

aid to efficient operation, or a possible deterioration in quality that might necessitate doing some work over again and so slow up production and consequently raise costs?

If none of these things would happen it would be perfectly proper to make the contemplated reduction. As a matter of fact it should have been made anyhow if the plant is really being run scientifically. On the other hand, if it can be proven that costs would go up or production be delayed and diminished, it would obviously be an act of folly to try to effect a saving at the spigot that would entail a loss at the bung hole. The greatest caution must be observed by the planning department to see that the executive has at hand all the possible information that will enable him to make decisions as to what will be done away with and what will be retained on the basis of undisputed fact and not on opinion or hunch. Too often action of this kind has been taken unadvisably only to be regretted after the harm had been done and too late to prevent undesirable results. Too much emphasis cannot be placed on the very grave necessity of preserving especially in hard times every adjunct to manufacture that has been demonstrated to be of value, whether the cost is large or small in amount, whether it is a direct or an indirect expense. There are many expenses that are universally regarded as fixed. Everyone knows that such charges as depreciation, taxes, insurance, interest and the like must be met and taken into calculation irrespective of whether times are good or bad. It is recognized as impossible to do anything else. There are other functions in the scientifically managed plant whose cost simply must be considered as inevitable as are "death and taxes" if the organization is to be able to exist successfully through these very times when legitimate reductions in expense are imperative. When very definitely reduced costs have been obtained through methods of routing, assignment, materials control, or any other planning activities, when these cost figures have been proved as they can always be proved if the facts are there, it would be quite as much the part of folly to do away with them under any circumstances as it would be actually to throw money into the street. The mariner does not set up his compass as an ornament to his ship in fair weather when he is navigating known waters in sight of land, and throw it overboard to lighten his ship when the storm breaks. The latter is the occasion when it is of paramount necessity. The scientifically developed planning functions are the compass and charts by which the executive must guide his craft in times of business stress and storm, and to at-

tempt to do without them in such a crisis is only to invite disaster.

There is one very useful chart that every chief executive should have before him at all times, one that the planning department should keep up to date. This is simply a graphical representation of the volume of expenses which the plant will incur for a given output subdivided into the A, B, C and D items and such further subdivisions of each as may be necessary to illustrate the relative amounts of expense in all important items. Say total expenses are \$1,000,000, of which A is \$175,000; B is \$400,000; C is \$350,000; D is \$75,000. Make four columns of heights corresponding to these amounts, all four inches wide, starting from the same base line. Then A will be 7 inches high; B, 16 inches; C, 14 inches; and D, 3 inches. Write the amounts at the top of each column together with its percentage of the whole, viz.

A—\$175,000.....	17½ per cent.
B— 400,000.....	40 " "
C— 350,000.....	35 " "
D— 75,000.....	7½ " "

Now divide each of these columns or blocks off into the next two letter subdivisions and write the amounts of these and the percentage of the whole expense in the space blocked off which is again proportional to the amount. You may carry this to three letters if you wish. In any event you will have before you a very striking picture of just how much each of your expense items amounts to and what percentage of the whole it is. This never fails to reveal some astonishing surprises as to the proportional amounts of the various expenses, and it frequently reveals the fact that some items which have been discussed with the idea of reducing them are found to be much smaller than expected while others, which were not considered important, loom very large. It makes no difference how often the amounts of these in figures have been looked at, the idea of their relative importance never shows as clearly as when made in this graphic way.

The writer has had an exceptional opportunity during the past two years of observing the workings of a method of management scientifically conceived and developed. The circumstances were about as trying as could possibly be imagined. The company had moved into a very greatly enlarged plant in March, 1921. About that time the business fell off in volume to a point even lower than it had been in the old and smaller plant. Stretching the imagination and the finances to the utmost, filling orders and manufacturing for stock to the limit, it was still only possible for two years to

operate this greatly enlarged plant at 40 per cent of its new estimated capacity, which was just about the production capacity of the original smaller plant. To price goods at a figure that would make it possible to sell them at all, it was necessary to figure the indirect expense at what it would be per unit had the plant been working at 60 per cent of its new capacity. And the greatest efforts to reduce the indirect expense from the 60 per cent capacity to that at which the plant was working, namely, 40 per cent, only resulted in lowering this item a small amount. The great bulk of indirect expense simply could not be influenced at all. It was there by virtue of the fact that the larger plant was being occupied instead of the smaller one, and it could not be lowered unless the new quarters were abandoned, which of course was not considered. In spite of these unfavorable circumstances it was essential to maintain intact every planning activity throughout the entire period. Indeed while the personnel was held down to the lowest possible limit, each individual was called upon for greater effort and harder work on the plan previously made, and the development of methods was continued as a matter of business necessity and expediency. The full application of every available mechanism of scientific management made possible the reduction of direct costs to a point that made commercial existence possible through the most trying period of the concern's life.

An experience such as this is the most conclusive evidence of the value and also of the necessity of developing, and in times of stress continuing the planning function as an instrument of executive control. To one who for many years had been working in an advisory capacity as a consulting engineer urging the adoption of scientific methods of management as the great need of industry, the actual experience of being in an executive rather than a consulting position, and of having to make the system work and work desperately, has been a most gratifying one. There has been demonstrated beyond the shadow of a doubt a far greater value of scientific management than its staunchest advocate has ever had the temerity to claim.

If future developments in industry are to evidence themselves largely along lines of better management, there will be an increasing demand for men with engineering experience to fill executive positions. This is inevitable, for real management is a science which is steadily developing its own theories and laws and requiring more and more the engineering mind and the engineering approach. This being the case, industry has a right to demand the services of those who can best and

most intelligently serve it. The time is passing when the engineer in order to maintain his professional integrity should remain aloof from actual participation in the industrial activities of the world and confine himself strictly to an advisory and consulting relationship with it. If the job is an engineering job the engineer must get into it actively. It is much easier for him to acquire the additional business experience that is necessary to conduct industrial affairs intelligently than it is for the average business man to master the additional engineering requirements that he now lacks. This being the case, the Taylor Society certainly will be called upon to contribute an increasing number of men to industry—men who are competent to fill creditably important executive positions—for there is no other agency today that is studying the great subject of the coordination of the factors of industry from the management point of view. The younger members particularly should have this situation very much in mind, for the future will certainly make heavy demands on them and they must be prepared to render this service when the call comes.

DISCUSSION

ROBERT JULIUS ANDERSON:¹ All will agree that this is a masterful presentation of the facts and we have so much at hand to discuss that one hardly knows where to begin.

Perhaps it is well that we pause a moment on this definition of a planning department. After listening to this paper I am more convinced than ever that we need to get together and strike some common ground.

Generally speaking, when the term "Planning Department" is mentioned we immediately think of just one thing, definite and complete production control through a central office. We ordinarily do not look upon a planning department as being capable of standardizing or designing equipment.

In some of the best organized plants in this country, many of the duties mentioned in this paper as those falling in the sphere of the planning department, are found in other departments.

For instance, how many plants will you find where the statistical division is in the planning department. The rule seems to be that this is a distinct branch of the accounting control under the controller. I am sure that the majority of plants lodge the responsibility for design, standardization of equipment, etc., in their en-

¹Production Manager, Bowen Products Corporation, Auburn, N. Y.