

the task of ameliorating conditions—a state of mind dangerous for the manager.

3. This, I believe, is not an overdrawn case, but as a Society we must remember the installation is known as a Taylor one, and the operation of that plant whether successful or no is spoken of in terms of a Taylor installation. If, therefore, business policies do not arrange for the retaining of the installing engineer on the business staff, because we are all pioneers this Society must arrange for a clearing house so that the manager can be guided by the experience of others in resisting some of the forces mentioned above. That is the problem I would lay before you today. Admitting for the moment that an installation with no superstructure has been made, we have, in time at least, an element of progress which calls for some change, some improved appliances which ought to be adopted in that installation, so the manager of such a situation must be kept posted in a definite way if the installation is to be looked upon with pride.

4. Allowing for the moment, whether right or wrong, that such a production manager as I have drawn exists, where can he turn for concrete examples and possible solutions of some of his problems? For instance, if that bug-a-boo "overhead" is presented, and the manager is seeking economy by installing office machinery, where can he find the experience of others who have attempted an installation of tabulating machines? Of if his Balance-of-Stores department has grown to such a size in personnel that bookkeeping machines interest him, to whom can one turn to learn the pitfalls and snares to be avoided? Have we thought far enough in our standardization so that many of our forms of issues, manufacturing orders, etc., could be printed in national houses and thus help in economizing?

5. In suggesting these thoughts it is recognized that as a Society we may not desire to put ourselves on record as favoring this or that method or appliance where both are equally desirable, but in our Society there should be a record of them as possibilities. I mean that the Society should make a special effort to educate the manager along the lines of finding out where he can get assistance which he needs.

6. As a further illustration of my thoughts permit me to give concrete examples of what I have in mind. The firm I represent is a manufacturer of textile machinery. Since the installation of scientific management there have been two production managers, and my tenure of office is passing through the phases cited

above. It has been found that to operate without scientific management would have meant consternation during the flood periods of the past few years; but it was found during those periods, however, that we had, many, many times to short-cut, as we call it, planning department routine in order to rush through special manufacturing orders; speed, not costs, was the dominant factor in our daily life, so that it was necessary to eliminate planning department time in our scheduling. So much became exceptional that your speaker feared often our lack of pre-planning might cause a stoppage. But by the same token we overcame obstacles, and it is the recording of these methods or operations and similar ones that I believe ought to be done by this Society. Surely it will help many a perplexed manager to check up and, at the same time, enable another to set himself right.

7. As a beginning of accumulated data I offer the following covering three problems with which we have been confronted: route sheet posting, material moving and balance sheet posting.

ROUTE SHEETS

8. Four years ago our system of route sheets was as follows: They were kept in files similar to the files which have been used in the balance department up to the present time. All move slips, foreman board slips, etc., which were to be kept as a matter of record while the lot was in process, were filed in pockets on an inserted sheet in these route sheet files. There were several disadvantages to this method, for the files were heavy and awkward to handle. It was necessary as a rule to take out a file, find the sheet, make the entry, replace the file and proceed with another one which made indexing very slow. Moreover, the method of putting these files together made it possible for them to fall apart, no matter how much care was used. If a file should drop to the floor the sheets would be scattered and all the slips mixed up, necessitating a long time in putting it back in its original condition. The filing of slips in pockets as above mentioned made the files heavier and more cumbersome, and made it practically impossible to find a slip on a given item without looking through all the slips with the same charge symbol. This method also made it difficult for a number of people to work at the same table, since the files took up so much room and the nature of the work made it necessary to be constantly taking them out and putting them back.

9. This arrangement resulted in the recorders becoming so numerous that the department became top-

heavy. We just had to cut down personnel. Consequently, there was evolved a visible index route sheet which is a Rand file laid flat on a table. We have at this writing two tables 16 ft. long and about 3½ ft. wide. One of the beauties of the system is the amount of space each man has for his work, for one side of the table containing approximately 400 to 500 route sheets is a fair amount of work for a man to handle under normal conditions. Consequently, with two tables we have four people where formerly there were twelve. It is safe to say that the tables have added 300 per cent to the efficiency of our route sheet clerk, as well as giving a very substantial saving in floor space. As a matter of fact, the duties of a route sheet clerk are broader in most respects than they were three or four years ago, for he is a material chaser as well as a route sheet clerk. The foreman board slips and move slips mentioned in the preceding paragraph as being kept in pockets in the old files are now filed in compartments or drawers built in the tables. Being filed there numerically and by operation, it is very much easier to find them than formerly. Another feature which we have recently adopted is the filing of third pocket machine box cards in a similar manner. Up to a short time ago these cards were kept in the machine boxes, and in certain cases—such as the punch presses where the operations are quick—a great many cards have to be filed together, making it consequently difficult for a route clerk to find the one for which he is looking. As we are filing them now by symbol and operation instead of machine, it speeds up the work greatly and makes it possible for the clerk to do practically all his work on his particular side of the particular table. Formerly the number of pieces finished on a given operation was put only on the inspection slip. As this inspection slip in the case of premium or piece work goes to the time department and is filed by days instead of by part number, it was very difficult to trace back in case it seemed necessary; so the practice was adopted of copying the number of pieces finished from the inspection to the foreman's board slip, then the board slip, which we have always kept filed until the lot was closed out, served as a record of that number of pieces and saved us the trouble of digging through hundreds of inspection slips to find the one required.

10. About four years ago a system of control sheets was started which supplement the work of the route sheets and give in graphic form the conditions of all the lots of every item. Theoretically this propo-

sition seemed to be valuable, as a great deal of information could be obtained from these control sheets, and items that were not receiving the proper attention and therefore falling far behind schedule for any reason could be detected. However, with greater efficiency on the route sheets due in part to the changes outlined above, and due in part to the education of the clerks employed at this work, we found an expensive duplication was taking place and that the information we obtained from control sheets could be as easily obtained from the route sheets. While it was not in graphic form, this was offset by the fact that it was supplemented by the knowledge of the man who was handling the items. We have helped in depicting this information by inserting the date on which a given lot of a given item reaches a department. This is entered by the route clerk on the return of the move slip. In checking over the items under his supervision when the same are actually working in the shop, he places a check mark beside that operation, thereby giving the two essential facts: the length of time that the pieces have been at that operation and whether the work has yet commenced. From the nature of our business, in the case of a great many items it is necessary to work faster than this, but for routine work on standard pieces the method has proved to be of great value.

MOVES

11. There is probably no part of our system which has suffered so much criticism and received so many suggestions for change as the moving of material in the shop. We are all agreed that the moving of finished material should be as instantaneous as possible, and therefore our efforts have been directed to this end. Although we allow on our schedules one day for moving from department to department, from the nature of our business and from the extraordinary conditions which we endured during the year 1920, it was necessary to expedite the moving. With the start of the system there were several causes of delay which could be enumerated as follows: First, the board slip and time card were sent to the window to be changed; then there would be a delay while the window clerk sent the inspection to the foreman who entered the number of pieces finished on the same and returned it to the office. Then the various board slips and inspection slips had to be sorted, matched and delivered to the route sheet clerks who would enter the number of pieces finished on the route sheet, make out the move and place it in a box to be collected by our chief moveman. The chief moveman would then return the moves to the