

the purpose for which the article is to be used. The design and the engineering departments can be of great assistance in this connection.

If proper standards of quality are to be maintained in the organization, it is desirable that the inspector should not report to an organization executive whose interest is primarily in quantity rather than quality. Nor should the inspection department be looked upon as being alone responsible for the quality of product. The inspection department is merely the instrument for checking the quality of work produced in the organization, to be certain that it comes up to the established standard. The ultimate responsibility for maintaining and enforcing quality in an organization rests with the foreman and workers in the producing departments.

The maintenance of a high standard of quality in an organization is also to a large extent dependent upon the attitude of the inspector in enforcing quality. The idea of prevention in connection with inspection, which was spoken of before, is important here also. Instead of merely rejecting work which does not meet the established standard, the inspector should indicate the cause of rejection and take the necessary steps to have the cause remedied, so that it will not be the reason for future rejections. Unless this is done much poor work will be repeated unnecessarily. Rejections are often caused by the failure of the worker to understand instructions, by his using wrong methods and poorly maintained machines and tools in performing an operation. If the inspection department will act to remedy these conditions, rather than merely reject work which does not meet the established standards, the result will be co-operation between workers and inspectors rather than the antagonism which now exists between these two groups in many organizations.

3. *Maintenance of Standards of Finished Product.* Maintenance of standards of finished product involves the same careful inspection which the maintenance of other standards requires. In some organizations at the present time this final inspection of product is performed by sales inspectors, or what have been called in some organizations consumers' representatives, who are in no way connected with the production department. They have complete authority to reject whatever articles they desire. The basic idea behind this plan seems to be that a product may pass a factory inspection but may nevertheless still be unsatisfactory from a consumer's point of view. It is the purpose of this inspection to look at the product as a consumer would look at it in order to decide whether or not the

consumer would be pleased with it. In these days of severe competition, the product must not only be technically correct but it must also be attractive to the consumer.

Maintenance of Plan of Organization and Its Mechanism

The maintenance of a plan of organization and its mechanism is a phase of maintenance of which one hears and reads very little, yet from the standpoint of scientific management it is just as important as any other phase of maintenance.

After the plan of organization has been carefully studied and worked out, standards established, routines developed and the business placed in condition to function in a most effective manner, it has often been assumed that it will do so without any further attention. Experience has shown that this is not so. Unless the plan of organization and the mechanisms which were developed in connection with it are constantly examined and inspected, members of the organization will gradually fall back into their old methods. The resulting condition is apt to be worse than the original one, since the organization will now be going through motions which will mean nothing. This slipping from the original plan will probably start by making so-called short-cuts or improvements due to a failure to understand the purpose of the mechanisms which were developed. This has occurred in many instances where consultants after reorganizing a business have not been retained to follow up their work by regular inspections. In such cases the consultants should be retained after the original installation is completed so that they may make certain that the plans of organization and the mechanisms which they devised for the particular company are being used as they should be used, and that there are no omissions or additions, unless they have been carefully considered by the persons most familiar with the reasons for their original adoption or omission.

Taylor recognized the importance of this type of maintenance and constantly emphasized it in his writings. In his work "On the Art of Cutting Metals" he says:

Even if these written instructions are sent to the machinist, however, little attention will be paid to them unless rigid standards have been not only adopted but enforced, throughout the shop for every detail, large or small, of the shop equipment, as well as for all shop methods.

¹⁰Transactions of the American Society of Mechanical Engineers, Vol. XXVIII, 1906, p. 54.

Again in "Shop Management" he says:

Perhaps the most important part of the gang boss's and foreman's education lies in teaching them to promptly obey orders and instructions received not only from the superintendent or some official high in the company but from any member of the planning room whose especial function it is to direct the rest of the works in his particular line: and it may be accepted as an unquestioned fact that no gang boss is fit to direct his men until after he has learned to promptly obey instructions received from any proper source, whether he likes his instructions and the instructor or not, and even, although he may be convinced that he knows a much better way of doing the work. The first step is for each man to learn to obey the laws as they exist and next, if the laws are wrong to have them reformed in the proper way.

It will be noted that Taylor did not say that if a standard was once established it should not be changed under any conditions. He believed that if it could be shown, after careful study, that a standard could be improved then it should be changed, but that it should be changed only by those who had set the original standard and were in a position to determine whether the suggested change was really an improvement or merely the desire of someone to have it changed for change's sake.

Dr. Harlow S. Person well summarized the need for constant vigilance in maintenance in Chapter I of "Scientific Management in American Industry" when he said:

The operations of an enterprise are the affairs of normal human beings and are subject to all influences of human nature—misunderstanding, inertia, inhibitions, carelessness, laziness. Training to do things according to a newly discovered "best way in the present state of the art" is a condition of learning with all the backslidings that result from the struggle between old and new patterns of conduct. A man may resolve to do a piece of work in a newly discovered best way with all the enthusiasm with which he resolves to grease and oil his new automobile precisely as set forth in the instructions; but six months later performance has declined from high resolve as badly in the one case as in the other—and for the same reasons.

Regular inspections are the method whereby the standards of organization mechanisms, procedures, etc., are maintained, just as they are the means of maintaining standards in general.

Conclusions

This paper includes a discussion of the maintenance of only a few of the many standards which might have been considered. It has not been our purpose to con-

¹¹Harper & Brothers, New York, 1911, pp. 138-40.

¹²P. 5.

sider in detail the technique of operation of any of the departments responsible for the maintenance of standards, but rather to consider the subject in a broad sense and to give some of the fundamentals and problems involved.

To establish standards in an organization is to raise the level of performance in that organization. Whether the established level is to be maintained will depend upon whether or not the standards are maintained. Maintenance of standards acts very much as a ratchet in preventing the established standards from seeking a lower level.

If standards are to be maintained, responsibility for such maintenance must be definitely fixed in the organization and a detailed technique developed for carrying out this responsibility.

The principle upon which modern maintenance is based is the prevention of variations from established standards by carefully planned inspections, the techniques for which have been developed as a result of research and investigation. These inspections are carefully scheduled, according to the frequency necessary for effective control, and a tickler file provided to be certain that the established schedule is maintained. In determining the type and frequency of inspection, its cost must be balanced against savings resulting therefrom.

If standards are to mean anything in an organization, and if they are to be properly maintained, they must be reasonable working standards. From a practical point of view it is impossible to maintain standards which are unduly severe.

In the maintenance of all standards, standard practice instructions or standing orders are an invaluable aid, and their importance can hardly be overemphasized. Every department responsible for the maintenance of a standard should develop a standing order which covers its work and sets forth its purpose, functions and procedures.

Departments responsible for the maintenance of standards should exercise an influence in the direction of the development and improvement of existing standards. Through the work of inspection much valuable information will be obtained for this purpose.

The importance of the maintenance of existing standards in an organization is as great as the importance of the standards themselves. Failure of proper maintenance means the loss to the organization of the difference between what should have been and what actually occurred. Without proper maintenance of