An Authentic Genius[1]

A Picture of Taylor to Excite Both the Romanticist and the Psychologist

By STUART CHASE
Investigator, the Labor Bureau, Inc., New York City

A BOY of twelve was troubled with nightmares. He devised a harness of straps and wooden points which automatically awakened him when he turned on his back. In playing croquet, it was the boy's habit to study the angles and velocity of the various shots, while his elders were content merely to hit the ball. When he walked across country he continually experimented with his legs in order to discover the step which would cover the maximum distance with the minimum energy. Years later, having been told by expert horticulturists that trees and hedges above a certain size could not be transplanted, he promptly developed a technique for moving box hedges and large pine trees which proved the horticulturists to be quite ignorant of their own business.

For the Midvale Steel Company he built a steam hammer which stretched the laws of physics, though it proved the mightiest hammer ever designed, and he built an extraordinarily efficient chimney like the tower of Pisa which men swore would fall down, but which did not fall down. For a paper mill he devised a hydraulic yanker of logs from stream to factory floor; he put his bark strippers in cages safe from dangerous machinery, and he cut the cost of sulphite pulp from twenty dollars to eight dollars and fifty-eight cents a ton. But it took him fourteen years to learn that "the best measure of the value of a tool lay in the exact cutting speed at which it was completely ruined at the end of twenty minutes." In the recesses of his mind, he kept a private chamber of horrors. In it were Germans, theologians, trade unions, politicians, professors and financiers. In brief, Frederick W. Taylor was that relatively rare human being, an authentic genius.

He was born in Germantown in 1856 of well-to-do parents. His father was of Quaker, his mother of Puritan, ancestry. He tells us that he inherited "a whale of a New England conscience." He prepared for Harvard at Exeter, but never matriculated because of his eyes. He entered the works of the Midvale Steel Company in which his family was financially interested, as an apprentice. He worked as laborer and machinist, was promoted to foreman, and at length became general technical advisor, having meanwhile qualified as a mechanical engineer at Stevens Polytechnic. Stevens taught him the principles of mechanics but the narrow engineering training was not a happy medium for the free flow of his genius. At Midvale, he laid the foundation of his system of scientific management as a sort of by-product in connection with his work on cutting steel. As an inventor, he revolutionized the art of high speed steel cutting, and for this achievement alone would have won lasting fame. But it was the by-product that ultimately came to claim first place in his heart, and it is for this by-product that he will be chiefly remembered. Inventions in technical processes had been happening regularly for a hundred years. The technique of scientific management was something new in the world. He left Midvale to become a consulting engineer in the new profession, and introduced his methods in many great industrial concerns, as well as in government arsenals and navy yards.

Sometimes he was successful, sometimes he failed, being unable to bring about that "revolution of thought" on the part of the management which was cardinal in his system. Always he was headlong, imperious and tactless. A very demon of a man, the stronger because he knew his facts, while his opponents dealt largely in hearsay. If Spencer's idea of tragedy was a theory killed by a fact, Taylor's idea of tragedy was a fact killed by a theory. He became President of the American Society of Mechanical Engineers, but he was a relatively unknown man until Brandeis tranfixed the country with the news that the railroads were wasting a million dollars a day. This charge was based primarily on Taylor's work, and the work of engineers who had followed Taylor. Following the famous rate case, "Taylor efficiency" (a misnomer as we shall see), and "Taylorism" became al-

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most as well advertised as "Einstein" today—and about as well understood. And ever since, his name and his work have moved in storm and fury and adulation. During the latter part of his life (he died in 1915) he devoted himself to extending the knowledge and application of scientific management without financial remuneration of any kind. For this work he often drew heavily upon his private income. There is no question but that he was utterly sincere in regarding it as a solution both of the problem of capital and labor, and of underproduction. He hated trade unions, but he lived and died in the belief that the outstanding sanction for his method was that it would lead the worker out of bondage. Beside this goal, profits and production per se took a secondary place in his mind.

Mr. Copley has had no light task in telling the story of this extraordinary man, and on the whole he has done a remarkably good job. These two volumes will never rank as one of the world's greatest biographies, but from them we get sound, technical insight into what Taylor did, and a picture of the man himself which can excite both the romanticist and the psychologist. The tempo is seldom heroic, adulation is mercifully absent, the cracks in the armor appear as well as the brave shield and buckler. It is recorded for instance that when Taylor debated his theme before a Congressional investigation committee, he so completely lost his balance that his ravings had to be stricken from the record. And while he regarded all the taboos of the great American home, his opinion of the church was largely unprintable, and he was a past master in the higher profanity. The author has greatly increased the value of his book as a human document in thus avoiding the usual biographical glucose.

But perhaps even more important than the personal story, is the attempt to get into focus the movement which Taylor launched on an unwilling world. What was this thing—this "scientific management" that the builder of corkscrew chimneys forced down the throats of angry executives, that caused Mr. Gompers' remaining hairs to stand on end, that filled the pages of the newspapers in 1911 until "efficiency" became a national slogan; that translated this man's ill-written books into a score of foreign languages, that founded the Taylor Society, that laid the university by the ears, and at last raised him to the dais of an engineering saint before whom men bowed down and worshipped? What did Taylor discover? What has scientific management done to our behavior and our thinking in the generation which has grown up since "On The Art of Cutting Metals" was first published?

Taylor or no Taylor, scientific management would have come. Perhaps not so soon, perhaps not so concretely, perhaps more tactfully, but it would have come. Back of Taylor were Babbitt and Sellers, and a certain Frenchman who in 1760 was time-studying the process of pin making. The growing scientific spirit would have forced a critical analysis of management and industrial planning. We have not here so much the shadow of a great man, but a genius loose in a gathering shadow.

What Taylor did was to apply scientific methodology—as opposed to trial and error—to the job of making up a given amount of raw material into given finished product, on the principle of a minimum of waste and friction. To accomplish this end it became necessary to analyze every factor in the circuit, to bring to bear the last word in technical knowledge, and ultimately to set up performance standards. If the job was making locomotive tires, the raw steel, the cutting tools, the arrangements of cutting machinery, the belting, the power load, the lubricating and cooling devices, the handling of supplies, and the physical motions of the men who ran the tools, must all be analyzed and coördinated by hundreds of laboratory experiments until the best way was found. (In his high speed steel work, Taylor conducted no less than 40,000 experiments.)

The basic principles as stated by Taylor include: first, the development of a science for each element of a man's work, to replace the old rule of thumb method; second, the selection and training of workmen to follow the science laid down; third, the payment of extraordinarily high wages to workmen who approached the standard performance set up, and of ordinary wages to those who took more than the standard time allowance; and fourth, the dividing of responsibility between men and management on the basis of scientifically determined function.

Time study is not scientific management; piece work is not scientific management; "efficiency" is not scientific management. Scientific management goes to the root of the problem in hand and sets up a 100 per cent standard, based if you please on a certain amount of time study, and piece work rates. It is the *best* way of doing the job on the basis of extant technical knowledge. "Efficiency" on the other hand has to do with tinkering and patching, and, if it is