City (there are over eight hundred of them), and on this directory indicate the route which covered a particular street or number. Now it is only necessary to consult this directory exactly the same way that one consults a street guide, and the work is so light that the two girls not only handle it easily, but are able to devote considerable time during the day to other work.

This relatively unimportant detail was costing the company over a thousand dollars a year more than it should have cost.

MR. HENRY S. DENNISON[1]: I want to express my appreciation of Mr. Hathaway's admirable paper. I desire particularly to do so, because, although I am one of those who have been and shall ever be strongly interested in urging that this Society face the problems which are concerned with the instincts, the desires and the happiness of the worker, nevertheless I agree that it is just as essential to regard the technical problems. They are interdependent; one is no more important than the other. There is no escape from recognizing that. They are equally important because equally essential to the advancement of scientific management. We have a double task; we must study simultaneously both of these problems.

MR. DANIEL M. BATES[2]: You may be interested in the effect of standardization independent of any time study, just as a step towards getting ready for time study, as evidenced by a recent experience of ours. We had a calender running on cotton cloth which was turning out 17,000 to 20,000 yards a day. In getting ready to make time studies to determine exact standards on which to base new rates, and as a result of establishing preliminary, common-sense standards and of getting the workers interested, the production of that calender was increased to a maximum of 54,000 yards per day. We have only recently got to making the time studies and everybody concerned is keen for it.

WHAT too many progressive business executives fail to realize is that the scientific method, or fact analysis, is not to be applied sporadically; is not to be applied here and neglected there; begun and then allowed to lapse. For an executive to appreciate the meaning of fact analysis is not enough. He must create and maintain an organization to apply it. It must become a religion not only to him, but to the others in his industry as well. Simply to order sales to be analyzed, or a new accounting control to be established, without at the same time providing the ways in which it shall be done, and allowing for all of the consequences which will follow, is only to catch a glimpse of the meaning of scientific method. Glimpses alone are not enough; conviction is what is needed, and this must be general and felt by all those on whom responsibilities rest. The lesser officials, the department managers, and even the workers themselves, are the ones who are in a position to see the need for fact analysis; and, if convinced of its services, can be of inestimable service to the management in suggesting improvements to be made and in observing the results of the changes introduced. The technique of scientific method will have to be applied by the expert, but he should have not only the sympathy but also the cooperation of all those in whom any responsibility rests. An esprit de corps is indispensable.

Scientific method has been defined as a state of mind, and this is probably a true characterization if the condition is added, that the point of view it represents is consistent in seeking the truth and being guided by facts not at one time, in one place or under one condition, and ignoring them when it becomes advantageous, or when they are difficult to determine, but in all places, at all times, and under all conditions. Cost accountants, statisticians, and industrial engineers, in the study of business, are continually finding conditions which are deplorable; where every principle of scientific method is violated, and where businesses are running on without cost figures, depreciation reserves, sales analysis, and comparative and basic operating data. A remedy is sought at the hands of the expert, but only for certain specific ills, and not for a complete constitutional treatment. Changes are introduced with fear and hesitancy, doubt characterizing every innovation.

This is not the spirit of scientific method. To the fact analyst, facts are facts. They are welcomed for the truth they contain. The attitude toward them and toward the changes which they make imperative, is positive, receptive, and open minded; not negative, doubtful and hesitant. It is not a little truth, but the whole truth, which is wanted. Nothing is too sacred, too old, nor too customary to be challenged. Truth from whatever source is sought out and welcomed, and applied to problems as they arise. (Secrist, *Statistics in Business,* pp. 39 and 40.)

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[2]Agent and General Manager, Lewiston Bleachery and Dye works, Lewiston, Maine.

THE FOREMAN[1]

By

SANFORD E. THOMPSON[2]

WHAT is the foreman's place in modern industrial management, and particularly, during the development of new methods? A foreman often is the chief factor in assuring the success of the work.

This morning we propose to discuss the duties of the foreman, confining ourselves particularly to the foreman in general charge of the room or department —the gang boss, as he is sometimes called—how to fit him for his new duties, how to convince him of the advantages to the company and to himself of the changes in methods, and how to develop him to satisfactorily fill these new duties which devolve upon him.

When I was a young man I was assistant foreman on my first job, and I remember a discussion between the three highest officials of the company on whether a man could possibly make good as foreman if he did not *damn* his men. The conclusion reached was that he could not make a success without a complete sulphurous vocabulary. Those of you who heard Mr. Taylor deliver one of his graphic Harvard lectures appreciate the picturesqueness—at least so it seemed to the listener—of the old-fashioned shop foreman. Mr. Taylor brought out vividly the contrast between the old and the new; he pictured on the one hand the days of the autocratic, domineering task-master whose word is law, whose every action, however unjust, must be upheld by the management, to avoid loss of authority. Some shops still exist that are running on these principles. In contrast he pictured on the other hand the modern way of assisting the workman to do his work properly, instead of damning him for doing it wrong; of showing him the best way to do it; of giving him the right tools to do it with; of giving him perfect materials to work upon; of giving him constant work; of rewarding him in proportion to the quality, as well as the quantity, of his output; of listening to suggestions and complaints with a view to correction and adoption; and finally, of giving him a voice in the management.

Does even this group appreciate the changes in our relation to labor that functionalized foremanship, as worked out by Fred Taylor, has brought about? Do we realize how far this many-pointed contact with the workman is making possible the higher development and closer coordination between the management and the worker that our leaders of thought are preaching?

But to accomplish all of these things, not only must the scheme of organization be changed, not only must the duties of the foreman be revised, but there must be an entire change in the mental attitude of the foreman. It is no easy matter to change from a Czar—for that is his former position—to an instructor, no matter what classic lessons are to be taught in his school.

When a man talks of introducing scientific methods into his shop, I always ask, "How old are your foremen, how old is your superintendent?" I find that after a man is past forty, it is a most difficult thing—although by no means impossible—for him to appreciate that all of the traditions upon which he has built up his prestige must be overturned, that he must see others come in and take away one after another of what he has considered his symbols of authority. He feels until he gets into the spirit of the new methods that he is being stripped of his power, and furthermore that the changes contemplated will disorganize his department.

And remember that a successful foreman of the old school is a man of rather extraordinary ability. Consider the mass of detail he must cover frequently on the spur of the moment. In the daily performance of his duties he must schedule and route the work to the proper machines and operatives; hire the right number and character of operators; adjust wages; settle disputes; inspect quality; insure quantity of production; see that orders are completed on time regardless of the salesmen's eccentricities. Is it any wonder that the average foreman finds it difficult at first to cooperate in new developments which involve radical changes in his manner of life and action?

In the modern plant other men than the departmental foreman plan the work, distribute the men to the

[1]A paper presented at the annual meeting of the Taylor Society, December 6, 1919.
[2]Of the Thompson & Lichtner Co., Boston and New York. I wish to acknowledge my indebtedness to members of our organization for suggestions from their experience. S. E. T.