



NATIONAL STOCKPILE AND UNITED STATES SECURITY

Dr. John D. Morgan, Jr.

NOTICE

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Reviewed by: Colonel P. B. Klein, USAF

Date: 17 December 1959

INDUSTRIAL COLLEGE OF THE ARMED FORCES  
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COLONEL BLACK: General Houseman, Gentlemen: Stockpiling has been practiced by man since before the dawn of history. Stockpiling is generally engaged in to effect a current stockpile of strategic materials or items to meet an emergency at some future time.

Today we assess the problems of strategic stockpiling both from a materiel and an economic viewpoint, and, believe you me, there are many of them, especially economic.

I know of no more able or competent person to assess this problem for us than our speaker this morning, Dr. John D. Morgan, Jr.

Dr. Morgan, it is a pleasure to welcome you back to the Industrial College of the Armed Forces for your seventh lecture, and I underline the word "seventh," and to present you to the Class of 1960.

Dr. Morgan.

DR. MORGAN: Thank you, Colonel Black. General Houseman, Gentlemen, Guests, and Ladies: Colonel Black started to steal most of my talk there, going back to history, because I was going to talk about how the squirrels stockpile their nuts when winter comes on, and all that sort of thing. But he stole all that, so I'll have to go into the early part of history and get at least a little biblical authority for stockpiling, because, believe you me, we need to cite all the authority

for stockpiling that we can get our hands on these days with the Budget Bureau. So, to get the Bible to work on it, you recall in the early days of Egypt, as told in Genesis, the Lord, Himself, appeared to Pharoah in Egypt and told him to set aside one-fifth of the production of the land in the good times for the seven good years. If you figure out about how much this would be, it meant that they had about two years' normal use stockpile if for Egypt's seven good years they took one-fifth of the production and put it aside.

So there we have a biblical authority for stockpiling, and man has tried to put a little aside. The concept of having a reserve in being is nothing that I need to expound on for an audience such as this military group.

The United States, though, learned its lesson the hard way, and, if you go back and read Baruch's Report of the War Industries Board from World War I, you will find that the production effort was seriously impeded by lack of imported strategic materials. Baruch recommended a stockpiling activity in World War I and at the end of that, and nothing was done.

In 1939-40, as the war clouds loomed, Congress authorized a stockpiling program. They had about \$100 million appropriations up to the beginning of World War II, but the shortage of materials incident to those times was such that we had only about \$25 million worth of materials in the stockpile at the start of World War II.

Well, the lesson having been learned again, and production held up and delayed, plus the need for convoying supplies from distant and dangerous sources, which diverted military forces from the main effort of fighting the war to the secondary effort of protecting the distant supply lanes, the people and the Congress became conscious that we needed a stockpile. They amended and beefed up the Stockpiling Act at the end of World War II. In fact, the act currently on the books is the Act of 1946.

I might just read the preamble of that act to show the intent of the Congress at that time. This is Public Law 520 of the 79th Congress. It says:

"The natural resources of the United States in certain strategic and critical materials being deficient or insufficiently developed to supply the industrial, military, and naval needs of the country for common defense, it is the policy of the Congress and the purpose and intent of this Act to provide for the acquisition and retention of stocks of these materials and to encourage the conservation and development of sources within the United States, and thereby decrease and prevent, wherever possible, the dangerous and costly dependence of the U. S. upon foreign nations for supplies of these materials in times of national emergency."

Well, that was the policy. The administration of the Stockpiling Act in the period 1945 to about 1953 was, as you may recall, in the hands

of the Munitions Board of the Department of Defense. They did a very creditable job, in my opinion, in laying out the ground work for the stockpile. In fact, either you get more relaxed and friendly as you get older or the present situation gets more fouled up, but, as I look backward in retrospect, they did a better job then than might be going on now. Be that as it may, they had a hard time getting money for the stockpile. You recall--most of you probably lived through it in one place or another--in 1948-49 the budget cycles were those of the military people. You were asked: Do you want \$13 billion for the defense establishment and nothing for the stockpile or do you want \$12.5 for the defense establishment and \$.5 billion for the stockpile, or do you want \$12 billion for the defense establishment and \$1 billion for the stockpile? What's your choice? Put that up to the Secretary of Defense any time and you know what his choice is.

But the Munitions Board did a good job of fighting within the circumstances.

At the start of the Korean War they had on hand about \$1.6 billion worth of materials. Of course there wasn't supposed to be any Korean War. I was in the National Security Resources Board prior to that. It was part of the Executive Office of the President, in charge of mobilization planning. We had the ultimate weapon; we had the monopoly of it. Atomic weapons made ground warfare impossible. We were going to save money and balance the budget. You recall all those arguments

then, and yet we had the Korean War. There wasn't supposed to be any more conventional wars. We didn't need any Army or Navy. The Air Force was going to do it all, or something like that. Strategic materials weren't so important, because you didn't need them for this two-day war, as you wouldn't produce anything. Yet, by golly, there came the Korean War, and all the things were short again--copper, rubber, tin, lead, zinc, manganese, chrome--and along with it we began to experience a new type of warfare, economic warfare.

In 1948 this country was getting 40 percent of its chromium and about one-third of its manganese, both essential ingredients in making high alloy steels, from Russia. As part of the Berlin Blockade and the Russian economic warfare activities in 1948, they quickly cut off shipments of those materials to us. There was a time prior to the Korean War, but leading up to it, where we actually kept an eye on individual boatloads of manganese ore coming into this country from other sources, so as to be able to divert a boatload that might be destined, say, to Baltimore and put it into Norfolk or put it into New York for some other steel company that was tied up. It was touch and go. In that period we weren't able to build stockpiles. In fact, in a few instances, there were withdrawals.

Well, then came the Korean War. We didn't know whether it would enlarge, and therefore the Government embarked on the policy of trying, if possible, to build up the stockpile promptly and to expand the supply

of these materials from nearby sources instead of distant ones.

You may think that the problem is all licked, but I would like to turn to a chart here and show you the situation in a recent year.

Here is a chart based on 1957, which is a pretty good year, because in 1958 we had the recession which cut production back about 20 percent. These numbers--0, 25, 50, 75, and 100--are percent of industrial supply that comes from imports. I haven't attempted to list all the strategic materials. I'll just point out a few of them and how they fit into the picture.

Down here on the 0 percent imports, which means that we are 100 percent self-sufficient, in that year we produced perhaps some excess and exported it. We find such important things as vanadium, magnesium, and molybdenum. Here we imported 20 percent of our copper supply; 40 percent of our mercury; 45 percent of zinc; 50 percent of lead and bismuth; 60 percent of fluorine, cadmium, and cobalt; 75 percent of bauxite, the ore for aluminum; 85 percent of columbium and antimony; 90 percent of nickel, beryllium, chromium, and manganese.

You recall that I mentioned that back in 1948 we were getting 40 percent of our chrome and 33 percent of our manganese from Russia. Here it is now in 1957--and the picture is not different today--and we are getting 90 percent of our chrome and manganese still from imports, not, however, from Russia. There is practically none coming from

Russia, but it is still coming from distant places like Turkey, Rhodesia, and the Philippines, in the case of chrome, and India and Brazil in the case of manganese.

Here is asbestos and platinum. There is 98 percent of the strategic grades of mica imported. In the case of tantalum, a high-temperature material; tin, which you know about; and industrial diamonds, 100 percent of our industrial supply was imported.

There are a number of other commodities that we are dependent on.

Now does the Government go around figuring how much of something to stockpile? I'll describe the theory of it. Incidentally, while I am speaking this morning as an individual, I want to say that the present staff of the Office of Civil and Defense Mobilization, which has the responsibility for the stockpile, very kindly brought me up to date on what is going on there at the present time. So I'll try to present the picture just as it is today. Any snide remarks, however, are my own responsibility, and don't reflect the official views of the Executive Office of the President.

This is the theory of it. They go through a supply requirements analysis. When you people get out of here after your term, one thing that is going to stick in your minds is this business about requirements. They never had any in the Revolutionary War; they never had any in the Civil War; they never had any prior to World War II; they never had any prior to the Korean War; and they don't have any at the present time.

So they calculate the requirements. They set out to get the military and atomic energy requirements. Let this blue here represent the military and the atomic energy. This was a calculation for copper. It might be copper for brass-case ammunition. A calculation for nickel might be nickel for jet engines or rockets. They try to get the industrial and the civilian essential needs. If this were copper it would be copper for electric wiring, or for generators in big plants. If it were nickel it would be high-alloy tubing for the petroleum refining industries. They calculate essential exports. It might be manufactured articles to our allies, tanks to Great Britain, or something like that, if that were part of the plan. In the case of a raw material, it might be molybdenum, such as we, as the world's greatest source, exported to Great Britain, or something like that.

In any event, they get a total requirement and they try to figure this out for three years. Actually there has been a lot of pulling and hauling on the short-war theory. So what they get is a sort of requirement for a six-month period, not representing an atomic war, but an all-out war without atomic attack--whatever that might be. Then they multiply that by six, because six times six months is 36 months, or 3 years. That's the military requirement. Well, it is better than nothing.

Well, they accumulate the whole thing. Then, from the Commerce Department they get these industrial figures on how much high-alloy

tubing the petroleum industry used last year, and figure that's how much more it will be next year. They do the same thing for copper, and so forth.

Then they set off against that the supply figures. What was our domestic production? If this were copper it would be the mining production and the recovery from scrap. What are the imports from nearby sources? Canada and Mexico are nearby strategically accessible places. What are the imports from distant sources? There are Africa, Indonesia, Malaya--not Russia or China--we couldn't count on them--places theoretically within our orbit. They figure that based on known production capacity. In this effort the Bureau of Mines, Geological Survey, Department of Agriculture, for agricultural items, the State Department, CIA, and anyone else who has any worth-while information, contribute. This side is very carefully worked out. I think the numbers on the supply side are so much easier. You can say that is accurate within 5 percent. The numbers on the requirement side are, necessarily, much less accurate.

Just a look at the raw data would indicate that perhaps the supply exceeded the requirement and there was no need to do anything about it. But the law said to reduce and eliminate, where possible, a dangerous reliance on distant sources. How do we reduce that? Well, they apply certain safety factors or discounts to this distant supply and to this nearby supply, and even to the U. S. supply, where there are concentrations

that would be particularly vulnerable to attack or sabotage, or something like that.

In computing these discounts, again the Intelligence agencies, such as CIA, the State Department, and the military who sit on the committees, contribute what they can. Then we come up with a discounted supply, still assuming some reliance on distant sources. But the difference between this three-year requirement and this three-year discounted supply is known as the basic stockpile objective. They have two sets of objectives. This first one is the basic one.

Because this represents the most dangerous condition, they try to achieve the basic objective as quickly as possible. That means they would expand the supply, if necessary, to get more material on hand. They would pay premium prices if need be, to get it, and so forth.

Then, having gone through that one calculation, they go through a second calculation. They discount completely the distant and dangerous sources. They take another careful look at the nearby sources, and they come up with a second and larger difference, in which they rely only on the United States and nearby sources such as Canada and Mexico in the North American area. That difference then becomes the maximum objective.

As I indicated, they try to achieve this basic objective as quickly as possible, because that is the most dangerous situation. They proceed,

once they have reached the basic objective, to get the additional increments of the maximum in a more relaxed manner, taking supplies off the market when they are available at reasonable prices, or when they are getting them under contracts previously made, or something like that.

That's the theory of it. Now, where do we stand? Well, statistically, they come out pretty well, because up until about two years ago we figured all these calculations on a five-year basis. Then, in order to save money, they cut the thing to a three-year basis. So, if you cut all your targets from a five-year basis to a three-year basis, you improve your statistical performance by about a ratio of something to something. That's why it looks so good today.

In fact, there are 75 strategic materials. Over here I mentioned the metals and minerals which constitute the bulk of the stockpile, but there are also such agricultural products as cordage fibers, abaca and sisal; certain drugs that come from distant places, like opium; coconut oil used to be on the list; <sup>and</sup> palm oil; because they needed them for certain chemicals and in the tinning industry. There are certain manufactured articles, like diamond dyes, and jewel bearings, that come from Switzerland, largely, where they have special skills for making them. There are certain articles that we manufacture here that are entirely synthetic, like silicon carbide, which is an abrasive. It isn't a natural material at all. But it is stockpiled because of the

great concentration of electric power in the Niagara Falls area, and if anything happened there much of our abrasive capacity would be severely cut back. So they stockpile silicon carbide and aluminum oxide abrasives.

All told, there are 75 strategic materials on the list. For 69 of the 75, the minimum stockpile objective, or the basic stockpile objective, has been reached. In other words, for 69 of the 75, that deficit is on hand. That doesn't mean that we have enough to fight a three-year war, because the deficit, over here, still assumes that there will be domestic production in that three-year war and imports from nearby sources in that three-year war, and some imports from distant sources.. It doesn't mean that we've got the total amount on hand.

The maximum objective is in pretty good shape, too. For 57 of the 75 materials the maximum objective is on hand. I say it wasn't this good a year or so ago, but, when they cut it from five years to three years, it improved the performance. In fact, they have on hand in the strategic stockpile a little short of \$6 billion worth of strategic materials. Of that about \$2 billion--and these are just round numbers--you can get the exact figures from the reports--is considered excess to the maximum objective. It wasn't excess in most cases when they had the five-year figure. The excess has come through the device of again cutting from five to three years. So, what was enough to meet

the five-year figure is a great excess on the three-year figure.

In addition to about the \$6 billion worth of strategic materials in the strategic stockpile, the Government is also, like squirrels or like dogs that bury bones here and put nuts over here and over there, filling a whole bunch of little holes, each under a different law and each under a different authority, which I'd like to explain, but we don't have too much time. So I'll just summarize them. They have nearly \$1 billion worth in what is known as the Defense Production Act inventory. I had better tell you a little bit about that, because, when the Korean War started, we were in such desperate shape in most of these materials that we thought the first priority ought to be given to expanding the supply of these materials in the U. S. A., that a going domestic productive capacity was even more important than a stockpile, because you could count on it year after year and you could expand it more if need be. As a result, we expanded the steel industry. At the start of the Korean War it was about 90 million tons capacity. We expanded it with tax amortization to 125 million tons. It has since expanded to 147 million tons, without any government assistance, I might add.

At the start of the Korean War the aluminum industry was about  
tons  
800,000/primary production. We expanded it to about 1,700,000 tons  
with Defense Production Act contracts. In essence, and very simply,  
we said to the aluminum people, "We will guarantee to buy your output

from the new plants for a five-year period at market prices if you can't sell it elsewhere." Those contracts were made under the Defense Production Act.

What happened? In 1951, 1952, 1953, as long as there were great and military production programs, a great demand for aluminum, the Government never put its hands on that aluminum. The aluminum was produced by the companies; it was sold in private-industry channels; it moved under the allocation system of the Controlled Materials Plan; and went directly into aeroplanes and other military articles. But then, when the military production program was phased out and these people couldn't sell the aluminum, they put it to the Government under those contracts. Most of them have expired now. But that's the type of Defense Production Act contract that gave the Government the material in the Defense Production Act inventory. They've got about a billion dollars worth of stuff in the Defense Production Act inventory.

Then Congress came along with legislation. The Agriculture Department, which is even better at stockpiling surpluses than the metals and minerals people, for many years, ever since 1949, in fact, had authority under the CCC legislation to exchange agricultural commodities in danger of spoiling or of loss of value through deterioration or excess storage charges for strategic materials, on the theory that the strategic material occupies a small volume, represents a high value, is something that the U. S. doesn't have an adequate supply of,

doesn't require covered storage, doesn't deteriorate, and therefore if they could trade a bunch of wheat or corn or cotton that was going to spoil and ran all these costs for manganese or chrome, or something, the country would be ahead. They have had that authority on the books for 10 years. They didn't do much about it until Congress in 1954 passed the Agricultural Trade Development and Assistance Act and set up a supplemental stockpile, supplemental meaning in addition to the strategic stockpile. Then Agriculture still didn't go ahead to do any bartering, because they very wisely said, "The CCC is a government corporation and our problem is to maintain our assets. If we convert all our assets of corn or cotton or wheat into manganese and chrome and that, how do we get paid back? Who pays us, unless we sell them, and then there is a great problem." So we came along in 1956 and had an amendment to the Agricultural Act which permitted materials obtained by barter to be put in the supplemental stockpile, and Agriculture to be reimbursed by appropriations. Then they were made whole on their corporate activity, and they bartered, and there is about three quarters of a billion dollars worth of strategic materials in the supplemental stockpile.

Adding all three stockpiles together, we find the Government has on hand about \$7.3 billion worth of strategic materials, \$7.3 billion. Now, I would be remiss in my duty if I didn't describe very quickly one or two other stockpiles. The CCC, which is the Agriculture agency,

has on hand \$9 billion worth of stock--corn, wheat, cotton, barley, oats, dried milk, cheese, and things like that. This is not stockpiled under the strategic stockpile; it is on hand under the price-support activities. But it is a national asset, and, when we are thinking in terms of limited war, all-out war, or nuclear attack, and so forth, we must look to the total reserves of everything owned by the Government. It may be that something to eat in the first couple of weeks of war of a nuclear type, or some clean water to drink, may be a more determining factor than five years' worth of tin in the strategic stockpile. So we can't just sit back and be happy with the strategic stockpile. We have to look at what CCC is doing.

Regrettably, none of their stuff is in a readily edible form. The wheat is wheat in ships and in silos; the cotton is not in clothing or blankets, it is cotton in bales; the corn is in silos; and so forth. But it is there, and it is something.

Then we have the Civil Defense stockpile. They have been in existence about 10 years. They have \$225 million worth of stuff in the Civil Defense stockpile, \$225 million. I was talking before about billions. That consists of about \$190 million worth of medical supplies, about \$6 million worth of engineering supplies, and some other odds and ends. Now, what's this \$6 million worth of engineering supplies? Just as a matter of comparison, the cost of just the engineer equipment to meet

the normal TO&E of an engineer combat battalion--not the reenforced battalion, but just the straight TO&E one, is about \$3 million. So they've got enough stuff stuck around to outfit two engineer battalions. Well, what's that in terms of nuclear attack on the United States? It isn't equipped, it isn't manned, it isn't organized, so, to all intents and purposes, it is nothing.

What's \$190 million worth of medical supplies? Well, we've got 180 million people, so it is about \$1 worth per man, woman, and child. You go into the drugstore and see what you get for \$1 today. That's what is in the Civil Defense stockpile.

The other billion dollars' worth in the strategic sounds pretty big, but the strategic materials work out to be about \$40 worth per man, woman, and child in the country--not too great an investment when you consider the importance of the strategic materials to our whole industrial life.

I added up the stockpile tonnage of the strategic stockpile. This is all the strategic materials but not the CCC agricultural commodities. There are 39 million tons of strategic materials in the strategic stockpile, the DPA inventory, and the supplemental stockpile. Well, now, what's 39 million tons? That is 3900 ten-thousand-ton vessels that don't have to be unloaded in time of emergency. More importantly, they don't have to be convoyed from the U.S.A. to the point where they load in some foreign country and back again. Even more importantly, that's a whole lot of stuff from a whole lot of fouled-up countries that we don't

have to be nice to in the future just to get the strategic materials. We may be nice to them for other reasons. We may want to protect them militarily for other reasons. As far as Indonesia is concerned, we don't have to be nice to them for the tin and the rubber. We've got enough tin and we've got enough rubber here in our strategic stockpile. Come all-out war, come limited war, come political or economic warfare, we can bleed down our strategic stockpile in an orderly way.

That wasn't the situation in World War I; it wasn't the situation in World War II; and it wasn't the situation in the Korean War. Tin, which had been about 50 cents a pound prior to the Korean War, went to \$1.80 a pound. Rubber, which had been 16 cents a pound prior to the Korean War, went to 60 and 70 cents a pound in just a year or two. We have a great lever in our stockpile toward price support and toward cutting down the cost of any future emergency production effort.

Let me tell you just a little bit more what 39 million tons of stuff means. In New York, which was the largest port by far operating in World War II, in 1942, the first year of the war, the Port of New York handled 9 million tons of imports. Well, the 39 million tons in the strategic stockpile means that as far as imports are concerned, on a comparable basis, our biggest port, like New York, would not have to worry about imports for 4 or 5 years. That means they can worry about exports, fighting the war, and not bringing in this other stuff.

Where is the stuff stored? It is stored all around the country in

200 installations, some military, some General Services, some near big industrial consumers, where sites are leased. So, in effect, they have stockpiled ton-miles of material, not just bringing it into the port, but moving it around close to the ultimate point of consumption. It is dispersed. It is 30 or 40 miles, generally, outside the major target centers, and yet close to points of consumption. So we would not need to foul up the railroads with great movement of manganese ore from port to steel mill. We would not have to foul up the railroads with great movement of bauxite ore from port to aluminum refinery. And so forth. Much of that movement has already taken place.

You hear a lot of grim tales here from your other speakers on how badly off we are. I have presented a picture that generally must sound pretty good to you. And I think that the strategic stockpile is in pretty good shape. But we can't be complacent. We can't sit back and say, "Well, that's fine. We've got that done now; there is nothing more to it." There are some additional problems.

I'd like to, in the very few minutes remaining, tell you about some of the areas that I think are real problems today.

Here is a chart on which we have plotted the melting points of various materials in degrees Fahrenheit, ranging from zero, 1000, 2000, up to 7000 degrees Fahrenheit. I'll just call off the materials and run up the chart. Here is tin, lead, zinc, aluminum, copper, beryllium, iron, nickel, cobalt, titanium, vanadium, platinum,

zirconium, chromium, hafnium. Watch this group as we get up into the high temperatures. Hafnium, columbium, molybdenum, tantalum, rhenium, tungsten, carbon.

Notice this green area here. This green area stops with iron, cobalt, and nickel. Away down here is aluminum. Here's copper. Much of our military technology, in fact practically all of it, is based on steel alloys and aluminum alloys and copper alloys. Here is aluminum; the melting point is away down here. Here are iron, nickel, and cobalt. Our stainless steels are iron, nickel, cobalt, and some chromium.

You can't use an alloy at its melting point. In fact, in general, you can use it only up to about 50 or 60 percent of the melting point, because it then rapidly loses strength, and there is certain recrystallization that takes place. As a matter of fact, in our jet engines, for a sustained operating condition, we are presently limited to about 1800 degrees Fahrenheit, and 1800 here is just about 60 percent of the melting point of the iron, nickel, cobalt alloy, which is what they are made of.

Now, as we get into the field of higher performance, how do we get higher performance in aircraft, or in a missile or a rocket or a space vehicle, or a nuclear reactor in a submarine or a nuclear reactor in a naval vessel? You know in the old law of thermo dynamics the greater the change of temperature that takes place, the greater the efficiency.

We have to go to higher temperature materials.

This stockpile equation here works out wonderfully in the case of a thing that we have been using for hundreds of years, like tin. You know how much tin we used last year. You multiply next year by a couple million people or something and say, "Well, if we used 50,000 tons of tin last year, we'll use 55,000 next year, and we are safe." When you come to manganese for steel, you've got 147 million tons of steel production and every ton of steel takes 14 pounds of manganese, so you figure out how much ore that is and it is pretty easy to tell how much manganese you need next year for all-out steel production.

When you start making alloys and materials for jet engines, rockets, missiles, and nuclear reactors, you don't make them out of the conventional materials. It is no longer a question of beer cans, sardine cans, and stuff like that for the Quartermaster. It is a question of ultra-high-temperature materials in these rockets and missiles. How much tantalum do we need? The old historical data do not give you the answer. How much tungsten do we need? The old historical data do not give you the answer. How much molybdenum, tantalum, and rhenium do we need? That's the question.

We have told the Office of Civil and Defense Mobilization to get together with the different agencies and figure that out. They say, "Well, we have to get requirements. We have to get the space agency

to tell us its requirements. We have to get the Defense Department to tell us its requirements." How does Defense get its requirements? You know the theory of it. They have a strategic plan approved by the NSC. They make up a military plan in support of the strategic plan. That is funneled down to the three services to make individual service strategic plans in support of that one. That is turned over to logistics experts to make a logistics plan in support of the service strategic plan. That is converted into steel, bolts, nuts, and stuff like that. That is added up and sent to Supply and Logistics, and that comes over.

Well, they don't even have a strategic plan. You know that. How can they go through all that and how can they figure out for the new materials what the requirements are? They don't know how many rockets they are going to need, or what missiles, 3 or 4 or 5 years from now. What is needed is a real, forward-looking judgment, based, not on requirements and not on strategic plans that, in a field like this, must necessarily be nebulous but on a scientific decision. There are only a certain number of elements and materials that possess certain properties.

Here I have listed all of them above iron. There aren't any more unless they find them in a reactor somewhere. What they need is to assemble a group of scientists to look ahead just as Einstein 20 years ago could have said, "You are going to need a lot of uranium." They can look at these materials and then go ahead and build up a good

stockpile of these materials needed for the future war. We've done a fine job getting ready for World War II. The old calculations make it a snap. The time to get these new and special-property materials is now. Why? Once the use of them is proved out, then the price goes up. Then every fouled-up foreign nation that has a small supply of these things hangs on to it. They think they've got something valuable. We ran into that in India with beryllium. Somebody thought beryllium was important in the AEC program and India put an embargo on it. As soon as Brazil thought uranium was important, and rare earths, it went around raising the price.

The time to get these materials is now, before we have the requirement. Indeed, when we have this barter authority, with \$9 billion worth of agricultural surpluses on hand, entailing storage costs of between \$1 and \$2 million a day, which is nearly a billion dollars a year, just storage costs, we should take our agricultural surplus, and take some money, if need be, and go out to some of these fouled-up countries in the world and give them all the stuff we can to eat and take back, what? Take back tungsten, take back rhenium, take back tantalum. We don't need molybdenum; we've got the world's supply of that. Take back columbium, take back chromium, take back hafnium; take back any of these really important materials and pile up a great big pile to support the future military production effort.

This is the great area that the Government is getting into. They've

got a defense mobilization order that says they are to try to make some assessment looking five years ahead. It is a difficult area to work on. It has not been overlooked.

Well, we've covered a lot of ground in a few minutes.

COLONEL BLACK: Dr. Morgan is now ready for your questions.

QUESTION: Sir, you didn't have time to talk about upgrading the stockpile. Just as the agricultural products are not readily edible or wearable, it seems to me that in an all-out nuclear war piles of ore are not really much good if you lose your smelters. Second: I never heard anybody talk about stockpiling plans for having prefabricated materials/<sup>so</sup>that we could quickly assemble a plant.

DR. MORGAN: A very good question. Much of the material in the strategic stockpile is upgraded to a certain point. For example, aluminum metal is in there. That was originally bauxite ore. It takes four tons of bauxite ore to make a ton of aluminum metal. That bauxite ore was converted into alumina and electric power was applied to make it into aluminum metal. It therefore represents a stockpile. One ton of aluminum metal stockpiled represents four tons of bauxite plus the transportation, the manpower, the electric power, and everything else necessary to make that aluminum.

I'll just stick to aluminum as an illustration. As long as it is in the pig form, you can then run it off into sheet, into bar, into wire; you can melt it; and you can make different alloys. So there is a question how much further than the bar form you should go, because the alloys

that are in use today and the specifications may not be, and very likely will not be, the alloys and specifications for critical uses 10 years from now. They will have much finer specifications and new alloys, or something like that.

I'd say the aluminum is in good shape; the copper is in good shape; that's all metal; the tin is in good shape. But then, from the civil defense viewpoint, which is exactly what you are saying, some of that aluminum now should be taken and put into the form of aluminum sheet and should be stuck around the country to put roofing on buildings, if they needed to repair roofing, or to put up temporary shelters, or something like that. An effort like that would require billions of dollars. They have done some talking about it. You've heard about the \$40 billion shelter program, and stuff like that. But they haven't done anything about it. The reason they haven't done anything about it is that every time somebody looks at the cost they get scared. But I just want to tell you this: I was associated with the strategic stockpile effort for 10 years, at least. We never would have got the money to stockpile the \$7 billion worth of stuff that is physically on hand now if we hadn't worked up a program, gone before Congress, fought for it, and defended it. I have generally found, with the exception of only one year, that the Congress would appropriate every cent that was asked for for stockpiling, and their only question would be, "Is this enough?"

If you've got a good program and defend it, you can get the money.

Now, on plans and parts of plants, they do have a few odds and ends in the Defense Production Act inventory. They have certain critical machine tools of long lead time, certain so-called elephant tools, that they have bought and stockpiled and what not. But again, it is a very modest effort and it hasn't amounted to anything.

QUESTION: Doctor, your program of bartering excess agricultural products for future alloys and minerals sounds very good. Have you studied the source of those to see if they are located in countries where our present allies are depending on those export markets for their survival? What would a barter program do to those countries?

DR. MORGAN: You mean, to take the case of India, or something like that, should we stay out of there and let the Canadians sell them wheat for dollars? That certainly is a factor that must be seriously considered. On the other hand, the United States, itself, has a great program under the Agricultural Act, known as Title L. Let me just tell you about Title L. We don't have to compete with anybody but ourselves. Under Title I you go to a country like Brazil, who needs wheat, you give them money in the form of U. S. dollars, and they convert that into local currency. Then they buy the wheat with the money that you gave them and you lend them the local currency back to do what they want with it for local development in roads, schools, and stuff like that. When you go through all the mumbo jumbo of lending and unlending and making CCC whole, it simply means that you give them the wheat for

nothing and you get nothing back. Under a Title I transaction you give them the wheat and get nothing back. Under a barter deal you go to Brazil and say, "If you want the wheat we'll give you the wheat, but we'll take columbium and tantalum and beryllium, and other things that you have, back." This wouldn't interfere with the British or the Canadians any more than would the Title I, and I think in the long run we would feel better because we would have something concrete back, and I think the Brazilians would feel better in the long run than having all these funny money loans that the U. S. Government has some string on concerning how they may be used. This is personal thinking.

QUESTION: Sir, we have a lot of gold stockpiled in Kentucky and we know where it is, and it is counted, I understand, sometimes. Now, this \$9 billion worth of stuff is an awful lot of stuff. Are you satisfied that the inspection and the accounting for this stuff in so many different places is going to result in our finding it when we need it and in the shape we think it is in?

DR. MORGAN: I was worried about that when I had an official responsibility for the stockpile. I went out with the storage people to several of the major depots, and, having had a little Army supply experience and knowing what you can get away with--I was usually on the getting-away-with side--we went in and spot-checked a few things. In other words, we didn't tell them we were coming or anything. We went right into the depot and got some GS-7 clerk and said, "Let's see

your stock-record card on tin." We went out in the open storage and counted the bars of tin, and so forth. While that is just a sample, I am satisfied that the thing is about 98 percent in good hands. In other words, I have heard enough complaints from contractors in my consulting business about lots of stuff that they had rejected on really tricky technicalities. GSA administers this thing, and will call the contractor and say, "Come and take your carload back." The contractor will say, "Gee, we can't take it back. What can we do?" GSA says, "Well, that's your problem. Bring it up to specifications." They can be pretty hard-nosed about it.

I think the storage and the inspection and the auditing and all that is very good. Some fellow may slip a bar of tin out from under a fence some night and sell it, but that's a very rare case--small stuff.

QUESTION: Dr. Morgan, do the Communist Bloc countries do any stockpiling?

DR. MORGAN: Yes, they do. In fact, when I was quoting all my authorities I didn't bother to quote the Russians, but Vosnuzenski, who was the Chief of the State Planning Branch in World War II in Russia, made a great point in his book on the Economy of the U.S.S.R. during World War II on the need for state mobilization reserves, not only of raw materials but of upgraded materials, fabricated materials, and end items. He gave great credit to their state mobilizational reserves in meeting the war, particularly when Russia was invaded and they had

to shift production far to the East. It was their reserves that permitted them to keep going. They have good stockpiles, yes.

QUESTION: Doctor, I come from a wheat state, so I was wondering, if we did not have any agricultural surplus, how much of the \$9 billion worth of stuff that we have stored away would you have to buy for the strategic stockpile?

DR. MORGAN: A very good point. When I said we ought to barter some of these agricultural surpluses, I by no means think we ought to barter all of them. We have to have a certain, fair-sized carryover to insure not only our own food supply but the food supply of our allies and the other free nations. While this is easy to say, we must do this not only in nuclear war but in limited war and in political and economic warfare. After all, the thing that permits us to be a leader in the world today is the possession of the retaliatory weapons, certainly, but it is also our great industrial and agricultural strength that permits us to deliver steel or end items to people, that permits us to feed them, and so forth. If the Russians ever possess the same retaliatory strength and then they have the raw-materials producing capacity, the food-producing capacity, and the end-item delivering capacity equal to or greater than ours, then the balance of power can shift in the direction of who is going to make the best deal, because most of these nations sitting around the fringe of this contest want to know who is going to give them the biggest deal. They don't care what happened last year,

or what you saved them from five years ago. It is the current problem, and you have to always be in a position of being able to offer something. It is our food and our manufactured articles that make us a world leader.

QUESTION: In mentioning the shift from a five-year to a three-year objective, I believe you said that this was done to save money. I have heard other reasons promoted for the reason for shifting from five to three years. I wonder, do you really feel that the principal reason was to save money?

DR. MORGAN: Well, on this 5 versus 3 business, the five years started with the Munitions Board back in 1946. They figured on five years just because World War II was five years. They figured 1941-42-43-44-45 was five years. They said, "The last one was five years, so maybe the next one will be five years." That's about all the magic that was in five. It could have been four; it could have been six; or any other number. Five looked like a reasonable thing to make provision for. The more years you make provision for, the less you need to be concerned that you made a little mistake somewhere in these nebulous calculations.

So the shift from five to three came largely, I think, to save money. I'll say why. In the first place, there was still a couple billion dollars worth of stuff yet unbought. So, when people made a calculation on the basis of five years, it showed a couple billion dollars worth of stuff yet to buy. When they made the calculation on three years, it showed just

what I have cited to you this morning, that the basic stockpile objective for nearly every material is on hand. So today they are buying only three things for cash--amicide asbestos, diamond dyes, and jewel bearings--which cost a few million dollars a year. So they are not spending any cash.

The second thing, and this whetted a gleam in some people's eyes, was they figured that if you are just even on a five-year basis on a \$6 or \$7 billion inventory, if you set it up on a three-year basis then you have a \$2 billion surplus, and they figured maybe we would sell some of the surplus and get the money back and help balance the budget that way.

Let's examine that one. In the first place, you can't go into the metal markets, or the strategic-materials markets and dump any big quantity in the market all at once without knocking the hell out of the price. In the second place, we have been spending years to build up all these allies all around the world and to help improve their raw-materials producing capacity. We want to get all these friendly foreign nations to earn dollars, and about the one salable thing they have in the world that we want to buy and that is a good dollar earner is the raw materials. So, if we build up the Indians, and build up the Brazilians, and build up the Chileans, and all these people, and then suddenly start dumping copper and manganese on the market, would they like us?

Thirdly, I think it is wrong from the long-run viewpoint, because

the United States, with 180 million people, and with 6 percent of the world's population, uses between one-third and two-thirds of all the metals and minerals moving in world commerce today. If the standard of living of the remaining 94 or 95 percent of the world's population increases just 5 percent, it will take more metals and minerals than it would to double our own standard of living.

So these things are great national assets. When you see the Paley Commission and these other people predicting that in a few years we are going to run out of this and we are going to run out of that and we are going to run out of the other thing, I think that the reasoning that we can sell some of the stockpile now and get some money and balance the budget is very shallow and is not looking toward the long-run needs of the United States.

Further, I don't think we ever calculated what the loss in taxes would be from the major U. S. metal and mineral producing people if they knock the price of some of these things down by selling them from the stockpile. We might get some dollars in on what they sold from the stockpile, but, if they knock the price of copper from 30 cents to 20 cents in the process, they lose taxes.

**QUESTION:** You brought up a question in your last discussion. I thought that the latest bill to reduce the stockpile from five to three years said not to sell off any of this stuff, such as copper, aluminum, and things that you talked about, things that wouldn't spoil if you kept them and didn't

reduce the stock below whatever you had on hand, and if you didn't have it you would bring it up to a supply for three years. My other question has to do with your statement about other countries' stockpiles. You stated Russia is in good shape. Does that mean that she is in as good shape as we are on the stockpile?

DR. MORGAN: Well, of course, we don't know too much about what the Russians are doing. We can say this: Russia is a vast country, many times bigger than our own. They have every known geologic formation there, and in world metal markets we have never found them actively in any of these strategic material markets except on very rare occasions. They may have bought a few diamonds, or they may have bought a little molybdenum, if they could sneak it through Italy, or something like that, when it was on the COCOM list, but they have never made any real effort to buy. I follow Russian pretty closely, read it, and what not, and from their own statements geologically they seem to have good supplies.

They have only a third of the industrial capacity that we have. If their steel production is 60 million tons and ours is 147 million, they don't need quite so much of these things. But they were a world supplier of manganese and chrome; they've got vast reserves of high-grade ore. They've got vast reserves of tungsten in China, great reserves of tin in Russia and China, and so forth. So we think they are in pretty good shape.

As to the question of what to dispose of, there was a committee known as the Pettibone Committee. I was very privileged to be a member of that. It recommended two things on disposal. We differentiated between the metals and minerals which are fixed in the ground, which are long-term assets, which don't deteriorate, and the perishable commodities like coconut oil and palm oil and natural rubber, and those things, which are annually growable, are not minerals, are costly to store, and do deteriorate. What we said in the Pettibone Report to the Director of ODM was in the case of the perishable materials. We said, "If you can sell off the excess down to the three-year maximum objective and do it in an orderly way, without fouling up the international picture, do it. But, in the case of the metals and minerals that are allegedly excess to the three-year maximum, retain them unless they are needed for national security purposes." What's a national security purpose? Well, if the Air Force is making a rocket and the rocket needs some tantalum and we've got more than enough tantalum for the three-year maximum, they supply the tantalum to the contractor and reduce the cost of the rocket that much. If you are buying brass-case ammunition to give the Indians or the Costa Ricans, or somebody, supply the copper and save 70 percent of the cost of the ammunition by supplying the copper for the brass.

There is a number of ways by which, in an orderly fashion, these materials could be used for direct national security purposes.

The OCDM, however, did not adopt that recommendation. They are now drafting legislation in which they propose to set up two stockpiles. They want to take all these different hiding places and put the material into only two--one the strategic stockpile and the other a reserve stockpile. They are going to go to Congress and ask for the authority to sell off anything they want in the reserve, which would be that beyond the three-year maximum. They want to give Congress 90 days to disapprove their action. The way the law presently reads, except for certain technical exceptions, they can't sell anything unless Congress approves it. But they want to work that around the other way. They'll notify Congress and, unless Congress disapproves it within 90 days, they can proceed and sell it off. This is the proposal currently being worked up in OCDM, and it will probably be submitted to the Congress at the next session.

QUESTION: Dr. Morgan, you spoke of stockpiling in the United States and also in the U.S.S.R. Would you comment on stockpiling in the NATO countries and other allied countries? We understand that there is not much stockpiling going on there, and I would like to know your views.

DR. MORGAN: There is not much going on there. In fact, what little stockpiles they had in some of the richer countries, like Great Britain, where the British Ministry of Supply built up reserves of material during the Korean War, reserves of tin, tungsten, copper, and

so forth, much smaller reserves than ours, but working reserves, they have sold off to get the money. They say it is better to have the money in hand than to have the material.

Well, it is easy for everybody in the world to sell off their stockpile as long as we have ours, because they know if worst comes to worst they will come crying over here in the next couple of years, just like Clement Atlee did in 1950, in the fall, when the Korean War was cutting off their stuff. What did we do? We diverted zinc from our stockpile to the British so that they could manufacture. If it is a great crisis, and so forth, it's right that our stockpile would be used to help them out. So they can with impunity sell off.

Now the question is: Do you want to build up stockpiles in Continental Europe, with the possibility of a massive Russian invasion of the entire continent? You are the military people. I'll let you come to your own mental conclusions on the desirability of encouraging great stockpiles to be built up on the European Continent. You just come to your own conclusion.

COLONEL BLACK: Dr. Morgan, we may not all agree as to the function of the stockpile but I am sure we all agree as to your stockpile of knowledge, <sup>of the subject</sup> which <sup>is</sup> ~~runs~~ <sup>over</sup>. On behalf of the Commandant and the College, thank you very much for a very interesting and productive lecture.