PETROLEUM IN FOREIGN COUNTRIES

29 September 1947

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This lecture represents the views and opinions of the author and does not, necessarily, reflect those of the Industrial College of the Armed Forces.

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CAPTAIN WORTHINGTON: Mr. Max W. Ball gave us a talk less than a year ago in this College. We felt it was one of the most informative talks of the year on a very critical subject, petroleum. We have asked him to come back to give this class the benefit of his knowledge of the developments since last year on a world-wide basis. We are particularly fortunate to have Mr. Ball back with us today. He is the Director of the Oil and Gas Division of the Department of the Interior.

Mr. Ball

MR. BALL: Gentlemen, you had a very interesting talk, I know, from Bob Allen on the domestic situation. The situation in the United States cannot be entirely divorced from that in the rest of the world and I do not intend to try to divorce it. So, it may be I will cover some of the things he covered.

General McKinley, in asking me to come again to the Industrial College to talk on petroleum, assigned me the subject: "The World Petroleum Outlook." That is a large assignment. It covers some 55 million square miles of land and nearly three times as much water, and the varying needs of more than two billion persons for light, fuel, power, and transportation. I respond to this assignment with more hesitancy than facts, for I shall be compelled to dive from the springboard of facts into the perilous waters of prophecy.

My hesitancy stems from a knowlege of how treacherous those waters are. I once heard a wise old oil man say, "You can only be sure of one thing about tomorrow in the oil business: you can be sure that it won't be what you think it is going to be."

Less than two years ago a committee of top-flight petroleum economists made a report to the Senate Special Committee Investigating Petroleum Resources. The forecast of demand in that report presented the view that prevailed generally for several months after the war ended. So far as I know, all of us shared it.

The economists thought that demand would drop off, with the departure of military requirements, in the direction of prewar consumption, with a subsequent slow growth during the years of reconstruction and rehabilitation. That was the one thing demand did not do. It hurdled the war period and started off from the high level where demand might have been had there been no war, and it has continued to move upward at

an accelerated pace. Within two years we have reached the level of domestic consumption that the oil industry economists estimated we would reach in ten years. We have encountered startling and almost unbelievable increases in petroleum demand in almost every phase of our civilian, industrial, and commercial life. The role of the prophet is a risky one, in his own country or any other.

Our current gasoline consumption is twice as large as the amount used by civilian cars and trucks during the most stringent period of wartime rationing. Our automotive fleet now is larger than prewar, but a significant difference is the larger proportion of trucks. Prewar, one registered vehicle in every seven was a truck; now the ratio is one in every 5.7. Put in another way, passenger automobile registration is up 3.5 percent from 1941, while truck registration is up 33.6 percent. The number of tractors on farms has increased and more of them are using gasoline, so that off-the-road consumption of gasoline this year may prove twice as large as the prewar use.

The number of domestic oil-burning central heating plants, or oil furnaces, used for home heating, will be at least 50 percent greater next winter than when the war ended; not when the war started; when it ended. The growth in oil-burning space heaters--individual oil stoves to heat one or two rooms, as distinguished from the furnace that heats the whole house--is even more startling. The number now in use is double the prewar level, but the outstanding fact is this, that in many of the central and mountain states the number of space heaters delivered during the first half of 1947 was larger than the number delivered in the whole of 1946. In terms of average oil consumption, three space heaters are about equal to one central house-heating plant.

Diesel oil purchases by the railroads during the first half of 1947 were 42 percent higher than in the first half of 1946, and yet there was no decrease in railroad use of heavy fuel oil, which is burned in steam locomotives.

Fuel oil consumption in the generation of electric energy at public utility power plants was 46 percent higher in the first half of 1947 than in the first half of 1946.

So it goes, from one petroleum product to another and from one use to the next. Petroleum demand in the United States has been increasing at a rate wholly unforeseen. The average gain in demand for all petroleum products in the United States during 1947 is estimated at 9.4 percent over 1946. The end of that gain period--what might be called the saturation point--is not yet in sight. There remains a large unfilled demand for automobiles. Millions of more homes will be built and many of them will be heated with oil. Most of the locomotives now

on order are of the Diesel-electric type. Some of our friends, the railroad people, in protesting before the Federal Power Commission against the building of a new gas line from the fields of the Southwest and the consuming areas of the Appalachian were very vigorous in their claim that the economy of the United States depended on the railroads and the railroads depended on coal; that any invasion by natural gas with any consequent decrease in coal consumption would greatly injure the economy of the entire country, not alone that of the railroads.

Their chief spokesman, after an hour or so of this eloquence and vigor, was asked how many locomotives were on order in the United States. He gave the number (I've forgotten what it was now) and then he was asked what percentage of them were coal-burning. Getting very red in the face, he said, "Eight." The other ninety-two percent were Diesel locomotives. In addition to the unprecedented present demand, we face an additional potential oil demand that will become an actual demand as soon as the instruments for consumption become available.

The increased demand for oil is not confined to the United States. It is world-wide. The September 1947 issue of "World Petroleum" contains an article entitled "Oil Consumption Rises Sharply in All Parts of the World." This article states that:

> "Elsewhere in most parts of the world, the current increase in oil consumption is even greater than in the United States, and sales could be increased substantially in many areas if supplies were freely available. European consumption outside of Russia and satellite nations is running 15 percent above last year. Consumption in the Eastern Hemisphere is up 26-27 percent over 1946. Western Hemisphere consumption in 1947 outside of the United States will be about 8.5 percent above 1946."

World-wide demand for petroleum is expected to increase to a level of about 10 million barrels daily in 1951. This is approximately double the prewar consumption in 1938, when slightly more than five million barrels daily were consumed. It took oil 80 years to reach a daily demand of five million barrels. A mere dozen years may increase demand as much as the preceding 80.

Demand for oil in the United States in 1951 is expected to total six million barrels daily, as compared with a little more than three million barrels daily in 1938. In the remainder of the Western Hemisphere, the 1951 demand is estimated at about one million barrels daily, as compared with 460,000 barrels daily in 1938. Eastern Hemisphere demand in 1951 is estimated at three million barrels daily, as compared with nearly 1.7 million barrels daily in 1938. The estimated total foreign demand of four million barrels daily in 1951 represents a gain of 40 percent over 1946; 40 percent over the year after the war, not the year before it.

The following table shows petroleum demands in the United State and foreign countries during the years related to this discussion.

U. S. Domestic and Foreign Petroleum Demands
(Figures in Barrels Daily)

Year	U. S. Domestic	Foreign	World
1938	3,115,000	2,127,000	5,242,000
1939	3,373,000	2,162,000	5,535,000
1940	3,625,000	1,838,000	5,463,000
1941	4,071,000	2,528,000	6,599,000
1946	4,907,000	2,866,000	7,773,000
1947 (Est.)	5,367,000	3,033,000	8,400,000
1951 (Est.)	6,000,000	4,000,000	10,000,000

Our estimates are merely bench-marks, but they give us approximate objectives to guide our thinking and the industry's planning. We look for a 10-million-barrel daily demand by 1951. We may hit 10 million per day sooner and 1951 may be larger.

If that is the demand outlook, what about supply? Can these increased demands for petroleum products be met? As soon as they are asked, such questions separate themselves into more questions which pin the problem down to crude oil supply, refining capacity, pipe lines, tankers, and all of the other facilities on the supply side. Over the entire area lies the shadow of time. If crude and facilities can be provided in ample quantities, can they be provided in ample time? Finally how about synthetics? If the demand cannot be met by the products of natural petroleum, will there be synthetic oils available?

I will submit first an answer to the last question, as that is the question most easily answered. Although the technique of production of synthetic liquid fuels from natural gas has progressed to the point where a small quantity may be available by 1951, provided adequate steel is available for the two projects now planned; and although the production of synthetic fuels from oil shale and coal is being actively developed by Government and industry, it is improbable that processes will be sufficiently developed and enough plants constructed during the next few years to make a significant contribution to supply. Important as synthetic oils are likely to be in the future, for the present our supply problems must be solved by natural petroleum and the products derived therefrom.

The supply of petroleum available to the United States has kept pace to date with increased demand, thanks to gains in crude oil production, the extraction of natural gasoline and condensates, and the

importation of crude oil and petroleum products. The trends in petroleum supply during the 1938-1947 decade are shown in the following table from Bureau of Mines sources:

U. S. Petroleum Supply
(Figures in Barrels Daily)

Year	Crude Oil Production	Other Oils Produced	Imports	Total Supply
1938	3,327,000	145,000	149,000	3,621,000
1939	3,466,000	148,000	162,000	3,776,000
1940	3,697,000	161,000	229,000	4,087,000
1941	3,842,000	231,000	266,000	4,339,000
1942	3,799,000	235,000	98,000	4,132,000
1943	4,125,000	247,000	174,000	4,546,000
1944	4,585,000	230,000	252,000	5,117,000
1945	4,695,000	315,000	311,000	5,321,000
1946	4,749,000	321,000	370,000	5,440,000
1947 (Est.)	5,040,000	356,000	453,000	5,849,000

The expanded postwar demand has not been met by oil from newly discovered fields. In the main it has been met by increased imports and the development of fields found before 1933.

The current rate of production in the United States approximates closely the maximum efficient rate; there is no substantial margin above current output for which transportation is available and which could be classed as reserve productive capacity. In my talk last year, I called attention to that very sad fact; that is, at the commencement of the war, had a reserve productive capacity in our domestic fields of about one million barrels a day. Today, we have virtually none. The Committee on Petroleum Production and Crude Availability of the National Petroleum Council, in its report of 10 July 1947, estimated crude oil availability of the United States, as of 10 June 1947, at 5,271,420 barrels daily. During the week ended 13 September, the United States is reported, by the American Petroleum Institute, to have produced a rate of 5,217,300 barrels daily, or 99 percent of the estimated total availability. The United States now is producing about as much crude oil daily as it should, on the basis of presently known oil reserves and their current state of development. To produce more would only mean injury to and shortening the life of our American fields.

L. F. McCollum, of Standard of New Jersey, has published in comparison with 1946, an estimate of the world's petroleum supply which may be attainable in 1951, as follows:

World Petroleum Supply, 1946 and 1951
(Figures in Barrels Daily)

	1946	1951 (Estimated as Attainable)
United States	4,749,000	5,166,000
Caribbean Area	1,180,000	1,539,000
Other countries	254,000	342,000
Natural gasoline, etc.	332,000	425,000
Total Western Hemisphere	6,515,000	7,472,000
Middle East	702,000	1,487,000
Russia (Estimated)	455,000	600,000
Other countries	211,000	416,000
Natural gasoline, etc.	51,000	54,000
Total Eastern Hemisphere	1,419,000	2,557,000
Total World	7,934,000	10,029,000

Nobody knows (except, perhaps, the Russians and I am not too sure about them) just what Russia is producing and still less what Russia is likely to produce by 1951.

You will note that the table calls for an increase of approximately two million barrels per day from 1946 to 1951, and that about half of this is expected to come from each hemisphere.

The 1951 figure for United States production is approximately the level of production during recent weeks. For the four weeks ended 13 September, the American Petroleum Institute has reported an average of 5,175,000 barrels daily. If adequate materials become available, and if price levels are sufficiently high to maximize exploration and to encourage development of both primary and secondary production, and if the present high level of intelligent "wildcatting" continues, and if there is no significant recession in business, the United States will probably be able to produce at least as much crude oil in 1951 as it does now. Present production levels may be exceeded in the interim; probably they will, particularly in 1948 and 1949, when additional pipe-line outlets become available to West Texas; but we will do reasonably well if by 1951 we are producing at present levels.

The projected increase of 360,000 barrels per day in the Caribbean area will require extended exploration and development, with Venezuela

the most likely hunting ground. At present the Caribbean area, and for that matter the rest of the Western Hemisphere, is in the same position as the United States, uncomfortably close to the maximum efficient rate of production. Whenever we get to talking about these supply problems someone always comes up and says, "Why don't we import more from South America?" Well, the answer is, "There isn't any more to import from South America. We are right up to the maximum efficient rate of production in the entire Western Hemisphere."

The ability of the Eastern Hemisphere to add a million barrels daily to its petroleum supply by 1951, as called for by the table, depends mostly upon the availability of oil-field equipment, and the completion of additional transportation facilities; the oil fields already discovered in the Persian Gulf area are capable, with added drilling and transportation, of meeting the indicated 1951 level.

Now, if you compare this table on estimated attainable supply with the earlier table on anticipated demand, you will note that the 1951 total, in each case, is about 10 million barrels daily. But, if you compare the tables further, you will note an anticipated Eastern Hemisphere supply in 1951 of roughly 2.5 million barrels daily, compared with an estimated Eastern Hemisphere demand of about three million barrels daily. Conversely, the Western Hemisphere, with an estimated 1951 demand of about seven million barrels daily, has an anticipated supply of a little less than 7.5 million barrels daily. These comparisons indicate that the Eastern Hemisphere still will depend upon the Western Hemisphere for about 500,000 barrels daily of its supply, even assuming the completion by 1951 of presently planned pipelines in the Middle East. I may say parenthetically although it looks as though the Trans-Arabian line will be completed by 1951 or possibly 1950, and the present looping of the line from Iraq to Haifa will probably be completed, the larger line that is being run from Iraq to the Mediterranean, and the large line running from Iran and Kuwait to the Mediterranean might be in operation by 1951, I would say it is extremely doubtful.

The 1951 supply and demand comparison has an added meaning to those of us who live in the Western Hemisphere. When I spoke before the Industrial College on 16 January, I referred to a map which illustrated the petroleum possibilities of the world and noted particularly that the land area of the Eastern Hemisphere is twice that of the Western Hemisphere, and that the most favorable areas for oil finding in the Eastern Hemisphere are also about twice those of the Western Hemisphere. This is a vital fact. The potential ultimate oil resources of the Eastern Hemisphere are double those of the Western Hemisphere. The problem of petroleum security is a hemispheric problem, not just a national problem.

In numbers, the ultimate oil resources of the world have been estimated at about 600 billion barrels, of which the United States is credited with 100 billions, or one-sixth; the Western Hemisphere with 200 billions, or one-third; and the Eastern Hemisphere with 400 billions, or two-thirds.

World production from 1859 to the close of 1946 totalled nearly 52 billion barrels, and the remaining proved reserves of the world at the end of 1946 total about 67 billion barrels. These figures indicate that about 119 billion barrels of crude oil, or about one-fifth of the world's ultimate oil resources, had been found and proved at the close of 1946. The United States has produced 33 billion barrels, or 33 percent of its expected ultimate production, while the remainder of the world has produced about 19 billion barrels, or only four percent of its expected ultimate production.

The United States, which has produced 64 percent of the world's oil to date, has been finding and using its oil resources at a faster rate than the rest of the world, or as the Western Hemisphere as a whole. From 1938 to 1946 the percentage of world production in the Western Hemisphere increased from 76.7 percent to 80.9 percent. That surprises a good many people who know how much foreign production was increased during the war for war purposes--and very fortunately it was or we would not have succeeded in keeping the war fueled. But despite that increase in new foreign production, it was nevertheless necessary to fuel the war, in very large part, out of the Western Hemisphere, as you can see. We did not have ready access to the Eastern Hemisphere's sources of transportation. And, moreover, the sources of supply in the Eastern Hemisphere had not been yet developed to the point where a quick, large increase could have been taken from them to meet the emergency. So the percentage of world output in the Western Hemisphere increased very materially during the war and immediate postwar years. Now that will swing back as soon as the East is provided with enough transportation facilities.

The following table, based on data from the 1947 World Oil Atlas published by "World Oil," shows the relation of crude oil production and proved oil reserves in the United States and the remainder of the world:

World Crude Oil Production and Proved Reserves

	1946 Production		Proved Reserves	
	Barrels Daily	Percent of World	Millions of Barrels January 1, 1947	Percent of World
United States	4,749,000	63.0	20,900	31.2
Venezuela	1,062,000	14.1	7,000	10.4
Other	370,000	4.9	2,300	3.4
Total Western Hemisphere	6,181,000	82.0	30,200	45.0
Middle East	691,000	9.2	27,300	40.8
Russia	455,000	6.0	7,600	11.4
Other	211,000	2.8	1,900	2.8
Total Eastern Hemisphere	1,357,000	18.0	36,800	55.0
Total World	7,538,000	100.0	67,000	100.0

With 45 percent of the world's proved oil reserves and about one-third of the ultimate oil resources, the Western Hemisphere in 1946 produced 82 percent of the world's oil, while the Eastern Hemisphere, with 55 percent of the proved reserves and two-thirds of the expected ultimate resources, produced only 18 percent. The Middle East, primarily the Persian Gulf area, which is credited with proved oil reserves larger than those of the United States and nearly as large as the whole Western Hemisphere, produced only about nine percent of the world's oil in 1946.

Petroleum demand is the demand for products derived from crude oil, the basic raw material, or from gases produced with the crude oil. The ability to supply petroleum products depends not only upon an adequate supply of raw material and upon facilities for its transportation, but also upon the capacity and location of refining plants. The following table, derived from C. J. Bauer of Standard of New Jersey, compares existing capacities with those expected to be available in 1951, on the basis of present plans for restoration, rehabilitation, and expansion:

Petroleum Refining Capacity
(Figures in Barrels Daily)

	1 January 1947	Existing Plants plus proposed additions by 1 January 1951
United States	5,400,000	5,800,000
Caribbean	834,300	1,034,000
Other	595,400	695,000
Total Western Hemisphere	6,829,700	7,529,000
Middle East	738,000	849,000
Russia	575,000	750,000
Other	595,700	961,000
Total Eastern Hemisphere	1,908,700	2,560,000
World Total	8,738,400	10,089,000

Comparison of this refining capacity with the preceding tables on demand and supply shows that Eastern Hemisphere demand by 1951 will be 500,000 barrels daily in excess of its estimated refining capacity and that refining capacity in the Western Hemisphere will exceed estimated demand by the same amount. This indicates that United States and Caribbean refineries will continue to supply the Eastern Hemisphere with about 500,000 barrels daily of petroleum products. This figure is close to the 537,000 barrels daily of crude oil and products shipped from the United States and from Caribbean refineries and terminals to Europe in 1946. Other exports from the Western to the Eastern Hemisphere, which totaled 116,000 barrels daily in 1946, are likely by 1951 to be supplied from the closer Eastern Hemisphere sources.

It will be noted that the estimated world supply of crude oil in 1951 is 10,029,000 barrels a day, all of which is expected to be needed, and that anticipated 1951 refining capacity is only 10,089,000 barrels a day. This is altogether too close for reliability or safety. No manufacturing plant can be depended upon to run steadily at virtually 100 percent capacity. Based on these figures, 1951 refining capacity will not be adequate.

The 1951 refining capacity indicated for the United States in particular appears inadequate to assure the processing in this country of the crude oil needed to supply the expected demand for petroleum products. This is a situation which can be adjusted by the oil industry through further expansion of refining facilities, if and when steel therefor becomes available, and the estimated magnitude of future demand is substantiated by performance in the next year or two.

As demands for petroleum products increase and as we look more and more to the more distant places for supply, the requirements for transportation increase. The increase is likely to be geometrical rather than arithmetical; it relates to expansions in space as well as in volume. More oil will have to be moved, and it will have to be moved over greater distances.

The need for additional pipe lines, particularly to move crude oil from west Texas to middle western refineries, from the Rocky Mountain area to the Pacific coast, and from the Persian Gulf to the Mediterranean, has been recognized and plans for their construction are under way or are being studied. Their building, like the expansion of all other needed petroleum facilities, depends on the availability of steel.

Active attention is also being given the need for additional tank cars. We have scrapped about 7,000 tank cars since the end of the war. Up until just a very few months ago, we had not built a new tank car, that is, a new, general-purpose tank car since 1942. Yet, at the same time, we have a greatly increased need for tank cars because we need to move more products.

Tank cars are coming along now, but they are not coming along fast enough by any means. Steel is again the bottleneck. There is also somewhat of a bottleneck in the car-building capacity of the two plants that build the tank cars.

Particular attention is being given to high-pressure cars to transport liquefied petroleum gas (LPG), so-called "bottled-gas," as they are so often called. Those products are in abundant supply in the Southwest and in acute demand in the Middle West and Western Appalachian regions. There are not enough high-pressure tank cars to haul them from the point of supply to the point of need. Until more steel becomes available and can be converted into tank cars, some middle western refineries will lack sufficient crude and some industries and perhaps some homes will lack some of the "bottled-gas" they need.

An industry study of the world tanker fleet compared the situation on 1 September 1945, immediately after VJ-day, with that on 1 September, 1939. Converting all vessels of 2,000 gross tons or over to a T2 type basis and eliminating all vessels 20 years or over in age, the study showed a net surplus of 5,106,600 dead-weight tons on 1 September 1945, over the dead-weight tonnage of 13,033,000 on 1 September 1939. This represented an increase of nearly 40 percent in tanker carrying capacity for the postwar fleet. This was interpreted to represent an adequacy in tanker supply--adequate for commercial needs and adequate for a reserve fleet for emergency needs. As late as 10 July 1947, a

committee of the National Petroleum Council reported that there were adequate tankers to the extent that those then owned by the Government were put into operating condition and made available for use.

There are indications now that the situation may be changing and should be reviewed as to tankers. The Maritime Commission reports that of the 481 T2-type tankers built and afloat they have disposed of 214. They have either contracted for sale or have purchase applications for (which probably will be eventually for sale) 268 tankers, which is one more than they have. So that the tanker fleet owned by the United States at the end of the war in all probability will be in private hands within the next few months or, say, the next year, except for those kept as a reserve fleet for the Navy.

That is one indication of the demand for tankers which exceeds previous estimates. We, the Maritime Commission, and a lot of people, went before a committee of Congress in May or June and told them the United States was going to have to stay in the tanker business for a long time because people were not going to buy all the tankers the United States had. Now it looks as though they are all going to be bought; as a matter of fact, there are applications to buy them all now.

That is only one indication of the following tightness in the tanker situation which may become more pronounced within the next year or so. The Maritime Commission has been able to fill only half of the applications for charters for tankers in September and they expect to be able to do very better in October.

Stocks of petroleum products which are piling up on the Gulf Coast are correspondingly short on the east coast. It seems to be anyone's guess whether that situation is going to ease-off during this winter, or not; or whether it is going to ease-off at all.

There are 156 tankers on order from foreign yards. If all of those tankers are built and in service before 1951: if the Trans-Arabian line is built, which will save some more from 60 to 80 tankers; if everything is kept afloat that is afloat now, including those that ought to be scrapped, we will be in a precarious balance on our tanker supply in 1951. Of course, all of this is assuming peace. We won't have any surplus and may not have quite enough by 1951, assuming all of those conditions. In other words, despite the 156 tankers on order from foreign yards, we may have a world-wide tanker shortage on our hands, or something close to it, before we can do much about it.

We have taken a brief look at some previews in petroleum: what the demand may be like over the next four or five years and what will

be needed to supply it. Put in a single sentence, the petroleum industry is called on to double in a few years the capacity that it has taken generations to create.

That's a staggering job. It will take a lot of material, a lot of work, a lot of time, and a lot of money. Oil industry investments in wells, refineries, and transportation will mount into billions of additional dollars before the job is done.

It is one thing to plot an increasing demand or supply on a piece of graph paper; it is quite another thing to do the actual job. Men will work all over the world, in tropical heat and Arctic cold, in swamps and jungles and on sand-blown deserts, day and night, week after week, to find more oil and bring it to the places where it is needed. Mills will roll sheets, plates, shapes, casing, and pipe. Engineers and contractors will design and construct refineries. Shipyards will build tankers. To do again in a few years a job that took 80 years to do before is going to take some doing.

There is no question in my mind as to the ability of the oil industry to do the job. The big question is whether it can be done fast enough to prevent scarcities. The implements of consumption--oil stoves and burners, tractors and trucks, Diesel motors and automobiles--can be manufactured and put to use much more quickly than can the implements of supply, such as oil wells, refineries, pipe lines, and tankers. If increase in the implements of consumption outruns that in the implements of supply, the result can only be recurring periods of scarcity, of varying length, in which the products available fall short of local requirements.

This shadow of time hangs over the oil industry, just as it does over others. In this postwar world of ours, too many people have to do things and want things at the same time.

Our current situation is tight enough--too tight for comfort. It is not due to a basic shortage of crude oil. It has resulted from a shortage of two other things--steel and time. Oil products will not be plentiful again until there is a free flow of the materials necessary to develop, produce, refine, and transport oil, and until the oil industry has had time to use these materials in drilling more oil wells, laying more pipe lines, erecting more refineries, and building more tank cars, barges, and tankers. The industry, I am confident, will double its capacity as fast as it can get the materials and use them, but that this will be fast enough to keep pace with demand for products I very much doubt.

Gentlemen, I have enjoyed greatly this second opportunity to talk to you. I hope that the little I have been able to tell you and the speculation in which I have indulged has interested you enough so that you will ask me to come back next year. If there are any questions you think I can answer or that Mr. Swanson, my Assistant Director, who is here with me, can answer, we will do our very best.

Thank you.

(2 October 1947--450)S/jf