

and both are in entire accord and working for the same object, so that it is a joint affair. That is typical of the way we arrive at all percentages.

The Chairman. Is not that 20 to 27 per cent arbitrarily arrived at by the judgment of a person watching the operation, of the time that should be added?

Mr. Taylor. No, sir; not the arbitrary judgment of anyone. An arbitrary judgment would be something that a man guessed at. But this is a scientific investigation, a careful, thorough scientific investigation of the facts. It is based on the fact that in perhaps as many as 20 cases, with different men on this general type of work, this figure has been proved to be correct. This is not founded on any one judgment; it is based on facts.

The Chairman. Is it not true that under the old system, in determining the length of time that it would take to produce a certain piece of work, that it was based upon the observations of some man relative to that work over a long period of time, and would not that be just as scientific and just as arbitrary as the method employed in securing this 20 to 27 per cent?

Mr. Taylor. No, sir. I suppose, as I walk along the street, for example, I could in a general way look at a trolley car and say it is going at the rate of 8 miles an hour, or 10 miles an hour; but that kind of arbitrary judgment would not compare in accuracy with timing the car with a watch. Watching horses when they are trotting by and guessing at their speed would not be anything like as trustworthy as that kind of observation which comes from the use of a stop watch. The one is guesswork, while the other is a careful scientific experiment.

For instance, when I was a foreman, as I told you, the workmen knew ten times as much as I did about how long it took to do work. Their knowledge was exact, because they looked at the time when they started a job and at the time when they stopped and knew exactly how long it had taken them. My knowledge was casual; I had in a general, hazy way, an idea that a job ought to take such and such a time; but I have seen myself judge from 300 to 400

per cent wrong, and I think that is true of all foremen.

The Chairman. Isn't it part of the scientific management, or the Taylor system, to bring all of the power of the management to bear on the individual in order to compel the individual to carry out the policy of the management?

Mr. Taylor. With the first man whom you tackle in a shop and want to teach and bring from the old method of doing the work to the new method, as a rule, I think you can say that you do bring heavy pressure to bear on the man. You are very apt to put three or four teachers around him at once to see that he does not skip out from under anywhere. You understand, of course, that is true of the first man. Under scientific management our procedure is to get one man working under the new conditions and at the proper pace, and then let him go right on earning his premium of 30 per cent to 100 per cent until he wants the new system badly. And invariably some friend of his—generally not one friend only, but a dozen of them—will come and ask for the same thing. When the men see a friend of theirs, right alongside of them, working practically no harder than they are working, but merely obeying certain instructions and directions given him and thereby becoming more efficient and doing the work quicker—when they see that man getting 30 to 100 per cent higher wages than they are getting, they want some of that velvet. The other men throughout the shop themselves come and ask for the new system. When scientific management is properly introduced, almost invariably we wait for the men to come and ask to work under the new plan.

The Chairman. When the power of the management is brought to bear on the individual workman, while time study is being made, would not the time study itself be inaccurate because of the abnormal conditions created by that power being brought to bear on the individual workman?

Mr. Taylor. Mr. Chairman, I have said before that in nine hundred and ninety-nine cases out of a thousand it has been our practice to have the workman cooperate with us in the most friendly manner in making this time study. The workman is just as much a part of this

time study, and a voluntary part of this time study, as we are a part of the time study. I say "we," meaning those of us who are on the management side. An effort is first made to get a workman to realize that this is the road toward high wages. And when he realizes that and knows that we must have a time study as a just and substantial foundation for both sides he is not opposed to time study, but consents to it with the greatest alacrity. We have had hundreds of men come and ask us to make a time study of their particular jobs.

The Chairman. Is it not true, under those circumstances, that a failure to cooperate means that his ability to earn a livelihood has been completely destroyed, or cut off to the extent of 100 per cent, while he realizes at the same time that his employer's earning ability is not altered; that a disagreement might continue as far as the employer is concerned, while it would mean starvation to him?

Mr. Taylor. I must say, Mr. Chairman, that I do not exactly catch your meaning; I do not think I understand you.

The Chairman. I will give you an illustration. Suppose, as I suggested to you some time ago, that there is an employer with 1,000 employees, and he deals with them individually, as this method proposes. The conditions are not satisfactory to the workmen. They are to the employer. The conditions made by the employer are satisfactory to him, but if the workman refuses to accept the unsatisfactory conditions his power to provide for himself and his family has been destroyed to the extent of 100 per cent; but the 999 of the employees continuing at work, the power of the employer to earn a profit has practically not been reduced at all. Now, you have on the one side the employee with no employment to earn a livelihood to live upon and starvation staring him in the face thereby, and on the other hand the employer continuing to produce the same profit that he formerly produced. Now, would not the disagreement under those circumstances simply result in the necessities of the workman ultimately compelling him to accept the terms of the employer?

Mr. Taylor. Mr. Chairman, my observation is that in very dull times, when there is a lack

of employment for good men in trades—those times come occasionally—at that time an unscrupulous employer might have an advantage. The unscrupulous employer, under those conditions, might have a very distinct advantage over the workmen. My observation, however, of the ordinary normal times in the United States is that a good workman need never be out of employment for five days. There is an immense demand for competent workmen in this country, in all normal times. I cannot recall in normal times a single instance of a good workman having to come anywhere near starvation because of lack of employment. There is always an immense demand for good workmen, so that the condition does not exist which you have outlined.

The Chairman. Is it not true that a man who is not a good workman and who may not be responsible for the fact that he is not a good workman, has to live as well as the man who is a good workman?

Mr. Taylor. Not as well as the other workman; otherwise, that would imply that all those in the world were entitled to live equally well whether they worked or whether they were idle, and that certainly is not the case. Not as well.

The Chairman. Under scientific management, then, you propose that because a man is not in the first class as a workman that there is no place in the world for him—if he is not in the first class in some particular line that he must be destroyed and removed?

Mr. Taylor. Mr. Chairman, would it not be well for me to describe what I mean by a "first-class" workman. I have written a good deal about "first-class" workmen in my books, and I find there is quite a general misapprehension as to the use of that term "first-class."

The Chairman. Before you come to a definition of what you consider a first-class workman I would like to have your concept of how you are going to take care, under your scientific management, of a man who is not a first-class workman in some particular line?

Mr. Taylor. I cannot answer that question until I define what I mean by "first-class." You and I may have a totally different idea as to the meaning of these words, and therefore I suggest that you allow me to state what I mean.