the motion carried out in the fastest way possible. However, in such a conception, the question of why this is the aim of science remains unanswered. It is simply a presupposition, a goal previously given, for the person who is to practice science. This, however, means that science itself, which is supposed to eliminate subjectivity, has a subjective beginning. As we pointed out through a passage quoted from Husserl at the beginning of this essay, as a result of the fact that the subjective (the motive behind the carrying out the task in the fastest manner) is disregarded in the scientific thematic, the disposition of the subject developing science (the manager or the engineer) cannot become the subject of science. The question is never posed why a task should be accomplished in the fastest manner. This is simply grasped as a given assumption the truth of which is not questioned. Once this is taken for granted, however, it is easy to determine on the basis of this definition whether a certain task is carried out in the right or wrong manner. Within this framework, if it is possible for a worker to

carry out a task faster by using another technique or method, then in the actually existing situation the worker is making a mistake, that is he is not acting scientifically. The task of science here is to eliminate those conditions that prevent the speeding up of the worker and to plan work in such a manner that it cannot be done faster whatever the conditions. This means transforming the subject (the worker), who previously was slow, into an object that works fast, by ridding him/her of his/her subjectivity. In this sense, the worker is no longer a subject for himself, but is converted to the subject stipulated by science.

This kind of rationalization attributed to science is closely related to the expectation of capital from within the production process. This expectation is to expand itself by increasing its value. Taken this way, rapid completion of a task means a higher increase of the value of capital. That is to say, the aim that Taylor takes for granted without questioning is a necessity for capital. As a subject, capital establishes a despotism over all other subjects and transforms its subjectivity into the sole condition for the existence of other subjects. At this point, it becomes clear why Taylor defines engineering and the engineer in terms of their use and utility to capital, why he converts the engineer into a cash machine. The task of the engineer, then, is to transform the worker into capital with the aim of augmenting capital.

Taylor's dialogue with a certain Schmidt, a worker, provides the most naked expression of his disposition:

"Schmidt, are you a high-priced man?"

"Vell, I don't know vat you mean."

...

". . . What I want to find out is whether you are a high-priced man or one of these cheap fellows here. What I want to find out is whether you want to earn \$1.85 a day or whether you are satisfied with \$1.15, just the same as all those cheap fellows are getting."

...

". . . Of course, you want \$1.85 a day -- everyone wants it!"

...

". . . You know just as well as I do that a high-priced man has to do exactly as he's told from morning till night. You have seen this man here before, haven't you?"

"Well, if you are a high-priced man, you will do exactly as this man tells you to-morrow, from morning till night. . . . Do you understand that?"

When this man tells you to walk, you walk; when he tells you to sit down, you sit down, and you don't talk back at him" (Taylor, 1947:45-46).

In this outrageous dialogue, "that man" refers to the engineer/manager (the scientist), rules such as "sit down, stand up, walk" represent engineering/management (science) and Schmidt, who has become a high-wage worker as a result of this process, stands for the human being transformed into capital, one who can never act as himself. If we reread the ideas put forth by Taylor in the *Principles of Scientific Management* in the light of what Marx had to say, the worker can be a real worker only to the extent that (s)he can exist for himself/herself as a kind of capital and the main function of scientific management seems to be providing him/her with the arrangement that would be helpful in achieving this aim.

Instead of a Conclusion

The discussion so far has shown that the professions of management and engineering, of considerable importance among technical professions, cannot be defined independently of the relations of production that determine the mode of production dominant in society. It is thus clear that the characteristics of the community of managers and engineers, who adopt an identity within the context of capitalist relations of production and who put their technical know-how and skills to use subject to these processes, cannot be grasped independently of the determining effects of capitalist relations of production. As we pointed out in detail, the process of the accumulation of capital is, above all, a process of the transformation of productive labour and the means of production into capital. This historical state of affairs implies the devalorization of the human being and his/her productive labour outside the sphere of their use for capital. Hence, in capitalist society the manager/engineer and management/engineering assume worth and meaning only to the extent that they help expand the value of capital. In effect, if we remember the "mission" attributed to the engineer and engineering by Taylor, we see that the engineer can gain social worth only insofar as (s)he defines the fundamental function of his/her profession in harmony with the demands and expectations of capital. In the perception of the manager/engineer who has adopted this outlook, management/engineering is nothing but the sum of techniques ("sciences") that play an important role in the transformation of the workers into capital. However, from the standpoint of capital itself, the value of the manager/engineer is not determined by the perception of the manager/engineer, but in the last analysis by the economic laws of capitalism. As can happen to all kinds of capital in the course of the accumulation of capital, the "manager/engineer as capital" himself/herself may be devalorized.

Thus, based on the above discussion it can be argued that scientific management is an ideology that accomplishes and is the bearer/guide of rationalization in the capitalist enterprise. Taking a historical perspective, one can say with Wallerstein (1996:71-72) that the process of rationalization, which is of fundamental importance for capitalism, has made necessary the creation of a privileged layer of wage workers including rationalization experts such as managers, engineers, scientists, teachers, etc. This has led

to the bureaucratic work organization with a meritocratic structure to become the specific institutional form of capitalist society. For Wallerstein (1996), in a world such as the current one, *science appears to be the mask worn by the irrationality of unrestricted accumulation*. The question we should pose at this point is the following: can science as a whole be characterized as a means of oppression that legitimizes all kinds of domination? If we remember that the major specific difference of the modern world from those epochs that preceded it is rationalism and that rationalism, far from being homogeneous, is polarized in the form of two different and mutually contradictory conceptions, it is really difficult to answer this question in the positive. With respect to science rising on the basis of economic/objective rationalism, the answer is no doubt yes. But when one considers science based on materialist/critical rationalism, which takes criticism as its basis, then it is impossible for the scientific investigation to be reduced to an instrument of ideological domination. The reason is that critical reason never takes for granted any claim to truth unconditionally, not even its own premises. In other words, its precondition is the absence of preconditions. This rationalism does not recognize any sovereign and leaves open the possibility that "objective" reality itself may be flawed. This position naturally charges the subject with a mission. The subject now is responsible for tearing down what Wallerstein has called the mask of science, for criticizing objective reality itself. In this sense, critical reason rescues science from being an ideology and transforms it into a critique of ideology. Needless to say, this transformation requires a serious questioning of *any* management perspective that claims to be "scientific".

Note

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