

is likely to interfere with the easy, precise, automatic action that results from the guidance of the sub-conscious mind and to detract somewhat from the skill. Obviously this desirable condition is not likely to be realized if there is in the operative's mind any suspicion, any fear, any economic theory, or any other idea from whatever source, that causes him to feel that the results of the observations may be opposed to his interests.

This desirable condition will be most nearly approximated if not only the operative but his fellow workers have a full understanding of the purposes and technique of time study. I include his fellow workers because even though the observed operative is fully disposed on his own account to be co-operative, if his fellow workers are not likewise disposed their critical and antagonistic attitude will likely produce an undesirable effect upon him.

It is not practical to teach time study technique to each operative. Where, however, there is a union, either trade or house, it should be practicable to find several members of the union who can be developed into capable time study observers. If the co-operation of the union can be obtained to such an extent, and the union can thus be equipped with competent time study observers of its own, appreciation of the purposes and technique of time study is likely not only to be conveyed to the union leaders but to spread through the body of workers much more effectively than could be accomplished by any "primer" written by technicians but not practiced by any of the workers. We learn by doing.

On the basis of my observations, I agree that, under conditions affording an incentive to productive effort, skilled workers tend to concentrate, in rate of output, closely around a norm. I have watched whole departments come in the course of a few weeks from a wide variation in rate of output up to a range from a few points below to a few points above the adopted standard. I have seen whole departments of experienced operatives go along week after week, each operative at or slightly above standard.

I do not mean by this, however, that every person chosen at random can attain such skill in whatever operation to which arbitrarily assigned as eventually to attain the standard. Some are better adapted to one kind of work, some to another. Where, however, there are properly determined and

properly applied production standards, a selective process goes on. It becomes apparent in the course of three or four weeks whether the particular recruit will be able eventually to attain the requisite skill and, if not, the recruit is transferred to another kind of work. Only those reasonably adapted to the particular kind of work remain at it.

It is because of this selective process that the operatives who remain on a given operation under a system of production standards attain rates of output that concentrate closely around a norm. The average time per unit for such operatives would, if charted, exhibit characteristics similar to the element-time graph for the skilled operative except that its "skewness" is likely to be in the reverse direction. A similar graph for the average time per unit attained by a group of unselected operatives, even though each had attained the maximum skill possible for him, would exhibit characteristics more like that of the element-time graph for the unskilled operative, although the most frequent time might not be so much greater than the most frequent time for the selected group.

There is undoubtedly a difference between the skilled worker and the "sport." I have in mind the operation of finding the two ends of fine copper wire that is wound into a solenoid ignition coil. These coils were multi-layer coils wound in sticks of fifteen coils each. The sticks were sawed up into the individual coils. Then came this operation of "pulling ends," which were concealed between layers of insulating "Jap" paper. There was one young woman whose finger tips were so sensitive that she could instantly locate these ends by passing her finger tips over the ends of the coils. Her rate of output was several times that of any other operative. She was made instructor in the operation: but she could not teach sensitiveness of touch to the other operatives.

John H. Williams. I infer from what Mr. Cooke tells us that the interest, in the needle trades in Cleveland, both of employers and employes, in real scientific time study has increased more or less in proportion to their troubles in adjusting their differences through negotiation and barter and that both employers and employes have resorted to time study as a basis upon which to adjust their differences largely because of their

¹Consulting Engineer, New York City.

inability to make a satisfactory adjustment in any other way.

I want to suggest the analogy of this situation to one which not so long ago existed in the relationship between buyers and sellers. The buyer had the advantage of the right of selection but the seller had an advantage in his knowledge of his trade and the article to be sold. Until the advent of the purchasing agent specifications were very much what time study has been in the past, theoretically practical but practically impractical.

It was not until both buyers and sellers found themselves fairly well matched in the art of horse trading that specifications were realized to be practically practical. So it is that as employers

and employes come to realize that there is little either side can hope to gain through barter they will increasingly resort to time study as a basis for the adjustment of their difficulties.

It frequently happens that through one man's self-interest the ideals of another have been realized. By temperament and predilection I am all with the technician and I call this realistic side of the question under discussion to his attention for no other reason. If present immigration laws continue, as seems likely, it is inevitable that employers' efforts for reduction in cost and employes' efforts for shorter hours will force them to more and better time studies as the only safe and lasting basis of adjustment.

THE SPRING Meeting of the Taylor Society this year is to be held in Washington, May 9 and 10, at the National Research Council headquarters, 21st and B Streets. It is to be a joint meeting with the Personnel Research Federation and the general subject under consideration will be "Leadership."

At the morning session on May 9, the question "What is Leadership?" will be discussed. Ordway Tead, of the New York School of Social Work, will give a definition and analysis of leadership; W. C. Cowley, of the University of Chicago, will discuss leadership traits common in all situations, and General M. B. Stewart, of the West Point Military Academy, will talk on the Army's Contribution to the understanding and development of leadership. Dr. W. V. Bingham, Director of the Personnel Research Federation, will preside.

On the same day there will be an afternoon session given over to discussion of the question, "How Are Leaders Being Developed?" Leaders in education, in business and industrial concerns and in labor organizations are scheduled to take part in this symposium. Morris Llewellyn Cooke, President of the Taylor Society, will preside.

Graham Wallas, of the London School of Economics and Arthur H. Young of Industrial Relations Counselors, Inc., will address a dinner meet-

ing on May 9 at the Hotel Powhatan, which is to be used as hotel headquarters during the meeting.

The general subject at the morning session on May 10 will be "Measuring Morale and Leadership Ability." Professor David R. Craig, of the University of Pittsburgh, will speak on methods and techniques for measuring the effectiveness of leaders, and those who have had experience in the use of these methods and techniques will take part in the discussion.

At the final session at two o'clock on May 10, a group, including C. R. Mann, of the American Council on Education; Dr. H. S. Person, of the Taylor Society; Miss Florence Thorne, of the American Federation of Labor, and Professor C. S. Yoakum, of the University of Michigan, will discuss "Next Steps in Research."

Those who wish to spend the week-end in Washington will be interested in special ten day return rates (fare and one-half) that are being offered by the Pennsylvania and Baltimore & Ohio railroads, on May 7. The trip to Washington must be made on May 7, but the return trip may be made at any time within ten days.

The Tenth Annual Convention of the American Council on Education, to which those interested are invited, is being held at the National Research Council May 6 and the morning of May 7.