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IMPORTANT TRENDS IN INDUSTRY
and
GOVERNMENT IN BUSINESS

By

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Mr. Director and Gentlemen of The Army Industrial College

It is a very great pleasure to have this long deferred opportunity to meet with you in this way. At the National Industrial Conference Board we usually refer to ourselves as "The World's Largest Trend-Mill," and often wonder what becomes of the grist we turn out, and what use is made of it.

The two subjects I was asked to talk to you about this morning are, of course, so comprehensive in their scope that it would take many lectures to cover them adequately. I shall therefore attempt only to touch upon some of the more important aspects of the trends in industry at the present time and of the relation of government to them, primarily from the point of view of your own interest in the problems that you are concerned with.

These two subjects are not distinct subjects today, unfortunately. They are inseparably related. The things that are happening in American industry today are dominated almost completely by the developments that are taking place with respect to government influence in industry. I shall therefore treat these two subjects together.

For convenience I shall divide what I have to say into the following topics. I shall discuss first the fundamental situation as regards labor supply in the United States, its quality, its characteristics, and its efficiency, second, the situation that exists with respect to wages and production costs, third, the picture as it presents itself with respect to prices and demand for industrial products, fourth, the situation as regards technological developments in industry growing out of the labor situation and of the price and consumer market situation, fifth, the picture that presents itself as regards the capital supply of industry upon which our future progress depends. Finally I shall refer to some of the characteristics of management in industry, its qualities, its point of view. These, after all, are fundamentally determining factors in the future progress of American industry. If I have time I shall conclude with some general remarks about the future long-run outlook for American industry in this country.

I beg your indulgence for a moment at the outset to remind you of some rather abstract and perhaps bromidic fundamental facts about our industrial system in this country. It is, or has been, what I constantly call an "Enterprise System" By that I mean a system that operates on this general principle It manufactures products on the basis that the price received, or the return for each man-hour of output, must cover the cost of labor per man-hour and above that cost must yield a sufficient return to make up for the wastage of capital in the course of production and to serve as an inducement for new capital for further expansion That, very briefly and generally stated, is the basis of our whole industrial system and I ask you to bear it in mind because in referring to some of the trends in the industrial situation later its importance will become obvious.

I shall discuss labor supply first, because the effectiveness of our whole industrial system and its progress depend upon the effectiveness of our working force in this country. I think perhaps Karl Marx, or some of our Socialist friends, would be delighted to hear me say that. They would think it amounted to saying what they have always been insisting upon. that all wealth comes from labor. Well, of course, fundamentally it does That is to say, our natural resources are useless until labor is applied to them so as to produce things that are useful to mankind in meeting its needs

When we are examining an industrial system and trying to appraise its situation and its future we must look first to the condition of the working force in the country, and there we are met today with some very interesting and difficult problems. First, of course, we are familiar with the fact that the population in this country is not growing as rapidly as it used to Its annual rate of increase is steadily slowing down, so much so that our population experts tell us that by 1950 or perhaps earlier we shall have a stationary population As regards our labor supply, the importance of that is obvious Assuming that we have the same proportion of our total population going into gainful occupations as we have had in the past -- which is subject to a great deal of qualification -- it implies that our available working force is not going to grow as rapidly as it has in the past.

As to the size and quality of our labor supply, we are met further by that complex of problems involved in the words "unemployment" and "employability" Before I discuss that particular aspect more fully, I want to say this about our labor supply in the United States Its quality, its productive effectiveness as

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a labor force is not increasing as it has in the past, is not even being maintained as it has been in the past. A great number of social factors, changes in public psychology, in social ideas, prevalent conceptions regarding standards of living, etc., together with a great many cultural factors, have tended to create in the American labor force a less definite disposition, willingness, or capacity to work, ambition to produce effectively, to exert the fullest possible effort. This is a general phenomenon that I need not attempt to prove or to elaborate upon because it is familiar to every one in business management of every kind who has to deal with a working force today. The working energy, the working capacity - quite apart from the tools that our working force has to work with - is not increasing, and it is fair to say that it is even decreasing. That would not be so bad if our available effective labor supply was increasing in quantity, but there we are met by the problem of unemployment, the portion of our working force which tends to remain idle, not engaged in effective production.

I want to invite your attention on that point to some very fundamental facts that definitely determine the prospects for the future. Let me put the picture this way to make it most dramatic. Let us assume that the rate of increase in total production and trade which we have seen in the course of recovery, from 1933 up to and including 1936, were to continue unchanged during the next four years, let us assume also that the rate of increase in production per man-hour in all types of activity that we have seen from 1933 to 1936 would continue unchanged, let us assume, third, that the prevailing weekly working hours in all occupations remain as they were on the average during 1936. What would be the situation as regards unemployment and employment of our working force during the next few years?

If we take the known facts and make those assumptions we are led inevitably to this conclusion that if we have today a number of unemployed of about eight million six hundred thousand persons, by 1936 the unemployed would amount to only about five million two or three hundred thousand persons. That number is equivalent to the number of new workers that have come into the labor market since 1929, together with the number unemployed in 1929. That is to say, we would have reabsorbed by 1936 all of those persons who have been thrown out of employment by the business depression since 1929 and we would have left only a number equivalent to the new workers, the young people who have come into the labor market since 1929. By 1940 the number of unemployed would be practically zero and might even, if you can imagine it,

be a negative quantity. That is to say, unemployment would be wholly wiped out in this country by 1940 and you would have a labor shortage. The demand for workers that are not available might range from five hundred thousand to perhaps a million for this reason. By 1940 these calculations would give you a figure of around four hundred thousand persons unemployed, but in normal times, at all times, we carry in this country a labor reserve of from a million to a million and a half persons who are not working at any given time because of illness, temporary seasonal stoppages of work, or shifts from one job to another. When that number is added to your four hundred thousand unemployed, the net result is a deficit of half a million to a million workers.

From 1940 on this shortage would increase progressively because of the slowing down of the rate of population growth, and the smaller number of persons who will come into the labor market from year to year. That prospect of impending labor shortage is something that should not be lost sight of in the midst of current discussions of possibility of having a permanent body of unemployed of five to six million persons in the United States. This prospect is constantly being put before the public by public officials and others as a basis for various projects and proposals for permanent unemployment relief, public works programs, etc.

To indicate the absurdity of that view of the future, of the prospect of having a permanent body of unemployed in the United States, these calculations that I have been putting before you very roughly could be turned around in this way. If we had from now on, in 1937 and in succeeding years, a permanent body of unemployed of five and a half million persons, and we were to maintain that many unemployed in the United States, what would it imply as regards the possible rate of increase of business activity, of production and trade, in this country from now on? The answer is that the rate of increase in general business activity, in the physical volume of production and trade in the United States, would have to be practically zero from 1936 forward if we were to maintain a permanent body of five to six million persons. In other words, it would be impossible in view of all the known factors of production per man hour, of increase in population, and of the normal rate of increase in business activity to maintain in the United States a permanent body of unemployed anything like five or six million persons. I say "impossible" in this sense. To do so we would have to make great increases in the average working hours of the

working population, we would have to make a tremendous increase in the production per man hour of the employed population. Probably these would not be sufficient to meet the labor requirement, we would have to draw upon new sources of labor that are not now fully utilized - that is to say, we would have to draft more women into business and industry, we might have to lower the age limit of employment, we might have to reconsider such provisions as those in the Social Security Act which henceforward will eliminate from employment all persons over sixty-five. In other words, we should be faced with an urgent problem of labor supply in the United States within the next four or five years if business activity were to increase even at a normal rate. Even if we do not assume that it would continue to increase at the rate at which it has increased since 1933, but at the normal rate of increase shown by one hundred and fifty years of experience, which is almost four per cent per annum, even that normal rate of increase would entail an increasingly severe shortage of labor for industry. That fact taken in conjunction with the tendency to lower working ability or working energy in our working population as a whole, creates a prospect that deserves very serious consideration, not only by industry but by all who are interested as you are in the possibilities of effective industrial production in emergency.

This sheer mechanical factor of available labor supply is complicated and intensified now by factors which are tending very rapidly to increase money costs of production - forces which are raising wage levels and otherwise hampering the effective use of labor. The wage trend, of course, as you know is upward. Our average hourly earnings in manufacturing industries today are about ten per cent above the 1920 level already and the purchasing power of weekly earnings in manufacturing industries, that is what the average weekly earning of an industrial worker will buy in goods and services he commonly consumes, is also about ten per cent above the 1929 level. That is a normal accompaniment of recovery and the labor disturbances that go with this process of wage adjustment during recovery are also normal. That is to say, during recovery from a depression we should always expect labor disturbance, labor conflict, organized effort to increase wages as prices rise.

But in the present situation there is something else in the picture, as you know. It is not merely the activity of labor organizations directed to the normal effort to raise wage

levels as cost of living rises during recovery. Such activity is now directed to other ends to the imposition of union power in the various industries. That is widespread and it is having many effects, of course, but the one that is important to consider, for our purposes, is its effect upon the effort of management to increase productive efficiency, and to offset the factors that make for shortage of labor in many lines. The net effect of all this labor pressure, pressure of labor organization supported by governmental policy, is to retard the progress of industry in recovery, to decrease its productive efficiency, to hamper the efficient handling of its labor force.

That would normally mean, of course, that industrial products, manufactured products particularly, would rise very rapidly in price. There has been a considerable rise in the prices of manufactured goods but not nearly so much as in the prices of raw materials, agricultural and industrial. The price trend that we have noted during this recovery process has been affected mainly by factors which have influenced agricultural prices and the prices of industrial raw materials, particularly minerals. The factors affecting agricultural prices are familiar to you. They have had to do with the drought and with the efforts of government to restrict agricultural production, and also to some extent with the influence of the devaluation of the dollar upon the prices of those international products that enter into world trade. As regards mineral products, the important factors have been not only the influence of monetary policies upon international raw material markets, but also the general international political situation which has created widespread fears of war and has tended in all countries to intensify the demand for mineral and other non-agricultural raw materials which are so vital for national defense. Therefore, we have had a pretty rapid rise in the general price level because of the rise in agricultural products and mineral raw materials, but not so much rise in the average of finished products.

That is important to remember in trying to understand the industrial trend today because it means several things. It means, of course, that relatively the purchasing power of producers of farm products and of mineral raw materials, or the producers of raw materials generally, have benefited in the recovery process because they are able to exchange their products for finished goods at a greater advantage than they were able to before, and it has thus assisted and stimulated recovery. We have a very prevalent body of opinion in this country that the great defect in our industrial organization lies in its unwillingness or its inability to decrease the prices of manufactured

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products as the productive efficiency of industry grows, that is, to pass the benefits of increased productive efficiency on to the consumer. There is the common assumption that that is true because of the definite or deliberate tendency of the manufacturing industries to attempt to control their prices by various types of arrangements. That kind of opinion is a very fundamental factor in the relation of government to industry at the present time. There is constant pressure being exercised upon industry in many government policies to force down the prices of manufactured products or to keep them from rising. I need not go into that in any detail but I want to point out that the impression that the prices of finished goods in this country have not been kept down and that the increase in productive efficiency of industry has not been effectively passed on to the consumer is a false impression unsupported by the facts. Any examination of the course of prices of manufactured goods in the last fifty years in this country will show very clearly that they have not risen as much as the prices of raw materials, agricultural and non-agricultural.

But there is another more subtle fallacy in that prevalent opinion, and that is that the way to measure the extent to which the increased productive efficiency of industry is passed on to the consumer is by the price of the finished product, completely ignoring the character of the product itself. If, for example, you were to measure the increase in the effectiveness of producing automobiles in the United States by taking the price of the Ford car today and the Ford car of 1914, and were to say that the difference between twelve hundred dollars and six hundred dollars measures the extent to which the consumer has benefited by Mr. Ford's enterprise in reducing the cost of producing automobiles, you would obviously be ignoring the enormous improvement that has been made in the serviceableness and the quality of the product itself. That applies through all of the manufacturing industries, especially in a country in which our characteristic manufacturing process is one of elaborate finishing of products rather than the production of standard commodities of common consumption.

So we are faced in industry today with a number of forces of public opinion and governmental policy which tend to create an atmosphere, and in many cases to produce actual pressures, to prevent the prices of finished products from rising under wage pressure and labor union pressure. That means a tremendous compulsion upon industry to increase its productive efficiency, to make every type of technological improvement

Before I come to this part of my subject, I just want to say one thing more about the market demand or price aspect of the industrial situation. It is profoundly and very generally affected today by the monetary and financial forces that are in the picture and that have been created by government which we commonly sum up in ordinary conversation under the word "inflation." They mean essentially this: that during this recovery process we have had an enormous creation of artificial purchasing power in the United States; an enormous injection into the consumer market of money borrowed in larger part from the future, and in part the result of a change in the value of our currency itself. This tremendous injection of purchasing power into the market under normal conditions would have tended to raise the price of all products unless the productive output of industry as a whole were increasing in proportion to the amount of new purchasing power put into the market. The fact that prices of manufactured products have not risen as much as one would expect in view of the increasing costs and the increased consumer demand or consumer purchasing power is an important, interesting, and unusual phenomenon in our whole industrial situation. It indicates the tremendous force of public opinion and of governmental policy that is being applied to industry today to hold down its prices - to prevent it from responding to all of the factors that are making for increased prices - so that its goods will move freely and effectively into the consumer market. Well, that can be done only by the most intensive application to problems of increasing man-hour output in industry, that is, technological development. This itself would make a whole course of lectures which would be of tremendous interest, because there is no one place that I know of where that whole picture, as it exists, has ever been brought together in American industry today.

During the depression period the rate of technological improvement in American industry was greater than at any previous period in our industrial history. It was greater, but much less spectacular. Most of the work was done quietly, silently in the research laboratories of American industry with an eye to the future. Practically all that American industry invested in its future during the depression was invested in that kind of silent technological development. The extent and scope of it we haven't begun to realize today. If that flood of new developments that were put not in process but put on paper during the depression were to be let loose in our industrial system in the next four or five years, my previous assumption

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about the possibility of a rate of increase in business activity from now on during the next four years, similar to that which we have had from 1933 to 1936, would be a gross understatement. We have no conception of the tremendous future rate of growth of American industry that is buried, so to speak, in our industrial laboratories today, or in the desks of our technicians. Mr. Kettering has given you some idea of that as regards the automotive industry, but this is only one of them and perhaps not the most important one. The relative possibilities of improvement in the automobile industry are not of as great total economic importance for the future as the possibilities of improvement in some of our other industries - chemicals, iron and steel, the metal industries generally - that are in process in our laboratories.

One important feature of this submerged technological development that has been going on during the depression is that it has not to do so much with the improvement in the man-hour output of the standardized products of common consumption as it has to do with the development of new products which will have tremendous influence upon the whole standard of living in this country, and will bring to the ordinary American citizen a range of new satisfactions and new conveniences which are now outside of his reach. In that lies the essential point about the possibilities for future industrial progress in this country. Those technological developments certainly would absorb much more than the labor that is released from the older standardized industries with such improvements in man-hour output as are made in these. My apparently fantastic forecast of labor shortage in this country would be tremendously intensified if we were to see these new product developments that are on paper in the laboratories let loose in the world in effective production in the next four or five years.

I now come to my next factor, which is directly connected with all that I have said before. To put those technological paper developments into effective production in our industrial system in the next five or ten years fundamentally implies that we are working under an enterprise system in which people have adequate freedom to apply technological improvements in producing products for distribution, sale, and advertising to the market generally. It implies also free access to a capital market, a market of new liquid savings upon which to finance the practical production of these new technological ideas that are on paper today.

About the first condition I need not say anything. The extent to which government regulation of actual management enterprise in the marketing of new developments may be exercised in the future is a matter of speculation and perhaps personal opinion. I have my own opinion on it, but it would not interest you very much. The second is the more important, concrete and immediate factor that faces industry in this country.

We have had during the depression a practical cessation of the flow of capital into industry. That is, to a certain extent, normal in a depression. There is very little new enterprise, little expansion to call for new capital. But in addition to that we have had imposed upon the capital market a comprehensive system of governmental regulation, exercised through security market control, affecting the flotation of new security issues and also affecting the freedom of the financial management of individual enterprises in determining whether they are going to seek new capital in the outside market. I am not questioning at all the justifiability of those regulations. The only point that I am making is that upon the normal tendency for industry to diminish its call upon the capital market for new capital during a depression and in the early stages of a recovery period there have now been imposed entirely new factors which emanate from governmental sources. The net effect is this. The improvements in man-hour productivity that have been made in the standardized commodity industries in this country through the replacement of obsolescent equipment, the few new products that have been put on the market out of the enormous file of paper ideas accumulated through the research work of our depression period in industry, have been financed almost wholly out of the surpluses, out of the savings of our enterprises which survived the depression. That is to say, this has been a self-financed recovery so far as capital supply is concerned. There has been practically no draft upon the general capital market, the pool of liquid savings upon which industry would normally draw for its progress from now on. That is reflected, of course, clearly in the fact that new security issues other than for refunding purposes, new security issues for new product developments or plant expansion, for replacement of equipment, have been almost negligible and still remain at a very low level.

There is an enormous amount of refunding of obligations of outstanding capital issues going on to take advantage of low interest rates and thereby to lower capital costs upon the existing industrial plants. That is all to the good, but it does not get us very far in the line of progress that we have been used to

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in this country in the past This, I say, is a fundamental factor in the outlook and in the whole industrial trend because, if this industrial system of ours in this country is to continue as an enterprise system, it can grow only if there is a continuously increasing pool of liquid savings upon which it can draw and if it has free access to that liquid pool Not only has its access to that pool been restricted in these ways but the whole tendency of the relation of government to business has been to discourage the increase of that pool of liquid savings itself. That is a very far reaching and fundamental factor in this situation Every line of action which tends to retard, discourage, or to make less remunerative savings of every sort, individual and corporate, is a deterrant to the accumulation of this pool of liquid savings upon which the future progress of American industry depends under the enterprise system.

We have developed an anti-saving psychology in the United States. To put it the other way, we have developed the philosophy of consumer purchasing power, that is to say, of immediate consumption rather than saving We have not only developed this anti-saving psychology, this psychology of spending, public and private, but we have had direct governmental efforts to force the spending of savings that exist In the taxation of undistributed earnings of business under the new Revenue Act you have a very definite effort on the part of the government to force the redistribution of corporate and business savings We must remember that business savings are, after all, the most important basis for future industrial progress. If we examine the course of industrial development in this country during the past hundred years and ascertain the sources from which this industrial development drew its new capital supply, we will find that it was principally business savings and the savings of persons with larger incomes who were able to save much of their income The general mass savings, individual savings, of the country as a whole, have not been an important source of new capital for the development of American industry in the past In attempting to force the dissipation of business savings by specific governmental measures we are striking at the heart of the possibilities of new industrial development and of industrial progress in so far as it depends on private capital supply. If you assume that we are going to replace this pool of private liquid savings upon which industry has drawn in the past by a new source, a source in government's hands, that creates a wholly different picture. You are then passing from the picture of a private enterprise system into a picture of state capitalism or state socialism in which government becomes the capital saving and capital investing agency.

I have now reached the limit of my time, but there are just two points in my outline that I still have to touch upon. One is the final factor of the quality of the industrial management that has to face this picture I have drawn. Let me put it this way. If we were to suppose that American industrial management were gifted with complete and perfect foresight, with unlimited knowledge and ability, and with unquestionable courage, I would say that it could handle these problems that I have tried to describe for you with a fair prospect of success. But industrial management in this country is very human. It has all of the virtues and all of the faults of the ordinary human being. It has, I believe, an enormous and unusual concentration of good will and good intention. That, I should say, is the understanding of American industrial management that has been most impressed upon me during my long period of contact with it - its earnest desire to do the best it can with the materials at hand, with the kind of labor force it has, with the kind of capital market that it finds, with the kind of research talent that it has available, and with the kind of consumers it has, and all of their changing fancies and changing ideas, changing tastes and changing demands. It has a colossal task of adjustment of all of these various factors into an effective productive mechanism which will have a certain degree of continuity and stability. It will not dissipate the capital that has been entrusted to it by its stockholders too rapidly. It never quite succeeds in avoiding some dissipation of capital for its stockholders. It has to build up, or try to develop relations with a labor force that will be fairly stable and effective in the productive organization. Upon all of that today is imposed the further task of attempting to build up some kind of effective cooperation with all of this great range of new governmental influences which have been brought to bear upon its problems. So if it makes mistakes and does the wrong thing from time to time in the future, I think it deserves a great deal of very patient indulgence and sympathy.

I should say that if one were to charge industrial management with any definite defects which it could correct they would be those primarily. First, lack of adequate effort to improve its capacity for foresight. This implies that as a whole American industrial management has not attempted in the past sufficiently, in my opinion, to make the fullest possible use of all of the information about this whole picture surrounding it that it requires for effective foresight - social, political, economic, domestic, and international. Foresight is the fundamental function of management. It has to provide against the future as best it can in handling all of the factors of labor and capital and consumer demand that it deals with. For effective

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foresight it needs the fullest and most comprehensive and reliable kind of information affecting not only its own plant, its own enterprise, but the whole industry of which it is a part, the relation of that industry to all others, to political and social factors in the country and then, of course above all, to the whole international picture. The task of foresight that faces management is a tremendous task, but it is a task that I believe it could do a great deal more to perform effectively than it has done in the past

The second defect that I think can fairly be pointed to in industrial management in attempting to deal with these very complex and difficult trends that I have described consists essentially in lack of sufficient conviction and understanding of its own essential function in our whole economic system. To put it slightly differently, I think that industrial management in dealing with all these problems during the past four or five years has tended to lose a good deal of its self confidence, to lose confidence in the indispensable necessity of its function in an enterprise system, and has been more and more willing to surrender or to submit its discretion on a great many vital points to outside influences of public opinion and of government which, in the end, are bound to be destructive to the effective exercise of the management function. That is to say, management has not, in my opinion, had a sufficiently clear and definite comprehension of the nature of the enterprise system in which it functions, of the conditions of effective functioning of that enterprise system, and of the indispensable part which it has to play in that enterprise if the system is to work effectively

Those are very general remarks about management, but I think if you keep them in mind in face of the kind of picture that is developing in this country today their concrete application will become more and more apparent to you as time goes on

I think it would be both wise and agreeable to you if I stopped at this point and let you ask some questions instead of indulging in any more prophecy and forecast.

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General Tschappat I would like to ask, Dr Jordan, what you think of some some extensive system of education for these labor forces? Could not some of these problems be overcome if industry

and management instituted some system by which they would get together in the way of training the labor forces? I understand that during the depression a great many mechanics and the workers in the metal trades failed to get the ordinary training which they had gotten previously so that after the depression as business picked up there was a great lack of machinists, and other mechanics, in the metal industry. Not only in this technical training but in other kinds of training, I wonder whether some system of education or get-together between management and labor force would be of advantage?

A You put your finger on a specific failure of management during the depression period. It has some excuses in lack of resources and otherwise, but it is definitely true that in great part the extreme shortage of skilled labor, in the metal working industry particularly, that we face today is due to the abandonment of effective occupational training plans and systems in those industries, as well as others, during the depression. I think management is becoming more keenly conscious of that. Our own surveys now under way indicate that industrial training programs to meet that problem of labor shortage in specific occupations are moving rather fast.

The broader aspect of the educational problem that you touched upon is, however, one that I think management has fallen down on more seriously. It has entirely or almost entirely neglected in the past effective effort to draw its own labor force into closer contact, intercourse, and cooperation with it and to build up in that way better understanding of the whole nature of our economic system and of economic conditions in general. We have only begun to think about this in American industry since the depression and we have lost so much time in the past that efforts to make up for that loss of time in a short while have in many cases been abortive and unwise and have had the opposite effect to that which they were intended to have. This is a long-time problem to which management needs to give very serious thought. After all, the only effective way in which the labor force as a whole can be brought into real cooperative relationship to management under an enterprise system is through the direct contact which the individual management in the individual enterprise has with its own labor force. Any general large-scale projects of mass education of workers, or of the public as a whole, are a broadside, shotgun type of thing that involves an enormous amount of waste motion and in many cases a terrific rebound that has very unfortunate effects. The more specific and direct the effort is to bring the labor force in the individual enterprise into contact with management the more effective I think it would be.

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General Schull. Dr. Jordan, I would understand from your lecture that you think this increasing shortage of labor is practically inevitable, traceable partly to the population condition that we are approaching and also to such technological improvements that have been made and may be released as time goes on. That is really an inevitable proposition under any consideration?

A. Yes.

General Schull: Take for instance a country like France that has had a static population for three or four decades, it some how or other has managed to maintain its economic and industrial position. I am not familiar enough with that condition to say how, but some how or other they have adjusted themselves to a static population. We will have to do that same thing, I presume, and whether it will mean we will lose our present eminent position industrially or not I do not know, but perhaps you could say a word about it.

A. It means inevitably a slower rate of growth unless you have a type of management in your industries that is able to offset the static labor supply by a sufficiently great rate of increase in technological efficiency so as to maintain the average annual rate of increase in general business activity and the rise in the standards of living which we have had in the past. In France, generally speaking, they have not had that type of management, by comparison with what we have had in the United States, and the rate of growth in France, of industrial growth, of growth of production and trade and the rise in the standard of living, have been relatively slow as compared with other industrial nations. They have had a labor shortage condition in France for a long time because of their static population. Their tendency has been to meet this shortage by the temporary importation of labor on an increasing scale from other countries, which I do not think has been a very satisfactory way of dealing with that problem.

In this country our rate of technological progress has been the highest of any country in the world. That is, the average annual rise in productivity per man hour, as far as we can measure it, has been higher than that of any country known in the past. To maintain that is going to be an increasingly difficult thing, especially with the tendency toward shortening of work hours and dilution of labor. The inclination of labor effort to slacken off, quite apart from governmental influences, creates a technological problem to maintain the average annual rise in

production, of trade, of three or four per cent, characteristic and persistent in American industrial history for one hundred and fifty years. To maintain that growth from now on is going to be an increasingly difficult problem, especially because of the increasing shortage of labor.

General Westover Dr. Jordan, do you know to what extent the apprentice system has been applied in industry in Germany in recent years? We know that during the period 1922 to '25 a great number of apprentice schools were in existence there to maintain what they called "the training of skilled people in industry " Do you know whether that was continued and whether it has contributed to the remarkable growth they are having?

A. I haven't the latest up-to-date information on that. A member of our Staff went to Germany recently to make an investigation of conditions there, has just returned, and I have not seen him since he came back. My general understanding, from our contacts with our industrial correspondents in Germany, which includes some of the executives of the principal concerns in Germany, is that under the Hitler regime that apprentice training system has been completely changed, for it has been substituted a mass of schools or camps for occupational training under government auspices, which have partly political purpose as well as the purely industrial purpose of occupational training

Captain Puleston Dr. Jordan, do you think there would be better agreement between management and labor if the factories were smaller and management saw a little bit more of the men? In many of these enormous plants labor has no feeling of loyalty at all and the men look to the labor organizer for his orders rather than to his immediate foreman

A. I am might glad you raised that point Captain I intended to mention it but forgot In dealing with this problem of labor shortage, labor supply, and the effective administration of labor, ten years ago in American industry, before the depression, management was foresighted enough to see that some effort toward decentralization of industrial operations would be necessary That was very rare foresight, too. Some steps were taken in that direction in some industries that were effective, for a number of reasons As regards labor supply itself, through decentralization there is some prospect of relief because you come nearer the sources of labor supply that are not ordinarily touched in the great concentrated industrial centers. The movement from country to city that has been going on for a long time is relatively slow, and it is very

helpful if industrial management tries to meet it or to get ahead of it by going out into the country with its productive operations. That has begun to some extent.

The difficulty lies in technological factors. We have developed our characteristic mass production industries on a basis which involved in the past great concentration of operations, either in relation to raw material supplies or by bringing together different operations into a continuous chain process, which is the essence of productive efficiency. If we are going to decentralize we are faced with the problem of making our technological improvements on a wholly different basis. Just what that will be is a problem that I do not believe many people in industrial management have seriously considered as yet. You have assembly plants in your automobile industry assembling a great range of products that are manufactured over a widely scattered area, but you still have your assembly plants and they are gigantic, large-scale operations in highly concentrated industrial centers which are ripe fields for labor difficulty. Unless in some way you can eliminate that bottleneck, that key to a whole industry which is vulnerable to labor attack, you have not gotten very much farther along in solving your problem. In my opinion, the decentralization of industry is one of our biggest management problems in this country today, and it involves not merely social and financial factors but technological ones that we have not begun to study adequately yet.

Colonel Van Nostrand: I am very much impressed with the way a very complicated subject is being cleared, but I am wondering through this long trend view whether the speaker can reassure us on the subject of eventual abdication of a theory of management and liquidation of an enterprise system?

A. You have got hold of the wrong man to answer that question. I have unfortunately, as the Colonel will testify, acquired a reputation of being a kind of Cassandra in this country during the past four years on that point, but I think that perhaps the best answer is to put it this way. If we take the equations that I have set down on paper, with all of those factors in them -- particularly the large function of government -- and just look at them as equations and solve them, there is only one mathematical answer to them. We have actually established in this country a practically complete mechanism for the transformation of our private enterprise system into a system of state capitalism, a mechanism which is set up and which has begun to operate and which will operate, in my opinion, gradually, irresistibly to grind up

the private enterprise system, to dissipate private capital, to gather private capital resources gradually into the hands of the state and establish a complete system of state capitalism

That, as I say, is a mathematical certainty. There is upon close inspection, however, a large unknown quantity in those equations, an unknown quantity that really prevents the effective solution of these equations. That unknown quantity is the quality of character of the American people, and any one who attempts to describe that is undertaking too large a task at this stage. I think we are too early in the process. This whole trend has come upon us too quickly to be able to judge the extent to which the American people as a whole, by temperament, by psychological characteristics, will allow itself to be brought unconsciously into a great state machine of that kind. That is the big question mark. There are times when I am very pessimistic about that unknown quantity and am inclined to feel that perhaps the quality of our population as a whole, its independence, sense of personal responsibility and integrity, its inherent energy and ambition, have declined through biological processes so that it can be absorbed into such a gigantic machinery of state socialism or state capitalism without any difficulty I do not know. It all depends, in my opinion, upon that. So far as the machinery is concerned, so far as the equations are set up, they are pretty definite and clear.

Colonel Jordan. I want to thank you on behalf of the School, sir, many many times for coming down here and giving us such an interesting talk.

Dr. Jordan. It has been a great pleasure.