

less, the worker would be paid for the time allowed plus the bonus time, making the plan identical with Taylor's differential rate in that respect. Thus if the job were done in 8 hours the worker would be paid $13\frac{1}{2} \times 50$ or \$6.75 instead of \$5.75 as in the original scheme. (This places a premium on beating the time set rather than meeting it, and in that, it has been my experience, a grave danger lies. It is a siren song to which the inexperienced or the greedy manager is all too willing to listen. Of course in taking as an illustration the accomplishment of a 10-hour job in 8 hours, I have gone to an extreme. Providing the time is accurately set, that there is no error in writing the instruction card defining the method, that the method is followed in doing the work, and that all of the conditions as to quality are complied with, there should be no such possibility, and it is unreasonable to expect the worker to do a job in less than the time set. Any such expectation indicates a lack of faith in the management's own ability to do its work properly, and will ultimately lead to disaster. Under "task and bonus" or "differential piece work" as applied in connection with scientific management, it is just as dangerous and undesirable to have work done in much less than the task time as to have it take more than the task time.

Where workers consistently beat the time it will invariably be found that it is at the sacrifice of one or all of the following: quality of work, tools and equipment, or the worker's own welfare. Here lies the objection to the temptation of Gantt's modification of his scheme, and I assure you that it is a very real one, although most people have to burn their fingers before realizing it.

Gantt's scheme was to set the time for the job. If the job was done in the time set (say 10 hours) your day rate is \$75 per hour. Therefore, you will receive 10 hours pay plus a bonus of 35 per cent. If, however, you exceed the time, you will receive merely your day rate, or 11 hours' pay but no bonus. If the work is done in 8 hours, you get pay for the actual time plus the fixed bonus of 35 per cent, or pay for $11\frac{1}{2}$ hours.

In one shop there was a perfect mania for beating time. The quality of the work turned out went down steadily, machinery and tools were put out of commission, and the management lost more than it gained.

Under the task and bonus system when properly applied, you will find that, taking the shop as a whole, 95 per cent of all the work is done in the time set.

In conclusion I want to emphasize the importance of something which is little understood and to the neglect of which may be traced the failure or troubles resulting

from any incentive scheme of wage payment; that is, failure to back up the task time with a clear and detailed definition of the method, the machine, the tools and the conditions upon which the set time is based. To say that the time allowed for boring a cylinder is 10 hours without specifying these things is comparable to saying that it should take a man one hour to travel four miles without specifying whether he is to go by ox cart or automobile, whether carrying a heavy load or nothing. It is like telling a contractor to build you a house for \$20,000 without saying what kind of a house is wanted.

For every job there should be a detailed instruction card giving the time for each elementary sub-division of the job and a complete list of the tools required. Examples of these may be found in my paper on "Standards" with which I believe you are familiar.¹ These must be made accessible to the worker for each job he does—not filed away in the office or planning department—and the management must see that the method upon which the time is based is followed. An important duty of that functional foreman known as the instructor or methods supervisor (originally called by Taylor the speed-boss because of his jurisdiction over cutting speeds), who is in the shop the representative of the time and methods section of the planning department, is to see that the prescribed methods are adhered to and that proper adjustments are made as exceptions arise.

Just as the standard method and equipment involved in the performance of an operation must be clearly specified, so also must the quality of workmanship be definitely and clearly indicated on drawings, specifications or their equivalent. Inspection for quality under any incentive system, vitally important, is under a task system imperative. It must be borne in mind that the bonus is paid for the work, not only being performed in the time set and according to the prescribed method, but also for its being up to the standard of quality specified; which of course, governs largely the method and time. Doing work in less than the task time is usually an indication of a let down in quality.

If it is clearly understood that the time allowed for a job is for doing it in accordance with the specifications, and the method is covered by detailed instruction cards and tool lists, the time may be revised without any objection or resentment from the worker to take care of improvement in method, equipment or material, changes in design, and so on, a new instruction card

¹ *Bulletin of the Taylor Society*, Vol. V, No. 1, Feb., 1920.

taking the place of the old one in all such cases. Suppose for instance we have a casting in which several holes are to be drilled and reamed. Later on it is found that one of these holes may be cored in the casting. All that would be necessary would be to cross off on the card the items covering drilling of this hole and the elementary time for same, deducting it from the total time for the job.

What ordinarily happens, in the absence of detailed instruction cards showing what the time for the job or the rate includes, is that changes of this sort and improvements are made in the work without changing the rate or time allowed. Usually such changes taken individually are quite unimportant and affect the total time very little, but they come about insidiously and steadily and in the aggregate, over a period of several years, amount to a great deal. They are perhaps the greatest cause for "rate-cutting" and other apparent

breaches of faith; and while they may be justified and inevitable from a business and economic standpoint, the worker cannot be blamed for feeling that they are unfair.

In the lack of standard conditions, clearly defined methods and quality, and of accurate knowledge as to the time work should take, will be found, I believe, the root of organized labor's opposition to any pay system other than straight day work.

Gantt's task and bonus system in its original form, when based upon a properly laid foundation and properly administered as a part of a complete system of scientific management is in my judgment not only the best from the standpoint of accomplishment in the matter of high production and low cost, but is tremendously valuable as a preventive of those misunderstandings and that mistrust that are at the bottom of most labor troubles.

GREAT managers are primarily concerned not with today, but with tomorrow. This is true because they have taken advantage of the possibility of standardizing those features of their work which lend themselves to standardization so that they are left free to give their personal attention where it is really most needed—to matters which cannot be systematically controlled. The administration of any industrial enterprise may be broadly divided into the management of *men*, and the management of *things* such as plant, equipment, and materials. The former constitutes the art in management, while the latter is susceptible to a more scientific regulation. If the administration of industrials is to become less of an art and more of a science, a sharp division must be made between those matters which from their very nature must remain largely in the realm of art—the functions of dealing with human beings and with intangible questions of policy—and those which may be controlled through predetermined and systematic procedure. (Farquhar, *Factory Storekeeping*, p. v.)

THE status of the foreman and the character of his duties and responsibilities has changed to a marked degree in most industrial establishments. Many of his former duties have been taken away and placed in the hands of specialists. He is no longer expected to hire his own workers, care for his equipment, produce and inspect work, determine sequence of orders, figure costs, etc. These and other important functions have been taken over by others better qualified by virtue of their education and training and because of the opportunity to concentrate on their individual problems. The foreman, however, remains the active executive head, responsible for the operation and the coordination of the work of his department with that of other departments and with the staff organization. He is relieved of many of his former duties, but is charged with even greater responsibilities. An examination of the duties of a foreman finds them a complication of technical, personnel, and administrative functions. (Porsky, *Practical Factory Administration*, p. 136.)