

me to see and comprehend its meaning. This experiment showed the reason why I was the slowest reader in my class and why on a given task in reading, in literature or any other subject, I took longer than any one else. While not a sprinter, my record for the fifteen-yard dash has never been beaten—not because I was a fast runner, but simply because the time reaction to muscular effort enabled me to get off more quickly after the pistol shot than any one else. I never could have made a proofreader, or earned my salt as bookkeeper, but I think I should have made a tolerably good motorman.

The step from *unsystematized* management to *systematized* is a difficult one because it generally means a more radical change in the personnel of the supervisory force than does the other step. The *unsystematic* manager is likely to associate with him men of a similar type. To do one's work in a systematic way is not wholly a matter of training, and the foremen and superintendents in a thoroughly *unsystematized* plant cannot always develop the habit of working by means of system. The *unsystematized* plant still remains, either because its competitors are in the same condition or because there is a large difference between costs and selling price, or because the business is dominated by one or more strong characters whose ability in other phases of their work more than makes up for their lack in organizing ability. Sooner or later, however, this class of industries will be forced to change or be eliminated. This has already taken place in a number of industries, as for example, the manufacture of shoes.

Twenty-five or thirty years ago there were more shoe shops than there are today. The competition in manufacturing shoes and the intricacy of the detail have made it impossible for the *unsystematized* plant to grow beyond the limit of the single foremanship plan, with the result that only the *systematized* plants could increase. The others were absorbed or ceased to be, and today there is probably not an *unsystematized* plant engaged in the manufacture of shoes. Indeed, some few shoe manufacturing concerns are developing *Scientific Management* very rapidly in all their departments. And what has happened to the shoe industry is now happening to other industries which are in the transitional period through which the shoe manufacturing industry passed twenty or twenty-five years ago.

III. SCIENTIFIC MANAGEMENT

A. *Accounting.* The accounting under *Scientific Management* shows the manufacturing and expense accounts for the year by thirteen periods of four weeks

each, instead of twelve monthly periods, and at the expiration of each of these periods it shows the profit and loss and assets and liabilities. These in the *unsystematized* plant are shown yearly, and not always in the *systematized* plant are they shown even monthly. Further, the group and unit costs of the various products, the cost and output of each department and all expenses which might be applied directly to the product, are shown in full, and the "comparative" features are much more useful because four-week periods give a more equal basis for comparison. A monthly statement as shown by the books in the *systematized* accounting does not give an accurate comparison because, for instance, some months will have five pay-rolls where others have four and the number of working days varies by quite a per cent because there may be five Sundays or five Saturday half-days.

In substance, the general accounts of the company are shown in more complete form every four-week period than is shown by the yearly accounting in the *systematized* class. The ledger accounts have absolute control over the stores department, over the quantity and value of stores, work and materials in process, and manufactured goods; and as every department and function of the manufacturing coordinates with every other, the accounting becomes a part of the very bone and fibre of the manufacturing.

One radical difference in point of view is that the ascertaining of costs does not have a special system installed for just that purpose, and the ascertaining of costs is not the end sought. Under *Scientific Management* costs come as a by-product of the means used for increasing efficiency. For instance, a ticket made up in the central planning department, when combined with the instruction card, serves to plan the work in advance; then it is used to control the order of work by being placed on a bulletin board; then it gives the workman his particular piece of work to do with the instructions how to do it. On this ticket is stamped the time at which the work is begun and when it ends. This same ticket then serves to check off the progress of the work on the route-sheet. Then it goes to the accounting department from which the man's pay is made up. It is then redistributed and furnishes the labor cost of the particular operation on the cost-sheet of the job. From cost-sheets similar to this are summarized not only the cost on all jobs, but also the department expenses and charges which appear in each four-week period statement.

In other words, the mechanism used under *systema-*

tized management for ascertaining costs performs little other work; under *Scientific Management* it has performed its part in producing work, and from it, as a by-product, so to speak, come the costs.

The ascertaining of costs by this method is done with but little more expense than is necessary for handling the regular work of operation. Too much emphasis cannot be placed on the value of the comparative feature in accounting. Comparisons are a great spur to increased efficiency, and this fact is recognized as well in the *systematized* management. For example: a certain group of department stores each doing a business in a different city and non-competitive, have found such good results from uniform accounting methods and the information that comes from comparison, that they jointly employ an accountant who collects the monthly reports in detail from these stores so as to make a comparison by items, and then prints these data for the use of the management of each store.

For instance, one manager finds that Department A in his store did \$50,000 worth of business the preceding month, had \$35,000 worth of stock on hand, and is shown in detail what the labor and other expense items of that department were. He sees that another store (did \$55,000 worth of business in Department A and had a stock of but \$20,000. He immediately summons his buyer and informs him of the result of this comparison, and asks why he cannot do as well as the buyer in the other store and release \$15,000 of capital now tied up in stock. The knowledge of what can be done and is done by the other store is often sufficient stimulus in itself to cause to be accomplished what otherwise would not be considered possible.

The expense and frequently the shutdowns for the purpose of the annual stock-taking are eliminated under *Scientific Management*, because the accounting absolutely controls the movement of materials in and out of the stores department, so its records show at all times the amount in stores and this value can be ascertained when desired. The work of proving the items of stores is done continuously, and the days, which often become weeks and months, that elapse before even large and well-organized concerns get the results of their stock-taking become a thing of the past. One large concern which is a customer in a business in which I am interested finished its year of stock-taking January 1, and it was early in August of this year before it got the results and knew how much stock it had on hand January 1. The same will apply to the amount of materials and labor in process, which the *systematized* manage-

ment finds even a harder problem to handle, and also to the value of manufactured goods.

B. *Purchasing.* *Scientific Management* is not satisfied merely to have plenty of materials on hand when wanted, to roughly standardize the principal items of stock used and to buy at the market rate, but demands that all materials be carefully studied with reference to—

First. The greatest adaptability to the work.

Second. Quality and uniformity.

Third. Price.

Fourth. Determination of the proper maximum and minimum that shall be carried, so that the stores department may automatically govern materials and supplies which should always be on hand.

When this has been done, care is taken to make all purchases on detailed specifications. The importance of using materials best suited to the work and which are uniform in quality and by standardization reduced to the smallest variety, is not sufficiently appreciated by the buyer in even the *systematized* plant.

For example, a manufacturer of razors using a thin blade could not secure a steel which would always act alike and produce a uniform result with uniform treatment. He employed a steel expert of reputation to assist him. This expert purchased the best razors that different barbers had, analyzed them chemically and microscopically, and, as every man who uses a razor might guess, found very great variation even in the same makes. In fact, he satisfied himself that no razor manufacturer, however well-systematized his plant was, had ever scientifically determined the best steel, or had purchased it on a formula that would standardize this material. As a result, all these years the buying of a razor had been a lottery.

After many tests this expert secured from various steel manufacturers samples of steel on their formulae and his own, and he finally developed a formula that would give the best razor steel known and maintain it uniform. As a result of this method of buying this manufacturer stood alone among the razor producers of the country in ability to produce razor blades of standard quality. If all his methods are as scientific as this, it is doubtful whether his competitors will ever overtake the lead he has secured. This is not an extreme example by any means.

Another illustration of the standardizing of materials. In studying the supplies of a business it was found that there were twelve kinds of wrapping paper regularly used and an investment of \$2,500 was needed