The historian in making this quotation stated that Napoleon reiterated a truth confirmed by the experiences of successive ages, *that a wise direction is of more avail than overwhelming numbers, sound strategy than the most perfect armament.* Similarly in industry,—*a wise policy is of more avail than a large plant, good management than perfect equipment.*

The historian goes on to say:

> "Even a professional army of long standing and old traditions is what its commander makes it; its character sooner or later becomes the reflex of his own; from him the officers take their tone; his energy or his inactivity, his firmness or vacillation, are rapidly communicated even to the lower ranks; and so far-reaching is the influence of the leader, that those who record his campaigns concern themselves but little, as a rule, with the men who followed him. The history of famous armies is the history of great generals, for no army has ever achieved great things unless it has been well commanded. If the general be second-rate, the army also will be second-rate."

These facts in military history have their exact counterpart in industrialism, and the real problem of today is how to select and train, or rather how to train and select our industrial leaders.

If we have proper industrial leaders we shall find that the men are following in their footsteps. Our factories always reflect the leadership. Mr. Feiss' factory reflects Mr. Feiss. Mr. Noyes' factory reflects Mr. Noyes. Mr. Kendall's factory reflects Mr. Kendall. It is the leader that counts, and this fact bears out the truth of Mr. Feiss' argument in saying that personal relationship is the basis of scientific management.

I am not only in complete accord with all that Mr. Feiss has said, but feel that I should like to add a little emphasis to the points he makes. Mr. Feiss' work seems to have been primarily devoted to the production of harmony. He brings out the fact that it is of more importance to have workers in harmony with the methods and aims of an organization than to have them particularly skillful in certain operations. In other words, team work is the first essential.

We are continually having the truth of this thing forced upon us. Perhaps the reason for this fact is that it is far easier to teach a man to do things skillfully than it is to teach him to work in harmony with others. The value of medical inspection of people to be employed and the advantages of periodical subsequent inspections have been so clearly demonstrated, that is is only a question of time before all progressive establishments will have both.

He speaks of psychological tests for the selection of workmen, about which considerable has been written. So far the results of this work, as far as I have been able to observe, have been meager, and much of the writing seems to indicate what people hope to accomplish. If these tests have for their object the determination of the general class of work for which a worker is fitted, they seem to give promise of great usefulness. Having found an operative naturally fitted for a job, however, we still have the problem of training him to do it regularly and in harmony with his co-workers. What we most need is some kind of a test which will tell us whether a man will accept training or not, and be loyal to the results. We frequently find that a man not naturally qualified for a job becomes, because of his susceptibility to training, a very much more desirable worker than the man who was naturally adapted to it, but who insisted upon doing it his own way.

Mr. Feiss rightly says these tests should not be used to eliminate people from industry to which they may possibly be trained, but to save such for the industry. He believes it to be the duty of an employer to the community to provide steady employment as far as it is possible. This subject has not been given the attention that it deserves, and difficulties of doing it have been accentuated by improper cost finding methods. With a proper consideration of the expense of idle plant and equipment, I think some of the difficulties will vanish.

Many people are shocked at seeing workmen standing idle for two or three hours a day. The manager of a plant is often very much excited if he sees men idle even for a few minutes; but he walks unconcernedly up and down the shop where there are machines idle day after day and costing him ten, fifteen, twenty, twenty-five or fifty dollars a day on account of their idleness. Those machines cost money; we have the interest on those machines to pay; we have the depreciation on the machinery; we have the rent of the building which they occupy; and all that goes on whether the machine is operated or not. Our cost-finding methods in the past have been such as to smear this expense over the cost of product which we made on the other machinery which was running.

We must separate the expense of idle machinery from the expense of that which is running. It is not fair to charge to the machine which is running the expense of the machine which is idle. Many people are beginning to-day to put down in exact figures the amount of expense incurred on account of idle machinery. To show that expense day by day is the next step to be taken. When that is done and people realize that the expense of the idle machinery is as great as it is, they will find some way of having the machinery run, and the workmen will keep their jobs.

For instance, suppose we had a plant which cost us ten thousand dollars a month if it were idle. Would it not be far better for us to run that plant and lose ten thousand that month than have it idle? If we ran the plant and lost ten thousand dollars, we should have our organization ready to take on any work at the beginning of the next month. If we shut the plant down and let the people all go, our organization is broken up and we are in a bad fix. Suppose that two concerns were competing under these conditions, and one of them shut its plant down and lost ten thousand dollars, and the other did not shut the plant down and lost ten thousand dollars. Business begins to come in; who would be ready for it? Mr. Carnegie recognized that fact; and in the early nineties, when there was a strong competition between the steel companies, Mr. Carnegie ran his plants while the Illinois Steel Company shut theirs down. The result was that Mr. Carnegie got control of the steel industry.

I am not strongly in favor of State legislation to cure these problems. I do not object to certain socialistic ideas, but I would like to see these things studied from their proper standpoint. Let us get all of the facts and see if we cannot solve them in a natural way without enacting laws. We know what most of the laws are enacted for; they are enacted to counteract the effect of some previous law which was bad, and the fewer laws we enact the fewer laws we shall have to repeal. If we can solve the problem without laws, let us to it.

The remarkable result that Mr. Feiss has shown in the increased permanence of employees is noted wherever methods even approximating those that he uses are employed.

Finally we come to the idea of democracy in industry. I emphasized the importance of this in a paper before the American Economic Association last winter. Nobody really believes that every man is mentally or physically equal to every other man, but he does believe that they are entitled to equal opportunities. If we base all our actions on knowledge and facts and do away with special privilege, we shall go a long way in the solution of our ideals of the democratic industrial state, and do much to solve our present industrial problems. True democracy really means *equality of opportunity, and authority based on knowledge, not on birth or special privilege.* If proper training and equal opportunity can be secured, we shall have a firm foundation upon which to rest the solution of our industrial problems.

MR. WILLIAM KENT[1]: I was at a meeting on the subject some years ago in Washington, and the question was asked how many men Mr. Taylor was able to get rid of in shoveling dirt and carrying rails and other things. A man representing a labor union said, "What I am chiefly thinking of is, what became of those men who were discharged." So here, he would say, what I am chiefly thinking of is what became of the one hundred and seventy-nine men that Mr. Feiss got rid of. There are eight hundred and some odd men that do the work as compared with ten hundred and forty-four that did the work before. What became of the poor fellows that had to leave?

I do not sympathize with that idea. I said in a paper some time ago that as the man who makes two blades of grass grow where one grew before is a public benefactor, so the man who causes one man to cut the grass that two or three cut before is a public benefactor; he is a public benefactor in discharging the two men. So Mr. Feiss has not done any serious injury to society in discharging the one hundred and seventy-five men.

But on the screen he showed that eight hundred men produced forty-two per cent more goods and got thirty-seven per cent more wages and their time was cut down from nine hours a day to eight hours a day. Those men who got thirty-seven per cent more wages, what did they do with the money paid them as wages? They must have put it in a savings bank and the savings bank loaned it to somebody, who would spend it, and that person who spent it went ahead and hired the one hundred and seventy-nine men. It is a mathematical certainty that if eight hundred men got thirty-seven per cent more wages, that amount of wages has got to be spent by somebody. You cannot spend money without employing people, and those one hundred and seventy-nine got jobs in that way.

MR. SANFORD E. THOMPSON[2]: One of the pleasantest days that I have spent for some time was Tuesday of last week in Cleveland with Mr. Feiss going over his plant. He showed me over the shop, through the well lighted, well ventilated rooms, among the help, girls most of them, who were working with the quickest motions, yet with quietness and lack of nervousness. At noon we went out into the field where the girls were playing games,—one group playing baseball, another group playing captain ball, another group playing "three deep". Then he took me to lunch in the dining hall, where we were served with well-cooked, appetizing food. The plant impressed me as a modern shop with the old friendly interest. We hear a great deal about the difference between the old fashioned industry and the present day corporation—the old fashioned industry where one man employs three or four workmen and takes a personal interest in them, and the modern manufacturing plant where men and machines are on the same basis. Mr. Feiss' plant, with its seven hundred odd employes, is similar in principles and practice to the old fashioned shop where the one man is owner, manager, foreman, and friend, and this comes in daily and hourly contact with his men.

The two points which stand out as distinctive in this shop are these: in the first place, the personal contact between the management and the people employed; and in the second place, the systematic plan for maintaining this personal contact. In another shop with a different kind of help we may have to use a slightly different method just as we vary, for example, the details of the routing system; but we may still have the same two fundamental elements—the personal contact and the systematic plan for maintaining that contact.

One thing must not be lost sight of—that the full results could not have been achieved except by (1) the adoption of scientific principles in both the manufacturing and service departments, and (2) the intimate personal relations between the management and the operatives. Without the high wages made possible by the systematic methods of fixing rates; without the uniform conditions of employment effected by the carefully planned sales; especially without the card records of the individual employees, the follow-up system to keep track of each individual, and the systematic supervision of the health, happiness, and recreation, even the best of intentions and actions would have failed to produce the harmonious atmosphere.

Along with this system, along with these scientific methods, must be the really personal relation. Either the manager himself or someone high enough in authority to discuss details with him—not simply receive orders from him—must be in close touch with him and appreciate the point of view of the men and women who work with their hands. It is this intimate relation which impresses one as the most distinctive feature in the management of Mr. Feiss' shop.

MR. R. POLIAKOFF[3]: I had no intention to speak at this meeting, this being the first time I have spoken in any American meeting generally. I had no idea what the paper would be about which has been here read. If I take the liberty to say a few words, it is because I want to say a few words in relation to that insurance scheme which has been so highly emphasized in opposition to the idea which Mr. Feiss has laid before us. Of course, insurance is a very good thing, but to consider it the only remedy for unemployment I do not think is to view the matter in the proper light. An instance has been here quoted about Germany, with a plant like that of Henry Lentz at Mannheim, or Zeiss at Jena, where if unemployment occurs the employee is entitled to a three months' wage. That is very good, but I do not think it matters very much if I know in case of panic or unemployment I will be safe from starvation for three months and do not care what becomes of me afterward. From this point of view insurance is in Germany a good thing, but to look upon it as the only remedy against unemployment would be wrong, and you Americans have a good instance and good proof that that is the case. And this is it: That from Germany come large numbers here to get jobs because they cannot get them in Germany with their insurance scheme.

MR. JOHN M. BRUCE[4]: I want to tell you one or two incidents that I think of about a point in the talk that Mr. Feiss has given you, pertinent, also to Mr. Gantt's remarks. Mr. Gantt said that team-work in the factory was really the big thing that Mr. Feiss had secured. I was at Mr. Feiss' office talking with him not very long ago, when one of the working girls came into the office crying, and said that she was

[1] Consulting Engineer, Montclair, N. J.

[2] Consulting Engineer, Newton Highlands, Mass.

[3] Asst. Prof. of Mechanical Technology, Imperial Technical Institute, Moscow, Russia.

[4] Consulting Engineer, New York City.