

possible only through scientific management, and that, in the individual factory, the burden of attaining these objects rests mainly on the shoulders of those who organize and manage the production and distribution of goods, and only in a certain specialized degree on those who specifically are charged with the care of the workers' welfare. The labour problem, in fact, is not an isolated problem, to be dealt with by units not directly responsible for production and distribution, to be studied by organizations divorced from the daily planning and execution of work, but rather one aspect, and the main aspect, of the whole work of managing a business scientifically. The conception that responsibility for promoting sound industrial relations can be allocated to one specific unit, that such work calls for specialized capacities and is aimed at objects of only secondary importance to other units in the organization, is wholly opposed to Taylor principles. The object of scientific management and organization is the betterment of labor conditions and the promotion of peace; the whole organization is indeed a personnel department. The development of sound labor policy is, in fact, synonymous with sound organizing and management.

It is on this ground that scientific management, as a great movement, may rightly claim to be serving, not just this or that particular business, but the whole world of industry and the social and economic life of the community. It is not just a means to greater efficiency, in the sense of producing more goods, but a profound contribution to bettering the life of the community.

I have been devoting my whole time (said Taylor) and almost every cent of money which I can spare from my income, to promoting the cause of scientific management; and my object in this work is primarily, I may say almost entirely, that of securing a larger measure of prosperity and happiness for the working people. I am, of course, and ought to be, interested in the material welfare of the companies who are using scientific management; but if the results of my work were merely to increase the dividends and prosperity of the manufacturing companies, I certainly should not devote my time to this object. Scientific management is for me, then, primarily a means of bettering the condition of the working people.

Listed again to the significant words which Dean Sabine, of Harvard's Graduate School of Applied Science, addressed to Taylor:

While listening to you and even more in thinking it over since I left you, I am persuaded that you are on the track of the only reasonable solution of a great sociological prob-

lem. The systematization and standardization of work has a bearing far beyond the organization of a particular business or industry. I do not believe that you are a socialist any more than I am, but you are preparing data for the solution of a problem on which socialistic and cooperative movements have time after time been wrecked.

Far too little has been heard and far too little account taken of the possible contribution of management, scientifically conducted, to what one may call the sociological problem of industry. Some of the greatest minds have striven with the problem of capital and labor, as if these alone constituted the body of industry. Modern sociological and economic thought has yet to realize that management is a third partner, whose position renders it an authoritative partner; that neither panaceas nor changes in heart, neither socialistic programmes nor experiments in cooperative working and governance will singly bring about a redirection of social progress, but rather the application to industry of the analytical and synthetical methods of science, by a body of management inspired by right-minded motives and viewing its work, in the day-to-day control of its shops and factories and warehouses, as highly constructive work in the building of a new order and the development of a new spirit in industry.

Consideration of Taylor's motive automatically tells us what was his conception of scientific management. To him, it was a philosophy, not a set of mechanisms or a hide-bound system. "The essence of modern scientific management," he said, "consists in the application of certain broad, general principles, and the particular way in which these principles are applied is a matter of entirely subordinate detail." And again, he said, "In its essence, scientific management involves a complete mental revolution"—on the part of the men and of the management. To this broad vision of scientific management he held throughout. In later years, when efficiency became a craze, and efficiency societies sprang up like mushrooms in a night, he maintained his same attitude—that scientific management was not essentially any of these things, but was "something that varied as it was adapted to particular cases, but always involved a mental revolution of employer and employee toward their work and toward each other." To Taylor, scientific management was a journey to an ideal, a course which led to some ultimate condition. It was not a static system, but a dynamic philosophy. "Scientific management," he said, "fundamentally consists of . . . a certain phil-

osophy which can be applied in many ways," and philosophy is purposeless without an ideal, and fruitless save as it serves to move life forward towards that ideal. One of our dangers is to regard scientific management as something we have "installed," when the essential consideration is whether our management and our men have achieved that mental revolution which makes any set of mechanisms living and permanent. In a phrase, this "complete mental revolution" consists of "recognizing as essential the substitution of exact scientific investigation and knowledge for the old individual judgment or opinion in all matters relating to the work done in the establishment." The Taylor ideal was a condition of industry where its daily tasks had been subjected to the reign of law, scientifically established, and equally binding on management and men. Towards this ideal his work was one long, consistent struggle. What was, indeed, the core of his work at Bethlehem? "Essentially, it was this: that the government of the Bethlehem Company cease to be capricious, arbitrary, despotic; that every man in the establishment, high and low, submit himself to law." "The gist of the matter is," wrote Taylor, "that scientific management demands that the acts of the men and movements of all these men and elements shall be regulated according to clearly defined scientific rules and formulae."

The most significant feature in Taylor's efforts to reach this ideal, however, is the fact that his main difficulty lay with the management rather than the men. Despite his early tussle with the men of Midvale, the main combats of his life were with those in the management. In some instances he encountered direct opposition; in others he had to face the perhaps even more difficult problem of the man who enthused over scientific management for others, but was himself not in need of its medicine. "It took over two years," said James M. Dodge, "for our organization to surrender fully, and so change our mental attitude that we became really receptive. I mean by this that I found no difficulty at all in having the heads of various departments agree that the introduction of the Taylor system would be most desirable, but in each case it was for everybody else in the establishment but entirely unnecessary for him." Taylor's own difficulties at Bethlehem and those of his associates in other plants afford ample evidence of the toilsome task it was to bring about in the various managements that "mental revolution" which he himself postulated as the essence of scientific management. Yet it was

only to be expected, and remains still one of the major problems of his followers. For, upon management Taylor threw a greater burden; he made operative efficiency a problem which was up to the management. Moreover he demanded that management should subject itself to the reign of law which was the outcome of his scientific investigations, and further demanded that the petty despotisms of the old-time foremen and managers should be broken down, their work scientifically organized, and their positions rendered rather that of teachers than of driving masters. It was only human, perhaps, that these innovations should be opposed, and the "mental revolution" a very slow grinding of the wheels. Conservatism and inertia are the property of no class, and Taylor had too many sad experiences with managers to escape this fact. "It was his mature judgment," says Mr. Copley, "that the philosophy of 'initiative and incentive' was, in the main, the lazy manager's philosophy; the management could talk as it pleased about the workmen being supposed to be expert in their trade, but the real reason for putting the details up to the workmen was likely to be that the management was disinclined to assume the duties, burdens and responsibilities that naturally belonged to it."

Yet, it was true in Taylor's own work and is true today that efficiency must begin at the top. The workers cannot transfer their skill to a management which is not ready to receive and use it, nor can they single-handedly standardize the conditions of their work. The development of efficiency is primarily a task of management, and efficiency is primarily a question of efficiency in those who direct and control the work of others. "Scientific labor can exist only as scientific management creates it. There is no labor that is scientific that is not the product of long arduous study with the methods of the laboratory," said Mr. Ernest H. Abbott in a singularly discerning statement. Management has yet to measure itself up to the standard which this ideal presents. It has yet to appreciate its responsibilities and the vast intricacy of its task. Whilst it continues to fall short, waste is the difference between what management is and what it should be. Of all documents perhaps the report of the Committee on Elimination of Waste in Industry is the strongest condemnation of the old-time management. It publicly places the main responsibility for waste on management. It is both a condemnation and a challenge. The philosophy of Taylor alone points