

RESTRICTED

1381

MACHINE TOOL INDUSTRY

7 March 1949

CONTENTS

	<u>Page</u>
INTRODUCTION--Lieutenant Colonel Frederick A. Henry, USAF, Faculty, ICMF.....	1
SPEAKER--Mr. L. D. McDonald, President, National Machine Tool Builders Association.....	1
GENERAL DISCUSSION.....	13

Publication No. 149-97

THE INDUSTRIAL COLLEGE OF THE ARMED FORCES

Washington, D. C.

RESTRICTED

RESTRICTED

1893

MACHINE TOOL INDUSTRY

7 March 1940

COLONEL HENRY: Gentlemen, during the seven weeks you are assigned to the Production Branch course your studies would not be complete without a full consideration of the "Machine Tool Industry." It is the very heartbeat of production. It is true that by the forging of iron, steel, aluminum, and other metals and by long and painstaking methods of cutting and forming, we could come up with something presentable and useful. But mass production lies with the machine tool alone for both quality and quantity. You have to go back only to the early days of the automobile and compare the earlier models which we saw on the screen here Friday, with the beautiful streamlined cars of today. The designers deserve great credit, but the secret of interchangeable and duplicate parts lies with the machine tool alone.

During the past five years the College realizing the importance of the machine tool industry has included in its curriculum studies of that industry, either by lectures, seminars, or student reports. This year is no exception, our speaker today is not only the President of the National Machine Tool Builders Association, which has aided us greatly in our studies in the past five years, but he is considered an authority in his own right; he is also Vice-President of the Warner & Swasey Corporation, Cleveland, Ohio. I am sure his remarks will give you a most realistic approach to this phase of production.

Gentlemen, I take great pleasure in introducing to you Mr. I. D. McDonald.

Mr. McDONALD: Thank you, Colonel. I feel a little bit like my son in 1941, when he got his only furlough in three years of Army service, and when by dint of a long distance telephone call I got him on a streamlined train out of Portland, Oregon. He had an upper berth over a captain in the Military Police. So this poor little back private was surrounded entirely by Army brass. That's how I feel this morning.

The interesting part of it was that there was one lone civilian on the train. He was the only person this poor little boy could talk to. He had a grand time with him until they were a few hours out of Chicago and then everybody on the train woke up to the fact that he was Eduard Bones of Czechoslovakia. I know I feel this morning about the same way he did.

I feel that it is a great tribute to the machine tool industry that you gentlemen have taken this small but vital industry as one of the

RESTRICTED

RESTRICTED

1504

objects of your study. All that I can say to you is what comes out of 30 years of living in the machine tool industry.

You know, once you become a machine tool man, you are always a machine tool man. There is something about it that gets into your blood. I don't know whether it is the satisfaction that you get out of creating things and then having them built, seeing them run and function, or not; but I think that has a great deal to do with it.

There are today 300 machine tool manufacturers in this country, making about 221 different kinds of machine tools. Of each of these 221 different kinds of machine tools there are all sizes. So you see that when you speak of machine tools you are speaking of a very complex industry.

We now have the JALMART reserve. We also have munitions plants that are equipped for the production of airplane engines, airframes, and weapons of various kinds; and yet one little change in any of these items will necessitate the purchasing and installation of new types of machine tools, because the job has to be done in a different way.

The machine tool industry is made up of very small companies. Probably the average company would have 150 to 200 employees. For the most part they have been founded and are being run by a very individualistic and competitive-minded group of men. There are actually some machine tool builders that hardly speak to others making the same type of machines.

Now, those 300 companies compete vigorously for a total yearly volume of business that would be a rather small monthly volume of business for any one of a number of the large corporations in this country. And yet that one industry--remember, I speak with the bias of a machine tool man--that one industry is the most vital industry in this country. It is vital because it is back of our whole standard of living, and it is back of our ability to defend ourselves.

We are much impressed by the loaf of bread that the housewife buys in the corner grocery. It is fine bread, wrapped in waxed paper and already sliced. But nobody thinks of the fact that the wheat that went into the bread was made possible by the tractor, that the milling machinery that milled the wheat, the reaper that reaped it, the machine that sacked the flour, the train that hauled it, the trucks that distributed it, the bakers' machinery, the very slicing machinery and wrapping machinery, are all dependent upon machine tools. Two or three or four steps back of the everyday market stands the machine tool. It is that one industry that has made possible the standard of living

RESTRICTED

which is typified by the loaf of bread that you can purchase in the corner grocery at a price of eighteen cents a loaf.

Now, many people think of the machine tool industry as being the generator of the mass-production industry. There is no question that it is. But let me say this: The mass-production industry may be the backbone of America's standard of living, but the real secret of its power is the ability of the machine tool industry to make machines that will make accurate duplicate parts whether they are made in twos or in millions. That is the secret of American manufacturing superiority, not necessarily mass production. It is the alley shop that can do the same job, the parts which the "gyp" parts maker can make for a Chevrolet car that will fit a Chevrolet car. That is the secret of American manufacturing supremacy which so many of the foreign visitors do not comprehend. They talk about the great mass-production industries and they go to Detroit, to the automobile industry, to see what American manufacturing methods are, when actually they should go down some of our back alleys and see these multiple spindle automatics, turret lathes, milling machines, engine lathes, and grinders, all tooled up to produce parts accurately. That is the secret of America's manufacturing supremacy.

What is the machine tool industry's secret of growth? The American machine tool industry's secret of growth is the fact that none of us are ever satisfied with our present machines. We were having a little discussion before we came up here this morning and someone related the story about the old southern general who bragged that the Rebels could lick the Yankees with corn stalks. After the war was all over he was asked why they didn't beat them with corn stalks. He said, "Because they didn't fight with those kinds of things." Actually the real genesis of the machine tool industry came during the Civil War, when the North found out how to produce rifle parts so you could take down a rifle, get a new part and put it in, and it would fit. That is where the machine tool industry started. We have learned a number of things in the machine tool industry. One of the major things is that we must constantly progress.

In talking with one of the President's advisers the other day, I was asked what the future prospect for machine tool prices is. I told him, "They are going up." He said, "Won't machine tool prices come down?" I said, "No, not by and large they won't, because the machine tool industry is so competitive that we always design up to a price." We don't cut prices to acquire markets, because the surest way to ruin a market is to start cutting prices. A man doesn't buy machine tools because they are cheaper; he buys machine tools because he has a job of work to do. If he thinks that the machine tool design is pretty stable and prices start to shade a little bit, he says, "Well, I can

# RESTRICTED

1890

get along with my old machine tools a little longer until I can buy them cheaper." So I think the machine tool industry after 1921 learned its lesson, that is, that it is fatal to the market for the makers to cut prices.

I said a moment ago that the machine tool industry was born during the Civil War. It is a very interesting thing that the greatest progress in machine tools comes out of a war. Actually many people think that the machine tool industry is a "war baby." It isn't. But in a period of national emergency two things happen. In the first place, during a war the things which users have long wanted to do about their machine tools, they are compelled to do. In the second place, after a war the machine tool industry has money enough to do those things it would like to do. I say that perfectly frankly because of the very vital and important part that the machine tool industry plays in the economy of this country, both in peace and in war.

Mr. Hitler recognized the vital necessity of the machine tool industry. As early as 1933 he took measures to stimulate the machine tool industry in Germany, because he knew that he had to have it to fight a war. We have to have a machine tool industry in this country to win a peace.

The machine tool industry, by and large, is a mature industry today. In other words, the principal functions that a machine tool should perform have been accomplished. New machine tools today are born of a combination of known principles. Somebody finds a way to put two or three of these functions together in a new machine tool, and a new machine tool company is born.

Probably the most essential element in the machine tool industry today is the core of skilled men which it has. As far back as I can find any record, the machine tool industry has trained its own men. Probably the first companies to have an apprenticeship training course were the Brown and Sharpe Manufacturing Company and the Pratt and Whitney Company. Wherever you find a machine tool company of any substance at all today you will find that it has its apprentice training course, out of which come its skilled mechanics and its supervisors.

Let me give you an example of what I mean by the necessity for trained men. We have been going through our plants installing new standards, and among them are standards for finishes. Suppose we have a cast-iron wearing surface. You know it has to be spotted with a scraper. You have seen the beautiful design on such wearing surfaces. For certain types of bearing surface we must have a certain number of those little dark marks to the square inch. It is the manual skill and the knowledge of the men who know how many of those little spots they have to put in the square inch that are essential in our work. It is the skill of the man that makes it possible, when he is given a sample, to reproduce the right number of bearing spots on each square inch of surface.

# RESTRICTED

Then the skill of the man also comes in in preparing the surface to be scraped. We discovered that we had difficulty in our scraping department because our planer hands were a little too careful in their work. The scrapers said they couldn't produce these surfaces. We went back and found that the planers were so conscientious in their work that they were taking a rough cut, a finishing cut, and then another finishing cut. What happened was that in the third finishing cut the little fine pieces of metal that were sticking up on that surface, the little pieces of roughness, were actually being peined over the surface. The planer hand was very conscientious, he was a good planer hand, he was producing a good surface; but the scraper hand would say: "Now, wait a minute. I have to have those little rough points in order to furnish a place for me to work."

That is an example of the type of men that we need in this industry. They are vital. We may have all the engineers, we may have all the managers and production experts we need, but back of them we must have that backbone, that hard core, of skilled workmen. That is the only thing that made it possible for this industry to do the job that it did in World War II--the fact that we had that core of skilled workmen that we could use, expand it and create a larger organization around it.

Over the years the machine tool industry has attained pre-eminence in world markets. Everywhere you go you hear of American machine tools. Foreigners come to this country to see our machine tools. The reason for that pre-eminence is very simple. In the first place, in this country we have the greatest single homogeneous market for machine tools in the world. The American market was one thing that created the American machine tool companies.

But it is not only because there was that great homogeneous market. It is also because the American people themselves have enough of that pride and adventurous spirit so that they will say: "Here is something better. Let us try it out." They are willing to gamble on selling the product it manufactures. That is the other thing that has created the American machine tool industry.

We have just finished a war. The countries abroad realize how handicapped they were in that war because they didn't have a great machine tool industry. Remember, the North won the Civil War because it learned how to make parts of a rifle that would easily fit together. We won World War I in part because of American manufacturing capacity. We won World War II partly because of American manufacturing capacity. These countries have seen that and they realize that back of it all is the machine tool industry; so they are all anxious to create machine tool industries of their own.

RESTRICTED

1950

That means that we have growing foreign competition. Over the past years when the demand for machine tools went down we could increase our foreign sales, and then, when the demand came up again, concentrate on our domestic market, offering our overseas customers longer deliveries. By and large this industry has sold, over a period of time, about 25 percent of its output in foreign countries.

Every foreign country that has a germ of a machine tool industry is trying to get all the machine tool business it can for its machine tool industry; each of these foreign countries realizes how dependent it is upon its machine tool industry. Today we find that over 50 percent of the requirements for machine tools that are directly or indirectly financed by the Economic Cooperation Administration are being built in foreign countries. We find that machine tool manufacturers in other countries--Italy, Britain, France--are in many cases making actual Chinese copies of American machine tools. They have even gone so far as to copy the mistakes that we made. They are trying desperately to establish a machine tool industry in each of their countries.

Britain always had a machine tool industry, which was about a third the size of ours; but the British machine tools have been exported to countries where the cost of labor didn't mean very much. By and large their machine tools were functionally all right. I am familiar with the turret lathe and keep using that as an example. Let me illustrate. You have a workman and he has to take hold of a turret lathe like this (demonstrating) and index it by hand. On a British lathe you have to actually put effort into it and pull it around. When you crank the cross slide, as we call it, you have to actually work at it. You can operate an American turret lathe by simply slipping it a certain way. The British machine tools are all right, but they are also limited in range, because they have been built to a price to sell to the colonies.

England is going ahead with her machine tool industry; so are Belgium, Switzerland, Italy, and Sweden. All these countries are going ahead, and we are going to find that they will compete in the American market, because they realize that in the American market is the key to a sound machine tool industry. We are not particularly afraid of them. The thing that we are a little bit afraid of is the fact that we are losing all of our foreign dealers, because they are not allowed dollars with which to buy our machine tools. Our dealers abroad, who have represented us in these countries for generations, are being slowly starved to death. These countries are subsidizing their machine tool industries. Britain today has an insurance plan against credit and exchange losses. The American machine tool builder has a difficult time trying to get any financing for machine tools through our own Export-Import Bank.

6

RESTRICTED

What are some problems of the machine tool industry today? In 1942 this industry produced 307,000 units. In the year 1948 we produced between 40,000 and 50,000 units. In the face of that shrinking volume we have all the labor pains that every other industry has had. We have rising costs. Labor rates, for instance, in machine tool plants are up anywhere between 85 and 90 percent over 1939. Material costs are up about 50 percent and overhead costs up about 140 percent. Machine tool prices on an average have arisen between 65 and 70 percent since 1939. So the machine tool industry is literally fighting for its life. We have tried to do all kinds of things to offset this shrinking volume. The thing which seems to me as being rather detrimental is the fact that machine tool companies are making everything under the sun today, from pocket knives to earth-moving machinery, and the brains and the ingenuity that should be providing the machines of tomorrow are going into that kind of production.

What has happened? After we had finished our war job in 1943, you asked us to build other things, which we did. Shortly thereafter the war ended and the great demand for all kinds of consumer production hit the automobile companies, the washing machine companies, and so on. There was a great expansion of plants and manufacturing capacity. There was a tremendous war surplus of machine tools in the hands of the Government. That surplus was not released in volume until 1946, and the machine tool industry got quite a shot in the arm because of the urgent demand that had to be filled in the meantime. But by the middle of 1946 the roof was falling in. The Government finally sold machine tools at between 18 and 20 percent of the cost of similar new machine tools. The machine tool manufacturers' market was pretty well washed up.

We don't complain about that, because we know that war is waste. The things that are manufactured for war are waste. But one thing that is manufactured in great quantities in war which has a tremendous residual value for the economy is the machine tools that are built, because they go on producing year after year after year; and they have the capacity to bring up the standard of living of the country. The prosperity of the golden twenties was brought about because of the productive capacity that was created in World War I. That is why I am not fearful about the fifties--because this tremendous productive capacity has been spread out all over the country. The individual machine tool companies won't profit, for studies that I have made of my own company indicate that it was 15 years after World War I before we came up to the general level of industrial activity. We are not complaining about that situation, but we are working hard to overcome our problems. Right now because of the combination of these various circumstances I have 1,800 men out on the bricks in Cleveland, because we could not accede to their demands for higher wages.

RESTRICTED

1870

We worked with the Army and Navy and there was finally created the JANMAT reserve. We felt there should be a reserve of machine tools held for a national emergency. There is such a reserve today. I think a reserve of something like 162,000 machine tools has been authorized. There are probably something like 130,000 of those tools in the warehouses or "tagged" to be sent there.

These reserve machine tools constitute competition for us in the postwar market. Somebody in the Army or Air Force wants a machine tool. Instead of leaving that in the reserve, it is hauled out of reserve and the machine tool manufacturer doesn't sell a machine tool.

Those things, combined with the loss of our foreign markets, have created the problem that we have in the machine tool industry today. The problem in the machine tool industry today is one of gradually coasting downhill. There are machine tool companies today that are operating four days a week, that have laid off these skilled men of theirs clear back to men of 15 years seniority. Those are the companies that have not gone into the pocket knives, the road machinery, and the agricultural machinery business to hold their forces together.

Our greatest problem is the problem of selling industry on its need for replacement. Actually, you may say that we have three distinct markets. It is a simple thing to sell in two of these markets. As I look at the markets, you have one market up here, which is not too large, which is to replace the machine tool that just won't do the job any more. It is easy enough to sell that fellow. Then we have here the company that starts out in a new business or invents a new product which requires an addition to the capacity of its plant and they just have to have a new machine tool. It is fairly easy to convince him that he has to buy that new machine tool. But the third market is the big market of cost reduction and the replacement of obsolete, and therefore wasteful, machine tools; that is the problem of the machine tool industry today--to convince American industry of the need for replacement.

You try to sell a man a machine tool today and he says, "Well, for heaven's sake, I bought my present machine for \$2,500 and now you want to sell me one just like it for \$4,200." You see, the impact of inflation has finally got into the capital accounts of those manufacturing companies. The grocer with his shelf of goods can get the entire cost of the inventory out of his selling price. He prices his goods so he can go into the market and buy that inventory over again and replace it. The machine tool inventory of a manufacturer is used up in the manufacturing of his products, just the same as the material he is using; but when it comes to replacing that inventory of machine tools, he suddenly finds that over 20 years he has not accumulated replacement funds to match present-day prices, because when he wanted to put enough of that cost into his reserves to do it, the Treasury

RESTRICTED

Department came in and said: "Whoa, now, you can't do that. You can take only 5 percent of that."

Today one of the biggest obstacles to creating an up-to-date plant in America is the depreciation policy which is followed by the Bureau of Internal Revenue. I hope there aren't any members of the Internal Revenue present, but I would tell them that anyway. Then what happens when a manufacturer wakes up to the fact that he hasn't enough dollars laid aside to replace his machine tools today? It means that he pays a tax--today it is a very heavy tax--on the additional dollars he must expend.

But suppose he says: "In spite of that I am going to take some of these dollars and put them aside"; and he accumulates a reserve, which he funds--he puts money aside also equivalent to that reserve. When the Internal Revenue Department comes in and says: "Didn't you ever hear of Section 102--Improper Accumulation of Surplus? You should have only so many hundred dollars in cash put aside here." He says, "I want to replace my plant." "Well," they say, "you haven't replaced it; so we will assess a penalty."

Manufacturers are very much afraid of those penalties; if the manager of a company ever gets into a position where a penalty like that is assessed, the directors can be held liable to the stockholders, the very people that would like to have had that money in the first place in the form of dividends. So the manager is caught on the two horns of a dilemma. If he doesn't accumulate the money, he can't replace his plant. If he does accumulate the money, he is liable for stockholders' suits or penalties. It is not a very happy situation in which to be.

We are not too downhearted about the whole thing. We have overcome many of these problems in the past, and we can overcome them again. There is some indication that some foreign business is going to come through to us. I believe there has been about 30 million dollars of that since the beginning of this government fiscal year, which is a little better than half of the allotment that will come to this country. Apparently next year we will have about 50 percent more, or \$75 million in the fiscal year beginning July 1949.

But that is only a drop in the bucket. The machine tool industry today has a capacity of one-half its wartime peak. That is physical or plant capacity. Its actual production is running today about 40 percent of its present physical capacity. During the war we toolled up in our plants so that we could take colored women--I know we did in the case of our plant--from the deep South who had never had shoes on their feet until they came into our plant, and we taught them to produce parts accurately and well. Today much of that tooling has been dissipated.

RESTRICTED

We have shrunk down every operation so that we are depending more and more on this hard core of skilled workmen. So today the machine tool industry has a possible capacity of about one-half of its wartime peak.

There are a great many things that the machine tool industry can do. One of the most important things that people talk about is the new techniques in the industry. There are these wonderful new metals-- I think they are actually alloys--that we use for cutting tools.

People talk about machining aluminum at ten thousand surface feet a minute. I have seen aluminum turned at ten thousand surface feet. I have seen forged steel turned out at unbelievable speeds. But that doesn't mean so much, and I will tell you why. I will illustrate in this way:

Not long ago I had to go to Detroit in a hurry. I left my office and drove downtown, which took me about 15 minutes. I parked my car. That took about 20 minutes. I got in a limousine and rode 45 minutes to the airport. I got there 20 minutes ahead of plane time. I had my bags checked and got on the plane. Then I rode on the plane for 40 minutes and I was in Detroit. I waited 20 minutes for my bags. It took me 50 minutes to get downtown in Detroit, with another 10 minutes in the taxicab to get to my destination. Now, when you talk about machining aluminum at ten thousand surface feet a minute, you could compare that with the 40 minutes that I was in the air. If you could take me over there in a jet plane in 20 minutes, at a saving of 20 minutes of flight time, how much would I have saved on the whole trip?

The real problem in the machine tool industry today is to take the greatest advantage of these new cutting media. There is a critical point at which a higher cutting speed doesn't gain you very much. For instance, if you were machining a piece of aluminum bar and you had to take a cut two or three inches long, how much could you save by machining it at the rate of ten thousand feet a minute over, we will say, two thousand feet a minute? It is just "zip" and it is done. But the workman has to pick that piece up from the floor. He has to load it into his chuck. He has to start his machine up. The time of starting up the machine and getting it to speed is more than the time taken in making the cut. Then he has to stop his machine. He has to take the piece out and put it back down on the floor.

There is a field for improvement in machine tool design. Machine tools are capable of using any cutting media that you can put on them. They always have been. Machine tools started out with carbon-steel tools, then they went to high-speed steels, then to Stellite and the new tungsten carbides, and to industrial diamonds. Machine tools are capable of using all of these cutting media to advantage. But the emphasis in machine tools is on ease of operation, on accuracy of index,

RESTRICTED

so that you can make parts that are interchangeable in the shortest possible flow to flow time.

Again I talk of my own company. We had an exhibit at the machine tool show at Chicago, a large machine with Stellite tooling that could be indexed and would repeat-index with an accuracy of two-tenths of a thousandth, fourteen inches from the face to the turret. It is these developments in automatic machines that will produce parts so accurate that you don't have to have secondary operations. Also, we can build transfer machines that do away with handling in-between operations.

You may say, "Electronics has made quite a lot of progress." But there is only a certain field into which electronics will fit. Just to find out what that was, we took three types of machines, all of the same size. One was the standard or geared head machine, the next was a semi-adaptation of electronics, and the third was a full adaptation of electronics. Putting a skilled operator on these three machines, we found that the skilled operator could produce nearly as much with the standard geared head machine as he could with this fully electronics-equipped machine. The difference in price on the machines was almost 100 percent.

Let me come back again to what I said about the machine tool industry making its greatest progress in wartime. The reason is that the industry during war has money with which it can just go simply wild on design. There is nothing we love better than to turn a whole group of engineers loose and say, "Boys, dream up the machine tool of the future." But one size of turret lathe, when they have dreamed it up, costs us anywhere from \$300,000 to \$500,000 to tool up.

I say this frankly because I think some people in Washington realize that it is a matter of principle with me. If there had been renegotiation of contracts in the Civil War, you would not have had a machine tool industry.

What did you get at Chicago at the machine tool show? There were some grand machine tools there. I will tell you what you got. You got interim designs. You didn't get the last word in machine tool design. Here was an industry that was willing to gamble 4 million dollars to try to bolster a fading market. No, you didn't get the last word in machine tool design. I can tell you that. When the machine tool industry can afford to turn these batteries of engineers loose and can afford to tool up the results of their design, you will get machines of which you never dreamed.

# RESTRICTED

1971

What about mobilization? We have Emergency Production Schedules. I would like to suggest to you, gentlemen, that in the case of an emergency they may really be phantom orders--ghosts of what might have been done.

Remember, the machine tool industry is sliding downhill. It is just like a locomotive with the fires banked. You cannot expect that locomotive to pull a 100-car train up the hill until you have rekindled the fire and got up a load of steam. We are shrinking our operations. We are abandoning facilities that made it possible to produce in volume. The skilled workmen that we have trained are being dispersed. And it takes anywhere from four months to a year to build machine tools under ordinary circumstances.

What happens if there is a sudden emergency? We found in World War II that the most precious thing is time--and we will find that true if another war comes. The only way that the machine tool industry can again pick up its load, if we are fortunate enough, is to have enough time to build the fire in the locomotive and get steam up. England started its defense program in 1936. The French were a little later. The Japs started their war program in 1937 or thereabouts. All of these countries turned to us for large numbers of machine tools. That was the thing that furnished the coal and furnished the steam; so that when the emergency finally broke, the machine tool industry was already under a considerable momentum in this country, or we could never have accomplished the job that we did. And actually it took three years to really get the job done.

I don't know what the answer is. All kinds of plans have been laid. One of the men who will be here this afternoon, I believe Mr. Herbert L. Tigges, has given of his time to come down to Washington to work out a skeleton organization of a new machine tool division in the National Securities Resources Board which is to be staffed with machine tool men if an emergency arises. You will find that the industry has lots of men who are truly patriotic and willing to do anything they can to help.

But let us be sure that if we plan this time, we don't do as we did the last time. I well remember that in the early thirties and in the late twenties there were many machine tool executives who came to Washington and they worked out some mobilization plans; but when the emergency of World War II came, those plans were completely scrapped. Take these men who know the job and know how to do it into your confidence and use them. They will give freely of their time and experience.

This industry above all hates to see a war, because it knows that inevitably it is called upon to do things which we know are fundamentally

RESTRICTED

wrong for the industry. We know we will have to go on a production spree. We are just like the fellow who has to go out and get drunk when he knows full well that he is going to have a headache afterward.

What this industry would like above anything else is a national policy that would make an arsenal out of every manufacturing plant in the country, not a graveyard. If we had a national policy that would encourage manufacturers to get rid of the old "crocks" that they are using today and replace them with up-to-date machine tools, you would not have to wait three years the next time to get the machine tools that you vitally need for war production. They would be there in place. That is what the machine tool industry wants. It wants manufacturing plants in the country capable of doing the job of war production if it is necessary. Then you won't hear about bottlenecks in machine tools.

And let me say again, "Use these men in the machine tool industry." This is an odd industry. It is different from any other industry in the country. Use the men who know the industry, who know how to get things done in the industry. Remember what I said about my son's experience. You may find an Eduard Benes. Thank you.

COLONEL HENRY: As I said in introducing Mr. McDonald, each year the National Machine Tool Builders Association has honored us with its president, who is an elected officer, to address us. We certainly appreciate the caliber of men who have been presented to us.

Any questions?

QUESTION: When you made the statement that there are only 221 different kinds of machine tools, I lost track in my mind of what a machine tool is. What is a machine tool?

MR. McDONALD: Let me give you the definition that we use. A machine tool is a power-driven machine, not portable by hand, capable of removing metal in the form of chips.

QUESTION: We have recently reached an agreement with the British on a standard thread. Has that affected the machine tool industry so far as producing more machine tools is concerned, or in modifying the old ones?

MR. McDONALD: I don't think it has affected the machine tool industry in this country at all. Is that correct, Mr. Berna?

MR. TELL BERNA: We may have to buy some gauges. That is about all.

# RESTRICTED

2173

QUESTION: What quantity of machine tools are being shipped to Russia and the other countries behind the Iron Curtain now?

MR. McDONALD: Now? None. That is very easy to answer. There were eight million dollars worth of machine tools on the floors of the machine tool manufacturers a few months ago that had been denied export permits. Those were there as a result of contracts that had been taken at a time when we were very good pals with Russia. You know, you can't build machine tools overnight. About the time these machine tools were finished I understand a gentleman got up on the floor of Congress and accused us of shipping machine tools to Russia to increase her war potential so the export permits were denied. Some of those tools have subsequently been sold to ECA nations. I happen to know that there are still some of them, about six million dollars worth, on the floors of the machine tool manufacturers. We would like to get rid of them if you can use them.

QUESTION: You mentioned that in 1946 the roof fell in, when the Army or, rather, the Government, started getting rid of machine tools at 18 to 20 cents on the dollar. What is the industry's idea as to the proper action after a war, not what they would like, but in the long-range national interest? What is the proper action or a proper action?

MR. McDONALD: First--and I emphasize that it should be first and not last--this country should have a stock pile of machine tools. It should have in that stock pile not only the standard universal-type machine tools, but it should have those machine tools that are special for war purposes and difficult to produce. Some of those I know went into the scrap pile.

It should then recover for the benefit of the Nation as much as can be recovered in an orderly liquidation of that surplus. The industry does not object to that at all. Does that answer the question?

QUESTION: Yes, except I am a little curious as to the latter part. Would you suggest that the surplus be turned back to the machine tool industry at a reasonable price for you to dispose of, or just how would you handle that?

MR. McDONALD: There are all kinds of theories on that, all kinds of plans that have been suggested. The one plan I didn't hear suggested this time was one that they put forward at the end of World War I--that we load them on an obsolete battleship and take them out in the Atlantic and sink them.

I think a great deal more might have been gotten for the public and for the country as a whole if a quantity of these machine tools

# RESTRICTED

# RESTRICTED

1077

could have been channeled back to the original manufacturers and there rebuilt and sold not only here but abroad. I think the orderly liquidation of these tools, if they can be preserved for such orderly liquidation, is probably the best thing to do, rather than dumping them at a fire sale.

QUESTION: You mentioned that a number of foreign countries are subsidizing their machine tool industries. In view of the alarming shrinkage of your volume in this country, do you feel that some sort of subsidy should be initiated here?

MR. McDONALD: No, sir. A subsidy is the last thing the machine tool industry wants.

QUESTION: What is the status of the apprenticeship programs in the various machine tool companies?

MR. McDONALD: Apprenticeship programs have been maintained. As a matter of fact, the National Machine Tool Builders Association has just published a new manual on apprenticeship. It is a very important part of our operation. We do maintain our apprenticeship schools, and we maintain as many boys in them as we can. There are some union contracts that limit the number that you can have. For instance, they say "you can have in any department not more than one apprentice to each ten workers," and so on. But we are definitely promoting our apprenticeship schools.

QUESTION: You spoke of a national policy. What will it take to implement that policy? Would it take something besides this change in the taxing structure that you mentioned? Also how far will our present stock pile of machine tools go toward taking care of the period before the machine tool industry could get into production in the event of an emergency?

MR. McDONALD: In answer to your first question, I think that a realistic approach to the problem of depreciation and of reserve could accomplish about all that is needed to create an arsenal out of every plant. All we have to do is to look at the European countries to see that. In 1945 I spent three months in Switzerland. I have never seen such modern, up-to-date, fine factories as they have in Switzerland. In Switzerland the manufacturer is allowed to write off 80 percent of his investment in the first year.

We know that this was one of the things that Mr. Hitler did in Germany. He allowed the manufacturer to write off immediately the full cost of the new machine tools. That is how he got German plants splendidly equipped. Swedish factories today are models. They write off 50 percent of the cost the first year. England also has adopted a much more liberal policy. I think the English write off 40 percent in the first year.

# RESTRICTED

# RESTRICTED

1878

This whole problem of depreciation and the rising cost of capital assets is one that has to be taken into consideration. If it is not, then industry in this country is slowly going to starve to death for lack of new capital investment.

They have accomplished that in some European countries by allowing a write up of remaining value. It has been done twice in France, the last time in 1948. Belgium allowed it in 1947. It was done in Germany in the inflation after World War I. I don't know that this is the right solution, but it is one solution for that problem.

To my mind an inventory of capital assets is not different from an inventory of materials, except that in an inventory of materials you have an opportunity to turn it over more quickly. You don't have the risk. But when the Internal Revenue Department says to you that the inventory of capital equipment can be turned over only once in 20 years, the risk is very great.

My theory is this--it is strictly a theory of my own, and many people do not agree with it. If you install a machine tool and it will pay for itself in savings in two years, two and a half, three years, that means that you have gotten back out of your selling price the full cost of that machine. If the purchaser or the owner of that tool were allowed to write off that investment as he has it returned to him, then he would be in that flexible condition that will allow him to take advantage of the market. It won't expose him to a 20-year risk. If he sees that machine tool prices are going up, he will step into the market and replace that machine, just the same as he would do with an inventory of steel or of brass or a grocer with an inventory of canned goods. It just means shortening that cycle. To my mind that would do a great deal to answer the problem and it would create up-to-date plants in this country.

**QUESTION:** This is allied to the last question. Would the machine tool industry expect any radical development or technological changes in the type of equipment to carry out a program like our jet program or guided missile program, for which we expect we are going to require a lot of machine tools? In other words, will the reserve stock pile that we have or will build up with World War II principal be the type of equipment we will need for such programs as jets and guided missiles?

**MR. McDonald:** I think in the first place--to finish answering the previous question, and I believe this will partly answer the last one too--our reserve stock pile is entirely inadequate, from the number of machines, from the types of machines, and from the condition of the machines. I know from the experience that our organization has had, where machines have been taken out of the stock pile and put into use

# RESTRICTED

# RESTRICTED

in some plants, that in many cases the machines have had to be completely rebuilt. If you have an emergency and you have to take a machine and completely rebuild it, there are more hours of labor involved in rebuilding that machine tool than there are in building it in the first place, strange as that may seem. If you are depending upon such a reserve as that for an emergency, it is not very good, to my mind. Sure, a reserve will help; but I don't think that it is the answer.

Mr. Berna, would you care to comment on that? Do you have any thoughts on that?

MR. BERNA: I would like to say, Mr. McDonald, that the guided missile program doesn't present any obstacles in the way of manufacturing problems. Any obstacle in the jet engine would be not so much in the type of machine tool, as in having better cutting tools to machine these new heat-resistant metals. I think that means that we have to make some parts of our tools harder, extremely tough. We haven't licked that problem yet. I think a different coolant or a better cutting tool on our present types of machines will lick that. Perhaps we should do more grinding and less cutting.

COLONEL HENRY: I have one question to ask to clarify your original interpretation of what is a machine tool. You said it is one which removes metal progressively in the form of chips. Hasn't that definition been expanded recently under your constitution to include forming machines?

MR. McDONALD: Yes. The constitution of the National Machine Tool Builders Association has been expanded to include also metal-forming machines. That doesn't change the definition of a basic machine tool, as we call it. We have the machine tool and the metal-forming machine.

COLONEL HENRY: Mr. McDonald, on behalf of the College I wish to thank you for a most informative lecture and discussion period. We certainly appreciate it and hope you will be back with us again.

(14 April 1949--450)S/rmg.

# RESTRICTED