FREE WORLD LEAD AND ZINC DEMAND

PRESENT AND FORECAST

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FREE WORLD LEAD AND ZINC DEMAND - PRESENT AND FORECAST

As has already been said on several occasions, 1964 established record levels of consumption for both lead and zinc with metal prices at their highest for a number of years, reflecting an extraordinary tight supply situation. This is an ideal time, while still flushed with the euphoria of the current metal prosperity and before we again slide into the slough of despondency called oversupply, to examine the structure of the world's demand for these products - all the better to prepare us for the future.

Perhaps the most significant indicator of how closely the industry has allied in the past few years is the fact that here we are this morning - consumers and producers together - rationally discussing the present supply and demand situation and venturing to peer into the future. To my knowledge this is the first time that such an important segment of the industry has openly and forthrightly endeavoured to examine the overall picture. We may find that this will become a regular feature of these Trade Association meetings.

Before describing the current situation in detail and certainly before we dare to look into the future, you may be interested in the statistical background information framing our present position. One of the interesting things that has happened since World War II is the apparent acceleration in the rate of consumption of lead and zinc. During the decade of the fifties, free world consumption of lead - with its ups and downs - increased at an annual average rate of about 2%. However, now - in the first half of the 1960's - this consumption is increasing at the rate of about 4%, while in 1964 itself lead demand rose 6% above the previous year. (Chart 1.) This acceleration is due in part to the fact that we have had sustained annual increases in free world consumption from 1958 uninterrupted by the type of slackening in demand that occurred in 1952 and again in 1958 itself. In the overall 14-year period lead consumption has risen from two million tons in 1950 to 2.9 million tons in 1964. I should point out that all lead statistics throughout this paper will include secondary materials and, in accordance with North American practice, weights are in short tons.

The zinc picture (Chart 2.) shows a similar pattern of accelerating demand - although perhaps somewhat more dramatically than does that for lead. On the average, consumption rose in the 1950's by about 3% annually; for the first half of the 1960's by 6%, then in 1964 itself by 9%. As can be seen, total free world zinc consumption increased from 2 million tons in 1950 - the same level as lead - to over 3.5 million tons in 1964. Please note in particular the exponential uplift of this consumption curve since the late 1950's, accelerating sharply in the last two years.

If one were to make a quick projection from these figures, one could properly conclude that for the present decade, the 1960's, total free world lead consumption should increase at the rate of around 4% per year, while zinc should increase at the rate of around 5%, but we will come to that in greater detail later on. In the meantime, what I am trying to do here is to shake us loose from the traditional thinking about the rate at which demand for these two metals is increasing. So many of us in the industry are used to thinking in the 2% to 3% annual growth rate range - the long term projection - that we have difficulty accepting the fact that markets for our stodgy old products have increased at a very respectable pace within recent history.

Let's pause for just a moment to relate percentage growth rates to actual consumptions. The old rule-of-thumb says that if you divide the figure 70 by the annual compounded growth rate you will determine the number of years in which consumption is doubled. Thus, at a compound increase of 6% per year, metal consumption is doubled over 12 years, and at 9% over 8 years - that is what could happen to lead and zinc respectively if the 1964 increase were sustained.

Lest we become too complacent, however, it is salutary to see what is happening elsewhere. In Chart 3 are shown remarkable increases in the uses of aluminum and plastics as compared to our own metals. Since 1950, aluminum has grown at the rate of 10% annually and plastics at the rate of almost 15% per year - this latter representing a doubling of demand every 5 years! While both aluminum and plastics do compete with many other materials, there is little need to remind this audience of the sharp impact of these products - individually and in combination - on lead and zinc. For a while we were nearly overcome by the surge of events depicted by this Chart, but it is interesting to note how we seemed to have gained strength in the past six years - as we have learned to capitalize on the distinctive characteristics of our metals.

Reverting back to lead and zinc, we come to the question of where the recent growth in consumption has taken place. For lead (Chart 4.), it has taken place in every part of the world but the United States. Most noticeably has Europe become a very large user of lead and its demand has increased by something over half a million tons in the fourteen years since 1950. About the same rate of increase has been taking place in most of the world other than Japan.

This particular regional breakdown was chosen because it illustrates several stages of metals use. The United States, well deserving of the title of the leading lead and zinc consuming nation in the world, has a per capita demand of 11 lbs. of lead and 12½ lbs. of zinc, 50% greater than any other region. Yet, despite its large annual requirement of each metal, its demand appears to be static. It spawned the sophisticated uses of these metals several decades ago - adapting them to the automotive and appliance economy to which it gave leadership.

Now the United States is hoist with its own technology petard. The uses that were born yesterday of an advanced technology, die today by the same means. It may thus have reached a demand plateau - a saturation level.

Until quite recently, Europe's lead and zinc demand focus was historical - on those uses which were proven by tradition. This is reflected in lead and zinc roofs, an application unique to Europe. However, now Europe is moving rapidly toward the automotive - and appliance - economy of the United States, and so long as traditional uses do not fade faster than the modern uses arise, the metals economy of this area should remain dynamic.

Japan is the upstart. Following World War II it had virtually no established pattern of lead/zinc consumption. Starting almost from scratch, its only dimension in metal use was what products it could sell either at home or abroad. And as both its domestic and export economies spurted forward, so did its lead and zinc demand. As can be seen, it now ranks among the leading consuming nations of the world - fifth in lead, second in zinc.

The view for zinc (Chart 5.) again is fairly self-explanatory except for the surprising magnitude of the increase in the area designated "other world". Also surprising is the fact that of the over half million tons of zinc used in this grouping of countries in 1964 in excess of 60% of it was used by only four countries - Australia, Canada, India and Brazil. Significantly, the first three together with Mexico take up the same percentage of "other world" lead.

Let us turn now to a more detailed examination of the individual demand trends in each of these market areas. With over one million tons of annual consumption of each metal, United States represents a market for well over one-third of the total world production. In this country, as is well known, both lead and zinc are tied to the automobile. For simple easy-to-remember relationships you can assume that about one-half of the lead and about one-third of the zinc sold here end up in motor vehicles.

First for a look at lead. The dominant position occupied by lead for batteries and lead in anti-knock compounds is evident from Chart 6. Together they take 640,000 tons, or about two-thirds of total U.S. lead. In an attempt to determine if there is any relationship between these consumptions and motor vehicle registrations we drew Chart 7. As can be seen, the correlation has not been too bad since about 1958, both curves rising at about the same slope. However, prior to that time the effect of upgrading gasoline by the platforming process and the impact of the 12-volt battery on lead consumptions distorted the alignment. We should remember that there are batteries and anti-knock compounds made for other than motor vehicles, and that there is a 10% exportation of anti-knock production from the United States, all of which mask a perfect graphical correlation. Generally speaking, however, with the rising car population a favourable outlook is indicated for lead requirements.

From Chart 6 we saw that 198,000 tons of lead were used for alloys. It should be pointed out that the automotive industry takes roughly one-third of this for body and radiator solders - and that completes the story on automotive lead uses.

In the industrial construction field, lead has a variety of applications, including caulking, traps and bends, waterproof membranes and, more recently, sound insulation. An increasing awareness of sound control is creating a rather promising new market for thin sheet lead. In Canada, where we are diligently trying to promote lead for sound insulation, we can see an ultimate potential of about 5,000 tons a year in the office movable partition field, assuming that all movable partitions were to contain lead. If this is factored by ten, it suggests a consumption of around 50,000 tons a year in this one use alone in the United States. Of course this rate of penetration will not be achieved - and the near term prospect might be for a use of 10,000, or even 20,000, tons a year. This also suggests that market development is a long, arduous task and, while no one will deny the long-term hope for lead in sound attenuation, many years of hard work lie ahead of us before this application represents a market equivalent to some of the current major uses - such as present semi-finished or pigment uses, both of which exceed 100,000 tons per year.

Recently the National Sports Shooting Foundation has been promoting the idea of hunting preserves. In addition, the gun and ammunition manufacturers have been promoting franchised gun clubs for skeet and trap shooting. Their efforts are reflected in the consumption increase of lead in ammunition from a 50,000 tons in 1963 to 56,500 tons in 1964, a surprising 13% increase.

Turning to zinc in the United States (Chart 6.), as you know die casting is the largest single outlet, accounting for over 40% of the United States' use. Of the nearly half a million tons used in 1964, about 75% went into the automotive industry. This is illustrated in Chart 8, which indicates the steady increase in zinc tons consumed and pounds per passenger car since 1960, which coincides with the introduction of the compact car. You may also recall that in the late 1950's difficulties with the performance of platings on zinc die castings temporarily steered designers away from zinc, but intensive research, originally sponsored by the American Zinc Institute and later ILZRO, produced superior plating systems. These plating difficulties, combined with a shift in public demand for compact cars in 1959, resulted in the sharp decline in 1960, but since then the trend has been steadily upward.

Another interesting consumption area is the field of galvanized sheet for the auto industry. In 1964 this industry consumed 650,000 tons of sheet - 15% of the total galvanized sheet production in the United States. Chart 9 shows how the market has grown rapidly from some 90,000

tons in 1955 to its present size. Once again this is a typical exponential growth curve and represents a bright spot for the industry. It is estimated that in this present year about one-third of all American car production will have unitised body construction, despite the return in some models to the traditional body and frame construction. Looking ahead we can expect increased zinc consumption by the automotive industry in this area, particularly if the industry adopts one side coatings. Incidentally, the factor normally used in converting tons of galvanized steel to tons of zinc is about 6%, or one-seventeenth.

The second largest zinc market in the United States is galvanising (See Chart 6.), consuming close to 40% of the total consumption, of which sheet galvanizing accounts for over one-half of this again. The continuous galvanizing line has played a large part in the development of galvanised sheet applications. There are presently 33 lines in operation and 9 under construction compared with only two at the end of World War II. Running at about 4-1/3 million tons, annual mill shipments of galvanised sheet are more than double those of the late 1940's. Even the hot dip galvanisers, who were hard hit by the early impact of continuous sheet lines, are beginning to bounce back with a vengeance. It was pleasant news, indeed, to read recently that the "hot dippers" expect a 30% increase in zinc use over the next 4-year period - and at that they may be conservative if some of the prospects for galvanized structurals and utility components should catch on.

EUROPE

Let's direct our attention for a few moments to the European scene. As we have seen previously (Charts 4 and 5.), Europe is now the largest consuming area for both lead and zinc. In one respect, Europe and the United States have really changed places. In 1950, the United States consumed half the free world's lead and zinc and Europe, recovering from the war, took about one-third. Those ratios are now nearly reversed with the United States dropping to one-third and Europe rising to 40%. The pattern of end-use consumption in Europe appears to be slowly moving toward that of the United States, in large measure, of course, due to the growing motor vehicle production. The most significant fact to be considered in forecasting demands is the anticipated doubling of motor vehicle registrations in the United Kingdom, France, West Germany and Italy between 1963 and 1970 to over 60 million vehicles. A corresponding doubling in battery lead consumption by 1970 has been estimated by others for these four countries alone and, of course, matching increases in anti-knock compound and zinc die casting consumptions.

As these demands are felt, we can expect some shifts in production as is now taking place in anti-knock compounds. Germany, which has heretofore imported all its anti-knock materials from England, will soon be producing its own and it will become a lead-consuming market for this use. Greece is following a similar pattern.

In detail (Chart 10), lead for cable sheathing is still the largest outlet for lead in Europe, accounting for nearly 30% of the total consumption. This application has held up well in contrast to the situation in the United States, where, during the early 1950's, high prices, short supplies and a changing technology resulted in substitutes. In Europe, despite some inroads by plastics, lead is still regarded as an excellent sheathing material, particularly where the highest standards are required, as in the cross-channel power cable between the United Kingdom and France. A radical change is unlikely within the next few years. While batteries are now in second place, in view of the expected rise in automobile population there is little doubt that batteries will be established as the largest outlet by 1970.

Lead sheet and pipe are still used to an appreciable extent in Europe, accounting for something like 15% of the total consumption, but this consumption has not been keeping pace with the rate of increase in construction, in part, due to difficulty in securing properly trained personnel. Methods designed to reduce the amount of field work are required such as would accompany more intensive methods of prefabrication.

On the zinc side (Chart 10.), the largest outlet for zinc is still brass, consuming about one-third of total consumption. Galvanizing is right behind it but, unlike the United States, European auto manufacturers have not yet been convinced of the merits of galvanized sheet. Increasing use of salt on European highways, coupled with better corrosion resistance requirements for exports to North America, are factors which could influence the European auto makers to use more galvanized sheet. The growing number of continuous galvanizing lines and the trend to prefabrication in the construction industry are favourable signs which could make galvanizing the largest outlet for zinc in the future.

As most of you know, rolled zinc is Europe's third largest zinc outlet but, as in the case of lead in construction, skilled workers are getting scarce and this traditional use may not keep pace with other applications, such as die castings, which are rising quickly in their popularity in Europe. Again, with growing automobile registrations, we can expect increased consumption in the Continental Countries. The die casting market in the United Kingdom and Europe, perhaps more than any other, is the one that expressed concern over the recent instability and high level of zinc prices.

JAPAN

The remarkable thing about Japan is not its present consumption levels of lead and zinc, which are about 6% and 11% respectively of world consumptions, but the dramatic rate at which these consumptions are growing. In only five years, since 1959, lead consumption has more than doubled and now ranks fifth among individual countries in the world. In the same time zinc consumption also doubled, and Japan now ranks as the second largest individual consuming country behind the United States. As we have noted with plastics, a doubling of consumption in that period of time represents roughly a 15% rate of increase each year.

Expanding auto production has been a major contributing factor. In the late 1950's, the Japanese auto market began to blossom and since 1960 export markets have been developed. Chart 11 shows the rapid rise in production of cars, trucks and buses, increasing from a little under one-half million units in 1960 to almost two million in 1964, making Japan now the fifth largest motor vehicle manufacturer in the world. The recent rise of exports is very interesting - Japanese cars are now appearing in North America as well as Southeast Asia.

As expected, then, for lead the largest growth has been in storage batteries, and Japan now consumes about 57,000 tons for this end use (Chart 12.). Potential use is still large, as the ratio of replacement to new batteries is only now about one to one, compared to the three or four to one of the more mature automobile economies of the United States and Europe. 1963 motor vehicle registrations were about 3½ million and indications are that by 1970 they will be at 6 million.

Lead for cable sheathing is the second largest use in Japan and in the past five years this consumption has also doubled. Estimates indicate that Japan will become the largest user of lead for cable sheathing by 1970. A considerable amount of new lead extrusion equipment has been installed in recent years and production of all types of cable is increasing. A radical change is unlikely within the next few years.

For zinc (Chart 12), galvanizing is by far the largest outlet, accounting for about 60% of total zinc consumption. As we shall see later, this is the largest individual proportional use for zinc for any of the areas we are examining. Consumption now stands at a very respectable 235,000 tons a year, which accounts for a per capita zinc demand as high as Europe's. Japanese galvanizing is concentrated in the fields of sheet and strip, which reflects the many applications for sheet in the construction industry. Strangely, Japan exports approximately one-third of its galvanised sheet production to other Asiatic countries - and even to the United States!

Zinc die casting and brass manufacture run very poor seconds in zinc demand in Japan, but the former, in particular, is a rapidly growing market and with the potential for further increases due to the expanding automobile and appliance industries. You may have noticed recently that a Japan Die Casting Export Company will be formed (presumably with government support) to promote exports of Japanese die castings, particularly to EEC countries. With characteristic Japanese enthusiasm and thoroughness, we can expect this activity to reflect a much larger zinc consumption a few years hence. The growing significance of labour and cost savings to the Japanese secondary industry should not be overlooked in forecasting metal demands, particularly zinc in die castings.

All in all, with Japan's expanding economy - and some experts claim it will be the second largest to the United States in the early 1970's - and with foundations for a large motor vehicle industry already laid, one would have to say that the outlook for further increases in both metals in Japan is, indeed, favourable.

This is an appropriate time to make mention of the rather radical change in the Japanese situation within the past few months. For the first time in a decade, Japan is now an exporter of zinc. This is primarily a supply situation with Japanese zinc production having increased by 15% over the past 12-month period alone. The compound effect of this greatly increased production and a temporary levelling off of consumption led to the surplus position. The fact that zinc metal prices were highly attractive in other markets, such as the United States, made possible the economics of this commerce.

WORLD END-USE PATTERNS

So far we have talked about the individual area consumption patterns, not let's put them all together and see what kind of a picture we get. The first (Chart 13), shows the difference in consumptions in the three major areas for lead for a recent single year. Here we see similarities in end-use patterns between Europe and Japan as contrasted to the United States. The proportion of lead used in cable manufacture and in semi-finished products, such as sheet and pipe, are the same in the first named areas. In the United States we note again the predominance of batteries and anti-knock compounds and in some alloys, all of which contribute to the automotive field.

Taking the world as a whole, there have been some significant shifts in lead uses in only the past 20 years. Prior to World War II the major outlet for lead world wide was cable sheathing, followed in order by sheet and pipe, pigments, and finally batteries. Today batteries are well out in front, taking 30% of the total lead consumption throughout the world, with cable in second place at 20%. It is interesting to note the significant place lead anti-knock compounds now hold a use developed only forty years ago and which now consumes about 10% of the free world lead.

The comparable zinc Chart 14 is rather interesting because all three areas have slightly different consumption patterns. As discussed, die casting is predominant in the United States with galvanizing the second important major use. In Europe galvanizing and brass are the key uses, and in Japan, as previously noted, galvanizing is away out in front of the other nearest uses brass and die casting.

Once again it is worth noting the changes that have taken place in world-wide consumptions of zinc in the past twenty years or so. Before World War II the major outlet was brass, followed by zinc sheet for building, a use largely confined to Europe, and then galvanizing. Today galvanizing is strongly in first rank and accounts for about 40% of the total world consumption and with brass and die casting each at about half that amount. As with lead in anti-knock compounds, we have in zinc for die casting an application attaining commercial significance only in recent decades. It now utilizes a substantial proportion of the world's zinc. Zinc sheet only accounts for about 10% of world consumption and is now fourth in importance in world use.

NEW TRENDS IN CONSUMPTIONS

Aware now of some of the transitions that are taking place, not only in the magnitude of markets but in end uses themselves, we might take a look at some of the latest developments to ready ourselves for forecasting possible demand in the years ahead. Let's start with lead. While the motor vehicle industry consumes about three-quarters of all battery lead, there is room for considerable expansion for applications such as battery operated lift trucks, lawn mowers, portable T.V.'s, etc. It is interesting to note that the proportion of lift trucks in the United States that are battery operated has increased most significantly since 1960 - some estimates claim from 18% to 30%. In the United Kingdom 30,000 battery-operated lawn mowers have been sold since their introduction only four years ago, and it is expected that by the end of the decade their production will exceed that of the gas-driven types. Portable T.V. sets came onto the U.K. market only in 1962, but now there are over 20,000 of them in use, and, not to neglect our American friends, in the United States about 60,000 battery-operated golf carts are now being used! No one will claim that these battery applications, which presently account for a small percentage of lead demand, are ever going to equal in volume storage batteries in the automotive field. None the less, they do indicate the diversity of products into which batteries are now being placed and the hope for future growth.

The construction of public buildings is a large and rapidly expanding industry and here we are finding some new possibilities for lead also. Already mentioned are those applications in sound control where lead is taking advantage of new building techniques and is being used in thin, lightweight office partitions which are factory made. It is also finding wider application for blankets or baffles for suspended ceilings in offices, and, as we all know, it is also being used in conjunction with gyproc and plywood to fabricate different kinds of partitions for public and residential buildings. In North America, school design is moving toward a flexible concept, using removable walls to divide classrooms. In Canada, the first lead-lined removable wall will be installed in such a classroom later this year. With a growing general awareness of noise and the need for individual and group privacy, it would seem that there are opportunities in the building field for greatly expanded uses of lead, where, because of its mass and limpness, it is ideally suited as a sound attenuating material.

The trend of lead use in anti-knock compounds is obvious. There are going to be more lead tetraethyl and tetramethyl plants erected throughout the world, and these products will be used in increasing quantities. We know of new plants being erected in Greece, Germany, Canada and Japan to illustrate this trend.

As labour costs rise, there is a definite trend to produce low-maintenance products and here zinc-coated steels, for instance, are being widely accepted for total protection in both industrial and commercial applications. This is shown in the growing use of galvanized highway guard rails, bridge rails and more recently bridges, which are expected to save millions of maintenance dollars. At present, painting and hot dip galvanizing are roughly comparable in cost for initial application. However, the service life expectancy of galvanizing is in the order of four or five times that of paint, which explains why many highway departments are dropping paint in favour of galvanizing.

In 1963, the first conventional all-galvanized bridge in the Western Hemisphere was completed by the Quebec Department of Highways. The bridge is protected by some 2½ - 3 ozs. of zinc per square foot of surface. It is expected to provide complete protection without any maintenance whatsoever for at least thirty years in the known environment, compared to repainting about every seven years if galvanizing had not been used. The galvanizing cost was only $10,000 more than it would have been to have it originally painted - 3% of the total cost and 5% of the structural steel cost. Since that particular bridge was completed in 1963, the Quebec Highway Department has slated two more bridges for galvanizing.

If you wish to be truly visionary, you might imagine future steel mills which will, as a routine matter, produce in-line galvanized structurals just as they now do with sheet. These will be fabricated and, after final assembly, retouched with zinc-rich paint on exposed steel surfaces.

A large potential market is in residential siding where zinc has given steel its protective cladding in the battle with aluminum siding. Another market is prefabricated building. In both applications prepainted or polyvinylfluoride coated galvanized sheet can be used for many years of maintenance-free service.

In the construction of the new Forth Road Bridge in Scotland, extensive use of galvanized wire was made. The suspension cables, made up of 11,618 separately galvanized wire strands, consumed 1,500 tons of zinc and will protect the steel cable during the service life of the bridge. In addition, all structural steel was metallized with 500 tons of zinc and painted, affording long-term protection with minimum maintenance.

Turning to die casting, this past year we witnessed intensive promotional campaigns by members of the plastics industry on a reported technical breakthrough, permitting the injection moulding and electroplating of certain types of plastics so as to compete with zinc die castings. While the acceptance of these competitive materials has been limited to date, we cannot lessen our efforts to improve zinc's position in the die casting field. The global importance of this use of zinc has already been indicated. In the United States the American Zinc Industry's survey of new model cars predicts an 8% increase in the use of zinc by

the automobile industry during the current year. While the 1965 models expect to use a substantial 2.5 million zinc grills, compared to 1.6 million in 1964 models, we are already hearing rumblings of several additional car models which may make the same switch next year.

Improved zinc alloys in rolled strip or extruded form are being scrutinized with great interest by several of the large auto makers in the United States for major trim uses. These new applications could open up areas for substantially increased zinc consumption.

FORECAST LEAD CONSUMPTION

Out of this composite of statistical trends, end-use consumption patterns, new technology, improved uses, individual market foibles and economies, and plain, old-fashioned judgments, we have tried to make a prediction of free world consumption of metals for the next four years, 1965 to 1968 inclusive. The statistical detail for lead will be found in Table I. Looking to 1968, we anticipate a total increase in free world consumption of lead of about 350,000 tons, or an annual rate of increase of 3%. This projection does anticipate a little slowing down of the present rate of consumption, particularly after the current year. By region, we anticipate the smallest growth in the United States at about 70,000 tons compared to 120,000 tons for Europe, 65,000 tons for Japan and 100,000 tons for the balance of the free world. By 1968, total demand will be 3¼ million tons.

FORECAST ZINC CONSUMPTION

It seems easier to be slightly more bullish about forecast zinc consumptions (Table II) than it does about lead, but, on the other hand, we do feel that the heat generated by the steeply rising demand of the past few years cannot be long maintained and so, as cowardly as it may seem, we have assumed that the consumption curve will bend downward slightly during the next four years. We are forecasting an increase in zinc consumption of about 500,000 tons, bringing consumption by 1968 to slightly over four million tons, or an average rate of increase of 3½%. Here again, because of the accelerating automobile boom in Europe, we are predicting most of this increase to be there - some 160,000 tons in the four years. All three other areas, United States, Japan and "other world", will each have increased within the range of 90,000 to 125,000 tons by 1968.

Having made these predictions, I would like now to qualify them. What does seem evident is that they are not specific annual forecasts but rather "trend" predictions. What we are saying is that on the way to such and such a trend consumption, by 1970 or 1975, it seems likely that world lead demand in 1968 will be about 3¼ million tons and zinc demand around 4 million tons. It is always easier and safer to predict

long term trends than to be pinned down to something definite which you might recollect a year or two hence.

For the morbidly curious, we do feel that actual 1965 lead consumption should be very close to the trend line but that zinc could be somewhat higher by as much as 75,000 to 100,000 tons - say to 3-3/4 million tons. But we are also saying that any bullishness displayed in the early years of the forecast may well be tempered by bearishness - or even a decline in consumption in the years just prior to 1968.

And finally, let us look into the crystal ball for the last time. The image is dim; the picture obscure; the future vague, out of focus. But slowly something seems to be taking shape which looks like this:

	Forewarned Demand (millions of tons)	
	1970	1975
Refined Lead	3.4	4.1
Slab Zinc	4.3	5.3

CONCLUSION

One common thought occurred to all of us at Cominco who had a hand in preparing this paper. And in concluding I would like to pass it on to you:

There is really no such thing as an isolated lead or zinc market any more - national demands cannot be segregated from like demands in other countries. Metal consumptions in Greece, or South Africa, or Japan are dependent upon the technologies of the United Kingdom, or France, or Australia. The prosperity of the total lead/zinc industry of the United States, equally as well as that of Peru, depends upon what is happening in the rest of the world.

It is time now that we gave full recognition to this interdependence - that we accept our mutual international responsibilities. What are some of these international responsibilities? Thinking only of stimulating or sustaining the dynamics of demand, there are several that come to mind.

First - There is the task of creating fresh demands, fresh markets in newly-emerging nations. Competitive materials are already getting a handhold in Africa, South America and Southeast Asia - we must do the same. I would suggest that the lead/zinc trade associations of the world (where senior officers are now meeting on a fairly regular basis) consider the formation of a central market development fund for use in areas not now covered by individual budgets.

Second - There is the need to give new vitality, a new upsurge to the demand for lead and zinc in the United States. Not primarily because the demand has been level for a decade and a half, but because the world looks to this country for leadership in new uses, in technological and market breakthroughs which will generate new consumption trends. To this task, the U.S. industry - importer, producer and consumer - must bring increasing vigour, talent and money.

Third - The entire industry - throughout the world - faces the challenge of matching the performance of competing materials, and the challenge of reaching beyond the present rising demand rate for lead and zinc. One of the mechanisms by which new waves of demand could be generated would be the massive international exchange of technical and market data. Should we not encourage our trade associations to arrange exchanges of lead and zinc industrial "trade missions" with other lands? - So that a person-to-person interchange of views on manufacturing techniques, product development, market promotion, and distributions can occur. This, coupled with more intensive exchange between individuals and corporations, should ensure that the merits of these metals are presented to the widest possible consumer group.

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FREE WORLD REFINED LEAD CONSUMPTION
PRIMARY AND SECONDARY

AVG. ANNUAL INCREASE
1950-1959 = 1.8%
1960-1964 4.1%

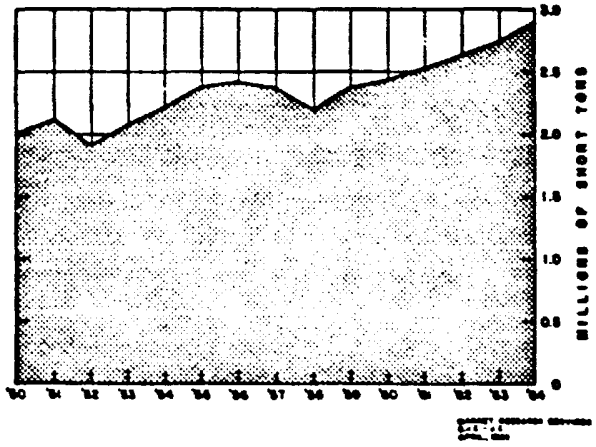

Chart 1

FREE WORLD SLAB ZINC CONSUMPTION
PRIMARY AND SECONDARY

AVG. ANNUAL INCREASE
1950-1959 = 3.1%
1960-1964 = 6.4%

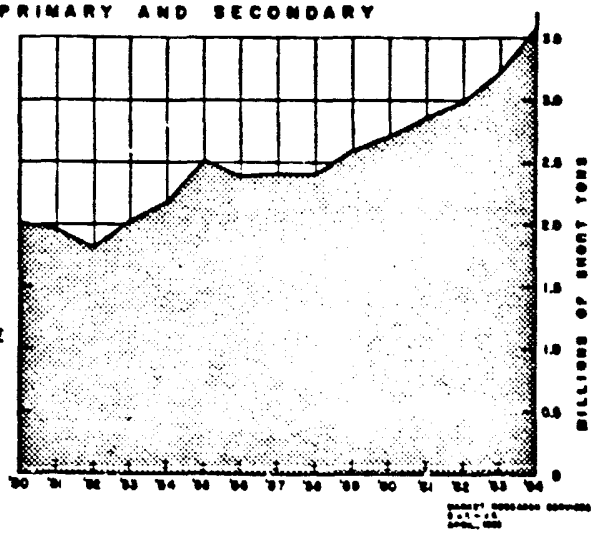

Chart 2

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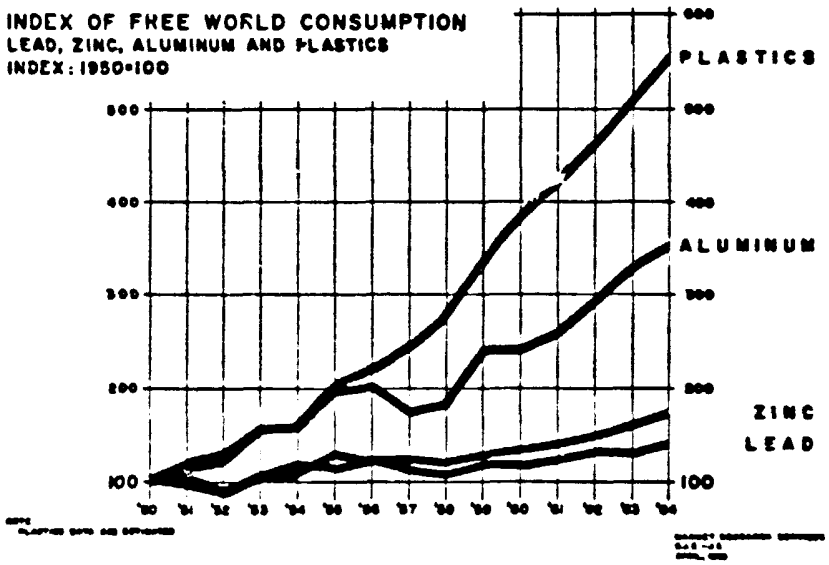

Chart 3

A. Olaf Wolff

1950-1964 COMPARISON OF FREE WORLD REFINED LEAD CONSUMPTION BY MAJOR AREAS (PRIMARY AND SECONDARY)

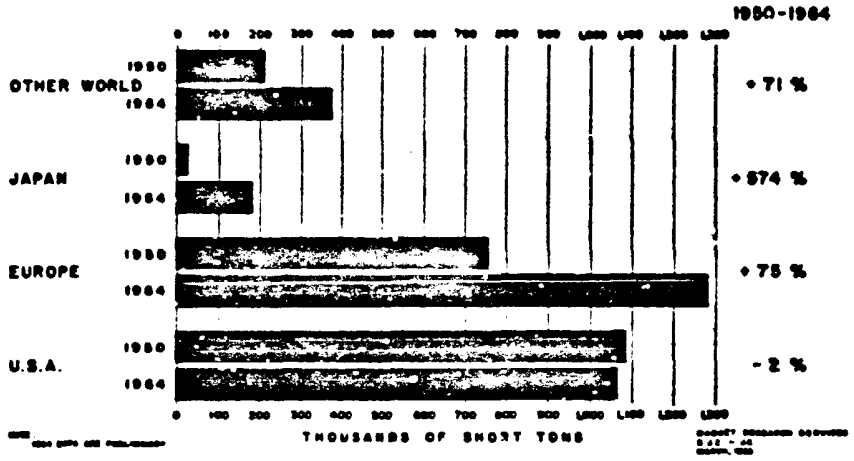

Chart 4

1950-1964 COMPARISON OF FREE WORLD SLAB ZINC CONSUMPTION BY MAJOR AREAS (PRIMARY AND SECONDARY)

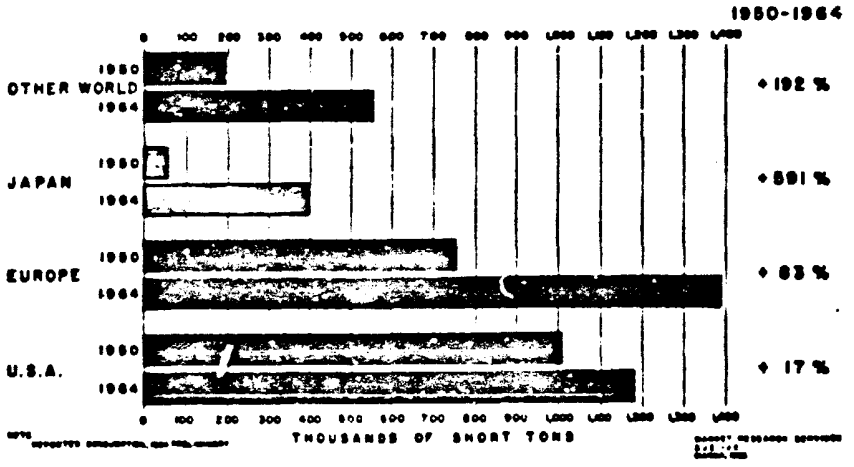

Chart 5

LIA15961

A. Olaf Wolff

U.S.A. 1964
LEAD AND ZINC CONSUMPTION BY END USE

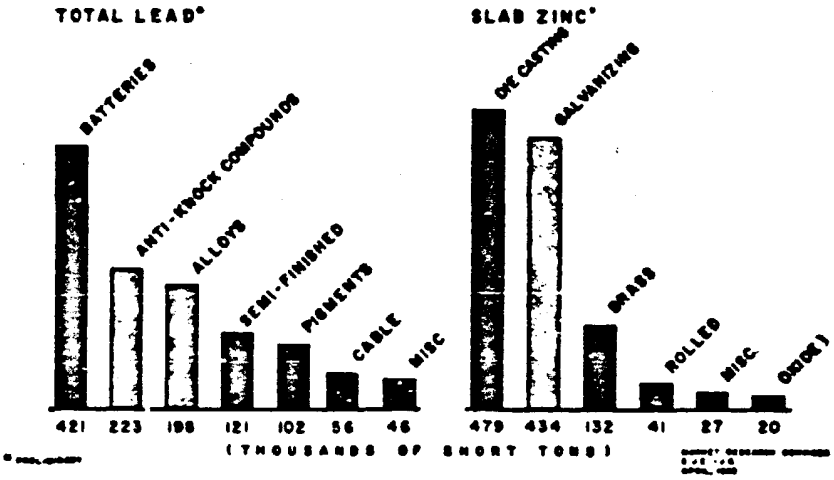

Chart 6

U.S. AUTO INDUSTRY; LEAD CONSUMPTION

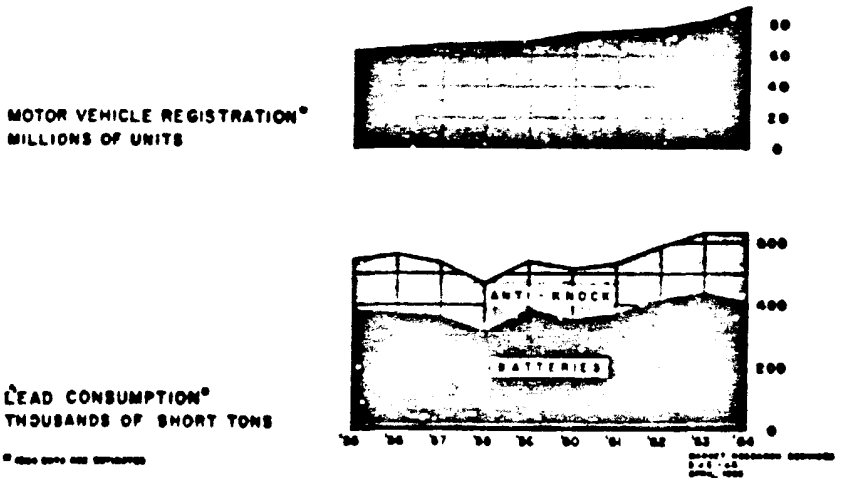

Chart 7

A. Olaf Wolff

U.S. AUTO INDUSTRY; CONSUMPTION OF ZINC DIE CASTINGS

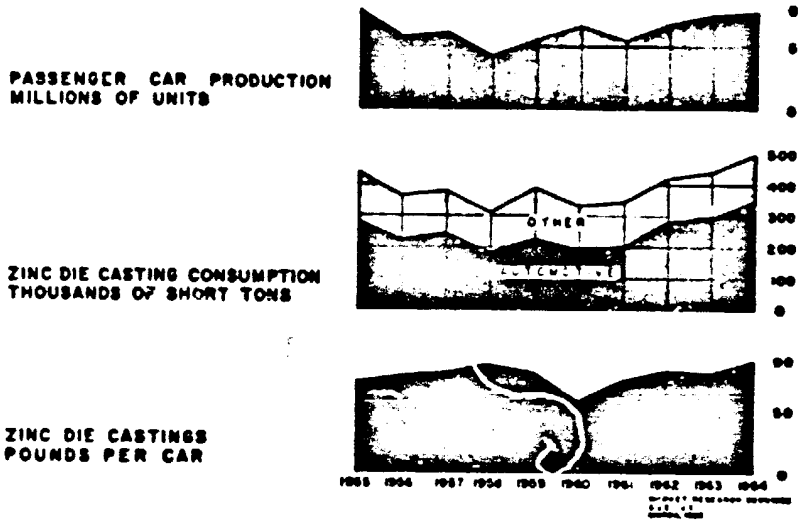

Chart 8

U.S. AUTO INDUSTRY; CONSUMPTION OF GALVANIZED SHEET

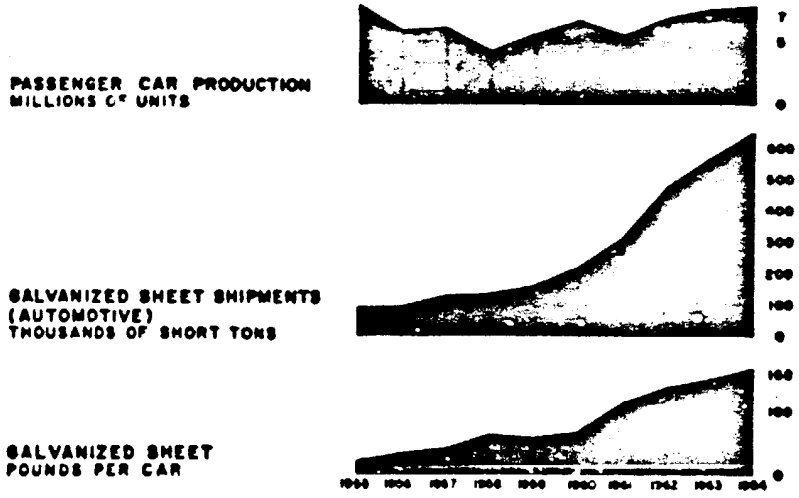

Chart 9

A. Olaf Wolff

EUROPE 1964
LEAD AND ZINC CONSUMPTION BY END USE

Chart 10

A. Olaf Wolff

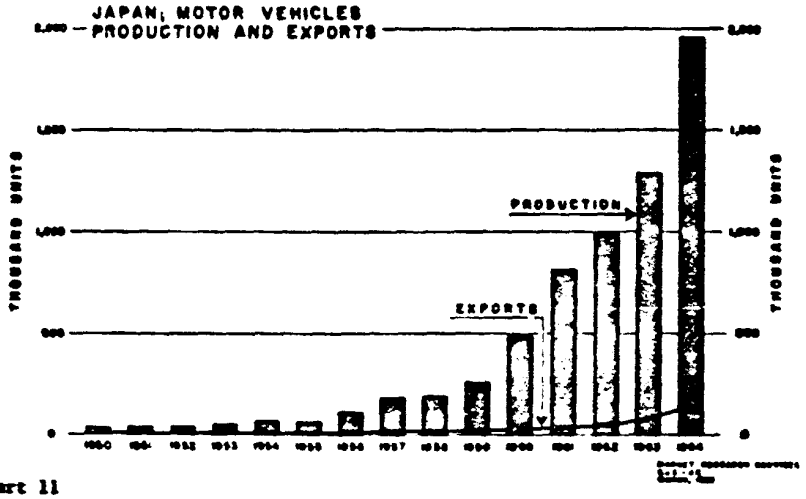

Chart 11

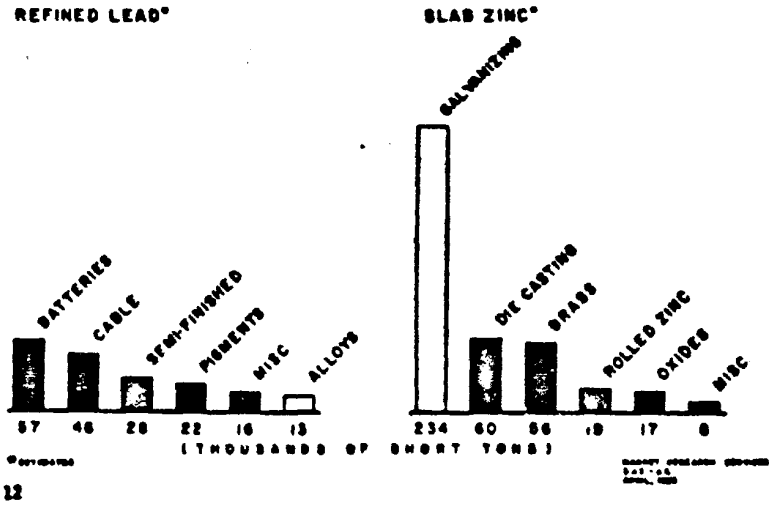

Chart 12

A. Olaf Wolff

LEAD
END-USE CONSUMPTION PATTERNS 1963

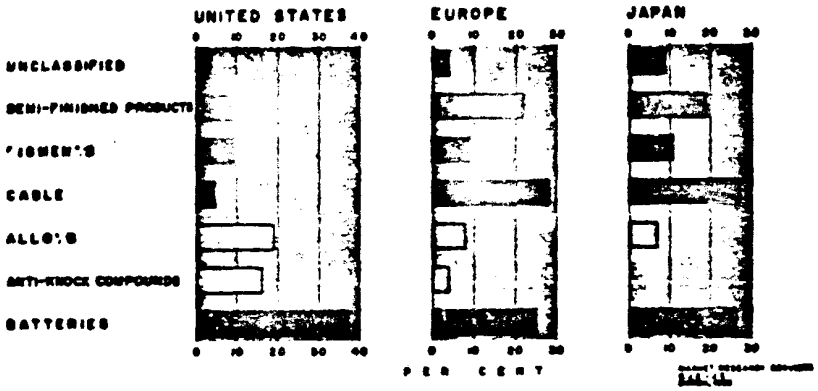

Chart 13

ZINC
END-USE CONSUMPTION PATTERN 1963

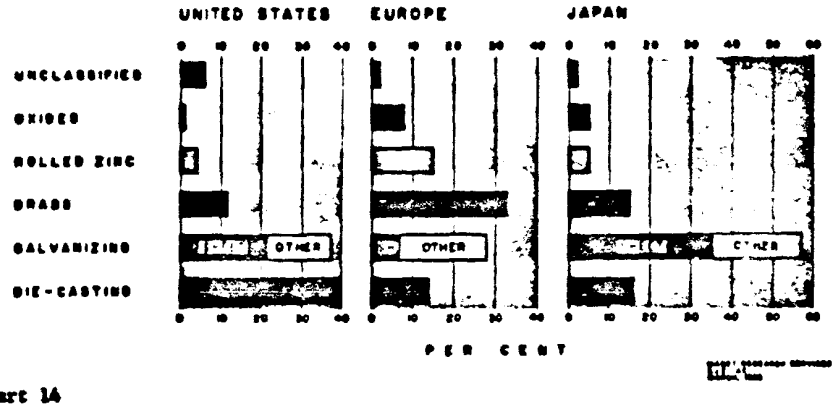

Chart 14

TABLE I

Free World Refined Lead Consumption

Forecast by Major Areas 1965 to 1968

(Thousands of short tons)

	1960	1961	1962	1963	1964 (Prelim.)	Forecast 1965	1966	1967	1968
United States	892	917	993	1,037	1,064	1,090	1,105	1,120	1,135
Europe	1,172	1,176	1,201	1,220	1,279	1,335	1,360	1,380	1,400
Japan	105	136	126	137	182	185	205	225	245
Other	270	297	310	346	375	405	425	450	475
TOTAL	2,439	2,526	2,630	2,740	2,900	3,015	3,095	3,175	3,255

Note: Historical data based on U.N. Statistics

TABLE II

Free World Slab Zinc Consumption

Forecast by Major Areas 1965 to 1968

(Thousands of short tons)

	1960	1961	1962	1963	1964 (Prelim.)	Forecast 1965	1966	1967	1968
United States	920	985	1,051	1,146	1,217	1,250	1,275	1,290	1,310
Europe	1,242	1,277	1,265	1,282	1,390	1,450	1,485	1,520	1,550
Japan	208	268	268	330	394	400	440	480	520
Other	353	382	423	503	554	590	615	645	680
TOTAL	2,753	2,912	3,007	3,261	3,555	3,690	3,815	3,935	4,060

Note: Historical data based on U.N. Statistics except United States which includes estimate of apparent unreported consumption.

A. Olaf Wolff