

tudes of the Chinese and American peoples toward their respective public officials, said that the Chinese expected their officials to do the right thing, and if events proved that they had not done so they would be summarily disposed of by cutting off their heads. We Americans, he thought, rather expect our public officials to be incapable and at times dishonest, and so we find ways to tie our public servants by hand and feet before they have the opportunity to go wrong. The budget has always struck me as a very refined, even if necessary, handicap to able administration. We shall undoubtedly work through it as we are working through the legalistic graft-preventing conception of Civil Service, sometimes called the Merit System.

A concrete example of the application of broad Scientific Management principles in the municipal field is to be found in the new central station of the Water Bureau of the City of Philadelphia at 29th and Cambria Streets, from which every activity having to do with the distribution of a 450,000,000-gallon daily supply is directed and controlled. It is probable that those who have had orthodox training in Scientific Management will not find at this station a single familiar mechanism.<sup>9</sup> But I can recall no more beautiful illustration of the value of standardization, functionalization and centralization. The work involves the operation of countless thousands of miles of water pipe ranging from 60-inch street mains down to the smallest sizes used in houses; say 75,000 street stops; over 100,000 meters, etc. The work is subject to all manner of variations due to location, pressure, character and age of construction, and emergency service—such as for fires, quality of the water, etc. Formerly this work was handled from eight separate so-called Purvey Districts equipped largely with horse-drawn vehicles, manned by a non-functionalized force, almost entirely without the aid of written records and using for the most part non-standardized equipment, tools and supplies. Credit for the development which has

<sup>9</sup>Taylor never claimed originality or special virtue for many of the mechanisms he used. But during a period of over thirty years Taylor assisted by a considerable number of more than average men worked to build up a consistent grouping of mechanisms which taken as a whole yield results not obtainable except through using some grouping of mechanisms similarly developed. It is only human to want to develop "for ourselves" and therefore necessarily anew. Some years hence, after it has been discovered what an opportunity and necessity there is for dovetailing and interlocking of mechanisms in management, there will develop a greater interest in knowing how Taylor did it. For this reason I hope our society will make plans for carefully filing every paper and other means of recording the details of Taylor practice.

been brought about during a period of at least ten years is fortunately well distributed among a large number of employees. The underlying principles have been bred into the personnel through many short steps and simple illustrations spread out over years of patient work. There is apparently no party of the opposition "waiting to throw the blankety-blank thing out."

An interesting phase of this work<sup>10</sup> is that it is leading slowly but I believe surely to inter-city standardization. At present I believe this only involves meter practice. But the principle once established, its application is sure to spread.

An illustration of a more orthodox application of Taylor methods in the work of Philadelphia's Water Bureau is found in the work done by Sanford E. Thompson in cleaning filter sand.<sup>11</sup>

In commenting on all this fine work Carleton E. Davis, Chief of the Bureau, who afforded the inspiration for and generally directed the changes, has recently said:

Our experience is an illustration of the fact that "the letter killeth," but the spirit of Scientific Management was the great influence which brought about the changes in the Water Bureau during the eleven years of my connection with it. Scientific Management influenced the animate, as well as the inanimate.

The hope of reward stimulates us all. The reward may be pecuniary, or it may be the satisfaction from a job well done. We all react to influences of good order and reasonable system. Scientific Management does bring a definite reward along some line, as a result of a job done better than heretofore. There is always the future in view—a Tomorrow, as well as a Today.

In saying this, I find my mind reacting to the broad influences radiating from Mr. Taylor's work, rather than dwelling upon any specific case of detail. I attribute to him, and to the work that he did, general principles rather than detailed application of these principles in any one instance.

My attention has been called by Henry Bruère<sup>12</sup> to attempts made in New York City "to specify the individual operations in sewer and sewer basin cleaning." He tells me that "a number of the practices are still in operation."

Because it affects county government, mention should be made here of the efficiency and economy

<sup>10</sup>I understand that this work has been quite fully covered in an article by Seth M. Van Loan about to appear in *Engineering News*.

<sup>11</sup>See "A Study of Cleaning Filter Sands with Opportunity for Bonus Payments," by S. E. Thompson, presented at the Annual Meeting of A.S.M.E., December, 1914.

<sup>12</sup>Formerly City Chamberlain, New York City, and distinguished pioneer in the crusade for better government in American cities.

survey which was started late in 1922 by the Board of Commissioners of Cook County, Illinois, under the direction of J. L. Jacobs, for many years a member of this society.

Another piece of work which I feel may fairly be credited in its conception and execution largely to Mr. Taylor's influence, and which is leading to co-operative effort between widely separated governmental units, is Mr. Hoover's work directed from the Department of Commerce toward standard specifications for State purchasing agents. Mr. Hoover's address delivered at the conference on May 26, 1923, is a classic on standardization. This work and Mr. Hoover's efforts toward "simplified practice" in industry were in no small measure inspired by the "Waste in Industry"<sup>13</sup> inquiry conducted under Mr. Hoover by a committee, a majority of the members of which are recognized advocates of Scientific Management.

Of a distinctly different character is the personnel work in the Post Office Department initiated by Postmaster General Will H. Hays and now being carried on under the leadership of our distinguished Past President, Henry S. Dennison. There has been organized something akin to a works council in the Department as a whole and in each of the larger post offices. In a recent letter Mr. Dennison said:

When I took up the work at the end of 1921, I followed along the health work<sup>14</sup> as vigorously as possible, but, of course, put my back also into the job of getting the councils solidly established. Because I don't believe that a council lives very long as a mere grievance or a merely representative body, I persistently urged thorough investigation and consideration of the actual facts which lay behind such questions as were brought up. This sort of work has encouraged the investigation habit in facing labor problems. With over a thousand councils in existence, there have, of course, been thousands of specific cases that have been studied and studied analytically rather than merely "debated".

The name of the official directing this work has very significantly been changed from Welfare Director, as first appointed, to Service Relations Director, which of course corresponds to the Industrial Relations Director used in private concerns.

Our work has been quite along the usual lines. We have helped to develop a magazine for the whole service, we have recommended the easing of the standing position for distributors and a properly designed stool for them to sit or rest on, we are studying a manual of training for those about to enter the service and for those in their first year,

<sup>13</sup>"Waste in Industry"; McGraw-Hill Book Co., 1922.

<sup>14</sup>Started by his predecessor, Dr. Lee Kaufer Frankel.

and so on. The difficulty about naming any of these things is that in so huge a project they are all, of course, of very slow development and quite in the nebulous state as yet.

A notable independent achievement of the Letter Carriers' Association is their determination that their jobs should be analyzed . . . actually 'time studied'<sup>15</sup>. . . in order that proper standards may be set and enforced. They hired the Labor Bureau, Inc.<sup>16</sup> to advise them and they accepted their findings in a report which received very broad approval.

Hollis Godfrey<sup>17</sup> suggests the adoption by government of one of Mr. Taylor's practices which was particularly useful during the Great War, as follows:

There is one side of Mr. Taylor's work which I have never seen expressed and which is of supreme importance in its effect upon governmental procedure as well as upon industrial practice generally, i.e., his insistence upon the written record. In an experience with the government which involves seven governmental appointments in five different divisions of the government over a period of some nine years I saw nothing more significant than the constant advance in selective written records on industrial matters, much of which I am sure was due to Taylor's work.

In the early years such records as were made of industrial processes were historical. They were not used as guides for the future. Taylor insisted that the written record should be so made that it could be used as a guide to future procedure; and I believe he was a pioneer, if not the pioneer, in such insistence. The effect of his work in this respect on the processes of government can hardly, I believe, be overestimated. I have always felt that this was the point which should be stressed. It has seemed to me that in reviewing Mr. Taylor's work, many of his outstanding achievements such as this have been neglected, and that material of infinitely less permanence has been emphasized.

Both our Army, through the conduct of some of the arsenals—especially the one at Watertown, Mass.—and the Navy, through the espousal of Taylor methods by its Construction Corps and individual line officers—notably Admiral Casper F. Goodrich—have been fundamentally affected by Scientific Management.<sup>18</sup>

<sup>15</sup>"Time study" as here used, and as it is ordinarily now used by the layman, has no very technical significance. Even the use of a stop watch is not necessarily implied. It includes frequently features of job analysis, motion study and other practices having fairly definite technical significance. It includes the ascertainment of all the details and facts about any given job that may be ascertainable.

It is the urge for justice which more and more is leading labor to demand measurement of work as one basis for wage payment. Justice as between individual workers in dividing financial returns is coming to be seen as only secondary to the division as between capital and labor.

<sup>16</sup>The Labor Bureau, Inc., 2 East 43d St., New York City. See its report "Supervision of the City Delivery Service," to the Postmaster General, May 26, 1923.

<sup>17</sup>President, The Engineering-Economic Foundation, Boston; formerly member National Council of Defense.

<sup>18</sup>See article "Secretary Newberry and Navy Yard Reform" in *North American Review*, 1909, by Casper F. Goodrich, Rear Admiral, U.S.N.