

Consider such a matter as the method of packing thread. If marketed with 200 yds. to a spool, instead of 100 and 150, there would be saved 5,146,815 ft. of lumber or 365 car-loads. The saving in shipping space of finished product is about 600 cars, in wrapping paper  $3\frac{1}{2}$  tons, and in twine, 5 tons. Had the yardage been reduced to 100 yds. per spool it would have required over 600 cars to transport the lumber, so that the total saving is 1,200 cars by using the 200-yd. spool.

With these few examples, it can be readily realized what tremendous savings might be effected if a safe and sane policy of standardization was put into effect through co-operative agreements. It means lower cost of production, smaller capital investment, etc., with a greater amount of capital released for more useful purposes.

#### Research and Standardization

Emerson's definition of a standard is as follows: "That which is established by investigation or authority to be a reasonably attainable maximum of desirability."

Research and standardization should go hand in hand, but the body controlling the former should not also dominate the latter. Research should point out the ideal, namely, the highest standard of excellence which should be approached as nearly as possible by the approved standard. The final specification must of necessity be a compromise between consumer and producer, the consumer demanding the nearest approach to the ideal, and the producer agreeing to that which is commercially possible, cost, rapidity of production, service requirements, etc., all having due consideration.

#### Standards Often Must Advance

Research bodies should never be satisfied that the ideal which they have set up is final, otherwise practice becomes crystallized and invention discouraged. What if the locomotive of twenty years ago, or even ten years ago, were to have been considered a final standard? What if the standard locomotive or standard cars recently adopted by the U. S. R. A. Committee were to be considered a final standard, or if the automobile of but a few years ago were no further improved upon? Such standardization, if not constantly open for revision, would, instead of benefiting the industries and mankind in general, actually do a positive harm.

Unfortunately, many standards have been adopted without a proper knowledge or without due consideration, and when such standards are once established it is exceedingly difficult, costly and inconvenient to abandon them. The one great shining example of this was the adoption of our cumbersome and unsatisfactory system of weights and measures.

#### Recommended D.C. for Niagara Power

When the great Niagara Falls power plant was to have been installed, expert opinion was secured to recommend whether direct or alternating current systems should be used. This was at a time when alternating current systems were quite new. Lord Kelvin, a great authority, recommended the installation of direct current apparatus. In the light of our present day knowledge on this subject, just think what a tremendous mistake that would have been. When it was finally decided to install alternating current, Professor Roland, of Johns Hopkins University, was consulted regarding the nature of the alternating current which should be used. After a painstaking investigation he recommended that current be delivered at 25 cycles. It, therefore, so happened that the expert advice that was followed in the installation of that plant resulted in the establishment of a standard for the current supply which has stood the test of time. In such an installation there is involved not only the power plant itself but all the existing circuits and equipments connected therewith, and it may therefore be realized how costly and inconvenient it would be to change, in a case of this kind, from one standard to another.

It frequently pays to adopt new standards, notwithstanding the expense involved, rather than to continue with an old standard which is evidently wrong and inefficient. Many examples exist in machine design, and in the standards adopted by the Master Car Builders' and Master Mechanics' Association and other standardizing bodies which are uni-

versally acknowledged as poor; but as the equipment has been built up about such standards and as to change would result in an enormous cost, they are unfortunately continued.

#### Cost Accounting and Industrial Co-Operation

Some time ago the New York milk dealers asked for an advance in the selling price of their commodity. They were unable to show the actual cost of milk delivered to the consumer and were therefore not in position to substantiate their demands. Investigation revealed the fact that adequate and reliable cost-keeping systems are rare. Some attempts have been made in certain industries to establish standard cost-keeping systems—the American Foundrymen's Association has a committee on the subject. They have retained an expert who acts in an advisory capacity to its members.

The cast-iron stove manufacturers have done the same. It was found that two manufacturers producing an identical line of stoves, exhibited widely different costs for the different types. A certain small type was sold by one manufacturer below the cost price of another, whereas, a larger type could not be produced by this same competitor at the latter manufacturer's selling price. The explanation is simple, namely, they used different methods for distributing costs.

With a standard cost-keeping system within an industry, all would be benefited because all comparisons of the many items going to make up the cost would be upon an equal basis. A most important assistance could be rendered our industries if there should be organized a National Bureau for Establishing Cost Systems, the function of which should be to investigate the accounting systems in vogue in the industries, and to render assistance in the establishing of standard cost accounting.

During the war startling facts were revealed in this connection. The cost, as submitted by different manufacturers, on the same specification were so widely divergent that upon the "cost-plus" basis the government would have been called upon to pay widely varying prices for the same commodity. The need for standardization in this connection is so apparent that the United States Chamber of Commerce at a recent convention passed a resolution favoring a system of uniform cost accounting in each industry. This resolution had the endorsement of approximately 3,000 men representing all lines of commercial and industrial interests, and emphasizes the growing desire and tendency of industrial leaders to do away with the rule of guess and gamble and to establish their industries upon the science of correct and adequate records and account. It is only by such means that the present day gross inefficiencies will become recognized and eliminated. True advancement in industrial management and operation can best come through industrial co-operation; it would be a pity to allow the fruits of the co-operation which was established during the war to be wasted now because of the throttling power of the now generally conceded unwise legislation which was enacted some years ago, namely, the so-called Anti-Trust Laws.

#### Benefits Capital and Labor

The value of industrial co-operation was well recognized and greatly encouraged by the government during the war. Without such co-operation the wonderful productive capacity of our industrial establishments could not have been availed of to its fullest extent. Through standardized conditions, standardized records and standardized accounting, industries can be brought under intelligent government supervision and control. It would thus only be possible for such co-operation to proceed and be encouraged without doing final harm to the public. In fact it would lead to the decided benefit of labor and of the public as well as to capital.

To emphasize the attitude of the present day in this connection, I will quote a resolution of the United States Chamber of Commerce, recently issued by that body, which so strongly represents our American industries:—

"Resolved: The war has demonstrated that through industrial co-operation great economy may be achieved, waste eliminated and efficiency increased. The nation should not forget, but rather should capitalize these lessons by adapting effective war practices to present conditions through permitting reasonable co-operation between units of in-