

ment of the post office, who became an adept at handling such letters. The other clerks were then instructed to throw aside all letters which could not be read instantly, and spend no time in trying to read them. These exceptions were then deciphered by the Nixie clerk. The result was an immediate increase on the part of all.

Slide Rules and Other Time-saving Implements. There are no problems in office work similar to that of cutting metals, and such slide rules are not necessary; yet there are many cases where special slide rules can be constructed, and of course all percentage figuring and such cases of multiplication and division can be performed on the ordinary slide rule.

There are many cases where labor can be saved by the use of computing tables especially made, charts, and calculating machinery. Mechanical bookkeeping is a very common thing in offices nowadays, even where no pretense of scientific methods is made.

Instruction Cards. The worker's instruction card is very useful in the office. The office manual is also a great aid to standardization of methods. The book of standard practice mentioned by Mr. Fuller is of great value, yet very few offices have anything approaching it.

The Task Idea. This is most successful, even in jobs which at first seem difficult to measure accurately.

Routing and Scheduling. This principle is also very important in office management, and yet little thought of by unscientific managers.

Cost Systems. An office cost system is of great advantage, but just about as many offices as factories go without one. Few executives have any idea of the cost of clerical work, and little constructive thought is given to cost reduction. It is astonishing but true that very few office managers know how many letters a typist can or does write, how many entries a bookkeeper can or does make, or how much of any kind of clerical work can be done.

All of these things work and work well in the office.

I have also found that not only do Dr. Taylor's principles apply to office management, but that the same method of analysis applied to sales development brings the same satisfactory results. My associate, Mr. M. E. Ream, has done some very remarkable work along this line.

One great difficulty I find in attempting to install scientific methods in the office is to get the company to understand the full significance of the term. They do not realize that scientific management means something more than a bonus system or piece rate. Few have

any conception of the possibilities for increasing their business by bettering their methods, their organization, and their control.

They have all heard of remarkable results of bonus or piece work systems, and many imagine that all that is necessary is "to find out how long it takes" to do a piece of work, and then set a price on it.

When they have established piece rates by such unscientific methods, they imagine that their work is finished. In one large office in New York a bonus plan is in operation based on no standards at all, but merely the general average of efficiency. Employees are paid a bonus for beating the average. As the low ones increase their efficiency, the average naturally is raised and the bonus per worker decreases. In other words, the more that is done, the less the worker gets for it. This same company argues that a high rate of turnover is a desirable state of affairs.

We are only beginning to appreciate the breadth of Dr. Taylor's fundamental ideas.

The broad outlook that these ideas give the manager is far more important for the future development of his business than the savings that may be made as a result of the application of scientific principles, even though these savings are usually out of proportion to the cost of installation.

MR. CARL G. BARTH:¹ I don't know whether you have heard this story or not. It is a story of a man not knowing what he was doing. I find again and again that people are doing work and do not know what they are doing. But here is the extreme case.

A railroad president had an efficient system for his men. It was principally a record of attendance. He found a man who had never missed an hour from his work in thirty-three years of service. He had been the most efficient man on the road, apparently. In this story the president is supposed to be in New York and this laborer up in the mountains of Vermont somewhere. The president sent for this employee; he wanted to see this most efficient man. So one day in came a great big Irishman, in response to the president's call, and he was let into the private office and the president of the road learned who he was. He said to the Irishman, "Is it true that you haven't missed a single day from your work in thirty-three years?" "Yes, sir", said the Irishman. "Can that be? What work have you been doing?" questioned the president. The Irishman replied: "I have struck every wheel of

¹Consulting Engineer, Rochester, N. Y.

every train that has come into our station and stopped for the last thirty-three years; I have hit every wheel with my hammer." "What do you do that for?" asked the president. "Well, I don't know," said the Irishman.

He had been doing that for thirty-three years, and he did not know what he was doing it for, and he had endangered the life of the passengers during those many years because although he had been hitting the wheels of the passenger cars with his hammer, he did not know that he had to look out for a peculiar noise that the wheel would make if there were a defect.

I am also reminded of a story of the man who poured water in the rat-hole.

Before telling that I want to say that I am sorry Mr. Fuller did not give more credit to Mr. Taylor. All the good things come from Mr. Taylor—a few good things from the Bible, but most of the good things from Taylor. I was delighted with the second speaker, that he did give Mr. Taylor so much credit.

Now, to tell my story. There was an investigation over in England of a navy yard, and as a member of Parliament was going along past an old building he saw a man sitting in a chair with a bucket of water, pouring water into a hole in the ground, a dipper-full at a time; every now and then he would take a dipper-full of water and pour into this hole. He asked the man "What in the world are you doing?" The reply was "I am pouring water into this rat-hole." "What are you doing that for?" "I don't know, but I have been doing it for twenty years." Following the thing up, it was found that it was true that he had been doing that, it was something that had been started simply as an emergency measure; twenty years before they wanted to keep any rats from coming out of this rat hole, and they started this man pouring water into the hole to keep the rats from coming out, and sure enough he had been doing that for twenty years.

MR. L. A. MILLER:¹ Mr. Fuller in his paper has very ably presented the necessity for and the benefits to be derived from the application of scientific principles to office management particularly as it relates to routine methods and the wage problem. So far as I am able to judge, he has made no statement that is not absolutely true and borne out by his years of experience with one of the most up-to-date companies in the country. The entire paper is based upon a conscientious and comprehensive study of clerical routine, and unquestionably such study will inevitably lead to

¹Office Manager, Willys-Overland Company, Toledo, Ohio.

a practice which will finally end in greater efficiency through the application of scientific principles.

The conditions brought about by the war are very acute. These same acute conditions should aid materially the companies where increased efficiency is possible and where operations have not been standardized to any great extent. Approximately 125 or 12½% of our office force have been called to the colors; but few of these men have been replaced. There are two reasons for this; first, those remaining have been thoroughly impressed with the idea that it is their patriotic duty to take over the additional burden imposed by the enforced reduction and they have been very glad to do this; second, cutting waste effort has been absolutely imperative. Of course, an organization where high efficiency has obtained could not realize the benefits as we have. I consider that we are fortunate in being forced to action.

Beyond a doubt, clerical efficiency under proper study and incentive may be increased 100%. It seems, however, that only the simplest operations have thus far been standardized, and I think this is largely due to the fact that even though a study has been made of all the detail which enters into the operations, the unit for measuring production has been either obscure or fluctuates to such an extent that it would appear impracticable to standardize. This leads me to the statement of a theory with which many might disagree; namely, that it is possible and profitable to standardize operations and offer incentives where production and the productive unit is not considered except as a basis for work assignment.

To illustrate: There are many clerical operations where satisfactory records may be kept of neatness, attendance, punctuality, deportment and accuracy; high efficiency in these respects will in all cases be reflected upon production. I have no doubt many will feel that such a plan is entirely too unscientific, but if we wait until we can actually measure each unit of product of clerical effort as definitely as we can measure the product of a machine, we shall be very slow to improve clerical efficiency. If I were to state the one reason which has attributed most of all to the delay in applying scientific principles to office management, I would say that it is on account of the varying product and the obscurity of the unit. In the hundreds of clerical operations which the Curtis Company has standardized, under Mr. Fuller's direction, I am sure in a large percentage the productive unit is more or less determined by the law of averages. In other