

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.

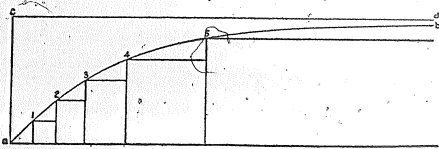


Fig. 22

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.

MR. CHARLES WUNCHEL¹: Colonel Hathaway's paper reminds me of an experience that I had some years ago while working as a machinist, which illustrates the difference between working in a shop where standard conditions have been established and in one run under the old style of management.

The Tabor Company having too much work for their vertical boring mill, and the work being wanted in a rush, tried to find some company that would do some of it for them, but the only thing they could do was to rent a 36" mill in a nearby shop, the Tabor Company to furnish the operator. So I, being an experienced operator, was assigned to do the work. After looking over machine and equipment, the first thing I found lacking were bolts, clamps, blocks, packing pieces, wrenches and tools, so after hunting around the shop and with difficulty getting a few bolts, most of which had threads stripped, and finding it almost impossible to get the other tools required, I went back to Tabor shop and got from the tool room a set of bolts, blocks, packing pieces, wrenches and cutting tools sufficient to complete the job and took them back with me. Well, the next thing was to get the machine in running order. I started to dig the chips from slots of table which had been rusted almost shut; then cleaned table thoroughly; then got ram loose on cross rail after working the best part of one day, to clean and put machine in condition to work. Finally after putting belt on cones and starting machine, setting cut that I thought machine should pull, found out that belt would not pull correct depth of cut, so shut down machine and hunted up belt man. But finally, after a long hunt and much asking, I found him and told him about the belt, and he said "all right I'll be down in a minute;" so I went back to the machine and waited for him. He arrived at last, looked at the belt; took hold and shook it and said; "That belt appears all right;" and before he would take it up and tighten it, I had to start machine to show him that it would not pull. Finally with a lot of grumbling he took belt off and took it away; cut a piece out; relaced it; and brought it back. Finally belt man came back and put belt on machine, and then it was time to go home; so the first day was spent in preparation and cleaning and getting machine in condition to do the job.

The next morning on going into the shop the first thing I did was to oil machine thoroughly, then start cut. My first day's production on this machine was three pieces in 9.9 hours, while in our own shop we

¹Tabor Manufacturing Co., Philadelphia, Pa.

were producing eight pieces in the same time. After working in that plant for about a week or ten days I was able to produce five and some days six pieces, but six was the limit due to waiting for help in taking off and putting work on machine. The Tabor Company had secured bids on this work from several concerns, the production promised being from one to three pieces per day.

A peculiar thing about the whole affair was the way the men in the shop came around to watch what was going on and looking over my equipment of tools. One man asked me if we had that many tools, bolts, blocks and packing at each machine all the time; he said an equipment like that would not last long around there, as everybody in the place would be borrowing this or that until at last there would be nothing left. I explained to him our system of issuing a complete set of tools for each job. Even the foremen and other officials of the Company would come to the machine and stand and look at me as though what I was doing was something out of the ordinary. Even with a smaller production and using my own tools, the work at this shop was harder for me than at our own shop because the handling facilities were not so good.

I was glad when the job was finished so that I could get back to the Tabor plant again where work was not so hard and conditions were much better. Just before I finished my work the manager came to me and said that if ever I got out of work or needed a job to come over and see him; he would see that there was work for me at their plant.

MR. W. H. LEFFINGWELL¹: When we have such an excellent paper as Mr. Hathaway has given, it seems unfortunate that he should have chosen so many of his examples from the machine shop and the factory. I am sure I am not telling Mr. Hathaway anything, when I say that these same principles apply to all lines of endeavor, but unless a few specific examples are given in an entirely different field, I fear that the man who thinks "his business is different," will find a loophole thereby to escape. In my experience I have found these principles quite applicable to all phases of office administration, and, as a matter of fact, the common practice of many concerns contains examples of the unconscious application of this same principle of standardization.

Many years ago, the National Cash Register Company standardized certain of their selling methods and

¹President Leffingwell-Ream Co., New York.

it is well known that they have been brought to a very high point of perfection.

The form paragraph system of "dictating" is another well known example of this same principle.

When we are surrounded with so many unconscious applications of this wonderful principle, it seems strange that the average manager does not consciously apply them to every detail of his organization. I think the reason is that the manager is accustomed to considering only the so-called broad aspects of his business, leaving what he thinks are unimportant details to sub-executives with little training in analysis. In one place, the dictating of twenty-four different classes of memoranda was eliminated by multigraphing one standard memorandum with twenty-four suggestive sentences, any one of which could be checked off, thus not only eliminating the dictation but the typewriting as well. It has often been observed that a typist addressing envelopes, unless trained in standard methods, wastes more than fifty per cent of her energy in useless motions. Standardized methods and training will easily double the output.

As an example of how "unimportant details" often cost a lot of money, the following case in the adjustment office of a department store will be given. There were two girls delegated to the task of consulting the delivery sheets when customers claimed goods were not received. Whenever there was a full day's work elsewhere, these girls seemed to be unable to keep up and a third employee was asked for. This did not appear necessary, for the volume of work turned out was not large. When the sub-executive was asked why the work required so much time, he said that he did not know except that this was a position which required a long period of training. I made a personal investigation and found a mysterious chart used by the girls in order to ascertain in which of the sixty odd books (one route to a book) a delivery record was supposed to be. After studying it for a few minutes, I asked the young lady to explain it to me as I could not quite understand the purpose of it.

She replied, "Well, I have only been here about three weeks myself and I don't fully understand it either. The theory is, however, that this is a record of the territory covered by each particular route. Not knowing the city very well, it is necessary for me in many cases to trace out several routes before I find the correct one."

In other words, the chart was prepared exactly opposite to the natural way. It was a simple matter to prepare a directory of all the streets in New York