with, the problem consists in making the best use of all available methods and in assuring a thorough coordination of all effort. This is essentially the problem of output which is generally inadequately understood in both cases. Production has been considered that period when, because there is no further problem to solve and no initiative required, the worker fails to find further interest in his work. The first foreman to come along was supposed to be capable of arranging all questions of detail with which he had to do. They lost sight of the fact that production is continually concerned with the most interesting questions pertaining to methods of production, machinery, tools, material, perfection in finish, interchangeability, and so on, and that mass production itself, in view of an attainable perfection, has made it possible to undertake inventions of tools and studies of material which would have been quite impossible with a limited production. Far from discouraging research, the study of these two kinds of production stimulates and develops a spirit which extends to further researches for obtaining greater perfection in execution. It is this spirit which we must develop in France, and the Taylor researches are certainly the strongest arguments which can be invoked to make us understand their necessity.

After having accused Taylor of destroying all spirit of initiative, it was said that he misconstrued the principle of authority or of unity of command. It is quite evident that the man who takes part in any collective action, of whatever sort, must submit to some authority, and that this authority cannot emanate from several sources. This admits of no argument. It is a useful thing to formulate principles; it clarifies ideas; but today, at least in industry, a passive obedience imposed in the name of however excellent a principle is hardly accepted any more. Moreover, it is not sufficient. In these days authority more than ever before must make itself acceptable, must create and use many types of cooperation. In order to do that it must thoroughly understand its own objectives. What is necessary is that authority "collaborating cordially with the workman" which Taylor predicted and which one may call the French type of authority. They have laughed at the Frenchman who, whether as workman or soldier, has been "willing to obey, but does not wish to be commanded." This has been taken as a joke, but it is no laughing matter. If you prepare the work with the greatest care and arrange the shop in such a way that everyone understands just how things are to be done, the workman will do his part without your being obliged to direct him every minute or to give him imperative orders whose significance escapes him, and which antagonize him. He is, in fact, the same man who says when he comes into a shop where order reigns, "here, at least, one feels oneself under command." He feels it for himself without anyone's being obliged to call it to his attention, which makes the whole situation quite a different matter.

It is in this way that intelligence must be developed in the shop. To this end it is not enough to introduce order; the workman also must receive definite training; he must be led to desire training. But the training of the men in the higher positions, deficient as it frequently is in its knowledge of human nature, must not be neglected.

The workman who is usually educated by life itself and by his environment is not always convinced that his condition as a workman can be improved by schooling. The man who has received his whole training in school is often totally ignorant of life. What can be done to give the workmen confidence in schooling and what is necessary to give the schools a comprehension of life? And especially, what can be done to make the desire for instruction the dominating preoccupation with everyone? It cannot be said that this desire literally does not exist, but it seems to be very feeble with some and very vague and undefined with others.

It is only necessary to follow the arguments raised by questions of instruction to reach the conviction that the problem is the same everywhere. People seem either to learn or to teach without knowing just why. Probably, because it is either a pleasure or a duty to learn or to teach. Manufacturers prefer to employ the students from the schools, doubtless for the same reason, because they expect to find them more capable than others, but without being able to define exactly the knowledge or the qualities that they are looking for. Some of the pupils from the schools are very successful. Is it because they have attended the schools or in spite of it? They belonged to the elect and have a diploma to prove it. Has the diploma any further significance? Has the school done more than bring them together? Have they, too, not been formed also by the environment to which they belonged or by that which they acquired?

When manufacturers are forced to say just what the training of the schools is expected to supply, they extricate themselves too easily from embarrassment by complaining of the absence of general ideas, or the lack of common sense. General ideas! Common sense! They should be more precise, and if it is too difficult to give exact definitions of those terms they should at least indicate the role which these factors which are so important are intended to play. Are they two different things, two extremes, or one and the same thing? Must one see in them a contradiction between the school and life? Moreover has it not been said that one must be a great man to understand the importance of a small detail?

Although eminent authors continue to write about education, they declare in the same breath that their efforts will be wasted. When they point out changes in program or new methods they complain of seeing the same old routines and tenacious prejudices rising up before them to frustrate their reforms. How can one hope, however, to take much interest in a change of methods when the end to be attained is in itself so poorly defined?

In spite of such discouraging facts we have great faith that scientific management will contribute to the bringing together of these currents; that it will make clear the value of instruction and orient it in the right path. The easier its usefulness is to explain, the more often it is proved by simple facts within everybody's reach (such as those which are demonstrated by the analysis and preparation of the task), the more general will become the sincere desire for instruction, and important results are bound to follow.

In a word, a sincere determination to secure instruction must be awakened by an orientation of ideas in accordance with facts. It is the fact which must serve as a point of departure for all teaching if it is to have real strength; the fact to which attention is called even in the shop and the fact on which the professor or the lecturer must place his dependence.

The great economist and engineer Le Play expressed an opinion which it is curious to compare with what we know of Taylor's training and of his turn of mind. It is apropos of the educational value of the thorough analysis of a given fact. "Energy," he says, "cannot take definite form without a determined spirit and a determined spirit cannot be vigorous and far-seeing unless it depends on positive methods of observation of facts." On this point there is remarkable unanimity of opinion between the French engineer and economist and the leader of the American School; but Taylor takes a long forward step when he introduces into the shop these definite methods of scrutinizing facts in order to bring about the desired alliance between all the forces whose collaboration is so necessary.

Early in September, 1913, M. H. LeChatelier invited several friends to meet Frederick W. Taylor, with whose works, thanks to him, they were already acquainted.

After conversing with several people present Taylor opened his talk by stressing two points:

He devoted himself at first to showing the great importance of scientific management (if a terrible crisis is to be avoided) not only from the economic point of view, but because of the necessity of making better use of all the means of production, of continuing to be their master instead of leaving them open to every chance, applying his principle to those means as a whole as well as to each particular case. After which he expressed the conviction that France was better prepared than any other country to make use of his ideas; that it was the country offering the best future for scientific management.

The first statement, relative to the economic bearing of his methods, called for little comment at that time, but today it seems like a prophecy. For we are, indeed, passing through a universal economic crisis which concerns everybody. We complain of the high cost of living. It is not, however, because the means of production are lacking but because they seem to be paralyzed for reasons which it is difficult to define. This crisis has taken us unaware, and doubtless one of the reasons why it is so difficult for us to extricate ourselves is the blind faith, characteristic of our civilization, in the ability of unhampered individual efforts to solve all economic problems. This simple formula coming to halt the hatching of more or less adventurous theories about social organization had succeeded in checking all progress in the middle of the last century. From the year 1848, Frederick Bastiat in his "Economic Harmonies" developed the conception of a natural organization in opposition to the artificial organization of the socialists, that is to the systems of Proud'hon, St. Simon, Fourier, and others. Organization had to give way to political economy. The equilibrium between Demand, Effort, Satisfaction, or in other words between Production and Consumption always seemed