

my experience, almost uniformly, that when a planning office sends a machine tool lay-out, or an operation instruction, into the shop the average worker, if he has the slightest opportunity, begins almost immediately to improve on it, and continues to do so. When the worker feels that he is contributing to preparation of the operation instruction along these lines, his interest presently is aroused and he studies the instruction. In my opinion an operation instruction sheet that does not enlist the worker's interest is a "dud" that should not be in the shop at all.

The development of a joint union-management control over wage incentive rates, in organized industries where no such control now exists, provides a third problem. Not long ago, I had a remarkable object lesson in the necessity for some such joint control, as I watched the time study department in a large New Jersey plant nibble at piece work rates, for no other reason than the fact that a few highly skilled workers, by dint of exceptional energy and assiduity, so increased their outputs that they were earning 50 per cent more than the regular union scale. Because five out of a gang of about one hundred and fifty skilled men earned an increase over this amount, the individual in charge of the time study department authorized reductions in the regular piece work rates of from 15 to 33½ per cent, although the original rates had been established only after careful and accurate time study. This act, to call it by its disagreeable name, was fraud. My task consisted of handling the ugly situation that developed between workers and management as a result of the absurd blunder. Workers need protection against such exploitation. Despite the fact that scientific management for more than thirty years has been combating unscientific rate setting and rate cutting, candor compels a statement that these practices still are widely prevalent throughout American industry. It has occurred to me that international unions, like the machinists or molders, could maintain, as part of the new function, a number of time study engineers to investigate irregularities of this character in behalf of the union. All the piece work rates in all the plants cannot, of course, be checked. *Methods* of rate setting in each establishment could be brought under scrutiny, however, and where grievances were reported, a few representative rates might be investigated by the union's engineers

in co-operation with the concern's regular rate setters. The wide use of wage incentives throughout industry is likely to continue for a considerable time, and while it does, a joint control worked out along the proposed or other lines seems necessary.

Problem number four consists of the preparation of a set of representative standard methods describing the efficient performance of jobs in each organized industry. All the jobs in all the plants obviously cannot be so described. There is sufficient similarity between these operations, however, to render feasible the preparation of a set of *model* methods for each industry. Thus in foundry practice the operations of the pattern shop, core room, melting room and molding floor have a high measure of similarity in all establishments. This is true, also, of the machine shop type of industry where the major operations and machines—drill presses, plain and turreted lathes, milling machines, planers and shapers, semi-automatics and automatics—are found in most shops. In every cotton, wool or silk mill some of the operations of spinning, winding, warping, weaving, knitting, printing, bleaching, dyeing and calendering are performed. In the hatting industry the operations of the front and back shops are found in every plant, great or small. Our wire mills conduct, almost uniformly, the same activities—rod rolling, wire drawing, stranding, insulating, twisting, braiding, impregnating, and so on. A quick survey of most industries reveals, a high degree of similarity in the processes of each, and makes the preparation of model methods seem a practicable undertaking. These standards, obviously, would be evolving records, subject to revision as often as advancing progress in the industry rendered a change necessary. The educational value to a union of such a set of methods would, I am sure, be great. They would be available also as standards of information and comparison in conferences about production methods, outputs, working conditions and other matters. Finally, they would provide each union with a foundation of scientific industrial knowledge, essential to the exercise of labor's proposed critical function—the central theme of my paper.

The last problem that I will refer to at any length is that of developing joint methods for the release and utilization of the vast creative potentialities of the industrial rank and file. I believe this to be one of the most important problems con-

fronting industry today. So much has been written on this subject during recent years, and so many interesting papers dealing with it have appeared in the *BULLETINS OF THE TAYLOR SOCIETY* that I would be carrying coals to Newcastle if I spent much time now in exploring its underlying philosophy. In a general way, however, it may be stated that there is a growing realization throughout society that the life of the average worker in most of our industries, instead of providing scope for the greatest possible release and development of his inner nature, is repressive of the best part of that nature, that is, the dynamic urge and necessity to create. Inasmuch as this creative urge is present in every human being in some measure, and finds its roots in the fundamental depths of human nature, we ignore it or deny it only at our peril. Yet this, in effect, is just what industry has done ever since the advent of the machine, and until comparatively recent years industry has been abetted and justified in the process by the nineteenth century philosophy of materialism. The awakening to which I have referred implies, among other things, increasing recognition of the fact that this repression of the worker's mental life is doubtless unjustifiable on economic grounds alone, for it involves a vast waste to industry of potential creative power—the power of the worker to learn, think, originate, suggest ways and means, and in every practicable way to participate in creative production.

In the face of daily evidence that machine industry offers considerable opportunity for the play of initiative and skill among workers, I find myself baffled by the extent to which the opposite point of view seems to prevail in current literature. Several books that I have read during recent years accept the conclusion that a mechanistic working existence for the worker is an inevitable condition of our mechanical age; and they lead on to the corollary that, as this is so, the worker's compensation must be found exclusively in an enriched life apart from his work. This better life is to be gained in shorter hours of work and a greater share in the products of industry, rendered possible by increased industrial productivity through new mechanical and technological developments. There is little doubt that the latter advantages will come progressively, in the manner described. But I cannot see that the worker is doomed to become a robot or mechanical man in modern industry.

Abundant necessity for individual skill and initiative, of a *new character and direction*, still exists, and, I believe, always will exist. Actual experience in developing initiative among workers, moreover, leads me to the conclusion that modern industry by neglecting somewhat this aspect of industrial organization, is wasting one of our most valuable social assets.

There is general agreement today among many managers as to the theoretical soundness of the foregoing. An increasing number of industrial establishments, also, in a groping sort of manner is using various expedients in the hope of salvaging some of this great, incalculable waste. Thus we have today such organization details as joint-job-analysis committees, suggestion committees, workers' suggestion boxes and kindred features. The Baltimore and Ohio plan of railroad-union-management co-operation is probably the outstanding vindication, thus far, of the worker's need for creative freedom in the performance of his work. This development, with its myriad of constructive suggestions submitted by workers to their joint committees, is in the very essence of the new industrial spirit of which I speak. Much experimentation along these lines still lies ahead, but I feel safe in predicting that this will be one of the most important directions of progress in the industrial world of tomorrow. So strong is my conviction that this is so, that I would like to propose a new principle to be added to those already included in our present conception of scientific management. This principle might be stated as, "The mobilization and organization, by every possible means, of the worker's natural interest in his work, and of his creative power."

A good start in this direction has been made in a few plants in which, during recent years, I have had the privilege of assisting. These establishments now have the joint committee and suggestion collecting features that I alluded to in the preceding paragraph. Most important, however, is the inevitable improvement that has taken place in each plant's working atmosphere by the mere fact that management has recognized the functional importance of the wage earner as a creative member of the organization. This has been true so uniformly, that whenever I am asked now how freedom of initiative may best be encouraged among workers, I am tempted to reply, "Just go and do it."