

Principles of Variable and Continuous Processing

The foregoing discussion and chart have attempted to show that the problems of organization control that exist under variable processing are absorbed under conditions of continuous processing. It has also been indicated that the principles and purposes remain much the same. The same fundamental practices are essential to success under both forms of organization. Even though there has for years been a philosophy of industrial organization as a guide to industrial development, the tendency to adopt a definite system or mechanism of organization still exists. Fairly successful results may come out of this tendency if conditions match those that are being copied. This is, of course, seldom the case, and visitors from one plant to another are often disturbed because they cannot take back some definite plan to apply to their own situations. It will be seen by consulting the chart that the same problems of organization must be faced by both variable and continuous process industries if scientific management principles are to be applied to both.

Some of the problems of industrial organization, besides the problems of training, are: the selection and design of equipment; the compiling of data on plant and machine capacity; the development of routing, methods, processes, mechanisms of coordination, reciprocation and accounting. All these have to be given the proper consideration so that an even flow of production may result.

In a variable industry machinery is not automatic and therefore data on machine capacity and time studies on work not covered by machinery are not a part of the organization structure. In the continuous process industry, time per unit is taken care of by the machine itself. In a variable industry, routing of work must be done for each order or class of work, whereas this is built into the machine in the case of continuous processing. Because of separate producing units in the variable industry, special mechanisms of accounting, control and supervision are necessary in order that coordination of effort, materials and machinery may be accomplished. Mechanical devices furnish this control in the continuous process. In the variable industry records of accomplishment must be kept, or memory must be depended upon, whereas in the continuous process industry machine and engineer-

ing data furnish these. Simplification and scientific administration are the natural results of continuous processing.

Reorganization and Mechanization

In reorganizing an old enterprise, the plane of mechanization toward which the enterprise is progressing must be considered. Organizations too often have in mind only the plane upon which they have been operating. They do not keep in mind the goal immediately ahead.

If it has been shown to be desirable, it is difficult to understand why industries do not more rapidly take on new machines and move toward continuous processing. Buying is done piece meal and often with no definite plan in mind. Machinery that has long been obsolete is carried on books. We can still observe manufacturers who buy second-hand machines worth thirty-five dollars or less for several hundreds of dollars. Or if they do not buy them they keep them in their shops. Even the poor man realizes that he cannot afford a thirty-five dollar automobile. This should be broken up for old metal, and so likewise should the old machine. It should not be allowed to clog our industrial organizations.

Andrew Carnegie is quoted as having said: "It is surprising how few men appreciate the enormous dividends derivable from investment in their own business. There is scarcely a manufacturer in the world who has not in his works some machinery that should be replaced by improved appliances; or who does not for want of additional machinery or new methods lose more than sufficient to pay the largest dividend obtainable by investment beyond his own domain. And yet most business men whom I have known invest in bank shares and far-away enterprises, while the true gold mine lies right in their own factories."

When we see real success in business we often wonder what caused it. We find upon examination that certain definite principles have been applied consistently and thoroughly, rather than haphazardly. Competition has forced the automobile industry to take advantage of advances in design and new equipment, and has materially aided in establishing its remarkable methods. The changes forced upon it have kept its equipment scientifically up to date and have prevented old age. The recent changes in some of our large industries will prove

not to have been the calamities that some believe them to be, but rather the salvation of industry and a gain to society.

It is curious that the modern banker, in view of our industrial progress, will take any chances with industries whose equipment has long been obsolete. At Saratoga or Belmont he would not buy a horse that had long been out of the running. Fancy harnesses or saddles in the form of budgets will not make old machinery run fast any more than such trappings will make an old horse run fast. It is claimed that some old industries have an advantage because machinery is carried on their books at practically no cash value. While this may be true in isolated instances, it has little significance. Large industries are going out of business in one locality and being built up in others. And whole factories are being replaced within industries. This means leaving old machinery and traditions behind, in much the same manner that the old automobile is left beside the road. The ingenuity that built up these plants apparently has not kept pace with progress. The old policy of making money by retrenchment is still with us, but it is becoming more and more dangerous as a long-run policy.

Some years ago I was assigned the task of ascertaining whether or not some of the older plants within an organization could be revived. The products of one of these plants had at one time led in its field. The original work in the plant had evidently been done by very remarkable men. Equipment had been installed for every possible operation, large and small. Control, accounting and other organization features had been well worked out. It had been a beautiful piece of work for its day. In fact it was so perfect that no changes had been made in it. It grew old gradually and generally. Product and processes had not been kept scientifically alive. I question whether spotted improvements would have kept it virile. Any marked improvement in product or process involved a problem of balance. Either complete reconstruction or scrapping was recommended; and the final outcome was that the plant was scrapped. Other plants presented less extreme problems but it was clearly indicated that only new construction would solve some problems and that reconstruction of practically obsolete equipment was not feasible.

Experience in other industries has shown that many problems are only to be solved by new

construction. Improvements in two of our largest industries, steel and textiles, show that whole plants have been reconstructed or discarded. No remedies would have helped some of these plants. One of these industries has fortunately rebuilt partly on its old ground.

There are numerous companies that could bring their plants up to date mechanically by installing the equipment that the market affords. This alone would mean a marked forward stride for industry. Other companies could very profitably utilize a more constructive engineering program.

Progressive Engineering Maintenance and Depreciation

Rapid engineering developments have forced modern industry to face the problems of engineering maintenance of organization, as distinct from mechanical maintenance. A company that recognizes such maintenance problems will have ideas concerning obsolescence as well as new ideas concerning depreciation. The company that does not face the problems of maintenance will eventually discover that its depreciation practices are unsound. The lack of physical maintenance evidenced in many factories, hotels and stores, together with a lack of progress, means gradual but certain death.

More rapid scrapping of old machinery in American industry would make for better business all around. The country might well interest itself in better plant machinery as well as in better roads and theatres.

Leaders in industry realize pretty clearly the importance to production of continuous process machinery, and therefore the importance of engineering. The fabrication points have been the places where economies have been effected. But with the emphasis that has been placed on engineering there has come a shifting in expense. Improvements in machinery are not all gain. Economies are now being sought at another point—where operating machinery and processes are being produced. The importance of economies at this new point has in some industries outweighed the importance of economies in the old field.

There are, then, two points of special interest to management in this new alignment. It must support engineering because of the stage of industry in which we find ourselves, and it must effect economies within the engineering field. It