the most elementary work to make this great change is a question of not a month, not of a year, but two or three years, even in the most elementary work, and that in an intricate establishment it is a matter of not less than five years before a great increase in the output per man can be made. While the change in the type of management is going on, and while the increase in output per man grows and the cost gradually goes down, the history of the world shows that the world uses more and more of the new materials created. The introduction of labor-saving machinery does not tend to throw men out of work; that is not the history of the industrial world, nor even the history of any individual industry, and I challenge you gentlemen to state a case in which it is not true that the introduction of labor-saving machinery in the end has made work for more men, instead of throwing men out of work. The history of all industries indicates that labor-saving machinery, which enables a man to turn out a larger output, makes work for more men in those industries, and it would do the same thing in the coal trade as in any other trade.

The Chairman. I believe it is generally admitted on all sides that the ultimate cheapening of the cost of production results in a greater consumption of the article and consequently a greater amount of production of the article, but is it not true that that increased consumption is itself a matter of growth; that it does not come suddenly?

Mr. Taylor. Yes, Mr. Chairman, that is true; but a study of industrial history indicates that consumption grows about as fast as production; that is the history of the world, I think. And, Mr. Chairman, as a matter of interest, I would call your attention to a very remarkable book on the law of wages which deals with statistics in the coal trade. This book was recently sent to me, and I have been reading it during the past few days; it shows statistically the effect of the introduction of labor-saving machinery on the wages of workmen in the coal trade, showing that the larger the amount of labor-saving machinery used in the industry the higher the wages. It is a most interesting book called "The Law of Wages," and it was published quite recently. Its author is Mr. A. L. Moore. I think you will be greatly interested in it, particularly in the conclusions or summaries of the last chapter; it is the most illuminating book statistically on the effect of various elements on wages that I have been able to get hold of.

The Chairman. Notwithstanding the fact that production keeps pace with consumption and consumption, to a certain extent, keeps pace with production, is it not true that when labor-saving machinery is introduced in any industry or any improvement in method introduced which reduces the number of men necessary to produce a given amount of material until the readjustment takes place, that a great many workmen are thrown out of employment and must be absorbed in some other lines until the growth in that line takes them back again?

Mr. Taylor. Yes; I think that is almost universally true. I think, however, it mainly comes about in this way; that the workmen who for years were accustomed to working in a certain way find that the new method of doing the work is irksome to them or sometimes that they are unable to do the work in the new way. These men find themselves not only seriously inconvenienced but they are sometimes brought to actual suffering from this cause; I think the introduction of labor-saving machinery is always accompanied by some unfortunate occurrences of that sort.

The Chairman. Now, then, what method has been developed or evolved by scientific management for taking care of the workmen thus displaced until the readjustment has taken place?

Mr. Taylor. I think I may say that in those establishments in which scientific management has been introduced there is not a single case that I can recall in which, after scientific management was introduced, there were less men employed than before. Not a single case, that is, in which the total number of men employed in the establishment were less than before. Sometimes many of the men who under the old system of management were workmen have been transferred from the working side to the management side, you understand, and in that case there may have been fewer workmen employed. By workmen, I mean those who are actually doing the work with their hands. But in this case the men who formerly did the work with their hands have been transferred to the management side, they have become teachers, guiders, and helpers. However, I do not think I can mention a single case in which there have been fewer men employed. I believe that in our arsenals, when scientific management will have been introduced, there will be more men at work than formerly; and I believe that in our navy yards the same result will follow. I believe that workmen from the arsenals and the navy yards who have appeared before your committee are laboring under an entire misapprehension as to the results which will follow the introduction of scientific management into the arsenals and into the navy yards, though scientific management has not been, and is not being introduced in the navy yards, according to Secretary Meyer. The results will be just the same there as everywhere else. I say there will be more men employed in the navy yards.

The Chairman. Then it is your belief that if this system of scientific management was universally adopted that no readjustment would be necessary so far as the employment of men is concerned?

Mr. Taylor. Mr. Chairman, there is a very great readjustment which necessarily follows from the very principles of scientific management. As I tried to outline at the beginning of my testimony, these principles involve a very careful study on the part of the management of the capacity and possibilities of each workman, and an entire change in that man's work if it becomes necessary, and it is necessary in most cases, in order to give each man the type of work to which he is best suited. So that scientific management does involve a series of very great changes in the workmen. I know of no system in which the changes are so great, but they almost all involve better conditions and more prosperity for the workmen; they are nine-tenths in the direction of good; they mean better work, higher wages, and more interesting work; those changes tend to make the workmen more efficient and make them into higher types of men. There are changes in plenty, but they are all to the good.

The Chairman. Is it not true that a number of men who have been eliminated from certain classes because they were considered not to be best suited for that class of work have been principally taken care of by virtue of the fact that the system in itself is only applied in a comparatively small percentage of the work to be done?

Mr. Taylor. Do you mean a comparatively small percentage of the work to be done in the world?

The Chairman. In the community at large?

Mr. Taylor. No, sir. If you will ask me about specific cases that you have in mind, I will tell you what happened to the men who were laid off. For instance, it may be in your mind to know what became of the 400 or 600 workmen in the yard of the Bethlehem Steel Co. that I spoke to you about and who were reduced finally to 140 men. There is a specific case.

The Chairman. In order that you may know what is running in my mind, I will say that I am not so particularly interested in any specific case as I am interested in what would be the general condition if this system was generally applied, and knowing from observation and experience the readjustment that has to take place when labor-saving machinery is introduced and knowing about the hardships that have to be borne by the workmen pending the readjustment, I wanted to find out—and that is what all this line of questioning has been leading up to—whether this scientific management has evolved any method by which the workmen could be taken care of during the period of readjustment.

Mr. Taylor. I have tried to explain that, Mr. Chairman, by saying that under scientific management we make a definite and careful study of each workman in the place; men are appointed in all of these establishments whose chief duty is to make this study of the workmen, of their possibilities and their character, and then to deliberately train each of those workmen to do that work for which he is best fitted. Under this system, then, instead of treating them brutally, they are treated as kindly as we know how. The only case that is at all usual, in which men suffer under this system, is this: there are certain men in all establishments who