

its relation to the operation preceding and to the operation following becomes an important issue. This relation or direction of flow may be recognized or disregarded in the arrangement or construction of the machine unit. Static expense is high when materials enter the machine in the opposite direction of the intended flow, or when materials enter and are discharged at the same point. Tracing the path of the machine process quite as methodically as we have done with process in its entirety will bring out whether or not the "straight line" principle has been employed and if dynamic potentialities have been realized.

In addition to direction of flow, the weight, floor space, mechanical abundance, loss of motion, and so on gain a tangible meaning when weighed in the light of their static and dynamic relative proportions. A detail discussion of these features cannot be offered in this summary, as they embrace too great a field relating to competitive types of mechanical principles involved in machine design. We wish to emphasize, however, that a clear recognition of the static and dynamic elements in a given machine unit lead to basic improvements and often to important development.

It is impossible to speak of construction in connection with process without mentioning the articles manufactured and the influence of their design upon the efficiency and continuity of process. In constructing a bridge, the method of its erection is a constant consideration in arranging the major members as well as the details, and the choice of design is sometimes decided because of a safe, economic and expedient method of erection involved. While original design is obviously a basis if not the basis for process, in many branches of industry it is entirely neglected and seldom is accorded the place of preeminence which it actually holds. Poor designs are the cause of much static expense; if new designs were augmented with charts of their process paths, allowing comparisons of design in point of process, a great deal of waste would be prevented at the source.

A determination of the value of process therefore would not be complete unless the design of the articles manufactured were analyzed. While design is a creative function and no set rules can be applied for its measurement, yet there is ground on which design may be approached in a systematic way insofar as process as a whole is concerned. We are referring to standardization of weights and measures of the raw

materials used, the interchangeability of parts, the number of parts and the number of group assemblies; in short, the elements responsible for a high static expense.

To sum up: the balance of static and dynamic elements allows a broad basis on which to judge organization, path of process, uniform load and construction.

IV. Balance Between Development and Status Quo

Every business is always in a state of development, expansion, betterment and change. None can afford an inflexibly rigid state of things which orders a monotone performance without alterations year in and year out. If the status of a business has been absolute for a number of years, development has of course been nil. An appraisal of process in point of *development* and *status quo* would necessarily rule negatively.

However, a settled status of process is of great economic value. The vim of performance is infinitely greater when guided by well-established routine, the effect being consummately the same as with a well-trained company of men. In fact, the final and full value of a process is never realized until it has reached the proved ground of a long continued run, in which every one has become thoroughly familiar with his individual duties as well as with the part he plays in the ensemble. This familiarity conserves mental and physical energy as decisions and actions increasingly are dictated by the subconscious and become forces of habit. This conserved energy in turn is free to concentrate on the critical moments of an operation or transaction until these too are subjugated, and so an astounding degree of dexterity and capacity for work is often developed. The economic value of this element can scarcely be overestimated.

But now we are confronted by a paradox. Changes are evil and still a necessity. It goes without saying that the economy of the well-established routine is keenly realized by the individual and that his aversion to an uprooting is strong in proportion to the amount of energy required to absorb a new status—this latter especially where duties have been added during the course of time, as developed dexterity has created additional capacity. A change under such circumstances would cause a most irksome situation of impossible burdens. Offhand judgment would say that the man is overworked or is not willing, when in reality development and status have clashed.

Nevertheless, as we must have development to keep

pace with the economic strides of time and must also conserve the status quo, it follows that development should take place by keeping intact as much of the status as possible. Instead of having no status and all development, development should affect only a fraction of the organization at a time, and should not proceed to additional territory until the new status is well under way, if not entirely matured at the point of its inception.

The status of a business is external as well as internal. For instance, the acquaintanceship of a group of salesmen in their specific territories establishes the status between the house and customers. A continuous disturbance here will prevent the rapid growth of mutually advantageous business relations, or might destroy the old ones. If change or development is needed in the sales policy, it should be planned by maintaining the ideal balance between the status and development by proceeding slowly and by tearing down only what can be put back in a hurry.

Some businesses are continually in a complete state of change and the true status is difficult to determine. Under the circumstances process would have a low value. In other businesses development is controlled by a budget and a schedule and goes forward in an orderly progression of successive steps until the in-

tended status is reached. Here the balance of development and status can clearly establish how much of the organization is being affected at a time, and not only can process be appraised but a reasonable estimate may be made of the projected improvement.

To sum up: The value of process finally is measured by the proportion of intact status to the extent of development being accomplished.

In conclusion we wish to say that we have merely touched the surface of the problem, particularly with regard to the main issue, which is the balance of the organization and the business problem and the control of and adherence to the principle aim established for a particular group. Quoting from Mr. Ford's Page²:

The tendency of every group to forget the principles on which it was founded has always been the great cause of organized failure. Established to maintain and extend a definite truth, the group trend has been consistently toward the self-absorption of the energy it receives. Could great organizers foresee and provide against this seemingly inevitable trend, the world would be afflicted with less ponderous group machinery and would possess much more efficient facilities for carrying on its vital functions than is the case today. In our time we are seeing the growth of the spirit which will eventually succeed in overcoming this Law of Adverse Returns.

²Dearborn Independent, May 16, 1925, page 11.

Fall Meeting

Engineering Societies Building, New York, December 3-5, 1925

THREE joint sessions with the Management Division of the A.S.M.E. are planned, presenting papers on Production Control in the Newsprint Industry by George D. Bearce; Plant Design and Plant Efficiency by Harold T. Moore; The Present State of Industrial Psychology, with especial reference to selection, training, technical cooperation and good will, by Lillian M. Gilbreth; Psychology in the Organization of Prison Industries by Edgar A. Doll, who installed such work in the New Jersey State Prison

at Trenton; Workers Cooperation in Management in the Baltimore and Ohio and Canadian Northern Railroads, by Otto S. Beyer, Jr.

Other sessions are being organized on merchandising and selling; the interests of the financier in better technical management; the relations between such executives as presidents, general managers, and department managers; a special session organized by and for younger members; and two sessions for teachers of management.

Save the Dates—December 3-5