

was no measurement of these by the experts of the Conference, and not even a guess was possible here. Yet these things are waste. They ceaselessly conduct a war of attrition against production, which periodically results in those industrial and social defeats which we call "business depressions." Periodically we sign a Punic peace with them, and as soon as possible the war begins again.

As methods develop for measuring these elements we shall begin to get quantitative estimates of waste in industry. We shall begin to measure not simply the degree of conscious technique of management as in the questionnaire and evaluation sheet shown in the Waste Report, but the concrete results of that technique or the lack of it as shown in terms of its twin products—men and goods.

PHILIP J. REILLY:¹ May I ask the Committee; first, whether the guide questions in the questionnaire were weighted, for the significance of the questions as indices of efficiency in organization and methods of operation vary greatly; second, whether the investigators, when they received answers from executives of plants investigated, assumed the answers were correct or checked up the accuracy of answers by further investigation?

FOR THE COMMITTEE: The questions were weighted. The answers of executives were checked up by the field investigators. It should be understood that the so-called questionnaire was not what is usually understood by the term; it constituted really a set of guide questions for investigators; it was the duty of investigators to get the facts by questions put to executives, by observations and by examination of records.

THOMAS W. MITCHELL:² The process of assigning relative value to the fifty items in the Field Work Evaluation Sheet was a difficult one; difficult because no one had hitherto paid attention to the individual power of these items. Consequently there was a great dearth of data.

Several methods were followed. One was to take such measurements of waste as were available—waste of capacity through seasonal idleness, waste through doing unnecessary work, waste of capacity through use of inferior methods and the like—and trace them step by step through the chain of causation back to items stated on the evaluation sheet. In some cases, where there had been no percentage measurement, as in waste of capacity through letting operatives run out of work,

the judgments of several persons who had had close contact with such factory conditions were combined.

A second method was to write each item on a card and then arrange these cards in the order of the judged importance of the items. Where relative values could be assigned to two or more non-adjacent items, when so arranged, this gave a certain measure of control over the assignment of values to intermediate items.

At the beginning of this process each engineer acted independently in assigning values to these items. These independent valuations were then brought together, compared and the differences threshed out.

One point that should be borne in mind is that we were endeavoring to assess the waste-producing power of each of fifty separate defects in management and organization. One question that was asked in connection with each item was this: If this specific item of mechanism were entirely absent and all the other forty-nine were present as fully and perfectly as is possible with this one absent, how much smaller would the output be than if this item also were present? The answer was a percentage of waste assigned to the one item.

A second question was this: If a plant had the very minimum of all these items of mechanism and this specific item should be applied, how much would the output be increased? Thus, if with the minimum of the mechanism of scientific management, a personnel department were set up with a competent head, by how much would output be increased?

The final result of this whole process was a set of maximum waste percentages. The fact that the waste percentages aggregated 225 per cent caused us no concern for the reason that they are *not additive* but are *multiplicative* items. The product of their complementary efficiency percentages was .0926, which indicated that with the absence of all scientific and systematic management mechanism, a clothing plant would turn out approximately 9¼ per cent of what it is capable.

We then scaled these waste percentages down proportionately so that their sum would be 100 per cent. These results constitute the base valuations placed upon the several items in our Evaluation Sheets.

C. L. BARNUM:³ An impression seems to exist that the Evaluation Sheet is rigidly dependent on either negative or positive answers to the key questions of the questionnaire. However, an examination of the questions will show that that is not the case.

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² Retail Research Association, New York.

³ Consulting Engineer, Philadelphia.

The first four questions, K₁, K₂, K₃ and K₄ are worded to bring out the type, suitability and degree of co-ordination of the organization, with reference, however, to size of plant and the class or character of product.

An answer of "No" to K₁, "Have you an organization chart or its equivalent?" does not mean that the co-ordination of the organization is necessarily "bad"; but the answer obtained will indicate its suitability with reference to type and whether it is conscious or unconscious.

A small store where the owner is salesman, book-keeper and purchasing agent has an excellent co-ordinated organization. The average printing plant is small, averaging ten or twelve employees. One would not expect an organization chart in a plant of this size. In a plant of 500 to 1,000 employees, however, some definite division of functions and responsibilities is necessary.

A. J. PORTENAR:¹ As some of you here know, I am again working at my trade as printer. I was for seven years in the Employment Bureau of the New York State Labor Department, doing what I hope was good work and very happy in doing it. The last session of the legislature ripped the Labor Department wide open and then sewed it up again; but when they were finished there were different people inside of it, all civil service laws to the contrary notwithstanding. Personally it is not a question of money; I am earning more as a printer than the state paid me. Yet such skulduggery with the civil service personnel is waste—and quite an important form of waste.

Mr. Cooke came to me this evening with a copy of that evaluation sheet and called my attention to the figures on it and asked me to criticize the percentages assigned to labor. I told him I had not the slightest intention of doing such a thing on a five-minute acquaintance with the figures. After listening to the addresses of the various speakers and the questions asked by those who asked them, I am convinced that my determination was sound.

I want to speak about a certain phase of this question of waste which was touched on here—barely touched on—and that was restriction of output. There are two kinds of restriction of output, as Mr. Walter Polakov pointed out in a very notable interview I once read, and one of them was that part for which employers are responsible, about which I

¹ Recently with the Employment Bureau of the New York State Labor Department.

intend to say nothing at this time.

The other part is the waste attributed to workers by conscious and deliberate restriction of output. I firmly believe there is not nearly so much of this as workers are charged with, but without attempting to "evaluate" the quantity of it, I want to put before you something in regard to it.

Somebody hires a man to do some work and at the end of the week he is handed his wages. Impliedly or otherwise, his employer lets him understand that he is through with that process. He has done the work he was hired to do, he has been paid for doing it. It is a closed transaction, and he is like a factor cancelled out of an equation. He has nothing to do with that end of the equation where you write an equal sign and then some figures. Now, the ideal employee is that person who takes an interest in his employer's business as though it were his own; that is, the kind of employee every employer is looking for. Yet you take away from him before he starts—in fact he never had and you won't give him—that incentive which would make it so much of his business that with the employer he would be only too glad to enlarge the figures after the equal sign.

My belief is that when—not if, but when—you will give to the workers an actual, positive share in management; when men shall sit in a board of directors not representing a dollar of investment but representing the human beings working in that plant, and those men know what the company buys, what it sells, what it sells it for, who it sells it to, how it makes it, how everything is done and why everything is done, and they have a voice there in the making and the buying and the selling and everything else that goes on, and in the end they have a share in what follows the equal sign; then you will give that incentive to those people to put into that industry, that business, that work, a personal sense of responsibility and a personal knowledge that will make employees of the kind that every employer, as I said before, always wanted—employees who take the same interest in his business as they do in their own. The answer is—*make it their own*.

Just one word more. At present the employer and the employee are like oil and water in one container—they don't mix. The employer's business is his business and only his. The employer's business is to get all he can for his product, seeing it through all the way. The employee's business is to get all he can for his work; what happens after that is not permitted to be any concern of his. Those are not the same