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Conservation Program of The War Production Board

by
Harvey A. Anderson

Technical Editor's Note: *The paper begins with introductory remarks by Chairman Maurice R. Caldwell.*

Chairman Caldwell: Our third paper is by Mr. Harvey A. Anderson, Chief, Conservation and Substitution Branch, Bureau of Industrial Conservation, War Production Board, Washington, D.C. Mr. Anderson is probably more or less new to us, so I will give a short history of his accomplishments. He has been with the Bell Telephone Company and the Western Electric Company for around 21 years and I understand that previous to that he has worked for the Bureau of Standards in Washington.

Right now, Mr. Anderson has a real job in Washington and is a very busy man. Under his Department, as he will explain, comes practically every material that is on shortage, or being followed by the government as being curtailed here and there, so I am sure Mr. Anderson will be very interesting to listen to, as he speaks to us on "Conservation Program of the War Production Board."

Mr. Harvey Anderson: Coming as the third speaker of a group of people down in Washington, I am unable to give the recorder an opportunity to know in advance what I am going to say, because I could not know until I had heard what our other WPB speakers had to say. I will try to find a few spots that have not been covered in these excellent talks that we have had.

This morning, as I came through my birthplace, a few miles south of here, I realized that at least from the standpoint of age, I would be qualified to be one of the trio of oldsters that the Chairman is handling this morning, because in a couple of years it will be 50 years since I started life down here in Plainwell, a few miles south.

This is my second war in Washington. I went down by request in April 1941, to help out on the problem of die castings and have been asked to continue on down there with the manifold materials conservation problems which have arisen.

It looked to us a year or so ago as though the problem down there would not be much worse, this war, than it was in the last war. Then it was largely a case of trying to find the best material for each purpose. Today it is a case of trying to find the most suitable material which is available. It makes us all feel small.

I am reminded of a story of an occurrence in Washington about a week ago. They just got a new Chief of the Iron and Steel Branch down there - Reese Taylor . . . He came from Los Angeles, where he was the president of the Union Oil Company - to take the place of C.E. Adams. Mr. Taylor, by the way, is an old steel man - he had been in the oil game just a few years . . . Reese is one of these big boys, about 6'4", weighs 250 pounds . . . He was in the other day, talking to Sidney Weinberg, the assistant to Mr. Nelson, and he started in with all the vim and vigor which is so characteristic of him, telling how he planned to remake the Iron and Steel Branch, correct all the deficiencies he thought existed there, simplify the whole job.

After he had gone on a little while, Sidney interrupted him and said, "Reese, you're a pretty big man, aren't you?"

"I guess so."

"How tall are you?"

"6'4"."

Sidney said, "You're big in every way . . . How much do you weigh?"

"250 pounds."

"Well," he said, "You know how big C.E. Adams is?"



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"He is a small fellow - about 5-1/2' tall, weighs about 140 pounds, I guess."

Sidney said, "You know, C.E. Adams was your size when he came to Washington." (laughter)

It does take the measure of a man down there. It is a job that is bigger than any of us. It is a job that cannot be handled from Washington. It is a job that necessitates the cooperation of all you people that are so capable of working independently in this country.

The group that I am associated with down there, the Bureau of Industrial Conservation, attempts to serve a staff function in channeling scarce materials into the avenues where they will be of the most value in the war effort.

We had several conservation groups in OPM a year ago and last fall Mr. Nelson drafted Mr. Rosenwald (Lessing Rosenwald, former chairman of Sears-Roebuck) to correlate the various conservation activities. He pulled in various groups, so that now we have a Specifications group under C.L. Warwick of the American Society of Testing Materials. They have the problem of studying the Army and Navy Specifications and attempting to eliminate wherever possible all inconsistencies, all requirements which are not essential or cannot be met with the materials at hand and, as far as possible, to try to get government organizations to buy from uniform specifications.

Howard Coonley, the Chairman of the Walworth Company, heads a Simplification Branch, which, as its name implies, is attempting to foster reduction in the number of varieties, sizes, shapes and colors that result in increased inventory, increased consumption of material and less availability for war purposes.

They have succeeded in making reductions in a great variety of things, bringing down the number of colors of dyes in hosiery, number of sizes, and shapes of glass containers, and a variety of other activities in the direction of simplification, carrying on in cooperation with the Bureau of Standards, which has been handling the simplification work for a number of years.

Then there is a Salvage Branch headed by Paul Cabot, which is attempting to bring out into useable channels all of the inactive critical materials, which are laying around the country. It is divided into four sections: (1) General Household Salvage, which had some connection with the unfortunate aluminum drive, bungled by our friend, the "Little Flower" from New York, because he would not allow the scrap dealers to take the very essential part which they must play in any salvage program. Our salvage group went out after paper, a campaign which, as you know, has been so successful that temporarily we have gotten quantities of scrap paper in excess of the paper mills' and paper box manufacturers' requirements.

They are going out after old metals with such success in the case of steel, that, last week, for the first time in many months, there was not a single open hearth furnace in America that was down because of lack of scrap. That has been an accomplishment which the discouraged and pessimistic people said could not be done, that we would have shut-downs, but a very effective job has been done in bringing in the old metals.

The little town I come from, in Illinois, put on a campaign a couple of weeks ago. One Sunday the men of the village got out and collected old scrap metals and rubber. In a town of 6,000 people, in one Sunday, they were able to bring in over 70 tons of scrap material. The country is full of this, and we can get it out if all of us do our part. Today the rubber campaign needs special emphasis and special co-operation.

Then they are going after old rags which can be used to good advantage and also including in their campaigns now, fats and greases and bones, where the glycerine is so needed.

Then there is another group in the salvage branch which has to do with (2) Industrial Salvage. They went to airplane plants last summer, getting them to classify their aluminum scrap, so that instead of selling the aluminum alloys out the back door, they are being returned to the original fabricators to be reworked and made into new, strong alloys. Classification of scrap is the secret of the whole program.



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In connection with industrial salvage, it is interesting to note that one steel company which was pessimistic about the shortage of scrap, and which had never been accustomed to do anything on its own part to increase its flow of scrap, felt they were going to run short. Our Industrial Salvage section suggested to them that they see what they could do to help themselves. As a result of considerable prodding, they went out, searched their plant, and found 125 carloads of obsolete scrap within the boundaries of their own plant. That is an example of the way in which self-help often will solve the problems that face you. Just as Mr. McCord told you. It must be the method of solution in your case.

Then there is another salvage group that is working on the (3) Automobile Graveyards. They started in in Maryland and there they were so successful that the number of junk cars that were brought back for remelting into steel exceeded the total number of cars that the preliminary survey had indicated were available in all the junkyards of the state.

The method that is being followed is to give the junk yard owners 30 or 60 days to strip the cars down and get out the non-ferrous metals and anything that is useable. At the end of that time, if they have not done their job and are not ready to sell their junked cars, our people walk in and take them over. You may recall seeing newspaper accounts of such requisitions. We have to get that scrap and if dealers expect to hold it for a source of income in their old age, they are due for a reawakening!

There is a (4) Special Projects Salvage Section which is attempting to get all of the old rails from the abandoned railroads and the steel from old bridges and old buildings. Many of these projects are tied up with legal restrictions and they have to be cleared, so that they can be wrecked. A bridge in Maryland was secured in that manner, and some of the old remaining tracks of the Boston-Westchester - a couple of streaks of rust have been pried loose so that they can go back and be melted. All over the country large amounts of these obsolete utility and governmental properties are being made available for salvage purposes.

The fourth one of the branches in the Bureau of Industrial Conservation is the Conservation and Substitution Branch, with which I am associated. We, as the Chairman has indicated, have contact with a large variety of materials, all the way from iron, steel and ferrous alloys, to rubber, textiles, paper and other non-metallics.

The whole attempt all the way through is to see if the materials which are scarce for military needs can possibly be replaced with something else that is satisfactory for civilian needs, or something else which is satisfactory for the less essential military needs.

Essentially, there are only three reasons why the War Production Board issues orders; in the first place, because the materials are needed, in the second place, because the manpower is needed, and in the third place, because the facilities, including transportation, are needed. One of those three reasons is or should be the guiding consideration in every case of the issuance of an order.

Now, of course, if we were able to be foresighted enough, these orders would come out in a logical sequence and in time so that it would not dislocate industry nearly as much as has been necessary with the volume of orders that has been issued recently.

Just last week this book on priorities reached my desk (holding up a copy) . . . this represents in very fine type the list of P, L, M, E and S orders which the WPB has put out in its short period of life.

It is an enormously complicated job, but throughout the whole thing, certain objectives are apparent.

For instance, last summer we sent to the War and Navy Department a list of critical materials and told the War and Navy Department, "If you don't design downward to the less scarce materials, there are going to be shortages for military needs, irrespective of civilian requirements."

That list still holds fairly good, with magnesium at the top, a metal which is relatively scarce still, but is going to be an extremely abundant material.

For many years, the only source of magnesium in this country was a plant up here in Michigan. The Dow Chemical Company subsequently put in new plants at Freeport, Texas, where they are getting increasing amounts of magnesium from sea water - an inexhaustible reservoir; natural gas, seashells and sea water are practically the only raw materials that are required. Magnesium



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production is increasing rapidly because, luckily, the British authorized construction of a plant down there long before we got into the war. There is also a new magnesium plant built at Las Vegas, New Mexico, another in California, and a new plant is going up in the Pacific Northwest. The sum total of magnesium production will be increased 60-fold over what it was before the war.

Magnesium will be an abundant material and something it behooves you all to learn more about to be prepared for the post-war period, but magnesium is not yet available in quantities that are needed for war purposes. We are way behind the Germans . . . electron metals were more abundant there in the last war than magnesium metals were here at the beginning of this war. Eventually this country will catch up.

Aluminum has already been discussed. We are in much the same position on that, except that the expansion that had taken place before the war provided us with a larger quantity, amounting last fall to about 70 million pounds of aluminum a month and it is going to go up until we will have a capacity of over 2,000,000 000 pounds a year. However, that amount of aluminum is not available yet and aircraft needs practically every pound of new aluminum we have.

There has been some loose talk about a surplus of aluminum; that is not a true surplus. The apparent surplus that exists has been due to failure of the fabricating facilities to keep up with the ingot production. There is some shortage of production capacity in sheet and extruded forms and forgings, but that is rapidly being rectified. With the contemplated expansion of the aircraft program, the aircraft demands for early 1943 will still be ahead of the aluminum production.

Nickel has also been referred to. The International Nickel Company spent some 35 million dollars last year to increase the output of nickel by 50 million pounds, but the output has not kept up anywhere near to the increased demand. The requirements from our Allies have gone up. New Caledonia, which was a source of a small part of our nickel, is being held by the Allied troops, but the conditions for shipping are not at all favorable. The nickel situation is so tight it is becoming necessary to take nickel out of armor plate, an application which is certainly a primary combatant use. You must realize that when nickel is taken out of armor plate and out of superstructures on board ship, there is no excuse for any claim that the use of nickel is necessary for plating except for military applications.

The potential tin shortage was not fully realized nor anticipated before the Pearl Harbor catastrophe, but practically all of our supply of tin came from the Dutch East Indies and Malaya and was smelted over in England. Today we have just gotten into operation a new tin smelter at Texas City, Texas, which has a limited capacity. It was originally designed for 1500 tons a month, which is a mere bagatelle when you realize we consumed over 110,000 tons of tin in this country last year. We call tin an irreplaceable metal . . . we have some stockpiles, thanks to the buying of the RFC, but not nearly enough. Part of the blame is due to the international tin cartel. What we use in tin we cannot expect to replace in any considerable per cent for several years.

We have about four detinning plants in this country, a couple in New Jersey, one in Pittsburgh, one in San Francisco and approval has been given for the construction of six additional detinning plants. The danger is that with a reduction in the amount of tin on tin plate for tin cans we will lose the chief source of raw material for the detinning plants. The maximum permissible tin coating was reduced from 1.65 pounds per base box to $1\frac{1}{4}$ and the can people are going as rapidly as possible to $\frac{1}{2}$ pound electrolytic coat and even cutting out tin plate entirely on a great many containers. I notice that dog food is coming out now with no tin; they are using paper. Dog food alone took one billion tin cans last year, and oil took one-half billion tin cans. Most similar items are prohibited now for packaging in tin, so that there is going to be a decreasing amount of raw material for the detinning plants. It causes the WPB serious concern as to whether or not to take critical materials for the construction of detinning plants when the source of raw material is being cut off.

Then copper, which has been referred to. The predictions on that become more pessimistic every time you hear them. The Army and Navy requirements are going up, even with the substitution of steel cartridge cases for brass. Our naval requirements are constantly increasing and the picture on the sources of supply is not comfortable.

A new open pit mine just came into production in Arizona in January. They spent some 35 million dollars down there to produce 75,000 tons of copper per year from low grade ore. With that increase and with the bonus which the RFC has arranged to pay the high cost producers over the copper ceiling, we are still unable to increase the supply here to anywhere near what we need. We are faced today with a very serious condition in the reduction of imports. About one-third of our copper ore came from Chile;



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bottoms today are tight; a lot of ships that formerly touched at South American ports and came up with ore in their holds, today are making a rapid turn-around from Australia and going back to the Pacific Coast to load up with supplies for MacArthur and his forces in the Far East.

As a consequence, we are getting less and less copper in from South America, just as we are getting less bauxite in from British and Dutch Guiana because of the sinking of our ships over on the other side of the Panama Canal.

Those five metals are and bid fair in the next few months to be available in inadequate quantities for military and associated essential civilian demands - such things as construction of military facilities and provision of defense housing.

The zinc and lead pictures are a little bit better, although the situation on high grade zinc is not nearly as optimistic as was predicted last fall. Last month only 15% of the total lead went into the "kitty" which is allocated by the WPB. The balance still was being shipped out to customers by the suppliers without full control. One of the objectives of the Conservation and Substitution Branch at this time is encouraging the use of lead in place of the other more critical metals.

The steel situation is becoming increasingly bad. I spoke before the Air Conditioning and Refrigerating Congress in Chicago a couple of weeks ago and a number of people came up to me after the meeting and said, "Why should we not use brass as a substitute for steel, because we can get the brass and we cannot get the steel."

Well, that situation was referred to by Mr. McCord. Our inventory and requisition operations have not worked out as fast and as adequately as they should have. We need all of the copper and copper alloys including the scrap for strictly military needs and will need them for many months. The mere fact that somebody has some of that scrap is no excuse for using it for non-essential applications and certainly not for substituting it for iron and steel. Although the deliveries are slow in iron and steel, we have some 80 million or more tons of steel and only about two million tons production of aluminum and copper. The difference in estimates of annual production of iron and steel is as great as total production of aluminum or copper will be next year. You have to keep your proportions straight or you cannot reason satisfactorily with a local condition where there may be a little excess of brass in the hands of some user temporarily.

The announcement was made in the papers recently that some of this steel expansion is going to be given up, because of the fact that critical materials which are required to build new facilities will have to be taken away from the construction of shipping and guns and planes and tanks today. Today is when we need these things. As Mr. Nelson put it, we have to use the "silver months" to maximum advantage.

I am not going to go into the other non-ferrous materials, alloy and plating materials, because they have been adequately covered, but I want to say a word more about silver. I have been pretty close to that deal down there. We have been trying our best to get a set-up whereby silver will be available for unlimited use in industry. You recall the announcement in the paper that we got the approval of the Treasury and RFC to the use of 40,000 tons of silver as a substitute for copper in bus bars in the new aluminum and magnesium plants. That represents a non-deteriorating use, where we can return it to the Treasury Department after the war and it will be equally as valuable and there will be no appreciable loss involved.

Today we import about 3500 tons of silver a year and we produce domestically about 2500 tons. The treasury offers to buy the foreign silver at 35¢ a troy ounce, but actually, industry is now paying 35½¢, so the treasury is not buying much foreign silver. However, the treasury is obligated to buy all silver of domestic origin at 71¢ a troy ounce and it is not permitted to sell any silver until silver bullion either attains a certain ratio to the gold holdings, which is fantastic, or until silver passes the price of \$1.29 a troy ounce, which is its monetary value. It is unfortunate that adequate silver is not available for industry when we know, for instance, that we can substitute solder containing around 2% silver, balance lead for 40%-60% and 50%-50% tin-lead solder.

We have adequate silver in the vaults up at West Point, which cannot be used because of the legal restrictions. We estimate that approximately 8,000 tons of silver could be used annually in industry as a replacement for critical metals in war equipment if there were no legal restrictions.



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Reference has been made to the use of gold for plating. Several weeks ago, I visited the California Institute of Technology and Dr. Clark showed me some work he had done a couple of years ago in connection with a silver investigation, namely, plating a few millionths of gold on top of silver. The suggestion has been made by some people that the gold would diffuse into the silver and the resulting alloy would not have the nobility of the gold. That was found not to be the case. Even when samples were given what he called the egg test, *i.e.*, boiled with ground, hard-boiled egg, and baked at 1100° and 1200°F., there was no tarnish apparent and even two years after the time that these specimens had been prepared and tested, the gold still was visible there in a form which indicated it had real merit as a protection from tarnish of the silver.

That is one of the things that is being considered along the lines Dr. Blum suggested for surgical instruments. I was in the office of the Under-Secretary of the Treasury some time ago asking for the loan of silver and he said, "When are you going to come back and ask us for our gold?" I said, "You will be surprised - we have already got plans for it." In a country that is wholeheartedly all-out for the war, we ought to find economical uses for as much as possible of our gold and I solicit your help.

One thing that I have not heard mentioned this morning is a coming development which is going to have some real value. That is the application of chromium plating on silver. It is being done satisfactorily and will be discussed at further length here in this meeting. Mr. Hogaboom of our staff is prepared to give some of the information which has been developed by the Underwood-Elliott-Fisher people and it looks very promising.

From the standpoint of the electro-tin deposition, we are doing the best we can to foster the utilization of the tin plating facilities of the shops of the type in this vicinity prior to the availability of the strip plating that the steel mills are putting in. The indications are promising that some work will be done, but of course, it is more expensive and there is considerable resistance. The steel companies would rather put in their strip plating lines.

Today the anomaly exists for the can manufacturers that black plate seems to be the neck of the bottle, rather than the tin which has been allocated for coatings. However, every possible pound of tin should be saved, and considerable quantities could be saved by using these batch plating methods that are available in your plants with relatively small changes.

These things move slowly. We have an enormous organization, but we are doing our best to help you out. I want to close by stating again that there are only three reasons why orders are issued: We need the materials, need the manpower, or we need the facilities and if any one of those three necessitate changes in American industry in order to win this war, and win it speedily, I know every one of you is willing to make the necessary sacrifices.

Thank you! (applause)