FREE WORLD LEAD AND ZINC SUPPLY

AND ITS RELATION TO DEMAND

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It is no secret that lead and zinc have been and are in extremely short supply. Also, it is no secret that the shortage is due to inadequate mine production of both metals to meet the free world demand. In fact, both metals are in such short supply that in 1964 the United States Government, by act of Congress, released 50,000 tons of lead and 75,000 tons of zinc from the national stockpile. Again this year legislation has been enacted authorizing the Government to release an additional 200,000 tons of each metal.

Having heard the past, present and future consumption discussion by Mr. Wolff, I will try to cover the same geographic areas for you from a supply standpoint and, for sake of convenience, on my charts I will carry along Mr. Wolff's consumption figures so that you will see the relation between the two. By viewing these, I hope I will be able to give you the answers to (a) why did it happen? (b) is there going to be enough to go around this year? and (c) what is the longer term outlook for supply-demand balance?

First, let me explain to you the basic assumption on which my forecasts of supply are based. I have no crystal ball and I make no pretense at trying to guess what ups and downs might be in the economy of the free world or any segment thereof in a given year. Whatever occurs in this regard can vastly affect either the supply situation or the level of consumption, or both. However, since our question today is whether or not there will be

enough to support a continuing strong economy, that is just what I have assumed. Under conditions of a weakening economy, supply always exceeds demand so that possibility has been dismissed for purposes of this presentation.

While lead and zinc are similar in general, they are quite different in detail and, thus, I will cover them separately, starting with lead.

LEAD

Chart #1 shows the free world consumption of lead from 1950 through 1964 and as projected through 1968, from Mr. Wolff's previous paper. Shown in relation to the consumption, are free world smelter production from 1958 through 1964 and projected through 1968, and recoverable mine production for the same period. The lower lines on the chart show the same figures for the United States only from 1958 through 1964 on an actual basis and projected through 1968.

Before analyzing the showings of the chart, let me explain to you the definitions used in the statistics making up the data used. The definition of lead smelter production is the same as that adopted by the United Nations Study Group for Lead and Zinc, namely, that they include only lead produced in pig lead and antimonial lead produced from smelters and refineries regardless of raw material source, but do not include secondary lead resulting

from remelted scrap but not smelted. Since statistics have been made up by the United Nations Lead-Zinc Study Group on this basis only since 1958, figures properly compiled are not available prior to that date.

Prior to 1958, the free world and U.S.A. mine production of lead had run a very parallel course with that of zinc, for which figures are available, and which will be covered later in this presentation. In 1958, lead was in gross over-production in the free world relative to consumption, the excess of metal production over consumption being some 290,000 tons. By the end of that year, producer stocks had grown substantially and prices had dropped considerably from their 1957 high. Free world consumption had fallen from its 1956 high by some 245,000 tons and mine closures were quite widespread throughout the world.

While as pointed out by Mr. Wolff, from 1958 until 1964 the free world consumption of lead increased some 700,000 tons, you will notice from the chart that free world mine production underwent no net increase whatsoever, being relatively flat at about the 2 million ton level for the 6-year period.

You will note also that while mine production of lead was not increasing, smelter production was. In fact, it increased every year from 1958 through 1964 for an aggregate total of 325,000 tons. Now this was caused by three things: (a) drawdown of ore stocks at

smelters and mines, (b) more scrap coming on the market because of increased prices, and (c) a permanent increase in the battery scrap run-around in several countries where the automobile population has increased markedly during the period. Unfortunately, statistics on a world-wide basis are not available which will allow a breakdown of these three factors. It is thought, however, that drawdown of ore stocks had run its limit by the end of 1964 and that 1965 and thereafter will see a smaller differential between mine and smelter production than the record 825,000 tons of 1964.

Any way you look at it, the conclusion in lead is that the shortage existing today is due to lack of increased mine production commensurate with the very substantial increase that has taken place in consumption.

While I will examine the exact situation in 1964 and 1965 in some detail later, let us now consider what is likely to happen to lead mine production between now and 1968. Here we find the situation will change radically. Last November, at the regular meeting of the United Nations Lead-Zinc Study Group in Madrid, a special subcommittee was appointed to investigate the probable increases in mine production in the next few years. I was made chairman of that subcommittee. Through information gained in that experience, plus additional information gathered from all available sources since that time, it would seem likely that lead mine

production in 1965 will rise approximately 225,000 tons over 1964, 1966 will see a further 180,000 ton increase, 1967 a further 120,000 tons, and 1968 an additional 220,000 tons, for a total increase in the next four years of some 750,000 tons.

This total is made up of approximately 150,000 tons in Europe, 300,000 tons in the U.S.A., 15,000 tons in Japan, 100,000 tons in Canada, and 180,000 tons in the balance of the free world. The 180,000 ton free world figure is over and above their 1964 production; however, certain interruptions caused 1964 production to be less than 1963 output, so that only 125,000 tons of the 180,000 figure represents true additional production capacity.

The European increase in 1965 stems principally from a 30,000 ton increase in Yugoslavia, a 15,000 ton increase in France caused by the starting of the Largentiere Mine, 10,000 tons from the Tynagh Mine in Ireland beginning production in 1965, and an increase in the San Marco Mine in Italy. In 1966, Europe will increase a further 40,000 tons, being entirely from the coming up to capacity of the Tynagh Mine. In 1967, a further 22,000 ton increase will stem from the startup of Silvermines property in Ireland and in 1968 a 30,000 ton increase from new mines starting up in Sardinia.

In the U.S.A. an increase of 30,000 tons is expected in 1965 due to increases in the Viburnum mines of St. Joe over the

1964 level, a 33,000 ton increase in 1966 from further St. Joe and Bunker Hill Southeast Missouri production, plus miscellaneous small increases, a further increase in 1967 of 47,000 tons, and a 200,000 ton increase in 1968 from the bringing in of the Amax-Homestake mines, the Cominco-Dresser mines, one of the Kennecott mines and the AS&R mine, all in Southeast Missouri.

In Japan, 5,000 ton increases are expected each in 1965, 1966 and 1967, with expansion of existing mines plus recovery of lead from the so-called black ores.

In Canada, 50,000 ton increases are expected in 1965 and again in 1966, caused by increases in the Brunswick Mine plus bringing in of the Pine Point Mine of Cominco.

In the balance of the free world, in 1965 a 20,000 ton increase is expected in Africa and a 10,000 ton increase in Australia from Mt. Isa. In 1966 reasonable increases are expected in Peru and India, with an additional 35,000 tons in Australia also from Mt. Isa. In 1967 a further increase is expected from Peru and a further increase from Mt. Isa. This boost of some 750,000 tons, or 38%, in world production in the coming four years will have some rather drastic effects upon the flow of lead as between various trade areas, which I will dwell on in some detail later.

Assuming that the differential between mine and smelter production in lead in the free world returns to about a normal

700,000 ton level, on the chart I have projected what this would mean in smelter production over the next four years. You will note that on a free world basis, smelter production and consumption cross in 1966 and in 1967 and particularly in 1968 a surplus of some 200,000 tons appears possible. I would like to point out, however, that this surplus is of the order of only 5% to 6% and an additional increase of 1% per year in consumption over that estimated could make this a relatively balanced situation. It appears most likely, however, that by 1968 we are going to see a balanced or slightly surplus situation in lead in the free world.

Looking now to the U.S.A. alone, you will note that the 300,000 ton increase between 1964 and 1968 in mine production, most of which takes place in 1968, causes the U.S.A. smelter production to just about equal U.S.A. consumption. The full importance of this I will discuss later.

Turning now to the immediate situation in lead, Chart #2 shows the mine production, metal supply and consumption for the years 1964 and 1965, estimated by half-year periods, for U.S.A. and the balance of the free world. Supply in U.S.A. is smelter production plus stockpile releases, and supply in the balance of the free world is smelter production plus net imports from Eastern Europe. I think the following observations are of interest.

In the first half of 1964, the balance of the free world

had smelter production plus imports from Eastern Europe representing a metal supply of approximately 95,000 tons in excess of their needs. U.S.A. had a metal requirement of consumption over smelter production amounting to approximately 100,000 tons and U.S.A. imports were actually 112,000 tons. Thus, in the first half of 1964, foreign smelter stocks were little affected and U.S.A. consumer stocks went up by some 12,000 tons.

In the second half of 1964, the foreign supply over consumption had dropped to 65,000 tons and while they exported some 100,000 tons to the States, causing a drawdown of foreign smelter stocks, this was not enough to take care of the 120,000 ton gap between U.S.A. smelter production and consumption. Thus, it was necessary to release some 50,000 tons of lead from stockpile.

Looking now to the first half of 1965, foreign supplies would appear to be some 80,000 tons in excess of demand but this again is not enough to fill the anticipated 110,000 ton gap between U.S.A. smelter production and consumption; thus, the authorization of some 65,000 tons currently being offered from U.S.A. stockpile. While it is quite difficult to say what consumers will want to do about their own level of stocks, it would appear that the 65,000 tons is as much as 35,000 tons in excess of the deficit position and unless consumers wish to increase their stocks, it would appear

that all of the stockpile offering may not be subscribed.

In the second half of 1965, it is anticipated that foreign supplies will shrink to an exportable surplus of maybe 75,000 tons, which is about 55,000 tons short of the anticipated U.S.A. consumption-smelter deficit. Thus, a further release in the second half of 1965, in all probability, will be required and should be somewhat better subscribed than the release of the first half. Any way you look at it, however, with the stockpile releases there is almost certain to be plenty of lead to go around in 1965 and with further growth in mine production in 1966, as previously pointed out, the situation should get progressively easier. With the very sizable U. S. Government stockpile remaining, adequate supplies will not be a problem.

To examine the effect of increased mine production previously described, I would refer you to Chart #3 which shows free world mine production, smelter production and consumption, broken down by the same trade areas used by Mr. Wolff in his consumption discussion for 1964, and the additions likely to take place by 1968. I have segregated Canada because of its sizable increase in mine production.

First, turning to the United States, as previously pointed out, mine production which was only slightly less than 300,000 tons in 1964, is anticipated to increase to almost 600,000

tons in 1968. Smelter capacity increase by St. Joe Lead in Southeast Missouri, amounting to 100,000 tons, should be at capacity well before 1968, the new smelter announced by Amax-Homestake, smelting both their ores and Cominco-Dresser ores, should represent another 100,000 tons by that time, and while not yet announced, the general supposition is that AS&R and Kennecott will bring in a similar volume of mine capacity and that commensurate smelter capacity will be constructed, which would increase the U.S.A. by some 300,000 tons net. Now, the reason for this new smelter capacity instead of employing unused capacity currently existing in the United States, is that this unused capacity is all in the Western United States and completely mislocated for the new lead developments of Southeast Missouri. Assuming Mr. Wolff's consumption increase estimates in the next four years of some 70,000 tons over 1964 consumption, it would appear that U.S.A. will be very close to self-sufficiency so far as lead metal is concerned, provided, of course, that they continue to smelt approximately the present volume of scrap and the present volume of imported ores amounting to some 120,000 tons per year.

Looking to free Europe, mine production is estimated to rise in the four-year period by some 150,000 tons. Smelter capacity increases in Europe have been indicated of about the same volume, and consumption increases in the same period are estimated by Mr.

Wolff to be approximately 125,000 tons. Thus, it can be seen that by 1968 Europe will require about the same volume of imported ores currently required and possibly 25,000 tons less of imported metal.

Japan estimates an increase of approximately 15,000 tons in mine production, new smelter production of 50,000 tons, and consumption is assumed to increase 65,000 tons. This would mean that Japan would be a market for an increase of 35,000 tons of lead in ores and 15,000 tons of lead metal over and above 1964.

Canada anticipates increased mine production of approximately 100,000 tons, increased smelter capacity of 30,000 tons in Brunswick, and increased consumption of only 10,000 tons. Thus, Canada will increase its exportable ore surplus by 70,000 tons and metal by 20,000 tons. The balance of the free world anticipates mine increases of approximaely 180,000 tons, with indicated smelter increases of some 90,000 tons and increased consumption of approximately 95,000 tons. Therefore, it would seem that exportable surplus metal from the balance of the free world will not change appreciably from that in existence today but the exportable surplus of ores will increase some 90,000 tons.

If these suppositions are correct with U.S.A. requiring no additional ore imports and 230,000 tons less of metal imports, Europe requiring no increase in ore imports and only 25,000 tons increase in metal imports, and with Japan having only a 35,000 ton

additional ore requirement and 15,000 ton additional metal requirement, it appears that both Canada and the balance of the free world may be hard pressed to find markets for particularly their increased ore production and possibly some metal production also.

The question now arises as to whether there are any undeveloped known ore bodies in the world over and above those anticipated to be brought in between now and 1968. The answer is yes there are some very substantial ones. Kennecott has two additional large ore bodies in Southeast Missouri, the Ruby Hill project in Nevada could be substantial but as yet is an unknown, and the MacArthur River ore body of Mt. Isa in Australia is reputed to be one of the large lead-zinc reserves of the world, to name only the major ones. Therefore, I do not have any feeling but that plenty of ore reserves and potential production exists to make lead consumers very confident about supplies for many, many years to come.

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Z I N C

Turning now to zinc, Chart #4 shows the free world recoverable zinc mine production, zinc smelter production and zinc metal consumption from 1946 through 1964 and projected through 1968. The consumption figures from 1964 through 1968 are those previously

presented by Mr. Wolff. The statistics making up the chart are those of the United Nations Lead-Zinc Study Group through 1964 and include all zinc produced by smelters from both ores and scrap but do not include zinc produced by remelting scrap or zinc dust. The lower lines on the chart show the same data for the United States only.

I would like to comment here that due to zinc metal production depending very little on scrap and since direct use of zinc ores for purposes other than metal production historically is about equal to the smelter consumption of scrap, the zinc mine production and zinc consumption curves are roughly comparable, which makes it a much easier metal to analyze than lead.

Looking at the free world lines, broadly speaking, the period 1946 to 1950 was a period when in general the three lines were fairly close together, representing in total a fairly balanced situation. In 1951 started the seven dark years of the zinc as well as the lead industry. This lasted until 1958 and the history of this period is largely responsible for the short supply that exists today. In 1952 mine production had exceeded smelter production by almost 200,000 tons and even then smelter production exceeded consumption by almost 350,000 tons, making a total gap between mine production and consumption of 550,000 tons, or a 23% excess. Only heavy buying for the U.S.A. stockpile saved the

industry from complete bedlam. By 1953, the U. S. industry, on whose market the huge excess had been dumped, pled to the United States Tariff Commission for relief under the escape clause of the Trade Agreements Act. The Tariff Commission recommended to the Executive Department that tariff relief be given but instead the Executive Department announced that it would buy for stockpile an additional 300,000 tons of zinc, the idea being that this would give consumption a chance to catch up with production. The results were disastrous. While consumption did continue upward, mine and particularly smelter production did too, and the gap continued, except for a one-year reprieve in 1955 when a one-shot 8-million automobile production year in the U.S.A. gave temporary relief.

In 1957 stockpile goals had been reached and the announcement of cessation of stockpiling was made. At this time, while mine production and smelter production had come into a fair balance, they were both still some 200,000 tons over consumption. Then, and only then, did the industry institute curtailments of mine and smelter production but this only after dropping prices to uneconomic levels and the building of huge metal stocks, which were to plague the industry for the next five years.

By 1958 the balance was achieved. From that year to this day, free world consumption has exceeded smelter production and smelter production has exceeded mine production, both in increasing

amounts. However, due to the huge stocks of metal built in the 1957-1958 period continuing to hang over the market, the period 1958 through 1962 was a period of depressed prices, except for a short spurt in 1959-1960 which was short-lived.

Looking back for a moment, the increase in zinc mine production from 1952 through 1959 changed in net but little. Only in 1960 did mine production begin to increase and this only at a rate somewhat less than that of increasing consumption. Thus, when the industry finally woke up in 1962 to the fact that consumption had risen some 560,000 tons since 1958, it was too late and the background for today's shortage was already laid.

I might comment here that the spread between consumption and smelter production of 100,000 to 150,000 tons, which is shown on the chart between 1959 and 1962, was actually filled by imports of 100,000 to 150,000 tons per year from Eastern Europe, principally Russia, Poland and Bulgaria. In fact, these imports are continuing so that the true gap between consumption and total metal supply to the free world is not as wide as the chart shows. As a matter of fact, total supply of metal and consumption were fairly well balanced from 1959 through 1962, but mine production was lagging badly.

By 1963, the consumption curve had taken a sharp upturn and from 1962 through 1964 metal consumption increased an additional

525,000 tons, making the total increase in consumption almost 1,100,000 tons between 1958 and 1964. With this terrific spurt in consumption and only a modest increase in mine production, the mine production-consumption gap in 1964 shows to have been 430,000 tons; however, when this is reduced by approximately 165,000 tons of imports from Eastern Europe plus 75,000 tons of stockpile release, the gap was actually more of the order of 190,000 tons. I will cover the 1964-1965 situation in some detail later.

You might wonder how in the period 1959-1964 it was possible to have more consumption than smelter production and more smelter production than mine production. The answer is that metal and ore stocks were both huge at the beginning of that period. Until the middle of 1964, the drawdown of these stocks could fill the gap. However, by the end of that period metal stocks were at an almost irreducible minimum and the same was true with ore stocks by the end of 1964. The year 1965 will see a much closer relationship between the lines as will be covered later.

Thus, you can see that today's problem stems from lack of mine production. Except for brief periods in 1955-1956 and 1959-1960, new mine production was discouraged by 12 years of low prices in the 1952-1963 period. While the problem was recognized by 1962 the gap between mine production and consumption was so large that

it could not be overcome and also take care of the 525,000 ton consumption increase which took place in 1963-1964.

Looking now to the future, as shown by the chart, planned increase in zinc mine production is nothing short of phenomenal. While the increase of 1964 over 1963 of 300,000 tons is quite noteworthy in itself, additional planned mine increase between now and 1968 total some 900,000 additional tons, which will bring the 1964-1968 five-year total to 1,200,000 tons of increased mine production, or 43%.

The 1965-1968 total of 900,000 tons is made up of approximately 235,000 tons in Europe, 75,000 tons in U.S.A., 70,000 tons in Japan, 170,000 tons in Latin America and Australia, and 340,000 tons in Canada alone. By years, the estimated increase will be 265,000 tons in 1965, 285,000 tons in 1966, 265,000 tons in 1967, and 80,000 tons in 1968.

In Europe, the increase of 60,000 tons anticipated in 1965 is made up of small increases in Finland, France, Germany, Greece, Ireland and Sweden, with rather major increases in Yugoslavia and Italy. Europe in 1966 will see 10,000 ton increases each in Germany and Italy with a 25,000 ton increase in Ireland. 1967 will see a 30,000 ton increase in Italy and 20,000 tons in Yugoslavia. 1968 will see a 70,000 ton increase in Ireland, with approximately 10,000 tons in Sweden.

In the U. S. A. increases will be 30,000 tons in 1965, 20,000 in 1966, and 25,000 in 1967, being made up of a new mine in Maine and increase in St. Joe's New York State production, a substantial increase in American Zinc Company and Tri-State Zinc Company in Tennessee, and small production connected with the Southeast Missouri lead ores.

Japan will have 20,000 ton increases each in 1965 and 1966, with a 30,000 ton increase in 1967. Honduras will increase 4,000 tons in 1965-1966. Peru anticipates a 50,000 ton increase in 1966-1967. South Korea will have a 6,000 ton increase in 1965 and Australia a 100,000 ton increase principally in 1965-1966.

Canada anticipates increases of 121,000 tons in 1965, 88,000 tons in 1966, and 131,000 tons in 1967. These are made up of additional production at Mattagami, Orchan, Lake Dufault, Brunswick Mining & Smelting, plus the bringing in of Cominco's Pine Point project and the new Timmins project of Texas Gulf Sulphur.

Looking again at the total free world situation, since smelter ore stocks are drawn down to an almost irreducible minimum, it is anticipated that smelter production will stick very closely to ore production starting in 1965. By 1966, the gap between mine production and Mr. Wolff's projected consumption is less than the anticipated imports from Eastern Europe, and by 1967 it would appear that there will be a theoretical free world surplus approximating

the anticipated imports from Eastern Europe of 165,000 tons, remaining about the same in 1968.

Again, one should not necessarily consider this as an excess because it is of the order of 4% of the 4 million ton mine production and consumption anticipated at that time, and a change of only 1% per year in the trend line of consumption from 1964 through 1968 could well overcome it. All that can be said is that mine production, smelter production and consumption should all return to a reasonable balance by sometime in 1966 and the situation should remain reasonably balanced for the next year or two thereafter.

Let us examine now more closely what is happening in the 1964-1965 transition period before the gap is closed. Chart #5 is similar to the lead chart previously presented and shows U.S.A. and balance of free world supply-demand situation by six-month periods during 1964 and 1965. The following observations are of note:

The first half of 1964 probably was the tightest period which will be experienced in the two-year span. The balance of the free world had an exportable ore surplus in the first half of 1964 over smelter requirements of 145,000 tons and the U.S.A. had a deficit of 240,000 tons. The balance of the free world had a metal deficit of 10,000 tons and the U.S.A. an additional metal deficit

of 75,000 tons. Despite the metal deficit outside the U.S.A., net imports into the U.S.A. amounted to 47,000 tons during the six-month period which partially filled the U.S.A. gap. Smelter stocks both in Europe and U.S.A. were drawn down sharply during the period and consumer stocks in the U.S.A. were drawn down somewhat. Ore stocks in the U.S.A. were drawn down quite sharply.

The second six months of 1964 showed an ore deficit in the U.S.A. of 220,000 tons with a surplus abroad of only 175,000 tons to fill the gap, plus a further ore stock drawdown. However, due to a 30,000 ton drop-off in consumption, principally in Europe, metal surplus abroad was 65,000 tons and the U.S.A. deficit was 105,000 tons. Thus, the 75,000 ton release of zinc from stockpile in the U.S.A. allowed foreign smelter stocks to be built up slightly and U.S.A. consumer stocks to be increased 15,000 tons, despite a modest drawdown of smelter metal stocks.

Turning now to the estimates for 1965, the first half will see exportable surplus of concentrates abroad equivalent to within 20,000 tons of the U.S.A. deficit. Whether or not this volume can actually be imported depends upon some relaxation in the U.S.A. quota order, a decision on which is long overdue and if not made soon could disrupt both consumers and producers in a major way. Metal surplus abroad would appear in the first half to be some 40,000 tons, and the U.S.A. metal deficit of 105,000 tons cannot

nearly be filled. However, with an 80,000 ton stockpile release it would appear that consumption requirements will be filled and there will be some increase in either smelter stocks here or abroad or in consumer stocks. Now I know that this does not match up with the situation you have experienced so far in the first half of 1965. The reason for this is that the stockpile release did not begin until late April. Without the stockpile release, the U.S.A. deficit was approximately 11,000 tons per month each month in the first quarter and if consumer stocks have been drawn down by some 30,000 to 40,000 tons, it is not surprising. However, the stockpile release should more than take care of the situation so that consumer stocks can be replenished prior to the end of the six-month period.

The last half of 1965 shows a foreign ore surplus slightly more than the U.S.A. deficit, meaning that the drawdown of U.S.A. concentrate stocks should come to a complete end by that time. Metal surplus in the foreign countries, while smaller than that in the first half, is more than enough to take care of the U.S.A. small metal deficit after another 80,000 ton stockpile release in this period. Thus, it would seem that the very squeaky period of 1964-1965 is going to be adequately bridged by the stockpile releases and 1966 should see the situation getting substantially easier.

Turning now to the effects upon world trade of the changes in mine production in the free world in the next four years, Chart #6 shows this broken down by the same trade areas as used by Mr. Wolff, except as in the case of lead, Canada is shown separately. Looking first at the United States, from 1964 to 1968 U.S.A. mine production will be increasing some 75,000 tons but smelter output should be increasing some 145,000 tons. This is entirely logical as in 1964 over 200,000 tons of economic U.S.A. smelter capacity sat idle because of lack of raw material. Some of this capacity might take as much as six months to rehabilitate but if economic concentrates are available, either it will be rehabilitated or existing active smelters can easily be expanded to do this volume of business. With a greatly easing concentrate situation contemplated in 1966-1967, this smelter increase seems logical. Thus, by 1968 U.S.A. will increase its recoverable metal in ore requirements some 70,000 tons over 1964 but its actual increased imports probably will be 100,000 to 120,000 tons higher because sufficient concentrates were not available in 1964 to equal the U.S.A. smelter output during that period.

Consumption, as estimated by Mr. Wolff, will not increase as much as smelter output and thus the chart shows U.S.A. will need less metal from outside sources than in 1964. However, since imports of metal in that year had to be augmented by stockpile

releases, if these are discontinued, actual metal imports should approximate or even be increased somewhat over those of the past few years.

Europe anticipates mine output increase by 1968 of 235,000 tons. Existing idle smelter capacity plus announced additions will bring smelter output up some 200,000 tons while consumption is going up approximately 160,000 tons. Thus, the net ore imports of Europe will drop somewhat between now and 1968 because of the large increase of its own ore supply. Likewise, since smelter capacity is anticipated to go up more than consumption, Europe will require approximately 40,000 tons less metal from the outside than in 1964.

Turning to Japan, ore output is anticipated in the four-year period to increase 70,000 tons, announced smelter output by 150,000 tons, and consumption by 125,000 tons. Thus, Japan, despite its mine output increase, will increase its ore import requirements by some 80,000 tons annually but decrease its metal import requirements by some 25,000 tons annually. So the three large industrialized areas of U.S.A., Europe and Japan, collectively, will require more ore but less metal from outside in 1968 than in 1964.

Looking at Canada, their ore output increase is estimated at 340,000 tons, metal output increase at 120,000 tons, and their consumption increase at 20,000. Thus, their ore exports should

increase some 220,000 tons and their metal exports by 100,000 tons. The balance of the free world will increase their mine output by 175,000 tons, their smelter output by 140,000 tons and their consumption by 105,000 tons. Therefore, their ore exports should increase by some 35,000 tons and their metal exports by some 35,000 tons.

Now, if this gives something less than a nice, clear-cut, concise picture of what is going to happen in the world from a flow of trade standpoint, I am not surprised for it would seem that the industrialized nations collectively are increasing their ore output more than their consumption between now and 1968 and their metal output enough to take care of their increased consumption. What, then, is to happen to the large increase in exportable ore and metal from Canada and to a lesser extent from the balance of the free world? The answer is that 1964 was a tremendous deficit year both for ore production under smelter production and smelter production under consumption. Consequently, if you add up all of the ore productions and smelter productions in 1968, you will find that smelter production shown hereon and ore production shown hereon are identical and balanced and that consumption, according to Mr. Wolff, is estimated to be about 50,000 tons over the mine and smelter production. Whether or not there is a surplus or deficit will depend on the accuracy of the mine predictions, smelter predictions,

consumption predictions and last but not least, the volume of exports to the west from Eastern Europe, which currently runs 165,000 tons per year. However, the whole group of figures fits together so closely that it certainly can be said that it will be far from our present dilemma and probably in a well-balanced or slightly surplus position.

Here, again, the question arises as to whether or not the increased ore projections contained hereon include all of the known undeveloped ore reserves of the world. The answer for zinc, as in lead, is no. In the United States an additional mine of some magnitude will probably come in in Tennessee after 1968. Ruby Hill in Nevada, if it is successful, could add substantially to U.S.A. production, as would several other smaller projects which are now in the formative stage.

The MacArthur River deposit in Australia which, as I have mentioned, is one of the major ore bodies of the world, is predominantly a zinc ore body, and if developed on the scale it could be, would be large enough to influence world figures. Many other projects are in formative stages but three to four years ahead rise as soon as mine announcements are made.

All in all, I think that for the long run we can feel quite comfortable about the potential zinc reserves and zinc production of the world. Since all of the new mines mentioned

herein are known to be quite economic, no substantially higher prices need be forthcoming to continue the orderly bringing in of this additional production.

It is my personal opinion that if both producers and consumers can orient themselves to the thought that their interests are best served by fair and stable prices, that both will benefit from the growth of lead and zinc for many, many years to come. The present squeeze was brought about by too long a period of too low prices and a repetition will bring about the same thing. It is my sincere hope that we will never see a repetition of such a major mistake.

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LEAD: Free World and U.S.A. Mine Production, Metal Production and Consumption (1965–68 projected)

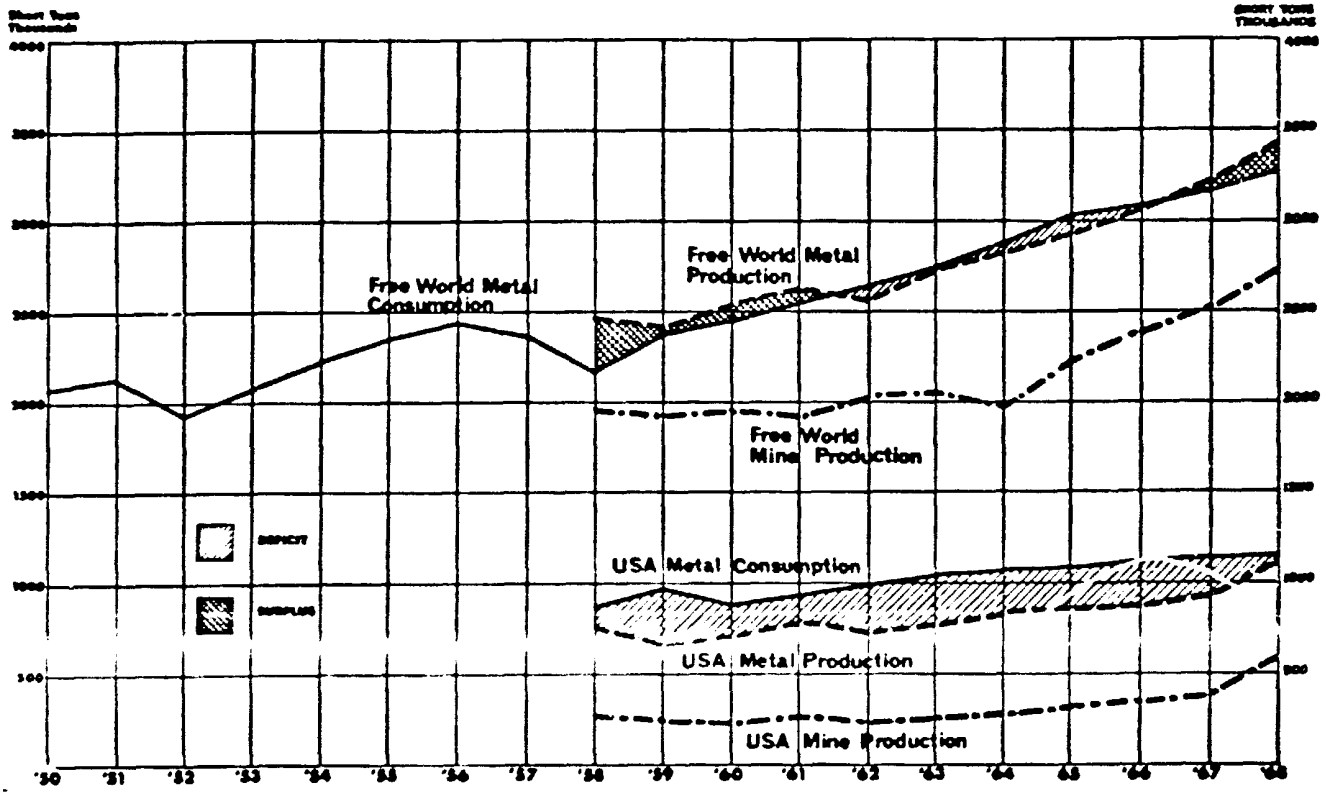
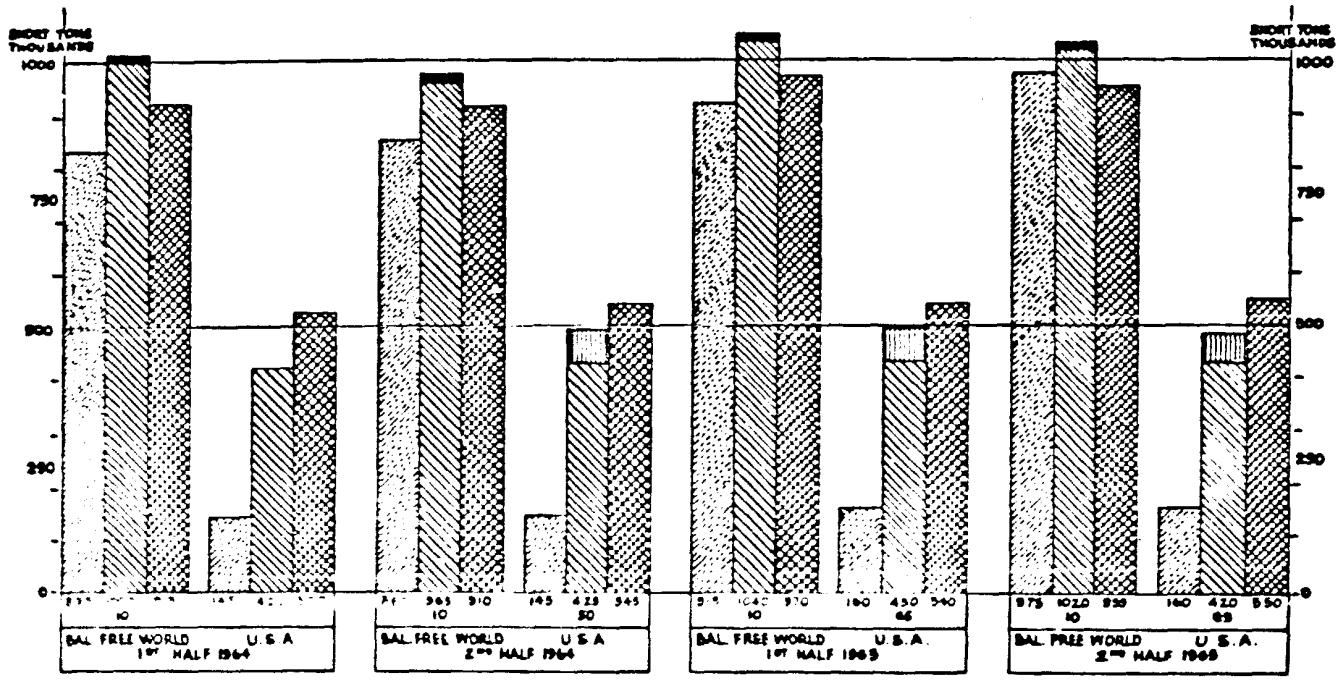


CHART 1

N 3553.01

LEAD: U. S. A. and Balance of Free World—Mine Production, Metal Production and Consumption by Half Years—1964 and '65



Mine Production Metal Production Metal Consumption Stock Pile Releases Imports East Bloc

CHART 2

LEAD: Mine Production, Metal Production and Consumption by Trade Areas (1968 Increase Over 1964 projected)

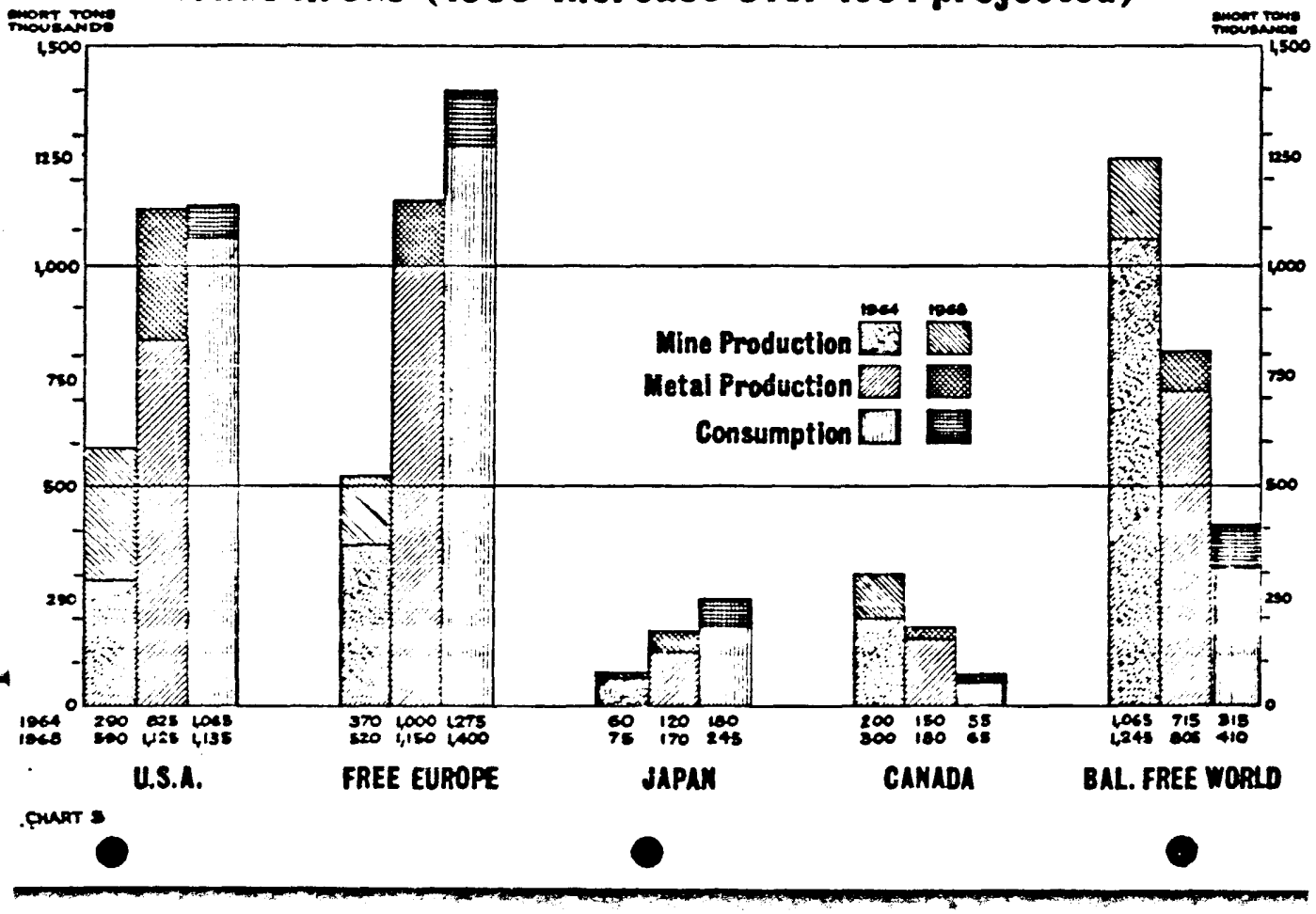


CHART 5

ZINC: Free World and U.S.A. Mine Production, Metal Production and Consumption (1965–68 projected)

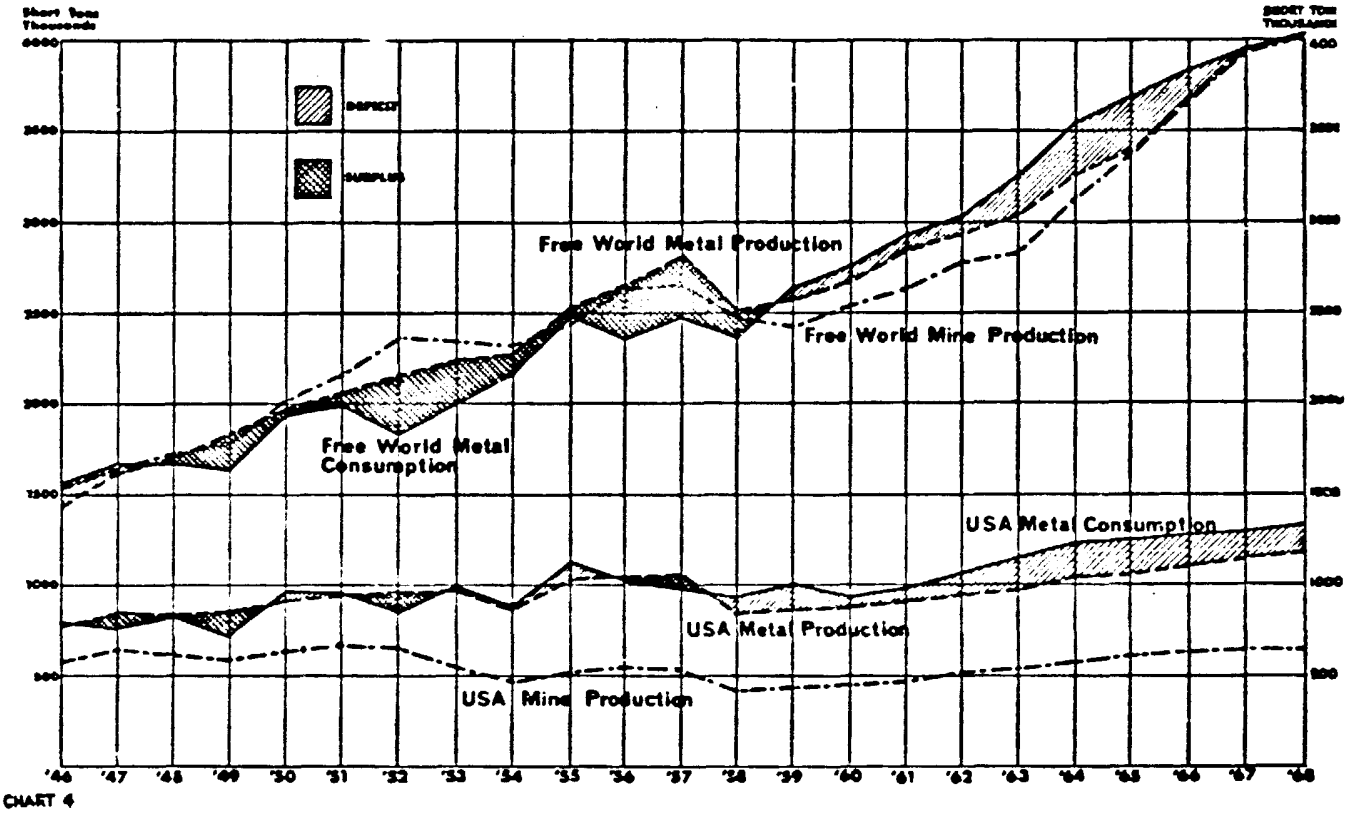


CHART 4

LIA15939

ZINC: U.S.A. and Balance of Free World—Mine Production, Metal Production, and Consumption by Half Years—1964 and '65

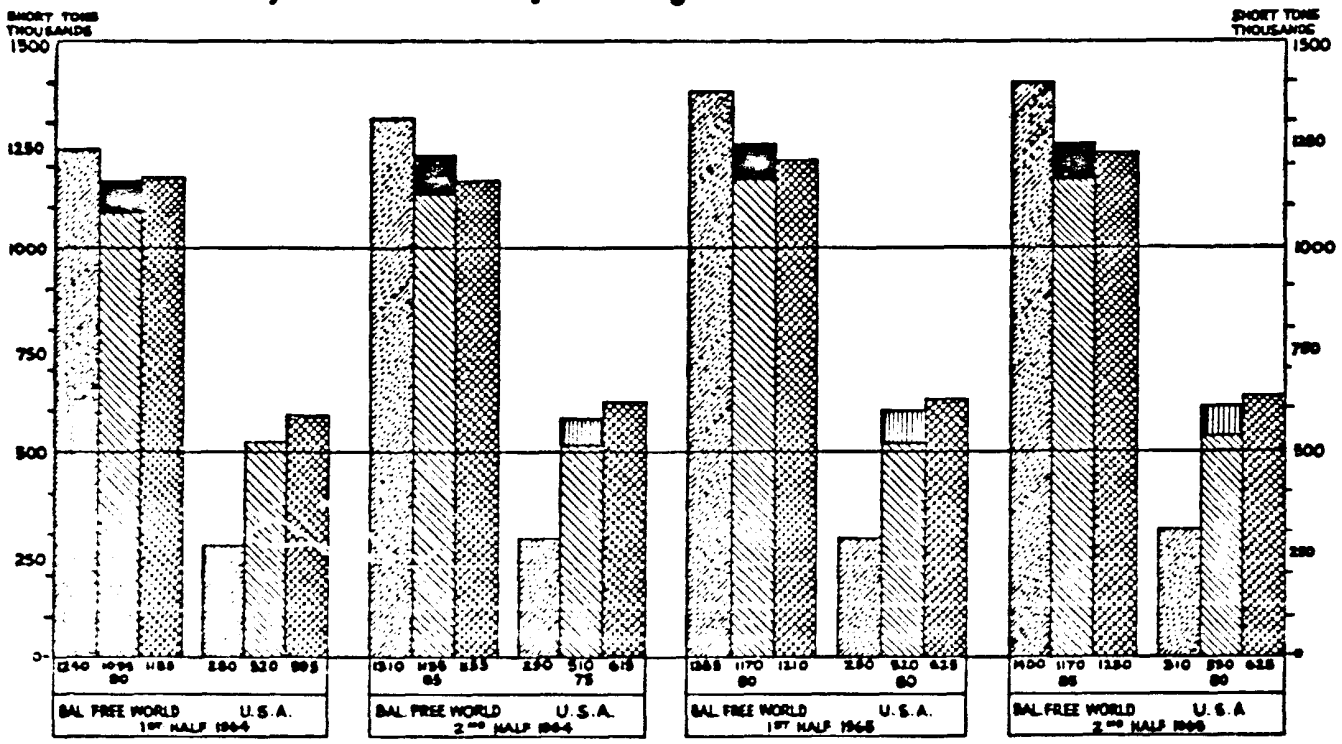
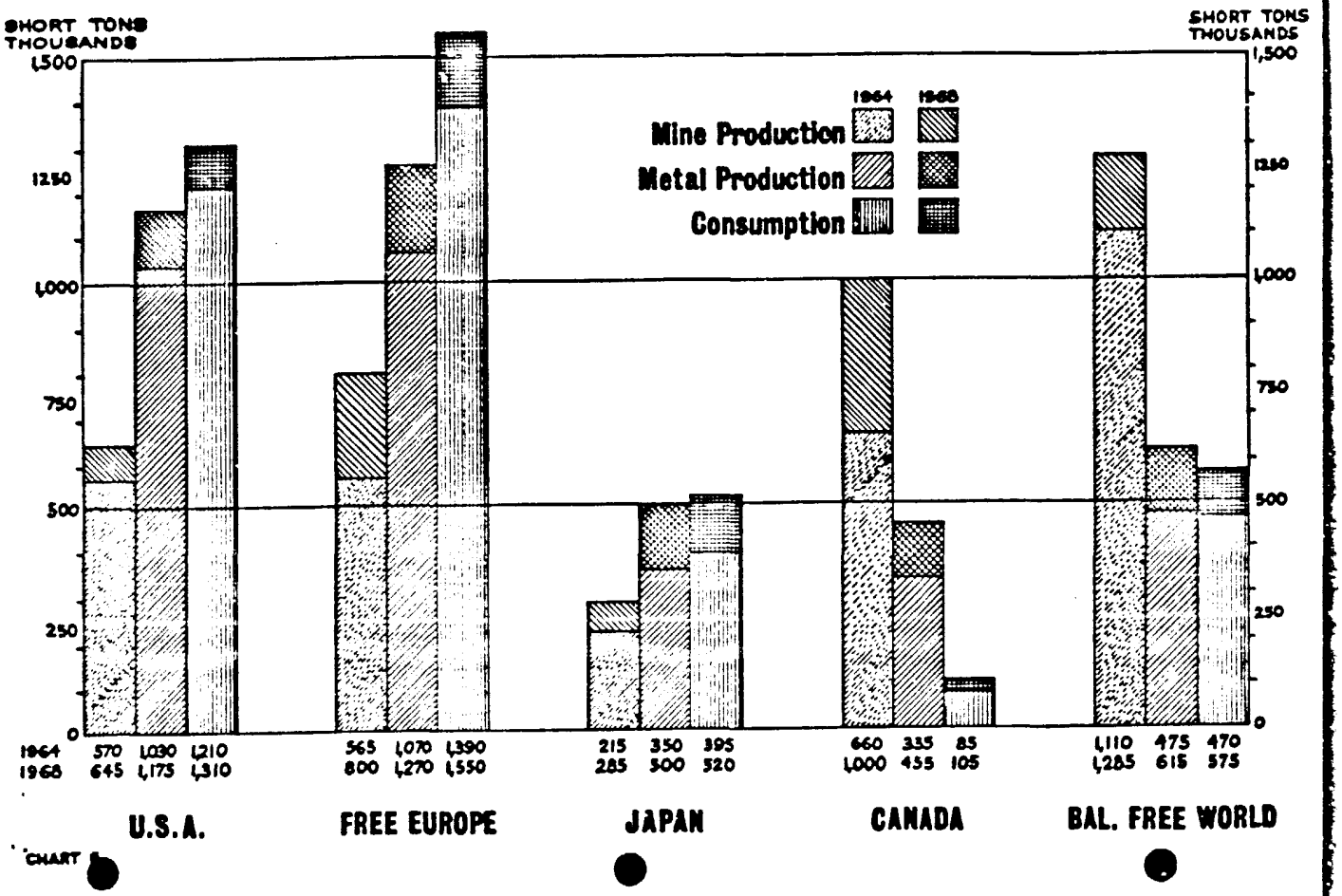


CHART 5

N 3553.05

ZINC: Mine Production, Metal Production and Consumption by Trade Areas (1968 Increase Over 1964 projected)



CHART