NATIONAL STOCKPILE AND UNITED STATES STRATEGY

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CONTENTS

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COLONEL ECKLES: Gentlemen, the subject of our lecture this morning is "The National Stockpile and United States Strategy." Our speaker is an old friend of the College. He is an eminent authority on this subject. Again it is a real pleasure to welcome Dr. John D. Morgan, Jr., 1/ to the College.

DR. MORGAN: Thank you, Colonel.

General Hollis, members of the class, and visitors, it is always a pleasure to come back to Fort McNair. I lived on the post for three or four years several years ago. I have many friends in the faculty and in the class. I hope I will have at least as many when I am done speaking as before I began.

You all are interested in the strategic stockpile, because we are piling it up primarily for the use of the military services in time of war. Our accumulation of a stockpile of strategic materials in this country has an added advantage to the military services, one that they may not be too aware of as they consider the size of the budget required for defense and defense-related activities. The existence of a large stockpile of strategic and critical materials allows the armed services in time of war to concentrate on their primary mission of fighting the enemy with the best materiel that they can have, rather than being distracted by the secondary mission of protecting many distant overseas supply lanes that would otherwise be needed to import raw materials.

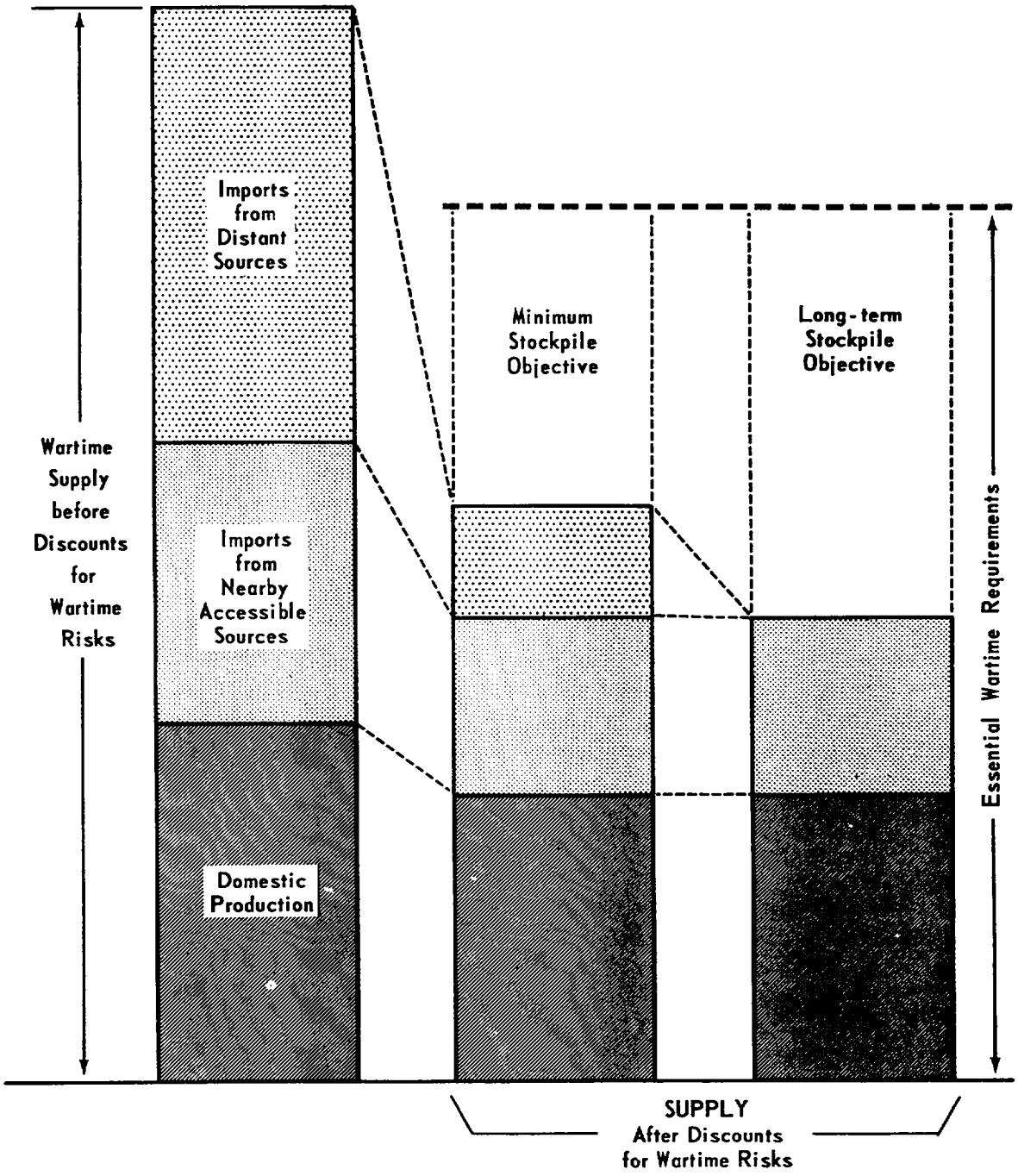
I would like to tell you something about the way we calculate the stockpile objectives (chart 1, page 2).

First it is necessary to estimate the requirements for a period of war. See the vertical line on the extreme right-hand side of chart 1. Let us let this line represent the requirements, including the military and the atomic energy requirements, the industrial and civilian requirements, and the essential exports.

1/ Opinions are those of the author and do not necessarily reflect official views.

Chart I

COMPARISON OF SUPPLY FACTORS IN DETERMINING MINIMUM AND LONG-TERM STOCKPILE OBJECTIVES



Now I will tell you a little bit about what goes into those. First, stockpile calculations cover an emergency (war) period of five years. This is a longer period of conflict than the Department of Defense has told us it is necessary to plan for. But the longer time period gives us an added safety factor in the entire equation, and thus we are making substantial provision for all sorts of contingencies that may come up during the uncertain years ahead.

For example: We may have a long period of cold war, in which certain important oversea sources of supply may be cut off. We might have atomic bombing and destruction within this country that would require all sorts of completely unforseeable requirements to repair the damage and restore some semblance of economic order. We might hav a ten-year war or we might have a thirty-day war. But if we stockpile strategic and critical materials for a five-year war, we have at least made a pretty reasonable and defensible contribution toward the security of the country.

The military generally give us requirements for a three-year war and we then extrapolate the curves that they give us, based on a three-year war, to a five-year period.

Let us consider for a moment the military requirements. If this were the chart for copper, the military requirement would include ammunition. Cartridge brass would be composed of 70 percent copper and 30 percent zinc. So on a weight basis the zinc chart would include 30 percent of the ammunition requirement.

If this were the chart for nickel, the military requirement would include nickel for the jet engine program. If this were the chart for tungsten, the military requirement would include tungsten for the high-velocity armor-piercing shell program. Thus the exact logistic plans of the military are very basic when it comes to calculating the size of the stockpile for any particular material.

Let us turn now to the industrial and civilian requirements. Those figures come largely from the Department of Commerce, but also from Interior, Agriculture, and other agencies where appropriate. If this were the chart for copper, an example would be copper wire for the electrical industry. If this were the chart for nickel, an example would be nickel for hospital equipment where nickel-bearing stainless steel ware is essential. If this were the chart for tungsten, it would probably include tungsten for certain restricted alloy-steel uses in industry, or tungsten wire for electric light bulbs, and so forth.

Finally, United States essential wartime exports are also considered. These are limited to essential exports to our allies of materials that the United States normally supplies in peacetime. We are not building up our strategic stockpile for the benefit of other nations, but we must plan to take care of their essential needs in the case of materials such as sulphur or molybdenum or vanadium, for which the United States is the major peacetime source. Thus the export requirement would include whatever quantity of molybdenum would seem appropriate for shipment, say, to Great Britain, to make jet engines in time of war, or vanadium to France or Germany or other countries where vanadium might be needed in their essential metallurgical processes.

In this manner a total requirement based on a five-year period is developed for each major material.

Next it is necessary to estimate the total supply that might be available to the United States in the same five-year period. Supplies come from domestic production (including scrap) and from imports from strategically accessible areas. (See chart 1, page 2.)

The supply data for metals and minerals covering the five-year period are developed by the Department of Interior, for agricultural commodities by the Department of Agriculture, and for chemicals and other materials by the Department of Commerce. They are checked with other responsible agencies where necessary. If this were the chart for copper, the domestic production would include the United States domestic mine production of around 900,000 or 1,000,000 tons a year. Then knowing which mines are in operation now, knowing the plans for new mines to come into operation (which information the Bureau of Mines receives from industry), knowing also of the depletion rate of certain existing mines (that perhaps in 1957 or 1958 may not then be in production), the Department of the Interior supplies a total figure for the United States domestic copper mine production. To this would be added the scrap data.

Next to be estimated are supplies from nearby accessible sources. If this were the chart for copper, that would include Canadian copper. If this were the chart for nickel, that would include Canadian nickel and Cuban nickel.

Also estimated are supplies from distant but strategically accessible sources. The Joint Chiefs of Staff advise us as to areas expected to be strategically accessible.

But we don't stop at this point. So far the supply estimates are gross import figures. For many materials if just the five-year gross imports were set off against the requirements, the supply would be greater than the requirement. But the Stock Piling Act says that we should "decrease and prevent wherever possible a dangerous and costly dependence of the United States upon foreign nations . . . in times of national emergency." So how do we define and determine "a dangerous and costly dependence?"

Based on information from the Joint Chiefs of Staff, the State Department, and others with competence in this field, we apply certain discounts, or safety factors, to the gross supply data. In the case of distant and dangerous countries the safety factors generally are, as you would no doubt suspect, much larger than they are for nearby countries or for United States production. The safety factors make provision for losses of ships and interference with shipping lanes. They make provision for internal confusion in certain foreign materials-producing countries. They also attempt by statistical formula to make provision for the old adage of not putting all of your eggs in one basket.

Thus a revised picture of supply is arrived at which we call a factored supply. Supplies from distant and dangerous sources have been substantially reduced. Supplies from nearby accessible countries have also been reduced, and, if you compare the bars in chart 1, page 2, even the domestic production has also been reduced in cases where certain facilities are particularly vulnerable to atomic attack or sabotage. Wherever we have a concentration exceeding a certain degree, we will reduce the supply estimate for the United States.

Then, comparing this factored supply with our five-year requirements, there is usually some deficit which generally becomes the minimum stockpile objective. (See chart 1, page 2) This minimum stockpile objective represents the level of materials that we think we have to have in the stockpile in order to fight a five-year war.

Group 1 of the stockpile list includes 75 materials, of which about 55 are metals and minerals, and the other 20 are largely agricultural commodities, and also a few drugs, and other items. Table 1, page 25, gives a complete listing of the items. The minimum stockpile objectives for all 75 materials are valued at about 7 billion dollars at the present time.

As of June 30th, materials valued at about 4.7 billion dollars were on hand toward the minimum objectives. Thus they were about two-thirds complete on an overall basis.

However, that doesn't mean that the status of completion of each of the 75 items is uniformly about two-thirds. In the case of tin and natural rubber and some other very important commodities, the minimum stockpile objective is 100 percent complete; while in the cases of nickel, mica, selenium, and some other equally important commodities, our stockpile is not quite as far along toward completion.

As a general rule the Government has tried to achieve the minimum objectives as quickly as possible. Thus it has been willing to expand production using incentives under the Defense Production Act of 1950, which Congress passed when it became obvious that materials shortages were serious in the early days of the Korean War. Over six billion dollars worth of commitments have been made to expand supplies of strategic and critical materials. About five billion of the six billion was for metals and minerals, and nearly one billion was for natural rubber.

We are fortunate that President Eisenhower has had a real understanding of the relationship of strategic materials supplies to the problem of fighting a war. He graduated from the Industrial College many years ago, and I understand that he also, as a major, participated in drawing up many of the war plans in the pre-World War II period. And I don't need to tell you what he did in World War II and subsequently.

Realizing that in World War I and World War II and the Korean War the United States suffered from shortages of strategic materials, it has been a major policy of his administration to assure that that does not happen again.

In 1953 there was some concern as to whether the expanded capacity in the metals and minerals industries could be maintained for defense purposes. Accordingly, the Cabinet Committee on Minerals Policy was established, consisting of the Secretary of Interior as Chairman, the Secretary of State, the Secretary of Commerce, and the head of ODM. That committee was particularly concerned as to whether the stockpile was large enough to make fully adequate provision for defense needs.

That Committee looked back at the stockpiling law, Public Law No. 520, that Congress passed in 1946, and they saw a phrase in there that the intent of Congress is to decrease and prevent wherever possible a dangerous and costly dependence upon foreign nations in time of national emergency. The Committee reviewed the problem of establishing stockpile objectives and concluded that the minimum objectives could, under certain conditions, be enlarged.

The Committee recommended a second discounting procedure to provide that in calculating a new set of stockpile objectives, the United States would not rely upon any source except those in countries near the United States that are equally reliable as though the source were in the United States itself. The President approved this recommendation.

As a result, then, based on a Presidential directive of early 1954, the ODM (which had become responsible for the stockpile since it was transferred from Defense to ODM by Reorganization Plan No. 3 in 1953) established what we call "long-term" objectives. For example, non-western-hemisphere sources are discounted completely; and even within the western hemisphere, 100 percent discounts are applied to everything except countries nearby the United States.

The difference between the requirement and the doubly discounted supply is the long-term stockpile objective. (See chart 1, page 2.)

I pointed out that United States policy has been to try to reach the minimum objective as quickly as possible. It is recognized that, once the minimum objective is on hand, there is a lesser defense need to acquire the increment toward the long-term objective--a less pressing need, but still a need. It is still necessary for defense, but we don't have to engage in major expansions of supply involving payment of premium prices or use controls and all that sort of thing to get that additional increment.

So once the minimum objective is on hand, the Government proceeds to acquire the remaining part toward the long-term objective when that can be obtained at reasonable prices, and where such procurement will also aid in maintaining the United States domestic mobilization base.

The maintenance of the domestic mobilization base makes a lot of sense, and I will explain why.

As shown in our basic stockpile equation, we are counting, in the case of many materials, substantially on domestic production in time of war. But if we were to let that domestic production go completely down the drain in peacetime, and then two or three years later refigured the stockpile objective, the United States would need bigger stockpiles to make up for the loss of domestic capacity and the United States would then be forced to go into world markets to buy. With no sizable industry in the United States to supply it, our previous experience has been that you pay higher prices in a situation like that.

Therefore, by maintaining the domestic mobilization base, we minimize the need for stockpiling a lot of material; and we also have a going domestic industry, that can make up for all of the unknowns and unforeseeables in an equation like this, because, after all, the stockpile is a relatively sterile thing. Once piled up, we have it on hand and available; but if the war lasts ten years and we have only stockpiled on a five-year basis, then we run out. But if we have a going domestic industry, we can always expand it or we can convert it. It gives us a lot more flexibility in meeting our problems.

Now, these new long-term objectives added about 3.4 billion dollars to the total value of the stockpile. So as of 30 June 1955, on an overall basis, counting the minimum and the long-term objectives together, the stockpile was valued at about 10.4 billion dollars; and materials valued at approximately 5.6 billion dollars were on hand toward those objectives.

Now, you may ask, Where is this stockpile stored? It is dispersed around the country at approximately 275 stockpile locations. The material is generally located outside of the major centers of likely attack. Yet it is located as close as possible to major centers of consumption.

And the stockpile of any given material is scattered around the country so that it is not all in one place. For example, some copper is out west, and some copper is also in several different places in the East. Thus we effectively stockpile not only the material, but also the ton-miles of wartime transportation involved. And if we have an attack upon this country where Federal control, at least in the areas adjacent to the attack, is going to be a pretty hard thing to work out in the early days, these stocks of raw materials scattered all around the country should be quite useful.

A lot of material is at military depots. You may have seen some of it there. Some materials are in the hands of the General Services Administration at special depots that they operate. Others are stored at public warehouses and at consuming plant sites.

That is the stockpile story as we see it. I am sure there are a lot of questions that you will want to ask. We will have time for questions in a little while. Meanwhile I wish to describe a few of the other programs that we have had to enter into, largely to supplement the stockpile program. And from the fancy title given this lecture, I see that I am to cover the strategic implications of all of this.

The strategic implications are very simple. Once we have our stockpile objectives on hand, it is not going to be necessary for the United States Navy, Air Force, or Army to defend many places all over the world primarily to get raw materials back to this country in time of war. I think that is the basic strategic significance. Now, we may very well want to defend South Africa and Indonesia and all sorts of places like that for other good and proper reasons, but we don't have to rush out and hold those places just to get tin or rubber or manganese or chrome from them, as we did in World War II.

I think there is another strategic significance about this stockpile equation that a lot of you people will be very intimately concerned with. It all goes back to the military requirements; and I am not here this morning to give a lecture on military requirements and how the calculation thereof might be improved. You will have that elsewhere, if you haven't already had it. But the translation of the joint strategic plans into service strategic plans and their subsequent translation into service logistic plans, and their review and accumulation and resubmission, and screening, and collation, and all of those three- and four-syllable words that go into it, mean simply that probably several years go by before we get up-to-date military requirements for important programs.

It is very important that we know not only the military requirements for materials for current military programs, but also what is likely to be in short supply several years in the future if new programs come through as the result of research in the field of rockets or in entirely new tactical concepts and so forth. There is a whole host of materials that we are currently stockpiling with which we can refight World War II in excellent shape. We have plenty of natural rubber, plenty of tin, plenty of manganese, and plenty of chrome. But, if some of these new weapons or new guided missiles are going to require substantial quantities of materials not now in short supply, maybe for fuels or special alloys in the high-temperature chambers, the sooner we know about it, the better provision we can make.

So far I have talked stockpiling because that is what I was asked to do. But I want to point out that the Government is not limiting itself only to stockpiling to meet these material shortages. We have a whole group of other programs under way that I will briefly describe, to show how they and stockpiling round out the complete supply picture.

I mentioned the Defense Production Act, which Congress passed in 1950. It gave authority to allocate materials, to direct them to essential programs, and also to expand supplies. We have made about six billion dollars worth of commitments to expand supplies of materials. I will cite a few examples.

In the case of aluminum, at the start of the Korean War, United States production was about 720,000 tons a year. Today United States primary aluminum production is about 1,600,000 tons a year. Aluminum production has thus been more than doubled in the past four or five years. And the reason why it was is that when the aluminum companies, or some of them at least, were quite hesitant to expand in 1950, the Government said, in essence: "We will buy your entire output of aluminum from your expanded facilities in the next five years if you cannot sell it elsewhere." With that underwriting under the Defense Production Act, they then had no fear of going ahead and getting the necessary financing and erecting the plants to get that expansion. Of our six billion dollars that I mentioned, nearly a billion and a half dollars is involved in aluminum.

In the case of copper the Government let contracts, some of which run into 1962 or 1963, assuring certain domestic copper mines that we will buy their expanded output, usually at prices of about 24-1/2 cents, if they cannot sell it elsewhere. Now, what has happened? The price of copper today has been around 50 cents a pound. Regular producers quote it to their regular customers at 43 cents, if they can get it from them. So none is being offered to the Government at the 24-1/2 cent guarantee, which is good. The mines are in production, and they are a part of our domestic mobilization base, which is where we want them. But we will live up to our contracts if at some time in the future the price drops below 24-1/2 cents. They will put it to us then.

Now, we also have the right under those contracts to call copper in and put it in the stockpile if we want to. It just so happens at the present time that the industrial demand is so high for copper, and the Stock Piling Act says the quantity to be put into the stockpile shall generally be in excess of the normal needs of consuming industry; so therefore we are not calling that copper and putting it in the stockpile. But if the international situation worsened and we thought we ought to complete our copper stockpile a little quicker, we could immediately call that in and put it into the stockpile.

I think tungsten provides an excellent example of expanding a domestic industry. In 1950 it was clear that the huge requirement

for high-velocity armor-piercing shells would be almost impossible to meet in the event of all-out war. The smallest of these shells took several pounds of tungsten, in the form of tungsten carbide, as a hard core in the center of the shell. Normally people use a tiny little bit of tungsten carbide as big as your finger nail on a tool as a cutting edge. But here came the Ordnance Department with terrific requirements. They wanted to make shells for the Korean War to stop tanks in Korea. They also wanted an adequate stockpile of tungsten in case we got into a major war, so they would be able to make a lot more of these shells.

So what did we do? The price of tungsten prior to the Korean War was around 20 dollars, duty paid, in this country, including a tariff of about 6 dollars. We were getting major supplies from China and Korea. In Korea there was a mine just south of the 38th parallel; but by the end of 1950 I think you know where it was. So the domestic tungsten producers were called in and asked to expand the supply of tungsten. Prior to 1950 there had been a couple of million pounds of domestic production annually.

There were no really clear answers to finding the best way of expanding supplies. So this was a very bold program, under the Defense Production Act in which the Government said in effect that it would guarantee to buy all of the tungsten that any domestic producer could produce at 63 dollars a unit for a period of five years if he could not sell it elsewhere, up to the time that the Government had acquired three million units. From time to time the amounts acquired were published, so that producers could see how close they were getting to the three-million-unit total.

Now, a unit is 16 pounds of tungsten. So the three million units is equivalent to 48 million pounds. That is a huge quantity of tungsten. The quantity authorized to buy was set higher than estimates of potential domestic production, because the Government didn't want miners sitting around thinking: "Am I going to produce the 2,999,999th unit and the Government will buy it, or am I going to produce the 3,000,001st unit and the Government won't buy it?" In 1951 we wanted a high enough figure so that anybody with tungsten could go ahead and produce it.

As a result of this program with a 63 dollar price--I might say, incidentally, that at that time the world price was about 80 dollars--our 63 dollars being lower than the world price--as a result of that guarantee the United States domestic tungsten mining industry is now

producing about 13,000,000 pounds of tungsten a year. United States industry is now consuming about 10,000,000 pounds a year. So the domestic tungsten mining industry is producing more than industry is consuming.

The price of tungsten on the world market has dropped to about 30 dollars delivered in this country, which means that foreign producers are producing it for 22 or less and paying about 8 dollars duty, shipping it into this country, and selling it to industry for 30. The domestic miner under the guarantee sells his entire output to the United States Government for 63 dollars. So the Government is getting a lot of tungsten.

This tungsten will go into the stockpile insofar as it fits within the minimum and long-term objectives. We will take another very searching look at our requirements to make sure that we have made provision for every conceivable requirement. There may even be a slight over-run beyond that.

So this poses the question, What happens to the domestic tungsten mining industry when the Government guarantee runs out? It will probably run out about the middle or the latter part of 1956.

The tungsten mining industry got together with the manganese industry and others, and in the last days of the last session the Congress passed a bill that by legislative action would have doubled all the quantities that the Government was obligated to take under the previous program. This was known as H. R. 6373. It passed the House and it passed the Senate and it was vetoed by the President because the defense needs of the country at this time do not appear to warrant such an extension of the program.

In addition to just procurement, there is a relatively small program, known as the Defense Minerals Exploration Program, in the Department of Interior, under which the Government puts up from 50 to 75 percent of the cost of exploring for certain metals and minerals. If some concern comes in and says: "I have what I think is a manganese deposit located out west. I am not sure whether it is any good or not. I want to drill some holes, and run some test operations to find out if it is any good"--well, after the Geological Survey and the Bureau of Mines have taken a quick look, if it looks like there is a reasonable chance, the Government will put up 75 percent of the money necessary to drill those holes, or whatever else is necessary in the field of exploration.

If within a ten-year period the miner produces ore and sells it, he has to pay the Government back on a royalty basis. If he finds something and he can't sell it, because the world price is too low, the Government's interest is called off at the end of the ten-year period. If it is a dry hole and he doesn't find anything, it is equally important in the field of exploration to assemble negative information, so at least we know where we don't have to go in a great hurry again and look sometime in the future. The records are filed and we know about it.

That program is a small one and involves only about 25 million dollars, compared with the billions that I have referred to elsewhere. But it is a quite important program.

Then we have a long history of congressional assistance to the producers of strategic materials in this country. The Internal Revenue Act of 1950, and again the Act of 1954, authorized accelerated amortization of facilities certified as essential for defense purposes. Under this program there has been a major expansion of industry in the chemical and other fields.

Perhaps the most noted example of expansion under the rapid tax amortization program is the steel industry. Prior to the Korean War the steel capacity in this country was about 85 million tons a year. With accelerated amortization the industry has expanded to the point where the capacity is now about 126 million tons a year. So that is a 50 percent increase in steel capacity.

The chemical industry has also expanded considerably with rapid tax amortization.

Congress has authorized a variety of other incentives. They exempted metals and minerals production from the Renegotiation Act. They permit a depletion allowance, which for most strategic materials is 23 percent. They permit deduction of costs up to 100,000 dollars a year for exploration and so forth, for tax purposes. They exempt from the excess profits tax, production of certain minerals normally produced in only small quantities in the United States.

We might cite the rare earths situation. Prior to the Korean War the United States was dependent in large measure on Brazil and India for rare earths. When the Korean war came along, we bought some for the stockpile. Since practically none had been produced in this country, rare earths were exempted from the excess profits tax. As

a result of discoveries and this exemption, plus a few other factors, the United States is now more than self-sufficient in rare earths. The big problem of the domestic rare earths producers now is to find markets for their expanded output. So that as we review the stockpile objective on rare earths, all other things being equal the objective should go down.

Unfortunately, in some quarters stockpiling is thought to be a magic solution to almost every problem. Fortunately, the enemy has held off for four or five years, so we have built up a pretty good stockpile for defense purposes. Now when anybody has something that he cannot sell, or when anybody produces something for which he gets a subsidy and he is afraid of losing it, he will say: "Why doesn't the Government stockpile it?" So we spend more time now explaining why we don't stockpile a lot of things than we spend in explaining why we do stockpile others.

Incidentally, we have never had any trouble in getting money from Congress for the defense stockpile. I personally know of no other program that has had the bipartisan support in the last Administration, and in this one, in the executive branch and on the Hill, as has the stockpile program.

Recently Congress has put into the law a provision that materials of agricultural origin that are surplus may be exchanged abroad for strategic and critical materials for a supplemental United States stockpile. We have our minimum stockpile. We have our long-term stockpile. Now Congress has created a supplemental stockpile. This may be above and beyond the quantity established for the strategic stockpile; and it is up to ODM to fix the quantities. In general the quantities fixed so far have been beyond the long-term objectives, but in no case such that the total of all stockpiles exceeds the total five-year requirement.

COLONEL ECKLES: Dr. Morgan is ready for your questions.

QUESTION: This question has to do with the stockpiling of ore. Would you discuss the merits of stockpiling ore versus the stockpiling of ingots, plates, or whatever it is that industry uses? Also the possible political or labor implications of processing to a more finished state.

DR. MORGAN: I really am glad you asked that question, because that is a point I had hoped to cover. The bulk of the stockpile

is now in the form where it can be readily used by a variety of industries, without being in such a restricted and upgraded form that its widespread use becomes impossible. Let me illustrate.

When we import into this country four tons of bauxite (the ore of aluminum) from either the Guianas or Jamaica those four tons of bauxite come in to the Gulf Coast as a rule, and are made into two tons of alumina. Those two tons of alumina are then shipped to places where cheap electric power is abundant. By the use of considerable quantities of electric power, the two tons of alumina are made into one ton of aluminum metal.

You can see in this process that if you stockpile one ton of aluminum metal, you have stockpiled the equivalent of four tons of bauxite, plus the ocean transportation, plus the facilities required to convert to alumina, plus the chemicals that are used in doing that, plus the shipment by river and box car to the aluminum reduction works, plus the needed electric power. Then if you also move those aluminum ingots to a place near where they are going to be consumed, you have stockpiled additional manpower and transportation.

There are a few items stockpiled that are not upgraded, such as manganese ore and chrome ore. But in the case of copper, that is all in the form of copper bars. Lead, zinc, and tin are all in the form of metal bars, not ore.

The President's Cabinet Committee on Mineral Policy, in reviewing the domestic mobilization base, was concerned also about maintaining fabricating capacity; and they said that when materials in the stockpile can be upgraded to the point to where they will be more readily usable in time of war, this should be done, in periods of lessened domestic economic activity, in order to keep those businesses which are essential to the mobilization base going.

So that, for example, if we ever have a period when the aluminum industry is running at less than capacity, I hope that our bauxite in the stockpile will be fed through the system for ultimate stockpiling in the form of aluminum metal.

I might go just one point further and show you what you run into if you upgrade too far. At the start of the Korean War the Air Force came to us and said: "We want you to stockpile a certain amount of tapered aluminum sheets." Such items would be a stage or so beyond

the aluminum ingot. We did buy a small amount of such sheets under the Defense Production Act.

Later we could not easily get rid of it, because once it was rolled to a certain taper, and once it had been made from alloys for whatever the Air Force wanted in those particular sheets, it was subject to rapid obsolescence. Within a year specifications both as to the alloy and as to the degree of taper can be changed. So you see, if we stockpiled everything at too advanced a level, we would lose the flexibility for new alloys and for new shapes and forms that would be needed in three or four years in the future.

QUESTION: You have answered a portion of my question. It concerns what you do when you have an excess of some particular item in this stockpile. I am thinking of a reduction in military requirements in some particular item. How do you dispose of that item? And what does that do to the market when you attempt to dispose of it?

DR. MORGAN: Congress was very concerned, when the basic act was reviewed and re-passed in 1946, that the materials in the strategic stockpile should not be allowed to overhang normal commercial markets. Release from the stockpile is possible in time of emergency on order of the President when he finds that it is necessary for defense purposes, or in the interest of common defense. ODM has been delegated that authority by the President in time of attack on continental United States. So in the case of a major emergency we don't have to bother the President.

In time of peace, however, we generally cannot dispose of anything in the stockpile unless Congress is advised of the plan of disposition. The plan must lie on the table for six months, so Congress can review it. That gives consumers, producers, importers, brokers, and everybody else who has a commercial or financial interest in that commodity, time to let their views be known to their Congressmen. And only upon express approval of the Congress would disposition be allowed.

That process will be gone through right now in the case of some hog bristles, which once were stockpiled because the Navy said they were necessary for paint brushes for wartime. If the plan of disposal is not in the Federal Register now, it will be in a couple of days.

I did not mention disposition for obsolescence or rotation or deterioration. There are a few ways we can get rid of materials

that have deteriorated that don't require express approval of Congress. But we don't need to go into that here.

QUESTION: This question is rather abstract. We increase our currency based on stocks of gold and silver. That brings up this question: Is there any feasibility perhaps of issuing currency on the basis of these stocks of other materials?

DR. MORGAN: I should simply say that is not in my field, but that is not my nature. I would say this: that in an industrialized nation like the United States, stocks of raw materials that are absolutely essential to the industries of the country probably have more real value than the many billion dollars worth of gold and silver that form the legal base for our currency. And certainly in time of war, the Nation with adequate supplies of tin, rubber, and so forth will be able to do a lot of things that the mere existence of a stock of gold or paper money would not make possible. Why money should be based on any particular metal or group of metals is a matter of national faith, psychology, history, and so forth, rather than being directly related to metallurgy.

QUESTION: Is there any other nation in the allied bloc that is paralleling this stockpile program? England, for example?

DR. MORGAN: No nation in the allied bloc is doing anywhere near as much as we are doing, that is, planning for wartime deficits for a five-year period, in which major overseas sources may be cut off.

Now, I do understand that the British Ministry of Supply during the Korean War maintained certain working inventories, which might have been four, five, or six months normal inventory for British consuming industries. The French arsenals and the Canadian arsenals must have a little bit more on hand than they need for a day-to-day or hand-to-mouth basis. But there are no formal official stockpile programs approaching the magnitude of the United States program.

QUESTION: On this stockpile is industry informed as to where it is set up in a given metal? I understand it can't be released except with ODM authority. Let us say that all of Washington was wiped out. How would a company go about getting information on where there is a copper stockpile near them? And how can they get hold of it?

DR. MORGAN: In time of all-out war we would undoubtedly decentralize responsibility for some releases, particularly in case of an attack upon this country. We could, for example, decentralize to the regional offices of the General Services Administration, which is the stockpile custodian, authority to release in the first 30, 60, or 90 days of the war certain amounts from whatever is in their custody on a regional basis. And the FCDA is informed of our stockpiles and where they are and what is in them. So whoever was in authority would immediately know what we had in that area. Then, as soon as Federal controls were established and we could have an overall program on a Federal basis, like DMS, or some other allocating program, stockpile inventories that remained undestroyed after the attack would be fed into that system.

QUESTION: Dr. Morgan, what you said about your tungsten-mining industry concerns me. I wonder if there are other industries in the same boat, because it appears that the Federal Reserve Board, the Council of Economic Advisers, or what-not are working to keep our economy stabilized, whereas if the stockpiling program functions the way you say it has, the way it did with tungsten, all it could do would be to reinforce a recession.

DR. MORGAN: I prefaced my remarks on tungsten by saying it was probably the best example of rapid expansion that I can cite. There is no other material where the United States industry is producing more than the total quantity industry consumes. In fact, in most of the big items, like aluminum, copper, nickel, and so forth, civilian industry is using up far more than the quantities resulting from the expansion programs. So the problem doesn't exist except in a very few areas, tungsten being the worst one.

Now, I point out that many of the tungsten people were in the tungsten business before the Korean War came along. They knew how much we were going to buy and what price we were going to pay for it and under what conditions. And they participated in the program of their own free will. Rather than feel completely unhappy at losing the government market at this stage of the game, they ought to feel fairly satisfied that they got a good price for a five-year period that they might not otherwise have received.

Regrettably, when we have met our defense needs for some of these materials, a few producers may have to suspend operations if the United States industry will not or can not buy their output.

QUESTION: Do you have any idea of the shelf life of natural rubber and black pepper?

DR. MORGAN: Yes. On the natural rubber, GSA has been keeping fairly close track of it. I understand that some lots that were purchased prior to World War II under the 1939 stockpiling program are still in the stockpile and still meet the specifications. They were very high-grade rubber. On the other hand, at the height of the Korean War, when we didn't know what was going to happen to Malaya and Indonesia, we bought some rubber that has a life of only a few years; and that material is being rotated out and replaced by higher qualities that have a much longer life.

We sample the inventories from time to time, calling in consultants as necessary. Material to be rotated is sold off to industry, and the Government buys an equivalent quantity right then and there. So we don't upset the market.

With regard to pepper, it is not now on the stockpile list.

QUESTION: Are there any indications that Russia is involved in a similar program to this?

DR. MORGAN: Yes. But I don't know the magnitude of it. There is no doubt that the U.S.S.R. is trying to cover their deficiencies in certain commodities.

I think we should appreciate that the U.S.S.R. has a couple of factors in their favor as regards materials. In the first place, their standard of living is only a fraction of ours. Therefore they are not consuming the large quantities of nickel, copper, lead, zinc, and tin, etc., in making TV sets, automobiles, and all the other consumer goods, that we are. Our requirements, even on a rock-bottom civilian level in time of war, are probably higher than the standard of most of the people of the U.S.S.R. today. So we need a lot more of these materials than the U.S.S.R.

The other advantage is that the U.S.S.R. covers many times the area of the United States. It contains practically every known geological formation. When you add the resources that China and Mongolia and other satellites have undoubtedly, with very few exceptions, the Communists ought to be able to find within their borders most everything they need, especially when intensive exploration without regard to cost is possible. They ought to be able to make pretty good provision for anything they need for important purposes.

QUESTION: In the case of the surplus agricultural products, is it possible to consider the stockpiling of grains and so forth?

DR. MORGAN: Yes. The Government should be careful in disposing of surplus agricultural commodities to insure that adequate stocks for a defense emergency are retained.

I understand, although I am not an expert on this, that cotton and wheat and some other materials like that, when properly stored, will last for many years with no appreciable deterioration. While the C.C.C. holdings are not legally a part of our strategic stockpile, nevertheless the Government owns them and can use them in the event of war.

QUESTION: Dr. Morgan, the right side of the chart you say serves as the basis for your requirements. Do you attempt, or do you plan, to maintain a proportion similar to the proportion of the requirements there for each one of these claimants in the stockpile in the event of emergency? For example, do you earmark approximately 25 percent of your stockpile for industrial uses?

DR. MORGAN: No. There is no guarantee that any particular claimant will get a certain share. If we are confronted with an entirely different situation, we may have to use the stockpile for defense purposes in an entirely different way than we calculated it for. The one thing that we are sure of is that, if we make this calculation on a five-year basis, we will have piled up enough stuff so as to have pretty good flexibility to meet almost any situation that may come up.

QUESTION: You have expressed concern about some of the military estimates. I think you also mentioned the possibility of some new programs coming along that might inject some considerable requirements. Haven't you in effect covered such contingencies by planning on a five-year basis instead of the military estimates?

DR. MORGAN: We have, for the materials currently on the stockpile list. So for manganese and copper and natural rubber and so on I am not too concerned. But, for example, if the Department of Defense is going to show a great new requirement for zirconium, which we don't stockpile at all, or if they are going to show a great need for lithium, which we don't stockpile at all, or for some complex chemical which industry produces only in minute quantities today, those are the situations where we need an advance look. I agree with you that for the items on the list where our stockpile is complete, we have a lot of flexibility. I am mainly concerned about items not now on the list.

QUESTION: Are there any legal restrictions to our buying materials behind the Iron Curtain? If not, have we bought any from behind the Iron Curtain?

DR. MORGAN: There are a variety of legal restrictions on industry buying behind the Iron Curtain. But I don't believe there is anything that would stop the United States Government from in one way or another, buying behind the Iron Curtain.

If you ask whether we have ever bought stuff from behind the Iron Curtain in the history of the stockpile program from 1946 to now, the answer is Yes.

QUESTION: Do the defense materials requirements include any material to be utilized in aid to allies? Or is the requirement based strictly on United States military requirements? Do you take into consideration what seems to me like a rather large requirement for aid to allies? Or do you dissociate yourself from any allied requirements?

DR. MORGAN: Where the military have allied requirements, they tell us about it, because we do not make specific provision for allied requirements outside of what we get from Defense.

Now, it is true that planning the stockpile on a five-year basis, with a built-in factor of safety, would take care of many such requirements. On the other hand, I am under the impression that the practice of whether or not allied requirements are included as a matter of course may vary from technical service to technical service.

QUESTION: You have indicated that when we mine intensively our domestic deposits, our stockpile requirements are lessened. On the other hand, some speakers here have indicated that our natural resources are on the way to depletion, particularly in some essential items. So that would lead us to the conclusion that the more intensively we mine, the less we have, and the greater the need for the stockpile. Would you reconcile those two statements?

DR. MORGAN: I will say this: that my personal belief is that we are not going to run out of anything in a hurry. Any time we are willing to pay a price over a period of time, we find a lot of new materials that we didn't know existed. I'll give you a few examples.

In a report that the geologists did on world columbium resources for us (when I was with the NSRB) prior to the Korean War, it was shown that the columbium requirement of the Air Force exceeded the world's known reserves. But the United States Government guaranteed

a 100-percent bonus for columbium for a five-year period or until a fixed quantity was bought; and we were amazed at the quantities that turned up. The result was that the quantity we set for the program has been met already and the five years have not expired. They found all sorts of deposits of columbium, some in the western United States, some in Canada, others in Africa. They found new ways of treating lower-grade deposits, that the geologists knew existed but hadn't thought were economically treatable and therefore hadn't included in their calculations. So we were just snowed under with columbium.

In the case of uranium, years ago geologists regarded it largely as a curiosity, found only in a few places in the world--such as Joachimsthal in Central Europe, Austria, the Belgian Congo, and Canada. But when the Atomic Energy Commission posted a price several times greater than the previous price for a period of years, they found ways of utilizing minute quantities of uranium in Florida phosphates and other deposits in this country, plus scattered high-grade deposits that nobody had even looked for. So now the United States has lots of uranium.

In the case of tungsten I told you we went from producing domestically one-quarter or one-fifty of our total industrial need to more than 100 percent of our needs.

In the case of petroleum, if you were to take the figures turned out every year on known reserves and divide them by the use, you could conclude that we are going to run out in the next eight or ten years. Yet every year we use more and more petroleum and we have more and more domestic reserves.

So personally I believe in the "develop your own resources" school and not in the "we are running out of it" school.

QUESTION:. I have another problem that needs to be reconciled. We had one speaker here, and others in the faculty and in seminars, who indicated that our foreign aid program, which is a multibillion dollar program each year, is needed primarily to protect overseas sources of raw materials. You have indicated that it is the national policy not to rely on those, but to build up our own sources. This seems to be going in different directions. Will you reconcile them?

DR. MORGAN: My whole talk this morning deals with a stockpile of strategic materials for a five-year period of all-out war. My thesis is that in time of all-out war, when the stockpile objectives are completed,

we can meet our total needs from the stockpile, plus domestic production, plus imports from Canada and Mexico and the Caribbean area. I was not talking about the long-range peacetime economic development of the United States over the next hundred years.

It may well be that the economic needs of the country, developing as they do over many years into the future, may require access to offshore sources of materials. On the other hand, when you see the possibilities of extracting valuable metals from low-grade ores, and finding ores in areas presently untouched in depth as well as substitutions developed by technology, in which nylon, dacron, and so forth can take the place of cotton and wool, in which vanadium and other alloys can take the place of manganese and chrome that came from abroad when you see how an aluminum sardine can can take the place of a steel can with a tin lining, when you go to the store and buy two little pickles in a plastic bag, with the juice in it and so forth, personally I think that, in peacetime, the United States can meet all of its important needs domestically if it has to.

I would further point out that if we are sincere in what we say about raising the standard of living of all these foreign countries, if we raise the standard of living of 400 million Indians 5 or 10 percent, and the standard of living of four or five hundred million people of Africa and more millions in Asia 5 or 10 percent, they will consume more raw materials than would raising our own standard of living one hundred percent. Therefore if we think that we are going to have a blank check on the world's resources outside of our own borders in the future, I think that is not likely to exist for long, because rising standards of living in these other countries will put in increasing demand on those selfsame materials.

QUESTION: It appears that the maximum amount that the pressure groups can advocate stockpiling would be the amount in that right-hand bar, the gross requirements. Could you give us an idea of the total money value of that total gross requirement?

DR. MORGAN: Our minimum stockpile objectives are 7 billion dollars. Our long-term stockpile objectives are 10 billion. But included in the domestic production data are substantial quantities of copper and aluminum and other materials where the domestic production is considerable. So the five-year wartime requirement for all 75 materials would be many more billions of dollars. However, I don't think anybody is going yo push us into the position of stockpiling the full five-year requirement for everything.

COLONEL ECKLES: Dr. Morgan, on behalf of the College, I want to thank you for a most stimulating lecture and question period. Thank you very much for taking the time to give us this excellent presentation.

(21 Feb 1956--2950)B/mmg

Table 1

V-MAT-MM-1 (Revised)
October 3, 1955

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF DEFENSE MOBILIZATION

MATERIALS MEMORANDUM-V-1
(Revised)
October 3, 1955

SUBJECT: CURRENT LIST OF STRATEGIC AND CRITICAL MATERIALS FOR STOCKPILING

Section 1. Purpose

This memorandum is issued pursuant to Section 2(a) of Public Law 520, 79th Congress. The materials as listed herein comprise those currently included in the stockpiling program. It should be noted that not all of the listed materials are under active procurement.

Section 2. Group I Materials

The materials listed in this section constitute Group I and have been or may be acquired through purchase pursuant to Section 3(a) and by transfer of Government-owned surpluses pursuant to Section 6(a) of Public Law 520, 79th Congress.

1. Abrasive, Crude Aluminum Oxide
2. Agar
3. Aluminum
4. Antimony
5. Asbestos, Amosite
6. Asbestos, Chrysotile
7. Asbestos, Crocidolite
8. Bauxite, Metal Grade
9. Bauxite, Refractory Grade
10. Beryl
11. Bismuth
12. Cadmium
13. Castor Oil

14. Celestite
15. Chromite, Chemical Grade
16. Chromite, Metallurgical Grade
17. Chromite, Refractory Grade
18. Cobalt
19. Coconut Oil
20. Columbite
21. Copper
22. Cordage Fibers, Abaca
23. Cordage Fibers, Sisal
24. Corundum
25. Cotton, Extra Long Staple
26. Diamonds, Industrial
27. Feathers and Down, Waterfowl
28. Fluorspar, Acid Grade
29. Fluorspar, Metallurgical Grade
30. Graphite, Ceylon--Crystalline and Amorphous
31. Graphite, Madagascar--Crystalline Flake and Fines
32. Graphite, Other Than Ceylon and Madagascar--Crystalline
33. Hyoscine
34. Iodine
35. Jewel Bearings, Instrument except Vee
36. Jewel Bearings, Sapphire and Ruby Vee
37. Jewel Bearings, Watch and Time-keeping Device
38. Lead
39. Magnesium
40. Manganese Ore, Battery Grade
41. Manganese Ore, Chemical Grade
42. Manganese Ore, Metallurgical Grade
43. Mercury
44. Mica, Muscovite Block, Stained A/B and Better
45. Mica, Muscovite Film, First and Second Qualities
46. Mica, Muscovite Splittings
47. Mica, Phlogopite Splittings

48. Molybdenum
49. Nickel
50. Opium
51. Palm Oil
52. Platinum Group Metals, Iridium
53. Platinum Group Metals, Platinum
54. Pyrethrum
55. Quartz Crystals
56. Quinidine
57. Rare Earths
58. Rubber, Crude Natural
59. Sapphire and Ruby
60. Selenium
61. Shellac
62. Silicon Carbide, Crude
63. Silk, Raw
64. Silk Waste and Noils
65. Sperm Oil
66. Talc, Steatite, Block
67. Tantalite
68. Tin
69. Titanium Sponge
70. Tungsten
71. Vanadium
72. Vegetable Tannin Extract, Chestnut
73. Vegetable Tannin Extract, Quebracho
74. Vegetable Tannin Extract, Wattle
75. Zinc

Section 3. Group II Materials

The materials listed in this section have been acquired principally through transfer of Government-owned surpluses pursuant to Section 6(a) of Public Law 520, 79th Congress, and constitute Group II. None is under procurement.

1. Bauxite, Abrasive
2. Cryolite, Natural
3. Diamond Dies
4. Mica, Muscovite Block, Stained B and Lower
5. Mica, phlogopite Block
6. Optical Glass

7. Platinum Group Metals, Osmium
8. Platinum Group Metals, Palladium
9. Platinum Group Metals, Rhodium
10. Platinum Group Metals, Ruthenium
11. Rutile
12. Talc, Steatite, Ground
13. Wool
14. Zirconium Ore, Baddeleyite
15. Zirconium Ore, Zircon

Section 4. Effective Date

This memorandum supercedes Materials Memorandum V-MAT-MM-1 (Revised) dated February 14, 1955, and is effective immediately.

C. F. Ogden
Assistant Director of ODM
for Materials