

value concerning your practical industrial propositions, especially with regard to whether they are or are not adapted to survive the forces of industrial evolution?

I wish, before considering specifically the advantages and disadvantages of the social scientist for rendering judgments of value to us, to join issue with the implication in the antithesis between "practical" and "theoretical". In making such a contrast one is betrayed by a narrow point of view. The concrete proposition which you make to-day, which you call practicable, may prove to be unworkable next year. Was it really practicable? The theory Professor X proposed today you declare impracticable, but five years from now it may be working. Was it impracticable? The one was practicable for the moment, but it proved not to be for the long run. The other proved practicable in the long run but seemed not so at the moment proposed—possibly in many instances just because you thought it was not and did not support it. In fact, when you say a thing is impracticable, you mean it cannot at once be adopted, and you may be right. But when you say it is theoretical, you should mean that, while at the moment you believe it to be unworkable, it may in the long run be the fundamentally correct thing. Therein is the contrast you should have clearly in mind. The antithesis is not between "practical" and "theoretical", but between the immediately practicable and the ultimately practicable, between the superficially practicable and the fundamentally practicable, between current practice and principles of future practice.

If the mind of any class of investigators is concentrated on searching out the ultimately and fundamentally practicable, may not their judgments be of great value to the "practical" man who desires to work with the current of the stream which bears him along?

This brief consideration of the conventional error in the use of the words "practical" and "theoretical" suggests the advantages and disadvantages of the social scientist as a competent judge of industrial mechanism, processes and policies.

In the first place, he has not had industrial experience. He therefore lacks technical information concerning materials and men. He not only does not know how a given material will react to a proposed process, but he does not know how human nature will react at a particular time to a particular situation. He has not those intuitive faculties developed by manager and workman in the plane of industrial operations, of which I have emphasized the importance. He acknowledges, in fact formulated, the evolutionary principle that development to be substantial must come by small increments of

change. But, because of lack of experience, he is not a judge whether a proposed measure is a small or too great an increment of change. Therefore we too frequently find him advocating measures which the manager's reason or intuitive faculties condemn as impracticable, i.e., too great an increment of change. We too frequently find the social scientist advocating measures which if put into operation, might "strip the gears" of the industrial machine.

In the second place, the social scientist too frequently adds to that disadvantage another: an unconscious assumption that some particular regime of industrial activity towards which he believes society is progressing is nearer than it really is, or is actually present. Possibly this disadvantage is but an intensified and specialized form of the first, but it exists and deserves special attention. It causes bias in the observation and in the interpretation of facts, for what a fact appears to be to an observer is determined in part by the environment in which he believes that fact to exist. For instance, I believe the fundamental error in the so-called Hoxie report on scientific management and labor is of this kind. There are, to one familiar with scientific management in operation, other conspicuous errors; but the great error is that the committee observed and interpreted facts with unconscious bias. Throughout the report scientific management is judged, not as a step in the evolution of industrial society, not as a reasonable and workable advance on current practice, not as a body of principles and mechanism which must fit into the existing industrial regime. Scientific management is not compared with other current management; it is compared with some form of management which belongs to a regime in which industrial democracy is more fully developed than at present. It is not therefore a reliable report on which to base current individual or state action. But just because it makes us consider scientific management in terms of a possible future industrial regime, it is a great report.

What is the relation of the social scientist to industry which enables him to see aspects of the truth which neither the workman nor the manager can see? It is that relation to industry in which he is not of industry, but is outside it. Both manager and workman are passing judgment with respect to something of which they are a part. The social scientist is passing judgment on something which he examines from without. That is a good principle of investigation and valuation, according to scientific management. The professional industrial engineer is impatient of that narrow-mindedness which prompts a board of directors to declare that no one outside their directorate can tell them about their business. It is just because the industrial engineer

comes in from outside that he can see things in their business which they, who are of it, cannot see.

The social scientist, because he looks upon the facts of industry from outside and from a distance, gets the broader view and the larger relationships. The manager, intent on the problems of to-day, is like the person who would attempt to project a curve by two fixed points: the functionalized student of industrial development corresponds to him who establishes three or more fixed points before projecting the curve. Or, to draw another analogy: he is like the military scout on a mountain eminence who searches out the lay of the land to direct the army which is marching through the valleys below. The army below may be defiling eastward through a valley, and every private and company officer believes that to be the general direction of march; the scout and the higher officers who receive and value his advice know that the general direction of the march is intended to be westward. The scout has the advantage of the distant point of view. On the other hand, the officers and soldiers of the marching columns, with their more restricted outlook, are the only judges of where camp should be made tonight and again tomorrow night, for they are the only ones near enough to determine the most advantageous locations of fuel and water. Both the scout and the captain are practical men, but they are practical on different planes.

It should be noted also that the social scientist, in his broad survey of industrial development, does not rely entirely upon what he sees for himself. He seeks both the manager's and the workman's observations and opinions, compares them with each other and with his own, and utilizes them in forming his own final judgments.

The social scientist's judgment of the social and

industrial value of any industrial proposition is not less valuable than that of the manager and that of the workman. Each is enabled to observe phases of the truth which the other cannot see. An approach to the whole truth is secured by combining and harmonizing their judgments.

That is why a group of men standing for the Taylor philosophy of management should welcome—should insist upon—the widest possible discussion of all phases of scientific management. Especially should they contemplate thorough discussion from the three points of view to which I have given special emphasis. To the manager's point of view should be added those of the workman and of the student of social evolution. Each can contribute something derived from an experience which the others have not had. In this way only can the truth be approached, and the truth is not easy to approach; for scientific management which originated in Mr. Taylor's mind as a method for solving a particular problem of industrial productivity, and developed in his mind into a body of universal principles of management, has finally revealed itself as raising fundamental questions of industrial philosophy.

It is in accordance with these principles of inquiry that the programs of meetings of this Society have been constructed. I wish to give testimony that the membership has responded readily. Inquiry has grown in breadth and intensity, the membership has grown in enthusiastic co-operation, and the Society has grown in importance and influence. That has been due to the nature of the reaction to the plans of the Governing Board. If there is no abatement in the growth of the co-operation of its members, there is no limit which one may place to the ultimate influence of this Society. And one does not fear an abatement of enthusiastic co-operation.

SCIENTIFIC MANAGEMENT AND PROGRESS¹

A DISCUSSION OF HOW FAR SCIENTIFIC MANAGEMENT IS COPING WITH PRESENT-DAY INDUSTRIAL PROBLEMS, AND WHAT IS THE OUTLOOK FOR THE FUTURE.

BY HORACE B. DRURY²

[This paper was published in the Bulletin of the Taylor Society, Volume II, No. 4, and read by title at the annual meeting in New York City, December 9, 1916. The following is the discussion.—Ed.]

LIEUT. FREDERIC G. COBURN:³ The author apparently makes the point that time study and task study to a certain extent inhibit initiative on the part of

the workman himself, and concerning that I want to make a specific comment to this effect. The ordinary workman learns his trade by accident; he chooses his trade and the workman from whom he learns it by accident.

Apprentice boys are not really taught trades; they "steal" them. It is a hit or miss matter. Now I am willing to admit that the time study problem is not susceptible of exact solution, but I claim that the result of time study is the evolution of a better way of doing the job.

There is no rule in any scientifically-managed plant

¹An address given before the first Congress of Human Engineering, held under the auspices of the Ohio State University College of Engineering, October 6-8, 1916.

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