dation than sentiment or philanthropy. The most liberal plan for hearing and adjusting "grievances," for collective bargaining, "social service," and even "a voice in the management" carried to the extreme of a business owned and operated by the workers, leaves us still upon the threshold, with the same task before us, that of providing the ways and means. It matters not who selects the managing personnel—provided that they be wisely selected; it matters not who makes the studies leading to the establishment of standards, who makes the route sheets, who writes the instruction cards—providing they be qualified for the work and that it be well done. The important thing to the worker, the employer and the consumer is that these functions *be performed* and that they be recognized as essential to the attainment of the end sought by all.

That scientific management—with its scientifically determined standards replacing "opinion," and placing squarely upon the management and holding it up to responsibilities and duties either previously not realized or evaded, and providing the practical mechanism essential to real co-operation between management and workers—makes for sound industrial relations, removes the causes of suspicion and mutual distrust, and avoids "grievances," has been amply demonstrated.

Discussion

Carl G. Barth.[3] Objections have often been raised against the establishment of standards as a procedure that blocks the way for improvement; and under certain conditions, if matters are not properly understood or handled judiciously, legitimate improvements may be too long delayed. In this connection I venture to quote the following from my paper "Standardization of Machine Tools," read December, 1916, before the American Society of Mechanical Engineers.

Before proceeding to any definite recommendations, it will be well to consider the objection so often raised to the adoption of standards of any kind—that standardization blocks the way for further development and improvement.

If this were unqualifiedly true, standardization would almost be a crime; but if we adopt a standard merely as representative of the best a trade or profession knows of at any one time, with the understanding that as soon as a *decided* improvement is brought out, a new standard will be adopted to parallel temporarily, and eventually replace the former standard, the danger of stagnation will be obviated.

[3]New Haven, Conn.

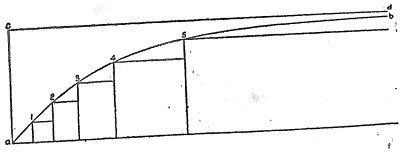

Figure 22

Perhaps my idea will be understood more readily by reference to Figure 22, in which the smooth curve *ab* tending towards the asymptote *cd* represents a gradual development with immediate adoption of improvements in any line toward an eventual highest possible attainment; and the broken line whose corners 1, 2, 3, 4 and 5 lie in this curve the only occasional adoption of such improvements, when these have attained enough importance to make it worth while to change from one temporary standard to a new one, both standards then being in use during the period of change.

Such a period will, to be sure, seem exceedingly inconvenient after we have once tasted of the fruits that the use of standards bring forth, but it will be as nothing compared with the troubles and expense of dealing with a lot of unstandardized equipment all the time. "Where ignorance is bliss, 'tis folly to be wise," surely does not hold good in these matters.

I also wish to say a word about the common misconception that a time study is necessary, or a good means, for ferreting out useless or wasteful motions, preliminary to standardizing a complex operation. Such motions are best ferreted out by common sense observation on the part of a person well versed in the trade, who has caught the right spirit, without any time study. The time study properly comes later, and may then be made by a person less expert in the trade; but no amount of mere time study of an unstandardized complex operation will directly lead to the elimination of its useless or wasteful motions. However, such time studies submitted to the scrutiny of a person well versed in the art may be that person's indirect method for detecting and eliminating useless and wasteful motions. Because of the misconception referred to, a lot of worthless time study is being made the country over by mere stop-watch men. Time study should not be taken up until conditions of machines, tools, materials and motions have all been properly studied in an every day, common sense and expert manner, and later standardized on the strength of the information thus gained.

Master Planks in the American Industrial Program[1]

Improvement of Living Standards; Increase of Output and Wages; Co-operation of Management and Workers in the Improvement of Methods; Stabilization of Employment

By WILFRED LEWIS
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Scientific management in the United States of America aims:

1. To raise living standards still higher by increasing the real income of all engaged in industry through progressive improvements and the cheapening of industrial processes;
2. To raise the high level of American wages still higher, with increases in output per worker;
3. To inspire both managers and workers to collaborate in order to improve the technique of production and distribution;
4. To keep men and machinery fully occupied.

I. The Gain in Real Income

In his latest message to the American Congress, President Calvin Coolidge remarked upon the "astonishing result of a reduction in the index price of commodities and an increase in the index rate of wages." Here has been the most direct of all additions to consumer buying power expressed in lower cost of production and increased capacity to consume the goods thus produced. The purchasing power of the average income in the United States in 1926 was forty-four per cent greater than in 1909, and thirty-six per cent greater than in 1921. This is based, of course, on the increasing output per worker. Between 1899 and 1904, the output per worker rose about five per cent; between 1904 and 1909, by about seven and one-half per cent. The depression of 1914 and the industrial dislocation which resulted from the war were such that the average output per worker in 1914 and 1919 was not greater than in 1909, although in that interval there had certainly been technical progress. Between 1919 and 1923 the output per worker in factories increased about twenty-four per cent and between 1923 and 1925 it increased again about eleven per cent. This is true of small plants as well as large; of those which are not engaged in mass production as well as those which are. President Coolidge accounts for our remarkable economic advance as coming chiefly through the elimination of industrial waste and the progressive gain in standards of efficiency.

The principles of scientific management and administration developed by Frederick W. Taylor and his disciples have at length grown to dominate the American industrial scene. The desire to reduce costs and to increase production, along with the conviction that scientific methods can be found which will make these things possible, are characteristic of the spirit of American management today. This spirit is as potent in the little business as in the big. Some of the smaller units are foremost in management methods.

Within the confines of its forty-eight states, lying between two oceans, the American nation has a trading area as great as all Europe, with no tariffs, no barriers to the freest exchange of commodities. In this continental customs union the huge aggregations of modern business and hosts of small enterprises have grown up, serving six score millions of buyers, and benefiting consumers as well as producers by the economies of scientific production and distribution.

With the growth of quantity production has come an increasing interest in quality. The American continental market is so diversified and exacting as to make quality increasingly important.

Another element, the financial element, has entered in. The annual savings of the United States now amount to about one-ninth of the national income, and the wise use of credit is fundamental to our social and economic development. The mining industry now employs more than ten thousand dollars in capital for every wage earner which it employs; manufacturing, more than five thousand dollars; the railroads, more than eight thousand dollars.

[1]Paper presented at a meeting of the Taylor Society, New York, December 9, 1927. Also presented before the Third International Management Congress, Rome, September, 1927.