

of a peining hammer and a file, takes a lot of non-standard components and assembles them into a non-standard knife. He produces a good knife but the labor-cost is high and the quality dependent upon his personal skill. Those of you who sometimes get fun out of a gun can well imagine what would happen if the gun action were assembled with a peining hammer and a file. We require no cutler to assemble our pocket knives. Scientific standardized mass-production methods enable us to use girls as assemblers. Standardization, thoroughly applied throughout the plant, also produces a marked contrast with the non-standard plant in the record of spoiled parts.

The need for inspection standards is so obvious that I shall not dwell upon it. In most industries business growth depends upon quality, quality depends upon inspection, and inspection depends upon adequate standards. Those master inspectors, the treasurer and the accounting staff, can usually tell you very quickly when your inspection standards go wrong. Your customers furnish your inspection standards whether you will it or not; your job is only to formulate them into language or form that your production staff can understand and to see that they are properly installed and maintained.

In adopting standards there must be established a mechanism for the replacing of old standards by new, as the development of standards has a tendency to keep an organization from developing and installing changes. One trained in marketing recognizes that pressure from distributors for special merchandising features has caused the adoption of many minor changes in the past which would never have been adopted if products had been standardized, but many products would have been more economical to both manufacturer and consumer if these changes had not been made. Where an important improvement has been accepted, however, proper mechanism should be set in operation to clean up all components which have thus become non-standard, retaining a sufficient supply for repair parts for a specified time as a service to the purchasers of the old form of product and to begin the manufacture of the components of the new type.

Standardization, in reducing the number of items in the line, has naturally the direct effect of reducing the finished goods inventory and this, too, without decreasing the service rendered the customer. Usually better delivery service can be rendered, and this point is accentuated if the manufacturer has to maintain a

chain of warehouses throughout the country.

Plant economies resulting from standardized products may be summarized as follows:

1. Reduction in number of product items;
2. Earlier plans and schedules;
3. Placing of manufacture on a tool basis;
4. Decrease in the variety of tools, jigs, fixtures and gages;
5. Decrease in number of production processes;
6. More nearly correct economic lot sizes in production orders;
7. Saving in idle machine times;
8. Decrease in raw materials inventory;
9. Decrease in tool inventory;
10. Decrease in work-in-process inventory;
11. Decrease in worked materials inventory;
12. Decrease in finished goods inventory;
13. Better ability to meet fluctuations in sales demands;
14. Gains in quality, quantity, cost and service.

DISCUSSION

A. W. SHAW¹: There are two comments that I should like to make. One is that the standardization programs of the Conservation Division were not the outcome of exact plans that we had when the Conservation Division or its predecessor, the Commercial Economy Board, was established, but that these methods were answers to certain problems. In other words, these methods were the answers that developed from necessities that arose in the war.

In the beginning our task was the conservation of the resources and facilities of the nation in time of war, or as President Wilson put it, "the studious conservation of resources and facilities by means of scientific commercial and industrial economies." And the very obvious approach to our problem of conservation, and the approach that most often was brought to us, was to make a distinction between commodities that were essential to the civilian population in time of war and those that were non-essential, and to cut off the manufacture of the latter. But it soon became obvious that you could not draw a definite line between essential commodities and non-essential commodities. You might on one hand agree upon a commodity which was less essential and on the other hand on a

¹President A. W. Shaw Co., Chicago; formerly Chairman Conservation Division, War Industries Board.

commodity that was most essential. But there was a wide range of articles that could not be classified in one group or the other.

So we adopted a policy of eliminating the non-essential uses of labor and capital and material and equipment from all types of industry. We gave up any distinction between candy and bread, let us say, but we endeavored to release an amount of capital and material and labor and equipment from all industries sufficient to supply that fund of resources necessary for the conduct of the war.

From that point then was developed the standardization program—"standardization" being, I think, a most unfortunate term. It really should be "simplification," or "a program of elimination." I wanted to explain to you how this work developed, to point out that we did not go to Washington with a definite program of standardization, but that simplification seemed to be the only way in which, and by which, we could release from the resources of the nation those resources necessary for the conduct of the war.

Here is one more point I want to make. I am not at all in sympathy with suggestions of new governmental agencies with powers of inquisition and enforcement to continue this work in case it proves advisable to continue such methods as were evolved out of war needs by the Conservation Division.

I feel that the first stage is to develop conservation work in each individual concern and from that into the industry and from the industry go to the associated groups of industries. I think there has got to be an evolutionary process toward methods just like the process we went through in Washington.

The first step to take in a business, it seems to me, is to bring the sales department and production department together. Standardization in one sense connotes a production problem. All production men understand the advantages of standardization. After taking this first step in the individual concern, you can go just as far toward standardization or simplification in it as you possibly can. The next stage is to go into the industry and to work out from the industry itself toward some coordinating group or some coordinating agency, logically the Department of Commerce, that will make it easier for a general application to be brought about.

Thank you for this opportunity to tell how this work developed, how the solution to our problems came from the business men themselves. I also am glad to give my point of view on establishing any new agency

of enforcement. We certainly do not want the Government to take on any more regulatory activities.

HOWARD COONLEY¹: The papers this morning impressed me with one very strong thought, and that is that just as Taylor followers have only recently begun to consider seriously the sales problems, so have they only begun to think of standardization from the sales and merchandising point of view. I am inclined to think that the producer after all is the least sufferer, and I say that realizing that I am largely a producer.

Over a series of years the producer is bound to get back his money and some interest on it. Here and there a business falls by the wayside from lack of success, but it is picked up by somebody else and the dear public must, as in every case, pay the bills. If the producer has five thousand instead of five hundred items it worries him and bothers him, but he finally extorts from the buyer his pound of flesh.

Nor is the merchandiser himself the keenest sufferer. He goes ahead as a general rule without much knowledge of what he is doing, without any system in his own business, and he in turn also makes the public pay. Therefore, to my mind it comes down to the very simple proposition that the consumer pays the bill and therefore the consumer is the one that should be primarily interested in standardization.

How does he pay? He pays first of all by errors in choice because he has no definite knowledge of what he should buy in order to obtain the best service. He pays by slow deliveries. He pays by high prices. I know there is not one of you in this room who as he has to move from place to place in the world—and we have to move a great deal these days—and possibly goes into a rented house or a rented apartment and finds the electric lighting fixtures in bad shape and tries to get a plug that will fit some particular socket, but finds that there are any number of different shapes,—round sockets, oblong sockets, upright sockets, (I don't know the technical terms)—but he must in the end go to much bother to match the socket with the proper plug.

I feel too that standardization should not only consider the physical aspect of the product but should consider also the aspect of price—possibly I will say the price list. To give you an example I am going to take you into the field of the Walworth Manufacturing Company because that is naturally the one with which I am best acquainted.

¹President Walworth Manufacturing Company, Boston, Mass.