

The manufacturing community as a whole, if not actively hostile, were at least reluctant to give a trial to ideas which had been practically discarded at two of the largest steel plants in America. But Taylor's work had trained a number of disciples, who thoroughly believed in his ideas and work, and there naturally were enough manufacturers who were interested in these new ideas of management to allow for a steady, if slow, growth in the application of these management principles during the succeeding decade. Among the more important plants in which Taylor or his direct associates worked in this period were the Tabor Manufacturing Company and the Link-Belt Company of Philadelphia and the United States Arsenal at Watertown, Mass.

12. Shortly after the beginning of the twentieth century, Taylor withdrew from actively installing management methods and began to philosophize and generalize on his experiences. The far-reaching significance of his principles and methods became clear to him and he began the task of transmitting them to others through writings and addresses. His writings of this period have become the very foundation of modern management literature. The first and best-known of these is "Shop Management." The book was first published in 1903 under the auspices of The American Society of Mechanical Engineers, having been read at a meeting of the society in June of that year. In December, 1906, Taylor presented as his Presidential Address to the same society his other masterpiece, "The Art of Cutting Metals." From that time until his death on March 21, 1915, he devoted himself almost completely to the task of spreading the gospel of scientific management.

13. After Taylor gave up the active practice of management installation, there quickly appeared a number of his direct followers to carry on his active work. Among the leaders of these, who have also made real contributions to the art and science of management, may be mentioned Henry L. Gantt, Carl G. Barth, Morris L. Cooke, Sanford E. Thompson and Horace K. Hathaway. These men have become known as the "Taylor School" in management methods work because their close association with the leader of the movement has caused them to be largely guided in their work by Taylor's own methods. The influence of Taylor was guiding, at this same time, other men in distant parts of the United States, and even of the world, along paths which led to the same goal, but nevertheless took somewhat different courses in reaching it. In the hope

of avoiding some of the pitfalls that Taylor's detail methods had fallen into at times, these other methods which were developed, frequently seemed radically different from those of Taylor. As to devices utilized they sometimes were different, but the principles they aimed to reach were his, although the executive might not always have been conscious of this.

14. Taylor's position in the management field is that of the first explorer. His researches, because of his personal ability, carried him personally further than might have been expected. Unfortunately, his abilities did not include that of selling his work in toto to many besides those most closely associated with him, who were always able to see the careful thought and study behind all his conclusions. Being the leader, and years ahead of the industrial community, he has had associated with his name some of the most violent opposition to the introduction of new methods in operation. This became particularly true because he was the first exponent of a cause which, though it has not grown beyond his imagination, has, as he most of all would wish, grown beyond the control of his immediate followers and his or their particular methods.

15. The public, and even the large majority of factory executives, especially outside the metal-cutting trades, had not had their attention focused on scientific management by any of the early work of Taylor or the development work of the Taylor men or others. Although there had been a general tendency towards improvement in management method, in 1910 but little was known of scientific management. In 1911 thousands had a general idea of what it meant, although their concepts were necessarily frequently warped.

16. This change came about through a startling announcement made by Louis D. Brandeis during hearings before the Interstate Commerce Commission, late in 1910, concerning certain railroad rate increases. Justice Brandeis, who at that time took the aggressive position against the proposed increase, stated that it was unnecessary because if the railroads of the United States should adopt scientific management the rate increase would be unnecessary. He explained that by this method a saving in operating expense could be accompanied by an actual raising of the wages of the railroad employees. In the same hearings, Harrington Emerson, an installer of management methods who had had wide experience in the shops of the Santa Fe Railroad, stated that the railroads could save \$1,000,000 a day by paying greater attention to efficiency of operation. These two statements, both coming from men of un-

doubted reputation, were given wide publicity and electrified the entire country. The general public of the country was as interested then as now in lower railroad rates and this new talking point against increases was more than interesting to them. It was peculiarly fortunate for the growth of the management movement that public attention was first focused upon it in connection with an industry in which the public was so vitally interested and concerning which it came into such daily contact as railroading.

17. Only a few days after the introduction of the evidence, the early December magazines gave much space to the dramatic testimony of the witnesses, and proceeded to give accounts of what scientific management was and what the results of its installations had been. Arguments began, debating societies debated the question, industrial executives were quoted as to why they thought scientific management was good or worthless. In March, 1912, the first "efficiency" society was organized in New York for the purpose of applying the scientific management principles of "efficiency" to every department of life, and scientific management as an element in the industrial life of the United States had come to stay.

18. Modern management shortly came to be known under the term "efficiency" and interest in "efficiency" became so widespread that it nearly caused the death of the management movement. It did retard it. "Efficiency men," fakers in every sense, who promised short-cuts to profits through panaceas, and whose knowledge of management was as shallow as their vision was narrow, sprang up over night. They managed to kill the word "efficiency" in American industry most promptly, and they nearly permanently injured the management movement. They failed for various reasons; first, they usually had no knowledge on which to base their efforts; second, if they did have the personal experience to qualify them, they usually lacked the broader concepts which would have permitted their work to be successful. They did not pay sufficient attention to the workers' point of view and they did not or would not cooperate with the regular organization. They tried to run rough-shod over the older members of the organization until the title of "efficiency man" became everywhere the key-word for concerted opposition. Recently the "consultant in management," with far different ideals and qualifications has replaced the "efficiency man," with very effective results.

19. Another retarding influence on the growth of the management movement at this time was the fact that

all the literature on the subject concerned the metal-cutting trades. When a manufacturer in another industry became interested in modern management and began to read Taylor's writings, or those of his co-workers, he soon discovered that everything definite about modern management was expressed in terms of metal-cutting. It was, therefore, but natural that they failed to look under the surface of the devices and terminology employed at the principles involved, and said that "it didn't apply to them." It was still to be some years before this difficulty was to be even partially overcome.

20. In the general growth of the management movement the leadership that had been Philadelphia's was largely lost. Sections of the country which were less conservative along lines of management method took to the new ideas more readily and in larger proportions than did Eastern sections. New industries which were developing, such as the automobile and allied industries, had a made-to-measure opportunity to develop management method along with manufacturing technique. These were largely located in the Middle West. The Middle West grasped at the opportunity of increasing effectiveness of operation that was offered by management method, and gradually developed, in many scattered localities, methods of operation which, though built up on the same firm foundations as those which served the early leaders of the management movement, were nevertheless constructed along newer and bolder lines. Of the examples of this work, the best known is that of the Ford Motor Company, whose examples of the economies incident to standardized operation, continuous assembly and newer wage-payment methods have profoundly influenced the whole of American industry.

21. At the time that the United States entered the world war the management movement may be said to have been in a condition of deflated interest but gradual growth. The necessities that were outgrowths of our entrance into the war quickly changed this situation to one of awakened interest and rapid growth. The declaration of war by the United States, in April, 1917, made it incumbent upon this country to organize itself for the prosecution of the war immediately and effectively. It meant the organization of the industries of the nation for the one common purpose. Without attempting to lay blame, or to decide whether there was blame, it is nevertheless true that in the several years of the war prior to America's entry into it, nothing had been done towards getting American industry ready