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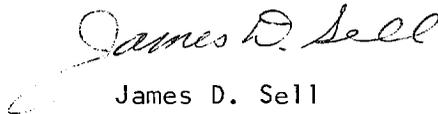
Exploration Department
Southwestern United States Division

December 21, 1984

"More About Copper -- Reflections on Fundamentals
in the Interdependent World of the 1980's"

I believe you will find the remarks by Charles F. Barber, former Chairman of ASARCO Incorporated, of interest. The paper was presented by Dr. Barber at the awards presentation banquet of the American Mining Hall of Fame sponsored by the Mining Club of the Southwest Foundation, Inc.

Also, in the packet are a few papers which Dr. Barber submitted as germane to the subject.


James D. Sell

Attachments

Remarks of
Charles F. Barber
Former Chairman
Asarco Incorporated

MINING CLUB OF THE SOUTHWEST

Mining Club of the Southwest*
Tucson, Arizona
December 8, 1984

More About Copper
--Reflections on Fundamentals in the Interdependent
World of the 1980's

Copper has been a big story here in Arizona all year--multimillion dollar losses on copper operations, layoffs, mine curtailments and shutdowns, the Phelps Dodge strike and, more generally, labor's response to austerity and the demand for greater productivity, the advocacy of Senator DeConcini and Congressmen McNulty and Udall, the President's denial of relief to the copper industry in the Section 201 case. And then, less than a month ago, Pennzoil's announcement that it had decided to withdraw from the industry and that Duval's copper properties were for sale.

This last has to have special poignancy here in Tucson. Duval's record as an operator and a successful innovator is outstanding. Pennzoil thus joins Atlantic Richfield, Louisiana Land, Occidental Petroleum and Texaco in withdrawing from the industry this year. These oil companies, which have the financial strength to hang on, have decided to write off their copper investments and put their energies to work elsewhere.

*American Mining Hall of Fame awards presentation banquet. The dinner was sponsored by the Mining Club of the Southwest Foundation, Inc.

Sir Ronald Prain, perhaps the dean of his generation in the industry, advised some years ago:

"Change is inevitable, and the fruits of success will go to those who adapt to it and make an ally and not an enemy of this almost universal human characteristic."*

It is fair to say that none of us foresaw the magnitude of the change to which we would have to adapt in our search first for the route to survival and then, down the road, "the fruits of success." Nor did we anticipate the extent to which the domestic copper industry would become a victim of other priorities of the U.S. Government.

The economics of the domestic copper industry have been thoroughly analyzed this year and all of you have been exposed to a great deal of heavyweight advocacy. I have subtitled my talk "Reflections on the Fundamentals in the Interdependent World of the 80's." My objective is to present the big picture in order to throw light on the President's decision in the Section 201 case. Each of you can then form your own judgment with respect to the future of the mines in Arizona.

I will begin my presentation with a number of oversimplified statements:

1. Copper is a capital intensive, cyclical industry producing a basic industrial material. Consumption is functionally related to the durables component of the gross national product on a world basis.

*Cited by Wolfgang Somes, "Mineral Policy of the Federal Republic of Germany and the European Community," 1984 American Mining Congress, Mining Convention, Phoenix, Arizona, p. 3.

2. A price representative of the economic value of copper depends on balanced markets. Historically a small excess of supply has produced a disproportionate decrease in price and vice versa. The markets are heavily influenced by expectations relating to the adequacy of supply and this is reflected both in the physical and futures markets.
3. Happiness in the copper mining industry depends on growth in demand over the cycle. It is easier to provide the required supply in an environment of growth. This brings good profits during the buoyant phase of the cycle and ameliorates mistakes in the timing of additions to supply.
4. Happiness in a copper mining company means having costs to market which compare favorably to those of its competitors in the free world and the financial strength to ride out the low phase of the cycle.

All this is elementary. Now a word about the demand side of the market equation.

On Demand

My generation had an exciting time in the copper industry. We were operating in an environment of growth. In 1950, the free world consumption of copper totalled about 2,500,000 tons of copper; by 1973 consumption had tripled to about 7,500,000 tons--a compound growth rate of over four percent per year. The challenge over this period was to discover, finance and develop properties in order to meet these steadily growing requirements. Silver Bell, San Manuel,

Pima and Mission and a number of other copper mines were developed near Tucson during this period. The return on investment was attractive. The United States government in the late 1960's considered security of supply of such urgency that it provided a major share of the financing for Duval's Sierrita mine under the Defense Production Act.

I should say a word about intensity of use. Growth of demand for material intensive products levels off as an economy matures. Broadly, the post World War II rate of growth of demand for copper was fueled in the 1950's by the rebuilding of Europe, in the 1960's first by the industrialization of Japan and the material needs of the Vietnam War and then later by above average growth in the developing countries. It was the expectation of continuing growth in the developing countries that fueled our buoyant expectations for the 80's.

At the same time copper was continuously engaged in the battle of substitutes with new materials and new technology. The energy cost inflation in the 1970's and the electronics revolution led to downsizing of products and less use of heavy materials. Your honoree last year, George Atwood of Duval, focused on the importance of an industry committment to research, innovation and market development to win new markets and defend established markets. George Atwood and I first became acquainted as fellow directors of the Copper Development Association and the International Copper Research Association. We both believed in the importance of research and were committed to maintaining the strength of these industry research and market development organizations.

Putting this all together, the Bureau of Mines as recently as 1979 in its year 2000 study forecast a "most probable" rate of growth of 3.6% per year, leading to an annual requirement of 19.5 million tons of primary copper in the year 2000.*

At that time, the prospective inadequacy of supply by the mid-1980's was regarded as most serious. I participated in a conference in London in May 1980 convened jointly by the AIME and the Institution of Mining and Metallurgy (UK) to address the problem. The root concern was the long-term adequacy of supplies of minerals. This concern stemmed from the natural consequences of political turbulence in the developing world and of the unprecedented inflation which had occurred in the leading industrial countries. Together these influences had swept away the bases for long-term private investment in minerals projects. My contribution was to describe the immense gap between the price required to sustain existing operations and that required to develop new greenfield projects. I presented a study that showed that a projected price of at least \$2.35 per pound would have been required to justify construction of the Guajone mine in Peru, had construction started in 1980.** I predicted there would

*Sousa, The U.S. Copper Industry (Bureau of Mines, October 1981), p. 78.

**Barber, Mineral Investment in an Anxious World, in National and International Management of Mineral Resources (The Institution of Mining and Metallurgy, London, 1981) pp. 133-152.

not be any more such mega projects for a long time. Michael West, publisher of the Mining Journal (London) referred to Guajone and La Caridad, then nearing completion in northern Mexico, as "the last of the dinosaurs." The late Sir Mark Turner, then Chairman of The Rio-Tinto Zinc Corporation, who had just announced the purchase of Texasgulf's interest in the Cerro Colorado project in Panama, shared the platform and defended his contrary judgment. It provided some lively by-play at the meeting.

The recession which began in 1981 and bit severely in 1982 brought losses and a round of severe cost cutting to the domestic copper industry. But the industry still anticipated a resumption of the projected growth in demand. This expectation was then shattered with stunning force following the financial crisis in Mexico in August 1982.

As the enormity of the LDC debt problem became clear, it also became clear that Latin America and much of the developing world was faced with an extended period of austerity and limited growth, and that all but the most urgent of the materials intensive capital projects then in various stages of planning would have to be deferred.

More recent forecasts by the Bureau of Mines and the industry have reduced anticipated average growth of consumption of copper over the coming decade to from 1% to 1 1/2% per year.

This reduction in the projected average rate of growth of demand has had a severe impact on the copper industry. On average, large and growing amounts of copper will still be required each year. But the price environment is likely to be poor because the appropriate response on the supply side of the equation, given existing equipped capacity, will be vastly more difficult.

Supply

The adjustment of supply in times of reduced demand has always been difficult for the copper industry because of the ponderous momentum of production and the fierce perverse dynamic which tends to rule the industry during recessions. This latter follows from the relationship between operating rates and/or grade of ore mined and unit costs.

The copper pipeline is long. The time required for mining-milling-smelting-refining-transportation to fabricator-manufacture of wire, sheet, shapes, alloys, etc. -transportation to manufacturer of products, etc. to market is long. And when prices weaken, the pressure on the miner is both to increase thruput and to raise the cut-off grade to get more units of production per period in order to maintain revenue. That response increases output and exacerbates the pressure on price. Historically, the burden of responding constructively to conditions of excess supply has been assumed by the largest and lowest cost producers because they tend to be the producers with financial resources to accept reduced revenues for a period in the interest of relieving pressure on price.

In former times, the inexorable cyclicity of the copper industry has led to bankruptcies and consolidations within the industry during each significant recession. By the late 1940's and continuing to the mid-1960's, eight companies, two British, one Belgian, and five U.S., controlled three-quarters of the free world's supply of primary copper.

These companies were headed by experienced men committed to the copper industry. Demand was cyclical, but to quote Ronald Fraser of the Anglo American group, there was "sufficient community of understanding and resolution among producers to minimize the adverse effects (of reduced demand) by taking appropriate measures."*

The structure of the industry changed dramatically in the late 1960's. By the time of the first oil shock in 1973, more than 40% of the supply of primary copper had passed into the hands of governments of developing countries. If we were to add the additional supply influenced by LDC government policy, the figure would be well over 50% of the supply.

The mining companies owned by governments in the developing countries have not at any time to date made a significant response to the economic imperative of reduced demand. They did not do so in the 1975-77 recession nor in the 1981-82 recession. They continued to operate at maximum available capacity in response to social priorities and the need for foreign exchange. The result for all of them and for all others in the industry has been the sacrifice of economic rents attributable to their natural resources and an immense transfer of wealth from the lesser developed producing countries to the industrialized consuming countries.

Thus the full burden of adjustment to reduced demand was, and continues to be, thrust on the private North American companies, as those of us here in Arizona know all too well.

*Ronald Fraser, "The Copper Industry: Then, Now and Tomorrow," presented at the Mining and Metallurgical Society luncheon, March 8, 1983, Atlanta, Georgia.

The irony of this record is that this lack of response has been financed, to a considerable extent, by support mechanisms the industrialized countries have put in place to aid and assist the developing countries.

I refer to the International Monetary Fund (IMF), the World Bank and the Multilateral Development Banks (MDBs). I find it extraordinary that over the last two years, the IMF alone has made available to six countries which produce over 50% of the supply of primary copper \$1.2 billion under its Compensatory Financing Facility, primarily because of the low price of copper and has made available to these same countries another \$2 billion under its general credit facilities because of shortfalls in the availability of foreign exchange. During the same period the multilateral development banks loaned additional tens of millions of dollars at concessional terms to Chile, Zambia and Zaire for investment in their copper industries.

Three billion dollars is a lot of money. I have urged that the IMF and the MDB's should contribute to the solution of the problem of excess supply of copper and not be part of the problem. I have made a number of suggestions to that end.* Senator DeConcini and Congressman McNulty have sponsored parallel legislative initiatives. To date there has been only a limited response by the international financial institutions.

Policy Issue

That is the setting. I come now to the policy issue that confronted the Administration in the Section 201 case.

*See American Banker, "Compensatory Financing Rules Can Be Counter-productive," September 27, 1983; "Economics of Copper in the Mid-80's; A Role for the Multilateral Financial Institutions," Materials and Society, Vol. 8, No. 3 (1984) pp. 481-489.

1. One of the highest priorities of the United States Government is to maintain the stability of the international financial system. This is regarded as "an all win or all lose situation, there is no in-between."* Hence the extraordinary measures to help Mexico, Brazil and Argentina, the largest debtors, avoid default. Hence, the pressure on the U.S. Government, the IMF and the commercial banks to accommodate the debtors. Servicing and eventual repayment of the debt will require both austerity and growth over an extended period. To make this scenario credible, the leaders of the industrialized countries have established a growth target for the industrialized countries of not less than 3% per year in real terms. Even this projects a sustained period of restrained growth in the developing countries and a deferral of all but the most urgent capital intensive, infrastructure projects. "Mega-projects are out," said one informed banker, referring to mining projects in developing countries.**

2. The Administration's policy strategy is based on economic growth -- free up the economy, encourage investment, avoid protectionist measures. The Administration's economic program has had remarkable success to date in stimulating growth. The performance of the U.S. economy has been the envy of the world. The gross national product has grown

*See "The Global Repercussions of U.S. Monetary and Fiscal Policy," Economic Policy Council of the UNA-USA (September 1984). The quotation is from Christian F. Baiz III, Vice President, Manufacturers Hanover Trust Company, "Metals and Mining Industry-A New Agenda," presentation to Society of Mining Engineers, Denver, Colorado (October 26, 1984)

**See Baiz, cited above.

by 15% over the last two years, albeit from a low base. This is the strongest advance for the U.S. economy in any two year period since World War II. Notwithstanding the strong dollar, more jobs have been gained in the United States than have been lost in the relatively few severely impacted industries.

The copper industry has participated in this advance in terms of consumption. Data available as of this date indicates that free world consumption in 1984 may be the greatest ever; it will surely be second only to 1979. Stocks on the terminal exchanges in London and New York have declined almost 50% since their peak in January - including each of the last three weeks. Although there may be some offsetting increase in refiners stocks, overall the level of inventories has declined substantially.* Nonetheless, because of prior conditions of excess supply and resulting overhanging stocks, the price of copper in real terms in dollars has been and remains at the lowest level in the century, except for slightly lower prices for a brief period in 1932.*

This is the setting. What I have just said is stated in the President's order in the Section 201 case.

*See Richard de J. Osborne, President, Asarco Incorporated, Presentation to Quarterly Meeting of Securities Analysts (November 1, 1984).

MINING CLUB OF THE SOUTHWEST

The President's order denying relief relies on pure economic theory. "I have determined," he wrote, "that granting relief is not consistent with our national economic interests." He listed three reasons:

1. The imposition of import restrictions "would create a differential between U.S. and world copper prices." This would "seriously disadvantage the copper fabricating industry" and "over time, shrink domestic demand for copper and add to the serious problems faced by U.S. copper producers."
2. "Import relief would also affect the export earnings of the foreign copper-producing countries, many of which are heavily indebted and highly dependent on copper exports. It would, therefore, complicate our efforts to maintain the stability of the international financial system and lessen the ability of foreign countries to import goods from the United States."
3. Finally, "there are encouraging signs that economic recovery is beginning to have a favorable effect on world copper prices...stocks have fallen...a significant price increase is expected in the near future."

The reasoning is classic. Impose no restraints on supply, encourage demand, "resist protectionist acts" and the working of the market system through price over time "will foster...recovery." Note also the reference to the Administration's "efforts to maintain the stability of the international payments system."

In a speech in London in October, the Director of the Bureau of Mines reviewed the cost-cutting and other survival strategies of the

U.S. copper companies. These developments, he said, "illustrate the free market at work; they also justify it." "We will probably have to accept some decrease in our mineral self-sufficiency as a trade-off," he added, "but the trade-off is acceptable."* In contrast, Senator DeConcini commented: "From my vantage point, the President has written off America's copper industry and the tens of thousands of American jobs that go with it."**

These two comments present the policy issue:

1. Will markets recover in time to prevent the virtual shut-down of the U.S. copper mining industry?
2. Will the recovery be sufficiently sustained to provide a basis for continuing investment in the U.S. copper industry?

The President says "yes" to both questions. His Director of the Bureau of Mines applauds the cost reductions which have been accomplished by domestic producers in response to the relentless pressure of the "free market at work" and anticipates "some" decrease in U.S. production capacity which he states is "acceptable."

Senator DeConcini is not convinced. He, Congressmen McNulty and Udall, and the principal industry executives have stated forcefully their view that certain measures are required now to forestall the virtual destruction of the domestic industry. They state that the U.S. mines are competitive and could hold their own in the free market on a level playing field, but that the producers in the developing countries, financed both directly and indirectly by the international financial institutions, are playing by different rules. That is unfair and the U.S. Government should seek appropriate remedies.

*Robert C. Horton, Remarks to the American Metal Market London Metal Forum (October 8, 1984) p. 24.

**Letter to the Arizona Republic, November 7, 1984.

MINING CLUB OF THE SOUTHWEST

What do each of you think?

This is an important national issue. There is no way that U.S. manufacturing industry and the U.S. defense establishment can supply their needs without the continued availability of a major portion of the 1,000,000 tons of domestic capacity still operating - except in the very long term.

* * *

Q. Mr. Barber, What do you think is the future of the copper mines in Arizona?

A. Given the President's premises, I understand his decision in the Section 201 case.

I do not question the commitment of the Administration to a growth strategy. The growth of trade and of the economic interdependence of nations over the post-war period has been an essential aspect of the sustained real growth and widely shared prosperity of the period.

I do not question the priority given by the President to maintaining the stability of the international financial system. In its present, extremely extended posture, I believe this presents a "we all win or we all lose" sort of challenge.

As a result of the strong economic growth in the United States and more modest growth in the other industrialized countries, consumption of copper in 1984 has been good and may turn out to be the highest ever. If the level of consumption is maintained in 1985, it is reasonable to anticipate, as the President stated in his order denying relief, "a significant price increase...in the near future."

I emphasize "near" future, because, as of this date, the price of copper remains below the costs of production of all but a handful of the world's copper mines and the costs of these few have been aided by devaluation of the local currency. The length of time that a private company can or will accept losses on operations is limited. Time runs out. As I noted at the outset, five oil companies which have a choice have decided this year to withdraw from copper mining in the United States. The capacity of the remaining mining companies to finance continuing operations is limited. That reality must command the attention of our national leaders. As I have said, there is no way the continuing needs of the United States can be supplied during periods of average and strong demand without the continued availability of the greater part of that capacity. The billions of dollars and years of time that would be required to replace that capacity elsewhere in the world is not and could not be available except in the very long term. Nor would the virtual loss of our economically competitive domestic copper industry be acceptable from any point of view.

The U.S. mines now operating are among the most efficient in the world and some of them represent the leading edge of copper mining technology. I hope Mr. T.C. Osborne's recent discussion of Asarco's cost reduction experience at the Mission mine in Arizona* will put to rest the notion that the major Arizona mines are not acceptably placed in the array of costs of the free world's copper mines.

*T.C. Osborne, Executive Vice President, Asarco Incorporated, Presentation to Security Analysts (July 26, 1984). See Engineering and Mining Journal, September 1984; pp. 21, 25.

MINING CLUB OF THE SOUTHWEST

To answer the question, I believe that the Arizona mines have a sound future. However, under existing conditions, they are a victim of other national priorities and time is running out.

We all hope and some of us expect that demand for copper will continue strong in 1985 and that, as stocks continue to decline, market forces will bring improved prices. The President's order states that he has "directed the Secretary of Commerce to actively monitor the domestic copper industry including inventories and the levels of copper imports." The situation is being closely monitored and I know that the concerns I have expressed are widely shared.

The longer term issues remain. The economics of the copper mining industry in the free world have been so bad for so long that they are forcing a widespread reassessment in both the United States and the developing countries of past strategies and policies.

I plan to continue to work encouraging public understanding of the issues and I hope that you will too. If we do, I have to be confident that there is a sound future for the majority of the copper mines of Arizona.

Mineral Economics Symposium

ECONOMICS OF COPPER IN THE MID-80's*
A ROLE FOR THE MULTILATERAL FINANCIAL INSTITUTIONS

Charles F. Barber
Chairman of the Finance Committee
Asarco Incorporated
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The growth of economic interdependence among nations has been one of the realities of the post-war years. It has been an essential aspect of the sustained real growth and widely shared prosperity of the period. The overall growth led to an increase in demand for minerals which fueled a parallel expansion of the minerals industry. But it also created economic linkages which transmit economic developments in one country or region to other countries and regions more quickly and, if substantial, more pervasively than formerly was the case. Thus the developing countries debt crisis, which emerged with stunning force following the financial collapse in Mexico in August, 1982, has led to a fundamental revision in the outlook for growth in demand for metals over the coming decade.

Of course, the copper industry has always been sensitive to its role in the world economy. Copper is one of the relatively few commodities of which it can fairly be said that a ton produced anywhere in the free world is of the same consequence to the price of copper here in Toronto as a ton produced anywhere else in the world. Moreover the same can be said of a ton consumed anywhere in the world. For copper moves freely in international trade at a cost which is small in relation to its unit value. Thus prices cannot for long be significantly different in different regions of the world, except as accounted for within regions by significant, government sanctioned trade barriers.

This is the setting for my remarks today, which takes as their text, two events which occurred in Washington within the last two weeks

On November 18, 1983, the U.S. Congress completed legislation authorizing payment of the U.S. share (\$8.4 billion) of the proposed quota increase of the International Monetary Fund (IMF).

On November 30, 1983, the Inter-American Development Bank approved a \$268 million loan to Codelco, an instrumentality of the Chilean government and the world's largest producer of copper.

Both measures were the subject of intense debate in Washington while they were under consideration.

Concern as to policies of the multilateral financial institutions, including the IMF, which related to the supply of copper from developing countries significantly impeded favorable Congressional action on the IMF quota increase and resulted in two prescriptive amendments to the legislation.

*The 1983 Hamilton Lecture, Canadian Institute of Mining and Metallurgy Toronto, Canada, December 8, 1982. A formal statement for views presented at the Symposium, published with permission of CIMM.

The same concerns, in the context of the relative economic strength of the borrower, undoubtedly influenced the U.S. director to vote "no" and the Canadian director to abstain when the Inter-American Bank Board of Directors approved the loan to Chile's Codelco.

I do not have to elaborate for anyone in this audience that there is a crisis in the world copper industry today.

In a paper given just a month ago at the Copper Development Association's "Copper '83" Conference in London, Sir Alistair Frame, Deputy Chairman and Chief Executive of The Rio Tinto Zinc Corporation, apologized for "using adjectives appropriate to the bubonic plague and the Black Death" to describe it. Let's look at the facts.

The last 24 months have been the worst for the world copper industry since the depth of the depression years. For about half that period, the copper price in real terms in U.S. dollars has been close to the price which prevailed at the very bottom of the depression of the 1930's. This was the case again last week, with copper in London selling at the equivalent of U.S. 61 cents per pound.

These prices are below the costs of production of all but a handful of the world's copper mines. How can that be? We read that a strong recovery is underway in the United States and that conditions are improving in Canada; our political leaders say that times are better. What accounts for the extremely low prices in the copper market?

The root cause is over-production which, as we know, is endemic in the copper industry. In his thoughtful paper, Sir Alistair reviewed all the reasons why this is so and why all mine managers, whether in the private sector or the public sector, resist curtailment or suspension of production when prices fall. They want to protect their organization and their unit costs. Miners are an optimistic breed and assume that prices will improve. Mine managers do not curtail he concluded, until it becomes a "financial imperative or hope of a recovery in demand in the near term are abandoned."

Responding to just such free market forces, the reductions made by North American producers last year were substantial. In 1982, mine production in the United States was reduced 25 percent from the previous year. At one point last year, 45 percent of the copper workers in the United States were on layoff. This is not a pretty picture. Total production in the United States this year will be further reduced from 1982 levels, reflecting the mine closures during 1982. Today, fifteen U.S. mines, with a nominal capacity of 540,000 short tons per year, are still shut down. Four others are operating on a curtailed basis at rates in the aggregate about 140,000 tons below normal operating levels. All of these mines have operated at their designed capacities within the last five years. The idle capacity is equivalent to about 40 percent of U.S. mine production in 1981, i.e., the peak year since 1973.

The picture is not very much different in Canada. Here the idle capacity is equivalent to about 15 percent of mine production in 1980, the peak of recent years.

Of course, in a free market, mine shutdowns and curtailments of production are a usual response to conditions of oversupply. However, the current crisis appears likely to be more prolonged than any we have experienced since the great depression. The new element is the changed structure of the industry. As a result of the nationalizations of the 1960s and early 1970s and the growth of nationalistic policies of producing countries, government-owned producers now account for more than 40 percent of the free world's production of copper. If government influenced supply is added, the figure is significantly increased.

The public sector mining companies have not to date made a significant response to the economic imperative of reduced demand. They have continued to operate at full capacity, responding to social priorities and the need for foreign exchange. The result for all of them is the sacrifice of economic rents attributable to their non-renewable resources and a transfer of wealth from the less developed countries (LDC's) to the industrialized consuming countries. The irony of this record is that this lack of response has been made possible, to a considerable extent, by support mechanisms that our governments put in place in an effort to aid and assist the developing countries.

These support mechanisms include the International Monetary Fund and the multilateral development banks (MDB's). The MDB's include the World Bank and its subsidiary, the International Finance Corporation (IFC), the Inter-American Development Bank and the other regional development banks. Notwithstanding the crises in the world copper industry, these multilateral institutions have continued business as usual, financing shortfalls in export revenues of LDC copper producing countries (the IMF) and approving loans for the development of still more production capacity (the MDB's). Hence the intense concern expressed by some members of the U.S. Congress and the U.S. Administration to which I referred at the outset.

THE INTERNATIONAL MONETARY FUND

While the North American mines were shutting down or curtailing production to protect their balance sheets or conserve reserves, the IMF was lending over U.S. \$1 billion under its Compensatory Financing Facility to six LDC copper producers.*

These six countries accounted for 50 percent of the free world production of copper in 1982. The entitlement of the six countries for financing from the IMF's Compensatory Financing Facility, under its rules, was enhanced by the low price of copper. The largest LDC producer of copper -- Chile -- drew about one-third of the \$1 billion total. The amounts drawn by Chile, Zambia and Zaire were due primarily to the low price of copper. In three other countries, Peru, Papua-New Guinea (Bougainville), and the Philippines, the amounts drawn were due significantly to the low price of copper.

This is a substantial amount of money in relation to the size of the copper industry. If half of that \$1 billion from the IMF had been used to buy copper and the copper had been dropped into the ocean deep, it's a fair guess that there would not have been any need for the other \$500 million. Why? Because \$500 million (at the average LME price in 1982) is equivalent to over five percent of the world's supply of copper.

If that five percent of the supply had been removed from the market, we would not have seen an average world copper price of U.S. 67.2 cents per pound. It would have been substantially higher.

Instead that \$1 billion relieved these six countries of the incentive to review production and marketing policy in the face of disastrously low prices. All continued to produce at full capacity. In the absence of adequate industrial consumption, stocks accumulated on the terminal exchanges and prices fell to levels necessary to attract investors and speculators to the market.

There is always a price quoted on the terminal exchanges at which someone will exchange currency for copper. In this sense, copper can always be "sold." But the price at which such transactions take place in a depressed market has nothing to do with the economic value of the metal.

There has also been a psychological factor which has had the effect of depressing market expectations. I refer to the strident voice of Chile's Codelco, the free world's largest copper producer. Codelco controls large reserves, is a low cost producer, and has disclosed plans to increase production by 50 percent to more than 1.5 million tons over the next decade. Two of its mines, Chuquibambilla and El Teniente, are among the lowest cost mines in the world. In 1982, in the face of falling markets, Codelco increased production 139,000 m.t., or 15 percent, over 1981 to a total above the peak production it had ever achieved in prior years. Production this year will be comparable. Codelco and Chilean government spokesmen have consistently explained this expansion of production as in line with Chile's objective of increasing its market share. The prevailing low prices and prolonged weak markets, they explain, provide an opportunity to force higher cost mines elsewhere to shut down.**

*Loans by the IMF are denominated in SDR's. At the current rate of 1 SRD = \$1.05, the total is equivalent to \$1.077 billion, viz: Chile \$310 million; Zambia \$200 million; Zaire \$112 million; Peru \$210 million; Papua-New Guinea \$47 million; Philippines \$198 million.

**This concept is echoed by the Secretary-General of CIPEC. "It is not the fact that a substantial proportion of the copper industry in the CIPEC member countries is state-owned that prompts them not to cut back production. Their reason for not doing so is that there are

The question I ask is this: Should this sort of predatory commercial behavior be financed by the IMF? In this instance, it is fair to suggest that it was. It is not enough for Chile's Codelco to insist that its operations continued profitable. If the largest and strongest producers of any metal ignore market realities in times of reduced demand, they ensure a prolongation of market imbalance and continuing loss of revenues of themselves and all other producers. If the financing available from the IMF to the host government relieves such producers from the necessity of dealing with market realities, the result is a destabilizing and not a stabilizing influence on the markets. Moreover, profitability is a relative concept where, as in the case of Chile, the local currency has been devalued 120 percent over an 18 month period.

The IMF was created to provide balance of payments assistance to its members when they encounter temporary shortages of foreign exchange. Under its general credit facilities, loans from the IMF are conditioned upon the borrower's submitting a plan of action deemed adequate by the IMF to correct the conditions which give rise to the member's foreign exchange shortage. The Compensatory Financing Facility was established in 1963 to provide balance of payments assistance expeditiously to members suffering a fall in revenues from exports of primary commodities. Loans under this special facility are subject to "low conditionality." The IMF staff must be satisfied only that export earnings from primary commodities have fallen temporarily and that the circumstances are beyond the control of the member.*

Under its general credit tranche facilities, the IMF has regarded an increase in exports as part of the solution. Under its compensatory Financing Facility, the IMF has made financing available to cover shortfalls in export earnings from primary commodities in accordance with arithmetical formulas set forth in its regulations. In neither program has it considered the possible consequence that in this interdependent world, the maintenance or increase in exports of a commodity by its LDC members may, under conditions of prolonged reduced demand, result in a still further decline in export revenues and thus be counterproductive.

I believe that the IMF's policies have in fact been counterproductive as to copper and that they have had a significant role in prolonging the disastrous conditions in the world copper market. At the very least, an opportunity to play a constructive role has been missed.

Under its charter, the IMF is directed, among other purposes:

"To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objectives of economic policy." Article 1(ii), Emphasis added.

At a recent minerals economics symposium in Washington, an official of the IMF, reflecting on the copper markets and the fact that the IMF had loaned more than \$1 billion to six copper producing members, expressed his opinion that the IMF, in considering prescriptions for domestic policies of members with balance of payments difficulties, should be looking at all times at the international implications of such prescriptions on other member countries.** This is a constructive statement of the IMF's responsibility under its charter.

This leads me to make a number of suggestions:

still a number of mines outside CIPEC where costs are higher on account of less attractive natural factors, or of political considerations in some instances, and it is felt that these should take the lead." E. Llosa, Secretary-General, CIPEC, in Quarterly Review, April-June 1983, 2nd page. Of course, there are high-cost mines in CIPEC countries just as there are low-cost mines elsewhere.

* See further, C. F. Barber, "Compensatory Financing Rules can be Counterproductive," American Banker, September 27, 1983.

**Dr. Azizali F. Mohammed, Director, IMF External Relations Department, 9th Annual Mineral Economics Symposium, "The Impact of International Trade and Finance Policies in the U.S. Mining Industry" sponsored by AIME, Washington, D.C., November 22, 1983.

1. The structural changes in the copper industry which occurred in the late 1960s, when governments entered the industry in a major way, have been followed by a change in management behavior. The mines appear to be regarded by the new owners as public service activities to generate employment and foreign exchange earnings rather than productive activities designed to earn the "economic rents" attributable to the ownership of non-renewable natural resources. The IMF's prescriptions encouraging exports by countries dependent on copper, without regard to market consequences, have reinforced these trends in a perversely counterproductive way. The result has been the sacrifice of economic rents by all producers and a substantial transfer of wealth from the developing countries to the industrialized countries where most copper is consumed. The lesson to be learned is that in designing balance of payments prescriptions for a major copper producing country, the IMF should consider the consequences of its prescriptions on other copper producing countries.
2. The free world has learned a number of lessons on the consequences of interdependence this last decade. The IMF has played a significant role in assisting its members to design and implement economic adjustment policies needed to restore their external positions to a sustainable basis. This it has done through its policy of "conditionality." Access to the IMF's resources are available only when the IMF is satisfied that the adjustment measures proposed by the member are internationally responsible and will be effective. The IMF has not heretofore concerned itself with the international performance of particular commodities. The counterproductive consequences of the use of its resources by producers of copper suggests that it should review this aspect of its operating procedures.
3. The IMF resources committed to the Compensatory Financing Facility are substantial. Administration of this facility requires an analysis of the causes of the observed fall in export revenues. IMF officials state that notwithstanding the appearance of "low conditionality" under its rules, it in fact encourages members seeking access to the facility to adopt effective programs to moderate the conditions giving rise to the shortfall. A review of copper production and marketing policy with its major copper producing members which have borrowed more than \$1 billion from the facility would be constructive, for the loans must be repaid.
4. More generally, I suggest that the rules of the Compensatory Financing Facility should be reviewed and amended. Access to the facility should be conditioned on submission by the member of a business plan responsive to prevailing conditions in the markets for the commodities concerned giving rise to the member's shortfall in export earnings.*
5. A thorough study of the possible use of the Compensatory Financing Facility as an instrument to assist in the management of supply in appropriate cases would be timely and in the interest of all member countries.

For example, the IMF could be authorized to enter into agreements with members in appropriate cases, to draw from the Compensatory Financing Facility an amount equivalent to the revenues deemed foregone by not producing (or not exporting) a stipulated amount of copper. Such agreements would be formulated on a case-by-case basis. This would be in contrast to the present rules which penalize a member when production is curtailed or stocks are withheld from the market because such action is deemed intentional and not beyond the control of the member.

Something like the foregoing has been authorized in the case of sugar. Under the 1977 International Sugar Agreement, exporting members are required to hold a prescribed minimum amount of stocks as long as prices are below an agreed level.

*There is also a question whether the present rules should not be interpreted so as to require a reduction in the entitlement of a member where it increases production and sales of a commodity at a time when the market for the commodity concerned is oversupplied. Such conduct is "intentional" and, in certain cases, may be deemed to have depressed the market price for the commodity and, in consequence, export revenues.

Under the IMF Buffer Stock Facility, members are permitted to draw an amount corresponding to the export earnings foregone by constituting such stocks.

6. I do not suggest that the IMF or any other body seek the establishment of an international commodity agreement for copper.

Stabilization of commodity prices has been a main objective of various initiatives under the United Nations Conference on Trade and Development (UNCTAD). Over the last fifteen years, more than a dozen international meetings have been held by the UNCTAD copper group to examine various schemes designed to moderate price fluctuations in the case of copper. To date, there have been no visible results.

Technical studies commissioned by the UNCTAD group have shown that upwards of \$5 billion would be required to make a start on a theoretically effective buffer stock facility. Even if funds in such amounts were made available, I am among those who believe there is not enough wisdom available to administer such a scheme in a constructive manner.

I believe that effective price stabilization schemes for the major metals are unlikely to be seen, or, if attempted, to endure for very long. Thus, it appears to me that the responsibility for constructive response to market realities will continue to rest on individual producers acting in their own self-interest.

What is lacking among the new public sector participants in the market, I suggest, is an understanding of their own self-interest. An IMF sponsored study group on the performance of capital intensive, cyclical industry in a free market would be instructive.

THE LONGER TERM ISSUE - FINANCING ADDITIONAL CAPACITY

To this point, I have focused my remarks on a possible role for the IMF in encouraging the management of supply during periods of severe recession in demand for a commodity. I now turn to the longer-term -- the financing of new or expanded production capacity. It was this issue that attracted particular Congressional concern during consideration of the legislation authorizing the increased U.S. contribution to the IMF. It was this issue that led the U.S. Congress to append to the legislation a number of related requirements. Thus the legislation requires the U.S. Executive Director of the World Bank "to take into account the effect that development assistance loans have on international commodity markets . . . to minimize projected adverse impacts."* The U.S. Administration is further required to report annually to Congress listing all appraisal reports circulated within the Bank "for project assistance which would establish or enhance the capacity of any country to produce a commodity for export . . . if such a commodity is in surplus on world markets or is likely to be in surplus . . . at the time the resulting productive capacity is expected to become operative . . ."**

The reasons for this concern are obvious from the U.S. point of view.

In January 1983, the International Finance Corporation, a subsidiary of the World Bank, had under consideration participation in a \$400 million loan to expand the Cananea copper mine owned by the government of Mexico and located about 20 miles south of the Arizona border. In May, the International Finance Corporation participated in a \$600 million financing of an expansion of the privately owned Mantos Blancos copper mine in Chile which will increase its output of contained copper from 60,000 m.t.p.y. to 83,000 m.t.p.y. In November, just a few weeks ago, the Inter-American Development Bank approved a \$268 million loan to Chile's Codelco as part of a \$670 million plan for the modernization and expansion of the Chuquicamata and El Teniente mines, two of the lowest cost mines in the world.

*Supplemental Appropriations Act of 1984, Title VIII, Sec. 808.

**Id., Title VIII, Sec. 813.

All this occurred during a year when the market was greatly oversupplied, the copper industry in the United States was in deep distress, and the outlook for growth in consumption for the balance of the decade was discouraging, at best.

Sir Alistair Frame, in his recent paper, carefully examined the outlook. He projected annual growth of consumption during the rest of the 1980s at somewhere between 1-1/2 and 2 percent, say 100,000 to 150,000 tons per annum. (This compares to annual average growth of just under 5 percent per year during the period 1960-1974.) Then he examined existing and soon to be available capacity and found it sufficient for six to ten years average additional requirements. One can argue with the details of the projections, but not the message. The free world debt crisis has led to a dramatic reassessment of growth expectations. The message is that it is time for restraint in committing finance to still additional capacity, at least until we have a basis for a more confident view of future growth of consumption of copper.

This leads me to a few concluding comments on the role of finance in mine development:

1. Historically mines were financed with equity and expanded with retained earnings and more equity. This enabled the industry better to cope with the recurring periods of reduced demand in this highly cyclical industry.

Because it was largely self-generated, capital was committed only when earnings made it possible or when the outlook attracted new capital. Availability of finance was a powerful regulator of mine development. Highly leveraged mine development by private companies emerged for the first time in the exuberant 1960s. When governments entered the industry, mines came to be developed or expanded on public credit, creating concomitant burdens on the balance of payments which do not abate during periods of cyclical recession. On the contrary, the interest burdens during recession increase pressures to maximize production and exports, even when it is known that such action in the medium term may be self-destructive.

2. The greater part of the financing for leveraged mine development has been provided by the commercial banks. Until very recently, finance has been readily available for mine development projects where the loan was made to or guaranteed by the host government. Public credit -- "sovereign risk" -- was substituted for analysis of project risk. This led to an undoubted erosion of the standards which a mine developer would otherwise be obliged to meet to justify borrowing to finance the development of new production capacity.

There is reason to believe that the current LDC crisis and prevailing high interest rates have provided a learning experience for the banks. One hopes that recent experience will cause the world's commercial banks to take a much harder look at the inherent economics of mine development projects presented to them for financing than has been the case in recent years. Even for the best of the new mine projects, the timing of bringing new production to the market is likely to be more critical to the economics of the venture than at any time since World War II. This is the harsh consequence of reduced growth expectations.

3. The policies of the export credit and foreign aid agencies of the industrialized countries with respect to financing of mine development projects should be reconsidered in this light. Experience indicates that the economics of a project may be regarded as quite immaterial by the lending or granting agency when the financing is used to purchase machinery and services from the lending country. I have previously cited the now recently completed lead silver refinery at Potosi, Bolivia, reported to have cost \$180 million, as an egregious example of this phenomenon.* It was financed in significant measure by the export credit agencies of two European countries. The plant now stands idle and a deadweight on this desperately poor country.

*C. F. Barber, "Accommodating Political Responses to Economic Imperatives." Bulletin of the Institution of Mining and Metallurgy, July 1983.

The same thoughts went through my mind last August when I read that Canada's International Development Agency was financing a feasibility study for a 45,000 metric ton zinc refinery for Bolivia's Ministry of Mines. If this is intended to provide work at public expense for some Canadian entrepreneurs, this is a Canadian matter and so be it. If it is seriously intended as the first step in the construction of such a plant, I suggest it is a matter of international concern as it would prove to be another unjustifiable burden on this poor country.

4. Experience suggests that LDC governments from time to time may confuse construction of mines and plants as such with productive economic development. Governments are inclined to borrow if they can for mine and plant development, equating construction expenditures with jobs and political influence and losing sight of the fact that the resulting project must earn profits sufficient to repay the debt. One of the designed objectives of the multilateral development banks is to encourage rational LDC economic policies under free market principles and global economic efficiency. The World Bank's charter, for example, spells out certain basic rules governing its operations. It must lend only for productive purposes. Its loans must be designed to stimulate economic growth in the developing countries where it lends and promote the long range balanced growth of international trade. The charters of the other MDB's contain provisions to similar effect. The MDB's are a source of relatively apolitical economic policy expertise and are uniquely placed to encourage individual country practices that increase the global efficiency of resource utilization. My experience suggests that the role of the MDB's in development planning and as a catalyst for other investment has been considerable.

I perceive a role for the MDB's of increased significance to the minerals industry in the period of adjustment and reduced growth which we now foresee. At times like the present, when equipped capacity is excess to the requirements of the market and growth prospects are subdued, questions of choice of projects for development and of timing become crucial to the performance of their mission of fostering balanced growth of the world economy as a whole.

5. I should say a word about the \$268 million loan to Chile's Codelco approved last week by the Board of the Inter-American Development Bank over the "no" vote of the U.S. Director and the "abstain" vote of the Canadian Director.

The El Teniente Portion relates to works required to establish a new tailings disposal area and for the development of new mining sectors underground to replace current production sectors. These appear to be necessary projects of the sort most of us have learned we must provide for routinely, normally out of cash flow. At Chuquicamata, Refinery No. 2 is to be expanded to replace obsolete capacity at Refinery No. 1 -- a normal modernization program which undoubtedly meets accepted project standards, but which could be deferred until finance is available from cash flow or commercial sources. Serious questions of timing could be raised with respect to the final project at Chuquicamata, a dump leaching project expected to produce 53,000 tpy of commercial quality cathodes.

The more serious issues are these. Why should a company owning two of the premier copper mines in the world have access to subsidized finance? Terms are 15 years with five years grace at the established IADB rate -- currently 12-1/4 percent.

Why should a government owned producer have access to concessional finance for deferable long-term capital projects when its owner is unable to deal with its existing debt commitments? Those of us in the private sector would have to curtail and defer capital programs under comparable circumstances.

Perhaps most important, why should concessional finance be made available for investment in the copper industry of a country which aggressively increases production during a period of severe recession, thus contributing to oversupply and uneconomic prices for all the world's producers? One would hope that officials of the IADB would have discussed this question with the borrower when they had the loan application before them.

Finally, if additional subsidized finance is to be made available from the MDB's, should it not be applied to more labor intensive development projects which would aid in the diversification of Chile's economy, now overly dependent on copper?

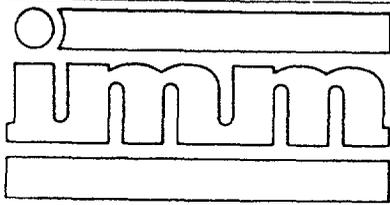
The actions of the Canadian and the United States government directors in abstaining and voting no, respectively, suggest, I hope, that these issues are now receiving some overdue attention.

CONCLUSION

As I see it, the world in which the minerals industry functions has changed. Those of us who are survivors have had to return to the basics. In the period of reduced growth in demand which appears to lie ahead, we shall have to maintain control of costs by all means at our disposal. We shall have to retain flexibility to adapt to possible additional rapid changes in expectations.

It is a truism that the industry produces copper to supply the needs of its customers, not the other way around. But those of us in the private sector may have to learn to live with the commercial behavior of public sector entities which do not respond to the rhythm of the industry and its economic imperatives. We may have to live with public sector producers who respond to different imperatives, who play by different rules, and who sacrifice their economic rents in the process. We should not underestimate the pressures on copper producing LDC's to maximum output of copper in the short run notwithstanding weak markets when the production and sale of copper is one of a limited number of options available to them to convert local inputs of labor and material into hard currency with which to service debts. The industry's customers have options, and they have been exercising them. The challenge of the private sector producer is to survive until free world growth in demand for copper once again achieves a better balance with available equipped capacity to produce copper. In the meantime, restraint by the international financial institutions in the supply of finance could be a moderating influence on the supply of copper to the market, both in the short and longer term.

In my remarks today, I have focused on a possible constructive role for the multilateral financial institutions in the performance of the mandates given them in their charters. They can assist the LDC's to advance along the learning curve in dealing with cyclical markets to the end of moderating the loss of economic rents which occurs when markets realities are ignored. This is a challenge worth pursuing, an opportunity which should not be missed.



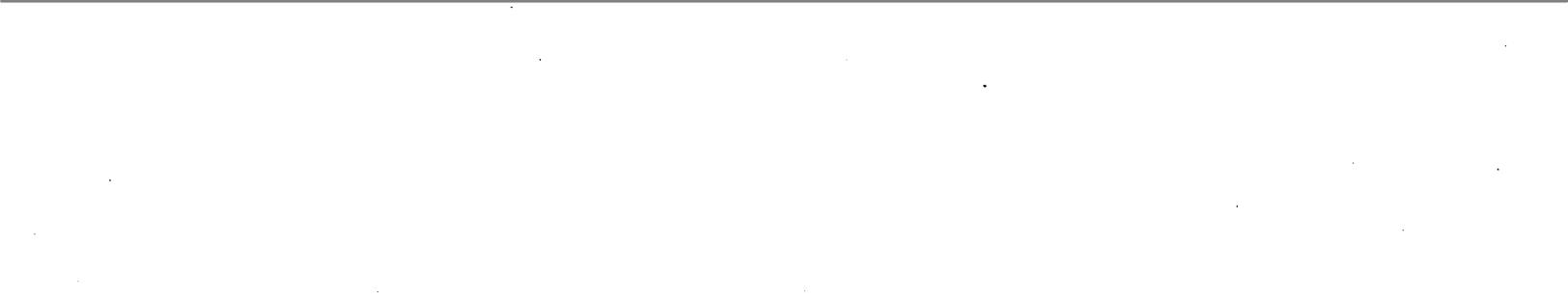
BULLETIN

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REMARKS BY T.C. OSBORNE
EXECUTIVE VICE PRESIDENT, ASARCO INCORPORATED
TO A MEETING OF SECURITIES ANALYSTS
THURSDAY, JULY 26, 1984

MINING CLUB OF THE SOUTHWEST

ASARCO'S COST OF MINING COPPER

OVER THE PAST YEAR THE QUESTION OF THE RELATIVE COST OF PRODUCING COPPER IN U.S. MINES COMPARED TO FOREIGN MINES HAS RECEIVED A GREAT DEAL OF ATTENTION FROM THE MINING AND FINANCIAL COMMUNITIES, FROM THE GOVERNMENT, AND FROM THE METAL INDUSTRY ITSELF. THIS IS NOT SURPRISING IN VIEW OF THE CRITICAL CONDITION IN WHICH THE U.S. COPPER INDUSTRY FINDS ITSELF, AND OF THE PUBLICITY SURROUNDING THE INDUSTRY'S PETITION FOR RELIEF FROM EXCESSIVE IMPORTS WHICH WAS FILED LAST JANUARY WITH THE INTERNATIONAL TRADE COMMISSION.

AS ONE WHOSE AREA OF CORPORATE RESPONSIBILITY INCLUDES ASARCO'S MINING DEPARTMENT, I HAVE TO CONFESS THAT I FEEL FRUSTRATED BY MUCH OF THE COMMENTARY I'VE SEEN AND HEARD OVER THE PAST SIX MONTHS WITH RESPECT TO THE COST OF PRODUCING COPPER IN THE UNITED STATES. I'M FRUSTRATED BECAUSE SO MUCH OF THE COMMENTARY HAS BEEN BASED ON BAD DATA AND MISTAKEN PRESUMPTIONS, AND HAS BEEN JUST PLAIN WRONG.

AGAIN AND AGAIN I SEE THE THEME REPEATED THAT FUNDAMENTALLY THE OVERSEAS MINES ARE HIGH GRADE AND THE U.S. MINES ARE LOW GRADE, THAT OVERSEAS MINERS EARN LOW WAGES AND U.S. MINERS EARN HIGH WAGES, AND THAT THEREFORE OVERSEAS INEVITABLY MEANS LOW COST AND DOMESTIC MEANS HIGH COST. ACCORDING TO

THIS CONVENTIONAL WISDOM, THE COMBINATION OF THESE HIGH COSTS WITH STODGY DOMESTIC MANAGEMENT MAKES INEVITABLE A DRASTICALLY SHRINKING ROLE FOR U.S. PRODUCTION BASED ON ECONOMIC REALITIES. SOME OF THE EDITORIAL COMMENTS SEEM TO SUGGEST THAT WE OF THE DOMESTIC INDUSTRY REALLY HAVE LITTLE OPTION BUT TO SIMPLY ROLL OVER AND ACCEPT THE INEVITABLE. THIS SORT OF GLIB CONCLUSION HAS, UNFORTUNATELY, BEEN ACCEPTED AS THE TRUE WISDOM NOT ONLY BY SUCH ENTITIES AS THE EDITORIAL BOARD OF THE NEW YORK TIMES, BUT ALSO BY SOME UNEXPECTED SOURCES BOTH IN INDUSTRY AND GOVERNMENT AND I'M AFRAID, EVEN BY A FEW INDIVIDUALS FROM AMONG THE DISTINGUISHED GATHERING IN THIS ROOM THIS MORNING.

HOWEVER, CONSIDERING THE GENERAL UNAVAILABILITY OF ACCURATE COMPARABLE COST DATA, I GUESS NO ONE CAN REALLY BE BLAMED TOO SEVERELY FOR GOING ASTRAY. EVEN A PRESTIGIOUS U.S. GOVERNMENT AGENCY WHICH DEALS WITH MINING RECENTLY HAD TO RELY ON U.S. COST DATA FROM THE LATE SEVENTIES, FACTORED FOR INFLATION, WHEN PREPARING A RANKING OF RELATIVE COSTS BETWEEN COPPER PRODUCING REGIONS. NOT UNEXPECTEDLY, SUCH METHODOLOGY PRODUCED A RESULT SUGGESTING THAT U.S. COSTS ARE THE HIGHEST IN THE WORLD BY MORE THAN 10¢ A POUND OVER THE NEAREST RIVAL. THIS IS, OF COURSE, NOT TRUE, BUT UNFORTUNATELY THIS KIND OF CONCLUSION TENDS TO GET PERPETUATED, FOR EXAMPLE, THE RANKINGS WERE USED BY A MAJOR U.S. OIL COMPANY IN ITS TESTIMONY BEFORE THE ITC OPPOSING OUR PETITION FOR RELIEF.

EVEN WHEN PEOPLE ATTEMPT TO APPLY RATIONAL METHODOLOGY

IT IS EASY TO GO WRONG IN ESTIMATING RELATIVE COSTS. THERE ARE TWO FUNDAMENTAL PITFALLS WHICH ARE DIFFICULT TO AVOID: THE FIRST IS FAILURE TO UNDERSTAND FULLY AND TO TAKE INTO PROPER ACCOUNT ALL THE MANY INTERACTING VARIABLES WHICH GO TO MAKING UP A MINING COST STRUCTURE. CLEARLY THE GRADE OF ORE, I.E. THE NUMBER OF POUNDS OF COPPER PER TON OF MATERIAL IN THE GROUND, IS AN IMPORTANT PARAMETER IN COMPARING MINES, BUT THERE ARE MANY OTHER VARIABLES WHICH HAVE A SIGNIFICANT IMPACT ON THE COST OF COPPER IN CONCENTRATE. I DON'T HAVE TIME TO GO OVER ALL THESE OTHER VARIABLES IN AN ORGANIZED WAY, SO I'LL JUST MENTION A FEW OF THEM AS MORE OR LESS RANDOM EXAMPLES.

FIRST, ASSUMING WE ARE DEALING WITH AN OPEN PIT MINE, THE WASTE-TO-ORE MINING RATIO HAS A STRONG INFLUENCE ON MINING COSTS BECAUSE GENERALLY IT COSTS ABOUT THE SAME TO MINE A TON OF WASTE AS A TON OF ORE. THE LATEST DATA I HAVE ON ARIZONA COPPER MINES LISTS THE AVERAGE WASTE/ORE RATIO AS 1.5 TO 1, WHICH CAN BE CONTRASTED WITH SOME OF THE ZAIRE PITS WHERE I UNDERSTAND THE RATIOS GET AS HIGH AS 11 TO 1. OTHER IMPORTANT VARIABLES THAT COME TO MIND ARE THE AMENABILITY OF THE MINERAL DEPOSIT TO MANIPULATION OF ITS MINING GRADE BY CAREFUL PLANNING, THE COST OF DRILLING AND BLASTING ORE AND WASTE WHICH VARIES WITH THE GEOLOGY, THE COST EFFECT OF DILUTION BY INTERNAL WASTE WHICH INEVITABLY OCCURS AT EVERY WASTE/ORE INTERFACE WITHIN THE ORE BODY, THE COST OF TRANSPORTING ORE TO THE CONCENTRATOR WHICH DEPENDS ON THE DEPTH OF THE

PIT AND THE LOCATION OF THE CRUSHER, THE COST OF CRUSHING AND GRINDING WHICH DEPENDS HEAVILY ON THE PHYSICAL PARAMETERS OF THE ORE, THE COST OF THINGS LIKE WATER SUPPLY TO THE MILL, THE COST EFFECT OF METALLURGICAL COMPLEXITY WHICH CAN RESULT IN METAL LOSSES, HIGHER REAGENT COSTS, A LOW CONCENTRATE GRADE AND HENCE HIGH FREIGHT AND SMELTING COSTS, ETC. ONCE THE COPPER IS IN CONCENTRATE, THERE IS THE HIGHLY VARIABLE COST OF TRANSPORTING CONCENTRATES TO THE SMELTER WHICH CAN MEAN ANYTHING FROM HAULING THEM A FEW THOUSAND YARDS TO A TORTUOUS JOURNEY OVER A LONG, POORLY MAINTAINED RAILROAD THROUGH AN INEFFICIENT PORT. ALSO, WE NEED TO TAKE INTO ACCOUNT THE AMOUNT OF BY-PRODUCTS AND THEIR VARIABLE PRICES WHICH CAN DRASTICALLY AFFECT THE DERIVED CREDITS AGAINST COPPER COSTS. ANOTHER IMPORTANT VARIABLE IS THE COST OF SOCIAL INFRASTRUCTURE, WHICH CAN RANGE ALL THE WAY FROM COMPLETE SERVICES FOR TENS OF THOUSANDS OF EMPLOYEES AND DEPENDENTS IN AN ISOLATED ENVIRONMENT, TO A SIMPLE UNPAVED PARKING LOT FOR EMPLOYEES WHO DRIVE TO WORK AS IS THE CASE AT MANY OF OUR DOMESTIC MINES.

I COULD GO ON BUT THE IMPORTANT POINT IS THAT THE CUMULATIVE EFFECT OF ALL THESE VARIABLES, PARTICULARLY IF MANY OF THEM GO IN ONE DIRECTION, CAN BE VERY SUBSTANTIAL AND CAN, IN FACT, LEAD TO A REVERSAL OF THE HIGH GRADE EQUALS LOW COST RULE. JUST AS ONE EXAMPLE, FEW WOULD QUESTION THE FACT THAT 0.5% COPPER IS VERY LOW GRADE ORE. THAT'S ABOUT THE PERCENTAGE OF COPPER RECOVERED PER TON

MINING CLUB OF THE SOUTHWEST

LAST YEAR AT THE PALABORA OPEN PIT IN SOUTH AFRICA, WHICH PRODUCED 116,000 TONS OF COPPER AT A SUBSTANTIAL OPERATING PROFIT. PALABORA IS ONLY ONE EXAMPLE OF A NUMBER OF VERY LOW GRADE MINES WHICH ARE ALSO LOW COST PRODUCERS.

THE SECOND MAJOR COMMON PITFALL IN DISCUSSING COST STRUCTURES IS A FAILURE TO RECOGNIZE THAT COST IS A DYNAMIC PARAMETER AT ANY MINING OPERATION; IN OTHER WORDS, A COST STRUCTURE IS RARELY SET IN CONCRETE OR RIGIDLY MAINTAINED OVER TIME. COSTS TYPICALLY GO UP AND DOWN AND SIDEWAYS. RECOGNIZING THAT ALL WE CAN DO IS TAKE SNAPSHOTS OF THE SITUATION, IT IS PLAINLY AN ERROR TO TAKE YESTERDAY'S SNAPSHOT AS TODAY'S REALITY. A GOOD ILLUSTRATION OF WHY COSTS MUST BE VIEWED IN THEIR CONTEXT IS AFFORDED BY THE FACT THAT DURING 1980, THE CASH COST OF PRODUCING COPPER IN CONCENTRATE AT OUR MISSION MINE COMPLEX IN ARIZONA, AFTER 61¢/LB. BY-PRODUCT CREDIT, WAS ONLY 22.5¢/LB. OBVIOUSLY WE WERE DEALING WITH A DYNAMIC SITUATION THAT YEAR, WHEREIN BECAUSE OF THE RUN UP IN MOLYBDENUM PRICES TO ASTRONOMICAL HEIGHTS, WE CHANGED OUR MINING PLAN TO CHASE WHATEVER MOLYBDENUM WE COULD FIND IN THE PIT WITHOUT REGARD TO THE GRADE OF COPPER, SO THAT DURING THAT YEAR OUR COPPER PRODUCTION

GRADE WAS ONLY 0.45% COMPARED WITH OUR LIFE OF THE MINE ORE RESERVE GRADE OF 0.61%. CERTAINLY YOU CAN SEE THAT LOOKING AT A SNAPSHOT OF 1980 WOULD BE MORE CONFUSING THAN HELPFUL IN TRYING TO ASSESS TODAY'S COST STRUCTURE AT MISSION.

A DYNAMIC VARIABLE THAT IS OFTEN OVERLOOKED IN COMPARING FOREIGN COPPER MINES WITH U.S. MINES IS THAT FOR GEOLOGICAL REASONS MANY FOREIGN MINES ARE FACED WITH INEVITABLY DECLINING GRADES AND WILL NEED PERIODIC INJECTIONS OF CAPITAL JUST TO STAY AT THE SAME LEVELS OF METAL PRODUCTION. BY CONTRAST, MANY OF THE U.S. MINES ARE ALREADY MATURE AND MINING PRIMARY SULPHIDES: ONE EXAMPLE IS OUR MISSION OPERATION WHERE WE SHOULD BE ABLE TO CONTINUE MINING AT THE AVERAGE ORE RESERVE GRADE OF AROUND 0.6% COPPER FOR THE NEXT THIRTY YEARS.

ANOTHER DYNAMIC VARIABLE WE HAVE SEEN WORKING IN THE INTERNATIONAL COPPER COST STRUCTURE DURING THE PAST SEVERAL YEARS HAS, OF COURSE, BEEN THE ABILITY OF FOREIGN GOVERNMENTS TO DRAMATICALLY CUT COSTS IN THE SHORT TERM BY CURRENCY DEVALUATIONS AGAINST THE U.S. DOLLAR. I RECALL THAT SOMETIME AGO THE HEAD OF THE ZAMBIAN COPPER COMPANY WAS QUOTED IN THE PRESS AS ANNOUNCING WITH SOME SATISFACTION THAT HIS OPERATIONS HAD TURNED AROUND AND WERE NOW IN THE BLACK AS OPPOSED TO THE RED, BECAUSE THE PRICE OF COPPER EXPRESSED IN KWACHAS

HAD GONE UP SO MUCH DURING THE FISCAL YEAR. WHAT HE SHOULD HAVE SAID, OF COURSE, WAS THAT HE HAD BEEN ABLE TO SLASH THE WAGES OF HIS WORKFORCE EXPRESSED IN DOLLARS, AT ONE STROKE BY DEVALUATION. WE HAVE SEEN THE SAME THING HAPPEN IN CHILE, MEXICO AND OTHER LATIN AMERICAN COUNTRIES WHERE OVERNIGHT REDUCTIONS IN DOLLAR EQUIVALENT WAGE STRUCTURES OF 50% AND MORE HAVE OCCURRED BY COURTESY OF GOVERNMENT FIAT. HOWEVER, I THINK IT SHOULD BE CLEAR TO EVERYONE THAT THESE NEW, LOW COSTS ARE IN NO WAY PERMANENT; THE WAGE STRUCTURES WILL SHIFT AND MOVE UPWARD AGAIN AS THE SUBSTANTIAL SOCIAL PRESSURES WORK FROM WITHIN. DEVALUATION IS A NICE NEAT WAY TO CUT U.S DOLLAR COSTS OVERNIGHT AND TO TURN CHRONIC MONEY LOSERS INTO INSTANT MONEY MAKERS BUT THE EFFECT BECOMES LESS EACH TIME IT IS DONE SO THAT THE COST SAVINGS ARE VERY LIKELY TO DIMINISH OR EVAPORATE WITH TIME.

BUT ENOUGH OF GENERALITIES: GIVEN THAT COSTS REFLECT INTERACTING VARIABLES AND THAT COST STRUCTURES CHANGE OVER TIME, WHAT IS THE PRESENT STATE OF PRODUCTION COSTS IN THE PART OF THE U.S. INDUSTRY WHICH REMAINS OPERATING? COSTS ARE A SENSITIVE SUBJECT FOR MANY REASONS, AND I DO NOT HAVE ACCESS TO COMPETITORS' FIGURES WHICH MAKES IT DIFFICULT TO TALK ABOUT AVERAGE COSTS. WHAT I CAN DO THIS MORNING,

HOWEVER, IS TALK ABOUT ASARCO'S OWN COST EXPERIENCE AT OUR ARIZONA COPPER MINES OVER THE PAST SEVERAL YEARS. AS YOU WILL SHORTLY SEE, THE COST REDUCTIONS HAVE BEEN QUITE DRAMATIC. FURTHER, I FEEL OUR U.S. COMPETITORS HAVE BEEN GOING THROUGH THE SAME PROCESSES OF COST REDUCTION, SOME PERHAPS NOT AS SUCCESSFULLY AS WE HAVE, BUT OTHERS PERHAPS WITH MORE SUCCESS.

IN A WAY ASARCO'S TWO OPERATING COPPER MINES ARE REPRESENTATIVES OF SPECIFIC TYPES IN THAT OUR MISSION COMPLEX (COMPOSED OF THE MISSION, EISENHOWER AND SAN XAVIER MINES) IS GENERALLY CLASSED AS A MEMBER OF THE MORE EFFICIENT GROUP OF U.S. MINES. BY COINCIDENCE, THE AVERAGE GRADE OF ITS ORE RESERVES AT 0.61% COPPER IS ALMOST EXACTLY THE AVERAGE GRADE OF SULPHIDE COPPER ORES MINED BY THE ENTIRE ARIZONA INDUSTRY OVER THE PAST TEN YEARS WHICH IS, I THINK, 0.59% COPPER. THE SILVER BELL MINE, BY CONTRAST, IS A RELATIVELY SMALLER OPERATION, WITH METALLURGICALLY COMPLEX ORE MIXED FROM TWO SEPARATE PITS AND WITH A CONSEQUENTLY BUILT-IN HIGHER COST STRUCTURE DESPITE ITS HIGHER RESERVE GRADE OF 0.68% COPPER. SILVER BELL IS IN THE UPPER COST HALF OF THE U.S. INDUSTRY, AND IS ONE OF THOSE MINES WHICH IS JUST HANGING ON A THREAD BETWEEN CONTINUED OPERATIONS AND SHUTDOWN AT THE PRICES WE HAVE SEEN SO FAR IN 1984. USING THESE TWO MINES AS EXAMPLES, I THINK YOU CAN EXTRAPOLATE OUR OWN ASARCO EXPERIENCE TO THE REST OF THE INDUSTRY AND REACH CONCLUSIONS WHICH HAVE SUBSTANTIAL VALIDITY.

REFERRING NOW TO THE HANDOUT SHOWING THE ACTUAL MISSION AND SILVER BELL FIGURES, YOU WILL SEE THAT IN EACH CASE THE COST OF PRODUCING A POUND OF COPPER DURING THE FIRST HALF OF 1984 IS COMPARED TO THE COST FOR THE FULL YEAR OF 1981. I'VE SELECTED 1981 BECAUSE IT WAS THE LAST NORMAL YEAR BEFORE WE BEGAN OUR COST REDUCTION CAMPAIGN IN 1982, AND TO GO FURTHER BACK WOULD RESULT IN DISTORTIONS FROM THE 1980 STRIKE AND FROM ABNORMALLY HIGH SILVER AND MOLYBDENUM BY-PRODUCT PRICES. THE COST LISTED AS MINING, MILLING, ETC., INCLUDES ALL ON-PROPERTY CASH DIRECT AND INDIRECT COSTS, AS WELL AS THE COST OF STATE AND INDIAN ROYALTIES, AND CHARGES FOR DIRECT SERVICES FROM OTHER ASARCO DEPARTMENTS SUCH AS CENTRAL ENGINEERING, ETC. YOU WILL NOTE THAT IN 1981 THE COST OF COPPER IN CONCENTRATE WAS 53.3¢ PER POUND, IN 1984 IT IS 36.6¢. THIS IS A FAIRLY DRAMATIC REDUCTION OF 31% IN THE FACE OF AN ACTUAL INCREASE IN THE GNP DEFLATOR OVER THE SAME PERIOD OF TIME OF ABOUT 15%. BY-PRODUCT CREDITS WERE 9.9¢/LB. OF COPPER IN 1981, AND 5.5¢ IN 1984, REFLECTING LOWER MOLYBDENUM AND SILVER PRICES THIS YEAR. CREDITING THESE BY-PRODUCT VALUES AGAINST THE COST OF COPPER, WE END UP WITH A CASH COST OF 43.3¢/LB. IN 1981 COMPARED WITH 31.1¢ IN 1984, A REDUCTION OF 28% DESPITE INFLATION AND REDUCED BY-PRODUCT CREDITS THIS YEAR.

THE COST TO THE MINE OF FREIGHT, SMELTING, REFINING AND MARKETING HAS ALSO BEEN REDUCED, FROM 42.6¢/LB. OF COPPER IN 1981 TO 32.1¢/LB. IN 1984. THIS 24% REDUCTION REFLECTS THE ECONOMIC FORCES AT WORK IN THE CONCENTRATE SELLING MARKET WHICH HAVE RESULTED IN SUBSTANTIALLY LOWERED CUSTOM SMELTING AND REFINING CHARGES. THE NET RESULT OF ALL THE ABOVE IS THAT THE CASH COST PER POUND OF COPPER AT MISSION IN 1984 TO DATE AMOUNTS TO 63.2¢/LB. AS OPPOSED TO 85.9¢/LB. IN 1981, REPRESENTING A REDUCTION OF ABOUT 26%. I MIGHT ADD IN PASSING THAT DEPRECIATION CHARGES AT THE MISSION COMPLEX AMOUNT TO ONLY ABOUT 2-1/2¢/LB., SO THAT THE BOTTOM LINE FIGURES FOR 1981 AND 1984 AFTER DEPRECIATION (BUT NOT INCLUDING OFF-PROPERTY CORPORATE OVERHEAD) ARE RESPECTIVELY ABOUT 88.4¢/LB. AND 65.7¢/LB.

CAN THESE NEW LOW COSTS BE SUSTAINED INDEFINITELY? THE SHORT ANSWER IS YES, IN SUBSTANTIAL PART. OF COURSE, I'VE DESCRIBED COST STRUCTURES AS DYNAMIC, AND THERE IS NO QUESTION THAT SOME COST WILL CREEP BACK IN NEXT YEAR AND GRADUALLY OVER A PERIOD OF TIME.

TURNING NOW TO THE FIGURES FOR OUR SILVER BELL MINE, YOU'LL RECALL THAT THE MINE WAS SHUT DOWN FOR ALL OF 1982 AND MOST OF 1983. AGAIN THE FIGURES SHOW A DRAMATIC COST REDUCTION DURING THE FIRST HALF OF 1984 AS COMPARED TO 1981, THE LAST FULL PRODUCTION YEAR. ON THE SAME CASH BASIS AS AT MISSION AND AFTER INCLUDING ALL SMELTING AND REFINING CHARGES, THIS AMOUNTS TO A REDUCTION OF 19%, FROM 88.7¢/LB. TO 71.9¢/LB. EVEN WITH THIS REDUCTION, WE ARE, OF COURSE,

ON SHAKY GROUND AT SILVER BELL AT TODAY'S PRICE. HOWEVER, THIS IS NOT A COSTLY MINE TO SHUT DOWN BECAUSE MUCH OF THE STANDBY COST CAN BE COVERED BY REVENUES FROM RECOVERY OF COPPER FROM LOW-COST LEACH DUMPS, I.E., THIS IS THE KIND OF MINE THAT MIGHT BE HIT BY A TEMPORARY SHUTDOWN BUT IS NOT GOING TO DISAPPEAR PERMANENTLY.

HOW HAVE WE ACHIEVED THESE FAIRLY DRAMATIC COST REDUCTIONS? FIRST OF ALL LET ME SAY THEY HAVE NOT BEEN ACHIEVED BY ANY KIND OF COLLISION-COURSE, HIGH GRADING TACTIC. AS I'VE SAID BEFORE OUR CURRENT PRODUCTION GRADE AT MISSION IS WITHIN ONE HUNDREDTH OF ONE PERCENT OF THE LIFE-OF-MINE ORE RESERVE GRADE. SOME OF THE COST REDUCTION DOES REPRESENT DEFERRAL OF STRIPPING MOST OF WHICH, HOWEVER, WILL NOT NEED TO BE PICKED UP FOR MANY YEARS IF EVER. MANY SOURCES OF COST REDUCTION REPRESENT SMALL INCREMENTS ACROSS THE BOARD FAR TOO NUMEROUS TO LIST IN DETAIL IN A PRESENTATION SUCH AS THIS. THESE HAVE BEEN ASSISTED BY A FUNDAMENTAL CHANGE IN THE ATTITUDE OF THE WORKFORCE. THERE IS NOW A WILLINGNESS TO WORK HARDER AND TO AGREE TO CROSS TRAINING, AND COMBINING OF JOBS. SUGGESTIONS AS TO HOW TO DO THINGS MORE ECONOMICALLY HAVE COME FROM ALL QUARTERS. THERE HAS BEEN AN ACCEPTANCE THAT A SUBSTANTIAL NUMBER OF JOBS MUST BE ELIMINATED TO IMPROVE PRODUCTIVITY TO THE POINT WHERE THE REMAINING JOBS WILL SURVIVE.

ON THE ENGINEERING SIDE WE HAVE BEEN MUCH MORE FLEXIBLE IN CONTINUALLY ADAPTING OUR MINE PLANNING TO THE SITUATION. THIS HAS RESULTED IN REACHING ULTIMATE PIT LIMITS IN SEVERAL SPOTS MUCH SOONER THAN ORIGINALLY PLANNED, WHICH HAS PERMITTED CONSIDERABLE IN-PIT DUMPING OF WASTE WITH CONSEQUENT SUBSTANTIAL COST SAVINGS. AT THE EISENHOWER MINE, WHICH IS A JOINT VENTURE WITH ANAMAX, WE HAVE RENEGOTIATED OUR OBLIGATIONS FOR THE NEXT THREE YEARS TO THE BENEFIT OF BOTH PARTIES. FROM THE STANDPOINT OF ASARCO THE RENEGOTIATED AGREEMENT GIVES US MUCH MORE FLEXIBILITY THAN WE HAD BEFORE WITH RESULTANT LOWERED COSTS. BACK IN 1981 WE COMPLETELY MODERNIZED OUR MISSION TRUCK FLEET AT A COST OF \$12.9 MILLION, AND REPLACED ENTIRELY THE FLOTATION SECTION OF THE MILL WITH MODERN OVERSIZED CELLS AT A COST OF \$6.9 MILLION. THE FAVORABLE COST EFFECTS OF THESE AND OTHER CAPITAL INVESTMENTS, MADE AT THE END OF THE LAST COPPER BOOM, HAVE SERVED US EXTREMELY WELL IN THE AREA OF COST REDUCTION DURING THE PERIOD SINCE 1981.

I THINK THAT OUR COST REDUCTION EXPERIENCE AT MISSION HAS BEEN TYPICAL OF THE U.S. COPPER INDUSTRY DURING THE PAST SEVERAL YEARS. SOME PEOPLE SEEM TO CARRY A MISCONCEPTION, PERHAPS BY ANALOGY TO OTHER INDUSTRIES, THAT THE U.S. COPPER INDUSTRY HAS FALLEN BEHIND TECHNOLOGICALLY VIS-A-VIS FOREIGN COMPETITORS. ON THE CONTRARY, SINCE THE END OF WORLD WAR II THE U.S. COPPER INDUSTRY HAS BEEN AT THE CUTTING EDGE OF

NEW TECHNOLOGY AND INNOVATION IN OPEN PIT METAL MINING. THE POST WAR TRANSITION FROM RAIL HAULAGE TO TRUCK HAULAGE, THE CONTINUOUS INCREASE IN THE SIZE AND ECONOMY OF TRUCK AND DRILLING EQUIPMENT AND MANY OTHER INNOVATIONS, INCLUDING IN-PIT CRUSHING, HAVE BEEN PIONEERED IN THE U.S. AND HAVE REPRESENTED AN IDEAL BLENDING OF OPERATING AND MANUFACTURING EXPERTISE IN A FREE ENTERPRISE SYSTEM.

THE OPEN PIT MINES OF LATIN AMERICA, OF CHILE, OF PERU AND OF MEXICO, ARE EFFICIENTLY RUN AND ARE WELL MANAGED, BUT IT HAS BEEN U.S. TECHNOLOGY WHICH HAS GOTTEN THEM WHERE THEY ARE AND THE TRANSFER OF U.S. EXPERTISE TO WELL-TRAINED NATIONALS HAS PERMITTED THOSE OPERATIONS TO CONTINUE AT EFFICIENT LEVELS.

ONE OF THE KEY POINTS IN OUR ITC ESCAPE CLAUSE PETITION HAS BEEN THAT THE CONTINUED LEADERSHIP POSITION OF THE U.S. INDUSTRY AND THE CONTINUED UPGRADING OF OUR COPPER PROPERTIES HAVE BEEN PLACED IN JEOPARDY BY THE CAPITAL STARVATION WHICH HAS OCCURRED DURING THE PAST TWO YEARS OWING TO LOW PRICES AGGRAVATED BY EXPANDED CHILEAN PRODUCTION IN THE FACE OF SLUMPING DEMAND AND THE CONSEQUENT FORCING OF EXCESS FOREIGN COPPER INTO THE U.S. WHICH IS THE ONLY REALLY OPEN MARKET OF LAST RESORT DURING TIMES OF OVERSUPPLY. WE WANT TO CONTINUE UPGRADING OUR MINES: WE WANT TO CONVERT TO STILL LARGER SHOVELS TO MATCH OUR LARGER TRUCKS, WE WANT TO LOOK AT IN-PIT CRUSHING AND POSSIBLE CONVEYOR BELT ORE MOVEMENT, WE WANT TO IMPROVE PARTS OF THE TRUCKING CYCLE BY COMPUTERIZED

AUTOMATIC RADIO CONTROLLED SYSTEMS REPRESENTING THE STATE OF THE ART. HOWEVER, WE DO NEED THE RELIEF SOUGHT IN THE ITC PROCEEDING OR SIMILAR RELIEF THROUGH THE U.S. TRADE REPRESENTATIVE TO GIVE US THE MEANS AND THE TIME REQUIRED.

FINALLY, ON THE GENERAL SUBJECT OF WHERE THE U.S. SHARE OF WORLD PRODUCTION FITS IN THE WORLD COST PICTURE, I HAVE VERY LITTLE SPECIFIC UP-TO-DATE COST DATA TO GO ON BECAUSE THIS DATA IS VERY DIFFICULT TO OBTAIN ON A TRULY FACTUAL AND COMPARATIVE BASIS, AND AS I'VE TOLD YOU THE PICTURE IS CONSTANTLY CHANGING. HOWEVER, BECAUSE SO MANY OTHER PEOPLE HAVE MADE BRAVE COMPARISONS BASED ON NON-EXISTENT OR FAULTY DATA, I FEARLESSLY OFFER UP MY OWN INTUITIVE FEELING ABOUT HOW THE PRESENT WORLD COST STRUCTURE FITS TOGETHER. I'VE SHOWN MY ESTIMATES (AND THAT'S ALL THEY ARE) ON A SHEET WHICH YOU HAVE WITH YOU, TOGETHER WITH A LISTING OF THE SHARE OF THE WORLD MINE PRODUCTION OF COPPER REPRESENTED BY EACH PARTICULAR COUNTRY OR REGION. I MAKE NO PARTICULAR CLAIM FOR THE VALIDITY OF THE FIGURES SHOWN, OTHER THAN THAT THEY ARE PROBABLY AS VALID AS ANY OTHERS YOU MAY BE LIKELY TO RUN ACROSS.

AS YOU CAN SEE FROM THE LISTING, I'M CONVINCED THAT CURRENT U.S. COST OF PRODUCTION OF COPPER LIES CLOSE TO THE MIDDLE OF THE PACK ON A WORLD BASIS, NOT AT THE HIGH COST END OF THE SPECTRUM AS MANY SUPPOSE. AS THE FOOTNOTE INDICATES, IF WE SUBTRACT CHILEAN PRODUCTION, WHICH AMOUNTS TO ABOUT 20% OF WESTERN WORLD SUPPLY, I THINK CURRENT U.S. PRODUCTION COSTS ARE VERY CLOSE TO THE AVERAGE COSTS OF THE REST OF THE WORLD. FURTHER, I THINK THAT THE DYNAMICS MAY BE WORKING IN THE U.S. FAVOR INASMUCH AS THE FOREIGN PRODUCTION CANNOT CONTINUE TO BENEFIT INDEFINITELY BY CONTINUED LABOR COST REDUCTION THROUGH DEVALUATION. GIVEN THAT U.S. PRODUCTION AT 17% OF THE TOTAL IS A LARGE ENOUGH BLOCK TO BE IMPORTANT IN SUPPLYING EVEN STAGNANT WORLD DEMAND, THERE DOES NOT APPEAR TO BE ANY ECONOMIC JUSTIFICATION WHATSOEVER TO TALK ABOUT THE DISAPPEARANCE OR FUNDAMENTAL NONVIABILITY OF THE U.S. INDUSTRY. ON THE CONTRARY, IF THE IRRESPONSIBLE MARKETING STRATEGIES OF THE MAJOR FOREIGN PRODUCERS CAN BE MODIFIED AND THE FINANCIAL ACTIVITIES OF THE INTERNATIONAL LENDING AGENCIES WHICH SUPPORT THESE IRRATIONAL STRATEGIES CAN BE RATIONALIZED TO SOME EXTENT, THEN THE U.S. INDUSTRY WILL HAVE NO TROUBLE SURVIVING AND INDEED REMAINING A STABLE MAJOR SOURCE OF WORLD SUPPLY AS WELL AS AN ESSENTIAL STRATEGIC ASSET OF THE NATION. AND, IF THE STEADILY FALLING STOCKS ON THE TERMINAL EXCHANGES AND OTHER INDICATORS PORTEND AS THEY HAVE IN THE PAST, A COMING UPWARD TREND IN THE COPPER PRICE, ASARCO WILL BE ABLE TO RESTORE ITS RETURN ON INVESTMENT IN COPPER PRODUCTION TO AN ADEQUATE LEVEL.

MINING CLUB OF THE SOUTHWEST

ADDENDUM TO REMARKS
 BY T.C. OSBORNE
JULY 26, 1984

ASARCO MISSION COMPLEX
 COPPER PRODUCTION COST
(¢ CASH PER POUND COPPER)

	<u>1981</u>	<u>First Half 1984</u>	<u>Cost Reduction</u>
Mining, Milling, etc.	53.2¢	36.6¢	31%
By-Product Credit	<u>-9.9</u>	<u>-5.5</u>	-
On-Property Cash Cost	43.3	31.1	28%
Frts., Smelt., Ref., Mktg.	<u>42.6</u>	<u>32.1</u>	<u>25%</u>
Total Net Cash Cost	85.9¢	63.2¢	26%

ASARCO SILVER BELL MINE
 COPPER PRODUCTION COST
(¢ CASH PER POUND COPPER)

	<u>1981</u>	<u>First Half 1984</u>	<u>Cost Reduction</u>
Mining, Milling, etc.	51.3¢	41.6¢	19%
By-Product Credit	<u>-5.5</u>	<u>-1.3</u>	
On-Property Cash Cost	45.8	40.3	12%
Frts., Smelt., Ref., Mktg.	<u>42.9</u>	<u>31.6</u>	<u>26%</u>
Total Net Cash Cost	88.7	71.9	19%

MINING CLUB OF THE SOUTHWEST

ACTUAL 1983 WORLD COPPER MINE PRODUCTION
AND ESTIMATED RELATIVE 1984 PRODUCTION COSTS

<u>Country</u>	<u>Mine Production Short Tons X 1000</u>	<u>% of Western World</u>	<u>1984 Estimated Prod. Cost (¢ Pound)</u>
Chile	1372.5	20.4	50¢
U.S.A.	1152.7	17.1	72
Canada	688.9	10.2	74
Zambia	566.1	8.4	80
Zaire	553.9	8.2	70
N. Guinea/Aust.	493.6	7.3	65
Europe	359.4	5.3	65
Peru	347.0	5.2	58
Philippines	299.2	4.4	75
S. Africa	226.0	3.4	60
Mexico	210.5	3.1	75
Other	<u>470.2</u>	<u>7.0</u>	<u>80</u>
	6740.0	100.0	Av. 68.7

Note: Weighted average cost of 80% of world
Production (excluding Chile) = 71.3¢.

MINING CLUB OF THE SOUTHWEST

REMARKS OF
RICHARD DE J. OSBORNE, PRESIDENT
ASARCO INCORPORATED
QUARTERLY MEETING OF SECURITIES ANALYSTS
NOVEMBER 1, 1984

A GREAT DEAL HAS HAPPENED TO THE COPPER MARKET SINCE WE LAST REVIEWED IT WITH YOU AT OUR ANNUAL MEETING IN APRIL OF THIS YEAR. WE THOUGHT AN UPDATE AT THIS TIME MIGHT BE INFORMATIVE.

1984 MAY BE A RECORD YEAR FOR COPPER CONSUMPTION. INVENTORIES ON THE COMMODITY EXCHANGES IN NEW YORK AND LONDON HAVE DECLINED BY NEARLY 50% SINCE THEIR PEAK IN JANUARY. PRICES DURING THE LAST SIX WEEKS HAVE BEEN LOWER THAN AT ANY TIME DURING THE MOST RECENT ECONOMIC RECESSION, AND EXCEPT FOR SLIGHTLY LOWER PRICES IN REAL TERMS IN 1932, AT THE LOWEST LEVEL IN THIS CENTURY. THESE ARE NOT NORMAL ECONOMICS AS WE HAVE KNOWN THEM IN THE COPPER BUSINESS IN THE PAST.

I WOULD LIKE TO EXAMINE EACH OF THESE FACTORS BRIEFLY, AND THEN DRAW SOME CONCLUSIONS ON THE CAUSES AND THE OUTLOOK.

FIRST AS TO PRICES. INCLUDED IN YOUR FOLDERS IS A PACKET OF CHARTS. EXHIBIT 1 SHOWS THE WEEKLY AVERAGE U.S. PRODUCER

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RICHARD DE J. OSBORNE

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PRICE AND THE COMEX AND LME WEEKLY AVERAGE PRICES FOR 1984. IT IS OBVIOUS FROM THE DATA THAT, EXCEPT FOR A BRIEF PERIOD OF RECOVERY IN THE EARLY SPRING FOLLOWING THE FILING BY THE U.S. COPPER INDUSTRY OF ITS TRADE CASE, PRICES HAVE TRENDED DOWN ALL YEAR LONG, ROUGHLY IN LINE WITH THE INCREASE IN THE VALUE OF THE DOLLAR. SINCE PRICES COLLAPSED FOLLOWING AMBASSADOR BROCK'S ANNOUNCEMENT ON SEPTEMBER 6, IT IS ALSO APPARENT THAT THE MARKET HAD ANTICIPATED SOME POSITIVE ACTION FROM THE U.S. GOVERNMENT ON THE INDUSTRY'S TRADE CASE. AS YOU MAY RECALL, AT THE TIME THE DECISION WAS ANNOUNCED, THE GOVERNMENT CONFIDENTLY STATED THAT, "THE STRENGTH OF THE ECONOMIC RECOVERY HAS HELPED TO REDUCE COPPER INVENTORIES DURING 1984. A CONTINUED DECLINE IN INVENTORIES SHOULD RESULT IN HIGHER PRICES."

THE DECLINE IN PRICE OF APPROXIMATELY 5 CENTS SINCE SEPTEMBER 6 WILL COST THE FREE WORLD COPPER INDUSTRY ABOUT \$660 MILLION ON AN ANNUAL BASIS IF THESE LOWER PRICES PERSIST. THE U.S. INDUSTRY'S SHARE OF THAT AMOUNT IS \$105 MILLION; CHILE'S \$135 MILLION; PERU'S \$40 MILLION; ZAMBIA'S \$50 MILLION; AND ZAIRE'S \$50 MILLION. IN CALCULATING THOSE NUMBERS, WE HAVE USED ONLY THE DIFFERENCE IN PRICE BEFORE AND AFTER THE ANNOUNCEMENT OF THE ADMINISTRATION'S DECISION. WHEN COMPARED TO THE 75¢-PER-POUND PRICE WHICH HAS BEEN USED COMMONLY BY THE INTERNATIONAL MONETARY FUND IN THEIR COUNTRY ADJUSTMENT PROGRAMS WITH THE

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MAJOR COPPER PRODUCING COUNTRIES, THE ANNUAL RATE OF SHORTFALL WHICH THOSE PRICES HAVE GENERATED AMOUNT TO \$520 MILLION FOR CHILE, \$160 MILLION FOR PERU, \$190 MILLION FOR ZAMBIA, AND \$200 MILLION FOR ZAIRE. OUR GOVERNMENT'S MISREADING OF MARKET REACTION HAS BEEN EXPENSIVE FOR COUNTRIES WHICH ARE DEEPLY IN DEBT AND NEED THE FOREIGN EXCHANGE TO FEED THEIR PEOPLE. AS AN INDUSTRY, WE WILL CONTINUE TO SEEK WAYS IN WHICH OUR GOVERNMENT CAN PLAY A CONSTRUCTIVE ROLE IN RESOLVING THIS PROBLEM.

IN EXHIBIT 2 WE HAVE ARRAYED THE ANNUAL AVERAGE PRICES FOR COPPER SINCE 1900 AND HAVE SHOWN THOSE NUMBERS ESCALATED TO 1984 DOLLARS USING THE GNP DEFLATOR. IT IS INTERESTING TO NOTE THAT THE AVERAGE PRICE OF COPPER SINCE THE TURN OF THE CENTURY HAS BEEN \$1.17 PER POUND. DURING NO DECADE DID IT AVERAGE BELOW 72 1/2¢ PER POUND IN CURRENT DOLLARS. THE AVERAGE PRICE DURING THE DECADE OF THE 70s, WHICH WE HAVE GENERALLY THOUGHT OF AS A DIFFICULT PERIOD FOR THE INDUSTRY, WAS \$1.21 PER POUND. BEYOND THE MERE RECITATION OF THESE INTERESTING FACTS, THIS TABLE SERVES TO SHOW JUST HOW LOW THE CURRENT PRICE OF COPPER REALLY IS IN HISTORIC TERMS.

EXHIBIT 3 SHOWS THE INVENTORY LEVELS FOR THE NEW YORK COMMODITY EXCHANGE, LONDON METAL EXCHANGE AND FREE WORLD REFINERS QUARTERLY FOR THE LAST TEN YEARS, AND EXHIBIT 4 SHOWS THAT DATA MONTHLY FOR 1984 THROUGH LAST WEEK. SINCE THE PEAK IN MID-JANUARY AT 894 THOUSAND SHORT TONS, THE MOST VISIBLE OF THE INVENTORIES,

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THOSE ON THE COMEX AND LME, HAVE DECLINED BY 46% TO 481 THOUSAND TONS LAST WEEK. THE LAST DATA AVAILABLE FOR REFINERS SHOW THERE WAS A SMALL OFFSETTING GROWTH IN REFINERS' INVENTORIES THROUGH AUGUST. NONETHELESS, OVERALL INVENTORIES DECLINED SUBSTANTIALLY. BY HISTORIC STANDARDS THE LEVEL OF TOTAL INVENTORIES IS STILL LARGE, BUT THE RATE OF DECLINE ENCOURAGES US TO BELIEVE THAT THE APPROPRIATE ECONOMIC ADJUSTMENTS ARE AT LAST TAKING PLACE.

PART OF THAT ADJUSTMENT PROCESS RELATES TO AN INCREASE IN CONSUMPTION. EXHIBIT 5 SHOWS THE HISTORY OF FREE WORLD CONSUMPTION OF COPPER SINCE 1960 AND INCLUDES A PROJECTION OF TOTAL CONSUMPTION THIS YEAR. AS YOU CAN SEE, DEPENDING UPON THE RATE OF GROWTH DURING THE LAST SIX MONTHS, THIS COULD BE A RECORD YEAR FOR FREE WORLD CONSUMPTION OF COPPER. THIS FACT IS NOTEWORTHY BECAUSE IT BELIES PREDICTIONS OF A NUMBER OF COMMENTATORS WHO CONTINUE TO FORECAST THE DEMISE OF THE COPPER BUSINESS. IF, DESPITE SUBSTITUTION OF COMPETING MATERIALS, DOWNSIZING OF AUTOMOBILES, AND SHIFTS IN INVESTMENTS AND EMPLOYMENT FROM MANUFACTURING TO SERVICE INDUSTRIES, THE CONSUMPTION PEAKS OF EACH CYCLE ARE NOT DECLINING AND IN FACT MAY BE GROWING, WE WILL CONTINUE TO HAVE THE GROWTH WHICH WILL HELP TO ABSORB THE EXCESS PRODUCTION CAPACITY WHICH NOW EXISTS.

THE OTHER LEG OF THE ECONOMIC ADJUSTMENT PROCESS IS, OF COURSE, SUPPLY. EXHIBIT 6 PRESENTS A CATALOGING OF PRODUCTION CAPACITY WHICH IS NOW SHUT DOWN OR CURTAILED IN THE UNITED STATES

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AND CANADA. A NUMBER OF THESE PROPERTIES WILL NOT REOPEN UNDER ANY PREDICTABLE SET OF ECONOMIC ASSUMPTIONS. WITHOUT COMMENTING ABOUT OTHER PEOPLE'S PROPERTIES, IT IS FAIR TO SAY IN ASARCO'S CASE THAT THE DECISION TO PROCEED WITH THE DEVELOPMENT OF THE UNDERGROUND SACATON RESERVE IS QUITE REMOTE, AND IT IS LIKELY THAT SILVER BELL WILL BE RUN ONLY DURING THAT PART OF THE CYCLE WHEN PRICES JUSTIFY ITS OPERATION. I SHOULD ADD THAT NO SUBSTANTIAL NEW MINES ARE BEING DEVELOPED IN THE FREE WORLD, AND RESERVES OF OLD MINES ARE DECLINING. SO WITH CONSUMPTION GROWING AT PERHAPS 1% TO 2% PER YEAR ON A SECULAR BASIS AND PRODUCTION CAPACITY DECLINING, THE PROCESS OF REBALANCING SUPPLY AND DEMAND APPEARS TO BE OCCURRING.

AS CAN BE SEEN FROM CHART 7, WHICH SHOWS COPPER CONTENT OF MINE PRODUCTION BY COUNTRY, THE LARGEST PRODUCER IN THE WORLD IS NOW CHILE. CODELCO, THE GOVERNMENT-OWNED COMPANY WHICH MANAGES THE MAJOR COPPER MINES IN THAT COUNTRY, HAS STATED IN THE PAST, A POLICY OF CAPACITY EXPANSION WHICH IGNORED FUNDAMENTAL MARKET PRINCIPLES OF SUPPLY AND DEMAND. THIS POLICY STATEMENT WAS REPEATED A NUMBER OF TIMES LAST SPRING AND SUMMER DURING THE PUBLIC DEBATE CONCERNING THE U.S. COPPER INDUSTRY'S TRADE PETITION. LAST WEEK, IN AN ARTICLE PUBLISHED IN AMERICAN METAL MARKET, SENOR TORRES, PRESIDENT AND CHIEF EXECUTIVE OFFICER, AND SENOR PINO, EXECUTIVE VICE PRESIDENT FOR SALES, OF CODELCO SEEMED TO INDICATE A RETHINKING OF THAT POLICY. A COPY OF THAT ARTICLE

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IS INCLUDED WITH THE OTHER EXHIBITS IN YOUR FOLDER. IN THAT ARTICLE CODELCO EXECUTIVES WERE QUOTED AS SAYING THAT THE LONG TERM COMPANY PLANS TO INCREASE COPPER PRODUCTION TO 1.3 MILLION TONS PER YEAR WILL DEPEND ON A SIGNIFICANT IMPROVEMENT IN THE COPPER MARKET, AND UNTIL THAT IMPROVEMENT IS SEEN, THE COMPANY INTENDS TO MAINTAIN THE CURRENT PRODUCTION LEVEL OF AROUND 1 MILLION TONS PER YEAR. THE CODELCO EXECUTIVES THEN GO ON TO DISCUSS THEIR COMMERCIAL POLICIES IN TERMS THAT REFLECT A MUCH MORE MARKET-ORIENTED OUTLOOK THAN DID THEIR PREVIOUS POLICY. IF INDEED THESE STATEMENTS DO REFLECT A CHANGE IN POLICY BY CHILE, THEY MARK AN IMPORTANT TURNING POINT FOR OUR INDUSTRY. THIS IS THE KIND OF DEVELOPMENT WE HAVE URGED OUR GOVERNMENT TO SUPPORT.

IN TRYING TO DRAW SOME CONCLUSIONS ABOUT THE FUTURE FROM THE SOMEWHAT CONFLICTING INFORMATION BEFORE US, I THINK WE HAVE TO CONCLUDE THAT THE ECONOMICS OF THE BUSINESS ARE SO BAD RIGHT NOW THAT THEY ARE FORCING A WIDESPREAD REASSESSMENT THROUGHOUT THE INDUSTRY OF PAST STRATEGIES AND POLICIES. BASED ON FUNDAMENTALS AND HISTORIC PRECEDENT, WE SHOULD NOW BE SEVERAL QUARTERS INTO A STRONG PRICE RECOVERY. THERE ARE SEVERAL FACTORS WHICH SEEM TO BE INTERFERING WITH THAT PROCESS. EXTRINSICALLY, THE AVAILABILITY OF UNPRECEDENTEDLY HIGH REAL RETURNS ON MONETARY INVESTMENTS AND THE STRONG DOLLAR HAVE HAD AN IMPORTANT EFFECT ON THE COPPER

MINING CLUB OF THE SOUTHWEST

RICHARD DE J. OSBORNE

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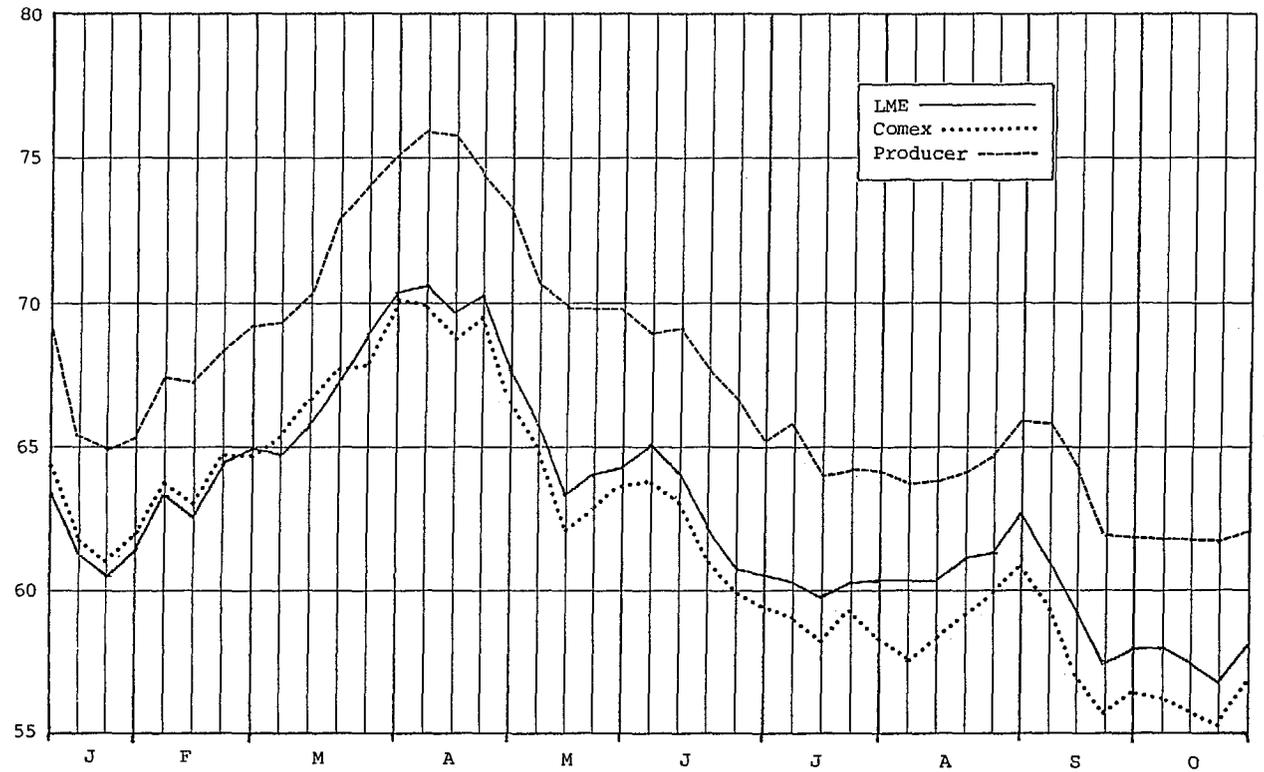
NOVEMBER 1, 1984

MARKET. INVESTORS AND SPECULATORS HAVE BEEN ATTRACTED TO INTEREST-BEARING INVESTMENTS AND HAVE NOT PARTICIPATED IN AN IMPORTANT WAY IN ANY OF THE COMMODITY MARKETS.

INTERNALLY, THE STILL WIDELY HELD VIEW THAT COPPER IS GOING OUT OF STYLE AND THAT AVAILABLE DEMAND WILL BE MORE THAN ADEQUATELY SUPPLIED BY THE UNBRIDLED PRODUCTION POLICIES OF GOVERNMENT-OWNED PRODUCERS IN THE DEVELOPING WORLD HAS BEEN AN IMPORTANT PSYCHOLOGICAL BARRIER. HOWEVER, WE BELIEVE, AS I HAVE STATED, THAT COPPER CONSUMPTION WILL CONTINUE TO GROW ON A SECULAR BASIS AT AN ANNUAL RATE OF BETWEEN 1% AND 2%, AND THE CHILEANS SEEM TO BE REEXAMINING THEIR PRODUCTION POLICIES. AND BASED ON THE RAPIDLY DETERIORATING ECONOMICS FOR ALL PRODUCERS, GOVERNMENT AND PRIVATE, IT IS POSSIBLE THAT THE U.S. GOVERNMENT COULD PLAY A CONSTRUCTIVE ROLE IN FOSTERING THESE CHANGES BY CHILE AND OTHER FOREIGN GOVERNMENT PRODUCERS. WE WILL URGE IT TO DO SO.

WEEKLY AVERAGE COPPER PRICES: 1984 Year-to-Date

(U. S. ¢ Per Pound)



MINING CLUB OF THE SOUTHWEST

Exhibit 1-2

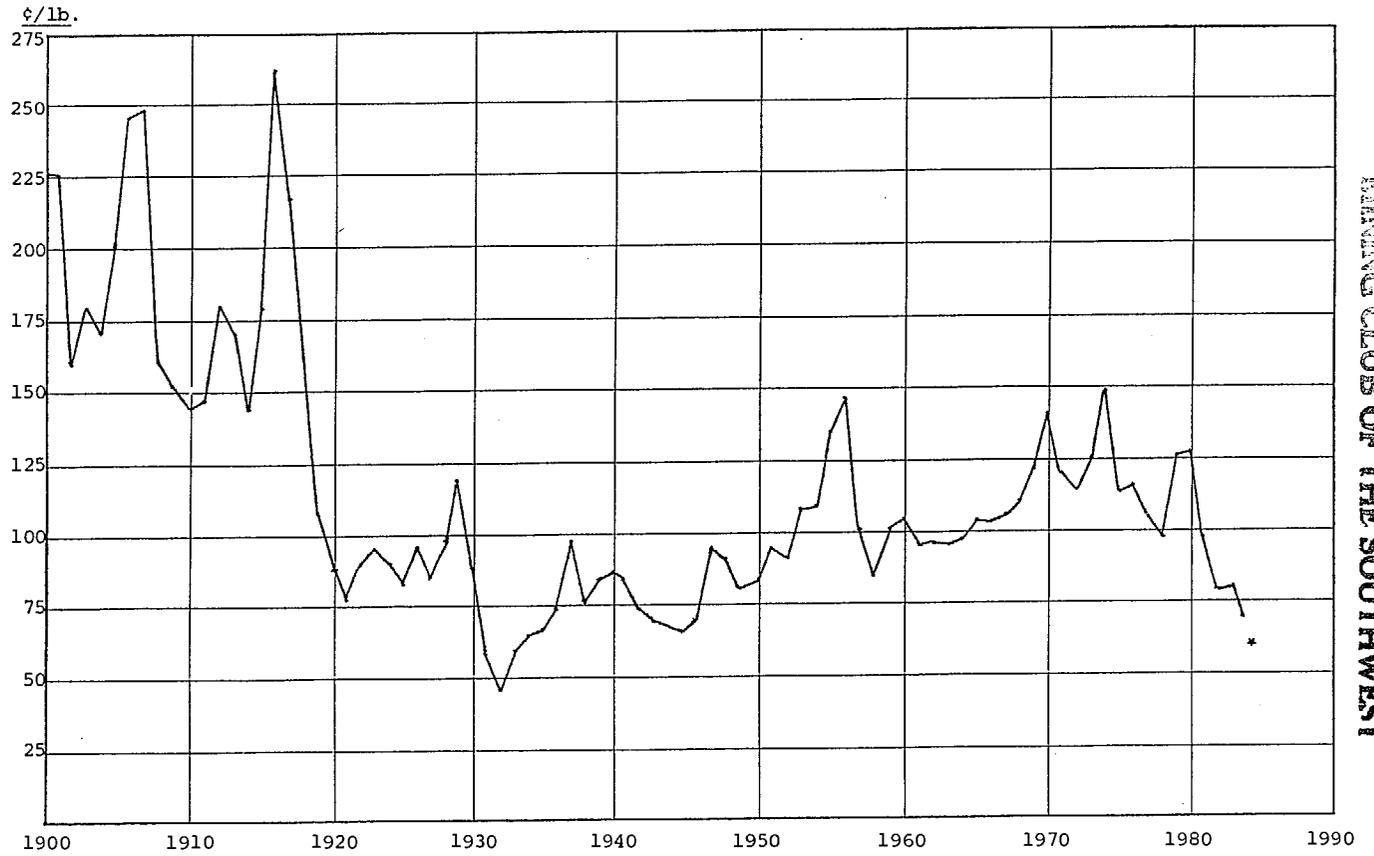
AVERAGE COPPER PRICES BY WEEK: 1984 YEAR TO DATE
 (All figures in U. S. ¢ per pound)

<u>Week Ending</u>	<u>London Metal Exchange</u>	<u>New York Commodity Exchange</u>	<u>Producer Price</u>
January 6, 1984	63.40¢	64.65¢	68.89¢
13	61.37	61.73	65.44
20	60.50	61.08	64.94
27	61.37	61.85	65.39
February 3	63.35	63.76	67.44
10	62.54	63.02	67.34
17	64.40	64.59	68.40
24	64.98	64.63	69.25
March 2	64.76	65.39	69.34
9	65.78	66.68	70.20
16	67.28	67.70	72.93
23	68.95	67.91	74.00
30	70.36	70.20	75.01
April 6	70.62	69.94	75.98
13	69.75	68.83	75.56
20	70.27	69.53	74.37
27	67.72	66.56	73.24
May 4	65.79	64.92	71.59
11	63.41	62.13	69.82
18	64.04	62.96	68.88
25	64.44	63.67	68.82
June 1	65.09	63.74	68.96
8	64.15	63.02	69.17
15	62.27	61.03	67.76
22	60.73	59.98	66.66
29	60.55	59.52	65.19
July 6	60.30	59.18	65.73
13	59.78	58.27	63.99
20	61.24	59.24	64.22
27	61.39	58.41	64.18
August 3	60.30	57.50	63.77
10	60.31	58.21	63.84
17	61.14	59.23	64.05
24	61.40	59.94	64.72
31	62.60	60.97	65.99
September 7	61.06	59.36	65.92
14	59.32	57.11	64.31
21	57.52	55.74	61.97
28	58.09	56.47	61.93
October 5	58.00	56.36	61.89
12	57.50	55.74	61.84
19	56.86	55.21	61.74
26	58.17	56.88	62.07

Source: Metals Week

HISTORIC COPPER PRICES 1900 TO DATE

Price Adjusted to Second Quarter 1984 by GNP Deflator



*Asarco Price 10/17-18

MINING CLUB OF THE SOUTHWEST

Exhibit 2-2

HISTORIC ANNUAL AVERAGE COPPER PRICES: 1900 - 1984

(Including Inflation Adjustment)

(All prices in U.S. ¢ per pound)

Year	Producer Copper Price Current \$	GNP Implicit Price Deflator 1972 = 100	Price Adjusted to 2Q 1984 by GNP Deflator
1900	16.54	16.3	225.53
1	16.40	16.2	225.48
2	11.96	16.7	159.15
3	13.62	16.9	179.08
4	13.11	17.1	170.35
5	15.98	17.5	202.87
6	19.77	17.9	245.34
7	20.86	18.7	248.63
8	13.39	18.5	160.75
9	<u>13.11</u>	<u>19.2</u>	<u>151.89</u>
Decade Avg.	<u>15.5</u>	<u>17.5</u>	<u>196.9</u>
1910	12.88	19.7	145.16
1	12.55	19.5	142.90
2	16.48	20.3	180.22
3	15.52	20.2	170.85
4	13.31	20.6	143.65
5	17.47	21.5	180.33
6	28.46	24.2	261.95*
7	29.19	30.0	216.38
8	24.68	33.7	162.58
9	<u>18.90</u>	<u>38.5</u>	<u>109.10</u>
Decade Avg.	<u>18.9</u>	<u>24.5</u>	<u>171.3</u>
1920	17.50	43.9	88.66
1	12.65	36.6	76.91
2	13.56	33.6	89.68
3	14.61	33.4	94.37
4	13.93	34.3	90.15
5	13.05	34.8	83.32
6	14.68	34.3	95.19
7	13.05	33.5	86.48
8	14.68	34.1	95.75
9	<u>18.23</u>	<u>33.9</u>	<u>119.38</u>
Decade Avg.	<u>14.6</u>	<u>35.3</u>	<u>92.0</u>
1930	13.11	33.1	88.11
1	8.24	30.1	60.94
2	5.67	27.0	46.73**
3	7.15	26.4	60.28
4	8.53	28.3	66.98
5	8.76	28.6	68.14
6	9.58	28.6	74.34
7	13.27	29.9	98.81
8	10.10	29.5	76.23
9	<u>11.07</u>	<u>29.0</u>	<u>84.91</u>
Decade Avg.	<u>9.6</u>	<u>29.4</u>	<u>72.5</u>

*Highest price in century.

**Lowest price in century.

MINING CLUB OF THE SOUTHWEST

Exhibit 2-3

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Year	Producer Copper Price Current \$	GNP Implicit Price Deflator 1972 = 100	Price Adjusted to 2Q 1984 by GNP Deflator
1940	11.40	29.5	86.04
1	11.87	31.7	83.33
2	11.87	35.6	74.21
3	11.87	38.1	69.24
4	11.87	39.0	67.58
5	11.87	40.1	65.88
6	13.92	44.7	69.15
7	21.15	50.0	93.94
8	22.20	53.4	92.41
9	<u>19.36</u>	<u>53.1</u>	<u>81.10</u>
Decade Avg.	<u>14.7</u>	<u>41.7</u>	<u>78.3</u>
1950	21.46	53.8	88.66
1	24.37	57.4	94.33
2	24.37	58.7	92.28
3	28.92	59.2	108.52
4	29.82	60.1	110.28
5	37.39	61.0	136.29
6	41.88	63.1	147.62
7	29.99	65.4	101.92
8	26.13	67.1	86.58
9	<u>30.82</u>	<u>68.2</u>	<u>100.51</u>
Decade Avg.	<u>29.5</u>	<u>61.5</u>	<u>106.7</u>
1960	32.16	68.7	104.06
1	30.14	70.2	95.48
2	30.82	71.0	96.52
3	30.82	71.9	95.26
4	32.17	73.0	97.97
5	35.19	74.4	105.14
6	36.00	76.4	104.73
7	38.10	78.9	107.35
8	41.17	82.1	111.54
9	<u>47.43</u>	<u>86.0</u>	<u>122.59</u>
Decade Avg.	<u>35.4</u>	<u>75.6</u>	<u>104.1</u>
1970	58.07	91.5	141.08
1	52.09	96.0	120.62
2	51.44	100.0	114.35
3	59.53	105.7	125.20
4	77.06	114.9	149.09
5	64.53	125.6	114.21
6	69.62	132.1	117.16
7	66.72	139.8	106.09
8	66.53	150.1	98.53
9	<u>92.75</u>	<u>162.8</u>	<u>126.65</u>
Decade Avg.	<u>65.84</u>	<u>120.7</u>	<u>121.3</u>

MINING CLUB OF THE SOUTHWEST

- 3 -

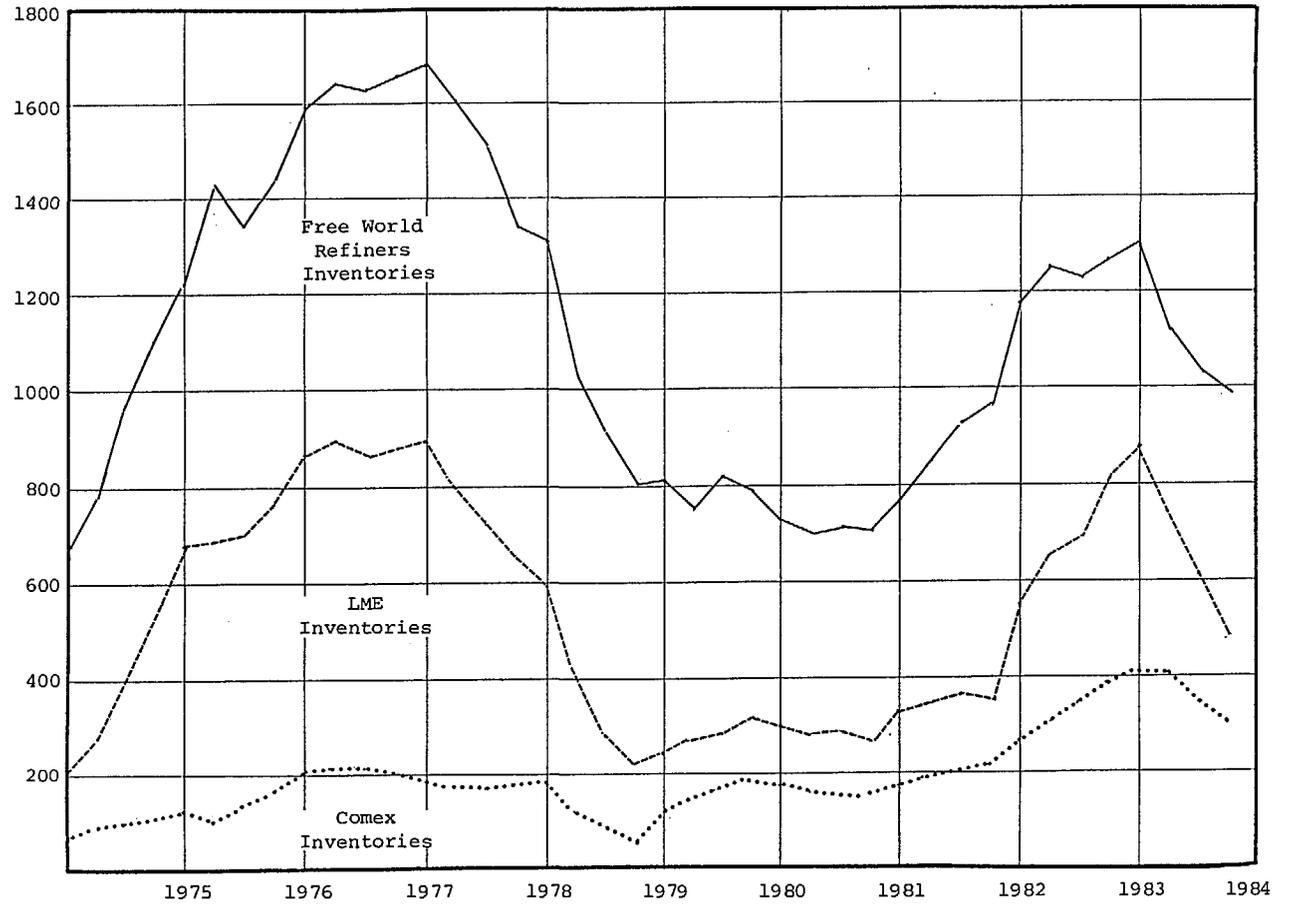
<u>Year</u>	<u>Producer Copper Price Current \$</u>	<u>GNP Implicit Price Deflator 1972 = 100</u>	<u>Price Adjusted to 2Q 1984 by GNP Deflator</u>
1980	102.19	178.4	127.34
1	85.59	195.6	97.27
2	74.56	207.4	79.92
3	78.33	215.3	80.88
1Q 1984	69.1	220.6	69.6
2Q 1984	70.5	222.3	70.5
Decade to Date Average	<u>83.5</u>	<u>198.7</u>	<u>93.4</u>
Asarco Price 10/17-18/1984	--	--	60.0¢
Average 1900 - 1983	--	--	117.0¢

Note: The official records caution against reliance on pre-1930 statistics for Gross National Product for reasons including structural change of index components and accuracy of records.

Source: American Bureau of Metal Statistics and American Metal Markets Yearbook

COPPER INVENTORIES 1974 - 1984

(000 Short Tons)



MINING CLUB OF THE SOUTHWEST

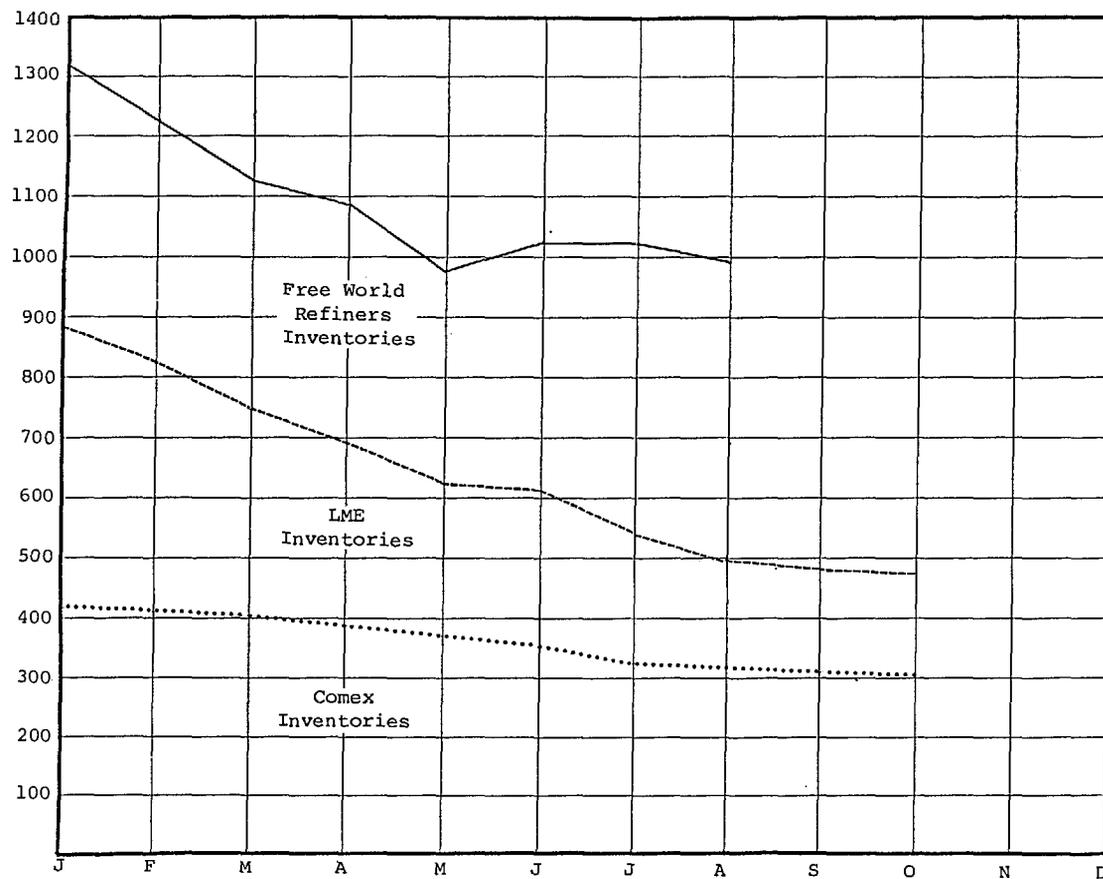
Refined Copper Inventories 1975 - 1984

(000 Short Tons)

		<u>Comex</u>	<u>LME</u>	<u>Free World Refiners</u>	<u>Total</u>
1975	First Quarter	74.2	200.8	519.7	794.7
	Second Quarter	78.8	334.6	550.2	963.6
	Third Quarter	87.6	486.3	535.2	1109.1
	Fourth Quarter	110.6	565.6	550.1	1226.3
1976	First Quarter	95.9	587.4	750.7	1434.0
	Second Quarter	113.0	591.8	652.6	1357.4
	Third Quarter	164.0	617.2	676.6	1457.8
	Fourth Quarter	201.0	665.2	724.3	1590.5
1977	First Quarter	213.2	675.8	749.3	1638.3
	Second Quarter	211.0	660.7	757.8	1629.5
	Third Quarter	200.3	680.0	776.4	1656.7
	Fourth Quarter	184.4	706.8	780.9	1672.1
1978	First Quarter	179.3	634.1	795.8	1609.2
	Second Quarter	177.8	554.7	783.4	1515.9
	Third Quarter	180.8	467.4	717.9	1366.1
	Fourth Quarter	179.6	411.9	718.0	1309.5
1979	First Quarter	136.6	280.5	610.1	1027.2
	Second Quarter	71.3	213.7	618.2	903.2
	Third Quarter	57.0	168.7	577.1	802.8
	Fourth Quarter	107.9	139.4	558.5	805.8
1980	First Quarter	145.7	130.0	497.2	772.9
	Second Quarter	167.3	121.3	538.3	826.9
	Third Quarter	185.4	140.8	462.5	788.7
	Fourth Quarter	179.6	134.7	414.9	729.2
1981	First Quarter	173.3	129.0	397.5	699.8
	Second Quarter	170.6	131.5	408.6	710.7
	Third Quarter	171.6	124.4	412.9	708.9
	Fourth Quarter	187.6	139.6	443.9	771.1
1982	First Quarter	195.7	141.8	509.3	846.8
	Second Quarter	202.2	159.1	566.1	927.4
	Third Quarter	207.1	150.6	601.2	958.9
	Fourth Quarter	274.4	279.1	630.9	1184.4
1983	First Quarter	306.1	340.1	621.8	1268.0
	Second Quarter	347.4	332.8	540.7	1220.9
	Third Quarter	389.3	426.4	460.6	1276.3
	Fourth Quarter	409.2	479.9	418.7	1307.8
1984	First Quarter	403.2	352.7	380.4	1136.3
	Second Quarter	361.6	250.4	426.1	1038.1
	Third Quarter	310.8	175.9	N/A	N/A

1984 COPPER INVENTORIES

(000 Short Tons)



MINING CLUB OF THE SOUTHWEST

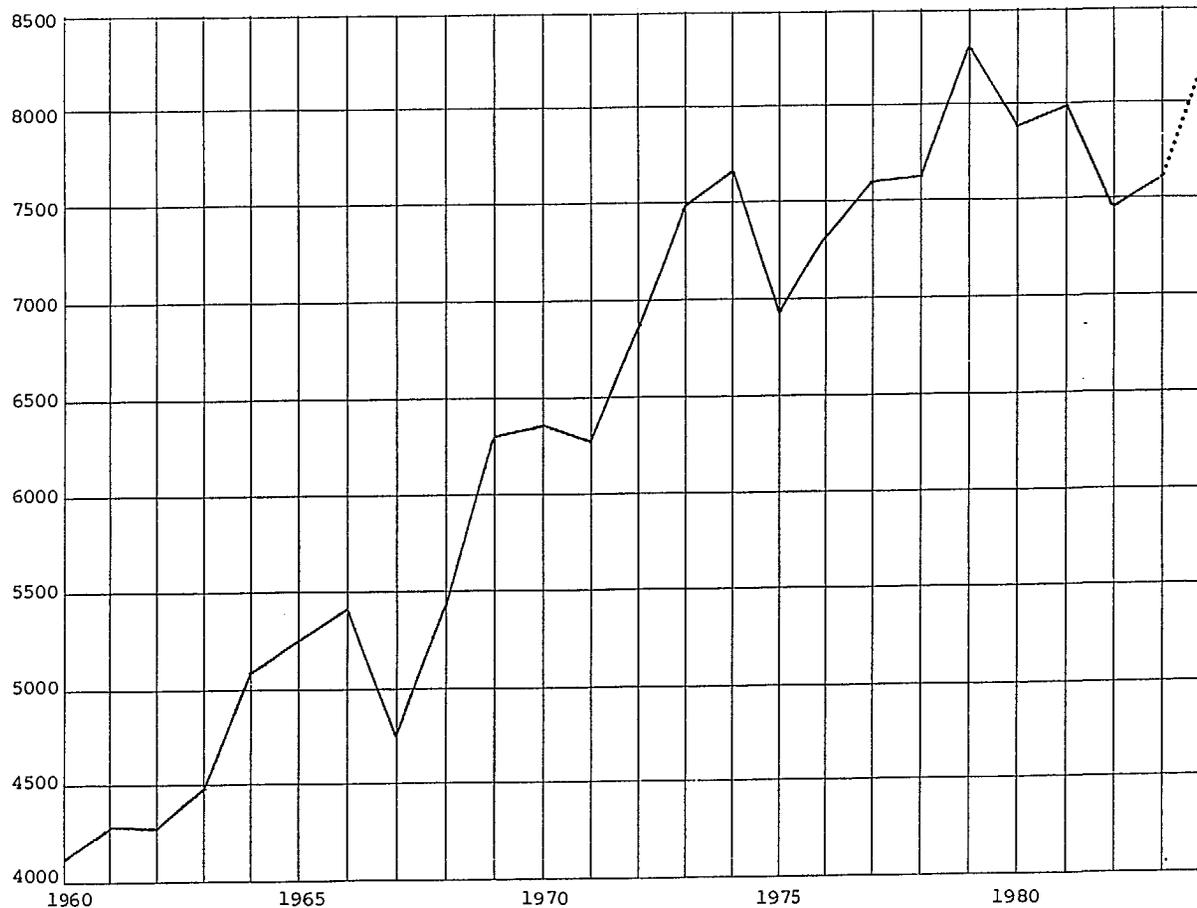
Refined Copper Inventories 1984

(000 Short Tons)

<u>Month</u>	<u>Comex</u>	<u>LME</u>	<u>Free World Refiners</u>	<u>Total</u>
January	417.7	468.9	428.7	1315.3
February	409.9	416.6	403.1	1229.6
March	403.2	352.7	380.4	1136.3
April	392.3	300.8	403.7	1096.8
May	372.5	255.5	354.7	982.7
June	361.6	250.4	426.1	1038.1
July	335.6	211.7	476.2	1023.5
August	320.6	178.6	491.6	990.8
September	310.8	175.9	N/A	N/A
October	301.3	179.7	N/A	N/A

FREE WORLD CONSUMPTION OF COPPER 1960 - 1984

(000 Short Tons)



MINING CLUB OF THE SOUTHWEST

MINING CLUB OF THE SOUTHWESTFREE WORLD CONSUMPTION OF COPPER: 1960 - 1984
(Thousands of Short Tons)

<u>YEAR</u>	<u>TONS</u>
1960	4,114.0
61	4,296.6
62	4,277.8
63	4,477.4
64	5,077.6
1965	5,245.7
66	5,605.3
67	4,759.7
68	5,403.3
69	6,303.2
1970	6,365.0
71	6,273.1
72	6,837.1
73	7,484.8
74	7,655.3
1975	6,922.0
76	7,315.6
77	7,592.1
78	7,605.5
79	8,306.9
1980	7,878.2
81	7,993.8
82	7,462.8
83	7,592.5
84 (Estimate)	8,300.0

Source: American Bureau of Metal Statistics Inc. (1960-1983)
Asarco Estimate (1984 Total)

MINING CLUB OF THE SOUTHWEST

Exhibit 6-1

NORTH AMERICAN COPPER MINE CAPACITY CURTAILMENTS

(Short Tons Per Year Recoverable Copper)
(As of October, 1984)

A. United States Mine Curtailments

<u>Operation</u>	<u>Idled Capacity</u>	<u>Comments</u>
<u>Asarco</u>		
Sacaton	20,000	Closed permanently
Silver Bell	17,000	Closed except leaching
<u>Amoco Minerals</u>		
Cyprus Pima	45,000	Closed
Cyprus Johnson	6,000	Curtailed
Cyprus Bagdad	75,000	Closed
<u>Anaconda</u>		
Berkeley	60,000	Closed
Butte (Underground)	5,000	Closed
Carr Fork	55,000	Closed
Butte	70,000	
<u>Anamax</u>		
Twin Buttes	100,000	Sulfide Closed - still running solv. ext.
<u>Copper Range</u>		
White Pine	54,000	Closed
<u>Duval</u>		
Esperanza	20,000	Closed
Mineral Park	15,000	Closed
<u>Hecla</u>		
Victoria	5,000	Closed
<u>Inspiration</u>		
Christmas	8,000	Closed
<u>Kennecott</u>		
Bingham Canyon	120,000	Curtailed
Ray - Electrowon and Cement	40,000	Curtailed
<u>Magma</u>		
San Manuel	20,000	Curtailed
Superior	45,000	Closed

MINING CLUB OF THE SOUTHWESTNORTH AMERICAN
COPPER MINE CAPACITY CURTAILMENTS(Short Tons Per Year Recoverable Copper)
(As of October, 1984)A. United States Mine Curtailments - Continued

<u>Operation</u>	<u>Idled Capacity</u>	<u>Comments</u>
<u>Noranda</u> Lakeshore	12,000	Curtailed
<u>Phelps Dodge</u> Tyrone	26,000	Curtailed
<u>Newmont</u> Copper Cities	2,000	Curtailed
<u>Quintana</u> Copper Flat	20,000	Closed
<u>Sharon Steel</u> Continental	<u>20,000</u>	Closed
Total - U. S. Mines	860,000	

MINING CLUB OF THE SOUTHWEST

Exhibit 6-3

NORTH AMERICAN COPPER MINE CAPACITY CURTAILMENTS

(Short Tons Per Year Recoverable Copper)
(As of October, 1984)

B. Canadian Mine Curtailments

<u>Operation</u>	<u>Idled Capacity</u>	<u>Comments</u>
<u>Consolidated Rambler</u> Ming	6,000	Closed
<u>Brenda Mining Ltd.</u> Brenda Mine	13,000	Closed
<u>Dekalb</u> Highland Valley	6,000	Closed
<u>Esso Minerals</u> Granduc	10,000	Closed
<u>Heath Steele</u> Little River	8,000	Reopens at 25% in '85
<u>Hudson Bay</u> Osborne Lake	6,000	Closed
<u>Falconbridge Copper</u> Perry	5,000	Closed
<u>Noranda</u> Bell	23,000	Closed - Stripping resumed
Gaspe	45,000	Closed
Goldstream	17,000	Closed
Granisle	16,000	Closed
<u>Sherritt</u> Ruttan	3,000	Curtailed
Fox	4,000	Curtailed
<u>Northgate</u> Copper Rand/Portage	5,000	Curtailed
<u>Union Miniere</u> Thierry	12,000	Closed
Total - Canadian Mines	179,000	
Total - North American	1,039,000	

MINING CLUB OF THE SOUTHWEST

FREE WORLD MINE PRODUCTION: 1979-1983 AND 1984 ESTIMATED
 (Thousands of Short Tons of Copper Contained in
 Ores and Concentrates)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984 Estimated</u>
<u>Free World Countries</u>						
Chile	1,171.4	1,177.2	1,191.7	1,367.6	1,372.5	1,365.0
United States	1,591.2	1,301.9	1,695.5	1,256.1	1,152.7	1,050.0
Canada	701.5	789.7	762.1	675.1	688.9	700.0
Zambia	648.5	656.8	647.5	583.8	566.1	495.0
Zaire	440.7	506.7	556.4	554.2	553.9	525.0
Peru	437.8	404.2	361.1	392.8	347.0	420.0
Other Major Producers	1,121.1	1,192.8	1,256.7	1,271.7	1,229.3	1,220.0
Europe	308.9	312.5	324.8	336.4	359.4	360.0
Others	<u>344.4</u>	<u>320.5</u>	<u>358.6</u>	<u>446.4</u>	<u>470.2</u>	<u>480.0</u>
TOTAL	<u>6,765.5</u>	<u>6,662.3</u>	<u>7,154.4</u>	<u>6,884.1</u>	<u>6,740.0</u>	<u>6,615.0</u>

Source: American Bureau of Metal Statistics Inc. (1979 - 1983)
 Asarco Estimate (1984)

Remarks of
Charles F. Barber
Chairman of the Finance Committee
Asarco Incorporated

MINING CLUB OF THE SOUTHWEST

American Mining Congress
Financial Conference
Phoenix, Arizona
April 6, 1984

Role of the IMF in Financing Surplus Commodity Production

It is my good fortune to present my remarks after you have heard Dr. Kuczynski* discuss the magnitude and some of the implications of the debt problems facing the developing world and especially Latin America. I have no doubt that maintenance of the integrity of the international financial system and the avoidance of the collapse of any of the major participants is the top priority of the International Monetary Fund, and a top priority of the Multilateral Development Banks, the major money center banks and the United States Treasury Department. The focus is on the larger debtors - Mexico, Brazil and Argentina. But Chile, Peru, Zambia and Zaire -- all important copper producers -- are also involved as major debtors. My experience and my instinct tells me that this priority of the international financial institutions is warranted, even though it has serious implications for the metals industries and, particularly, the copper industry.

In characteristically perceptive remarks not long ago, the then President of the Institution of Mining and Metallurgy** noted:

*Pedro Pablo Kuczynski, Co-Chairman, First Boston International, former Minister of Energy and Mines, Peru.

**Michael West, Publisher, Mining Journal (London) in Bulletin of the Institution of Mining and Metallurgy, No. 920 (July 1983)

"The disparities between the industrialized world and the developing countries are sometimes enormous and, in a sense, the minerals industry is in the middle. This is the very stuff of war and peace." Dramatic -- yes -- but there is an underlying reality. It lay at the root of Dr. Kuczynski's remarks, and particularly his response to the question as to the possible social impacts of the debt crises. Until the conditions for growth are restored, the people of the affected debtor nations face significant reductions in real income, severe in some cases. Reflection on this reality will help us understand some of the developments that have put the mining industry "in the middle," a hostage to other priorities.

This is a meeting of mining men and women who understand finance and of financial people who understand mining. In order to take advantage of the experience of this audience, I am going to use my time to present some of the issues in the hope of nourishing the seeds of understanding and of informed response.

The Copper Industry

I will focus on copper, but what I have to say has its analogue with other industrial metals found in the developing countries.

We all know the ingredients of the problem.

It is elementary in business that one produces to meet the needs of one's customers -- not the other way around.

Twenty years ago, three-fourths of the free world's copper production was controlled by eight companies - two British, one Belgian, and five based in the United States. They were led by

experienced men committed to the industry. When demand fell during cyclical lows, sales and then production were curtailed. The response was usually led by the largest and lowest cost producers.

Today a new rhythm has taken hold of the copper industry. As a result of the nationalizations of the late 60's and early 70's, over 40% of the world's production has passed into the hands of governments. The new managements respond to social and political, rather than economic criteria.

The public sector mining companies have not to date made a significant response to the economic imperative of reduced demand. They did not do so in the 1975 - 77 recession and they did not do so in the 1981 - 83 recession. They continued to operate at maximum available capacity, responding to social priorities and the need for foreign exchange. The result has been disastrously low prices in the marketplace, the sacrifice of economic rents attributable to their non-renewable resources and a resulting transfer of wealth to the industrialized countries where most copper is consumed.

The irony of this record is that this lack of response has been made possible, to a considerable extent, by support mechanisms that the industrialized countries have put in place in an effort to aid and assist the developing countries.

I have been asked to discuss "The role of the IMF in financing surplus commodity production." Many of the numbers to which I will refer are set forth in the attached table. See Annex A.

MINING CLUB OF THE SOUTHWEST

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The International Monetary Fund (IMF)

Over the last two years while the North American mines were shutting down or curtailing production to protect their balance sheets or conserve reserves, the IMF was lending over U. S. \$1.2 billion under its Compensatory Financing Facility to six LDC copper producers.*

These six countries accounted for 50 percent of the free world production of copper in 1982 and again in 1983. The entitlement of the six countries to financing from the IMF's Compensatory Financing Facility, under its rules, was enhanced by the low price of copper. As one would expect, the largest LDC producer of copper -- Chile -- drew the largest amount, \$310 million or about 26 percent of the \$1.2 billion total. The balance was drawn by Zambia, Zaire, Peru, Papua New Guinea and the Philippines.

This is a substantial amount of money in relation to the size of the copper industry, equivalent, at the average LME price in 1982, to 13 percent of the free world's supply of copper in that year. The significance of this amount will be apparent when one notes that the net accumulation of stocks in 1983 was only about 140,000 tons, equal to about 2 percent of world refined production.

*Loans by the IMF are denominated in SDR's, as shown in Annex A. At the recent rate of 1 SDR = U. S. \$1.05, the total is equivalent to U. S. \$1.197 billion, viz: Chile \$310 million; Zambia \$200 million; Zaire \$232 million; Peru \$210 million; Papua-New Guinea \$47 million; Philippines \$198 million.

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That \$1.2 billion relieved these six countries of the incentive to review production and marketing policy in the face of disastrously low prices. As governments, they did not in their copper operations face the harsh management discipline of the prospect of running out of cash. This is the discipline that forces even the most procrastinating of us in the private sector to confront the reality of the marketplace. All of the government-owned companies continued to produce at full available capacity. In the absence of adequate industrial consumption, stocks accumulated on the terminal exchanges and prices fell to levels necessary to attract investors and speculators to the market.

There is always a price quoted on the terminal exchanges at which someone will exchange currency for copper. In this sense, copper can always be "sold". The physical copper carry is financed on the contango. But the price at which such transactions take place in a depressed market has nothing to do with the economic value of the metal.

There has also been a psychological factor which has had the effect of depressing market expectations. I refer to the strident voice of Chile's Codelco, the free world's largest copper producer.

Codelco controls large reserves, is a low cost producer, and has announced plans to increase production by 35 percent to more than 1.4 million tons by 1988. Two of its mines, Chuquicamata and El Teniente, are among the lowest cost mines in the world. In 1982, in the face of reduced demand, Codelco increased production 139,000 m.t., or 15 percent, over 1981 to a total above the peak production it had ever achieved in prior years.

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Production last year and this year will be of the same order. Codelco and Chilean government spokesmen have consistently explained this expansion of production as in line with Chile's objective of increasing its market share. The prevailing low prices and prolonged weak markets, they explain, provide an opportunity to force higher cost mines elsewhere to shut down.*

The question I ask is this: Should this sort of predatory commercial behavior be financed by the IMF? In this instance, it is fair to suggest that it was. It is not enough for Chile's Codelco to insist that its operations continued profitable. If the largest and strongest producers ignore market realities in times of reduced demand, they ensure a prolongation of market imbalance and continuing loss of revenues for themselves and all other producers. If the financing available from the IMF to the host government relieves such producers from the necessity of dealing with market realities, the result is a destabilizing and not a stabilizing influence on the markets.

Under its general credit tranche facilities, the IMF has regarded an increase in exports as part of the solution. Under its Compensatory

*This concept is echoed by the Secretary-General of CIPEC. "It is not the fact that a substantial proportion of the copper industry in the CIPEC member countries is state-owned that prompts them not to cut back production. Their reason for not doing so is that there are still a number of mines outside CIPEC where costs are higher on account of less attractive natural factors, or of political considerations in some instances, and it is felt that these should take the lead." E. Llosa, Secretary-General, CIPEC, in Quarterly Review, April - June 1983, 2d page. Of course, there are high-cost mines in CIPEC countries just as there are low-cost mines elsewhere.

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Financing Facility, the IMF has made financing available to cover shortfalls in export earnings from primary commodities in accordance with arithmetical formulae set forth in its regulations. In neither program has it considered the possible consequence that in this interdependent world, the maintenance or increase in exports of a commodity may, under conditions of prolonged reduced demand, result in a still further decline in export revenues and thus be counterproductive.

I have to this point referred only to the \$1.2 billion made available under the Compensatory Financing Facility. But that is only a little over one-third of the amounts made available to these six countries by the IMF. I have brought all these figures together in Annex A.

As of the end of last year, these six copper producing countries had borrowed about \$3.5 billion from the IMF. Each loan is made for three to five years at the then current IMF interest rate which has for most of the last two years varied between 7.5% and 8.5%. This funding has released these countries and their copper producers of the necessity of confronting the harsh market consequences of excess production and very low prices for a principal export product.

I believe that the IMF's policies have in fact been counterproductive as to copper and that they have had a significant role in prolonging the disastrous conditions in the world copper market.

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Under its charter, the IMF is directed, among other purposes:

"To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objectives of economic policy." Article I(ii), Emphasis added.

The IMF's mandate would seem to require it to consider the effects of its prescriptions for one member on all other members. Clearly its charter authorizes it to do so.

What is the IMF's point of view? Of course, the IMF officials want to accomplish their mission in the most constructive manner possible.

The IMF was established to deal with temporary shortages of foreign exchange. As a matter of policy, the IMF has looked only to macro statistics; it has avoided getting into micro aspects, that is, the economics of specific industries. It views its role as concerned only with short to medium term foreign exchange shortages. It is concerned, for example, with national budgets, subsidies, deficits as a percentage of GDP, and the balance of payments.

If a country's exports are not competitive, the IMF's prescription is to devalue. Where copper or any other world commodity is the principal export, providing say 50% or more of export revenues, this may not make sense. But since the bulk of an LDC's production of copper is sold in international markets, devaluation does have the effect of reducing costs or enhancing revenues stated in local currency terms. To that extent, devaluation reduces the losses stated in Kwachas for ZCCM, the Zambian

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state copper company, or enhances the profit in pesos of Codelco, the Chilean state company. But every other user of the local currency is then subsidizing the local copper industry -- and the effects on inflation can be destructive.

What of the Compensatory Financing Facility (CFF)?

The IMF considers the CFF as a facility to provide a member breathing space and financing to permit the member to deal with its export revenue shortfall. The correct policy for the short term may be to curtail production of the commodity in surplus supply or, in the longer term, to diversify the economy. But this is not what happens. The copper producing countries have used the funding to maintain copper production. The doctrinal IMF response is that commodity problems and development strategy are not within IMF purview, but belong rather to the World Bank and the MDB's.

One can argue that the CFF has already put the IMF into the business of commodity economics. But here again, the IMF position is that it is concerned only with providing temporary financing to restore liquidity and it is not the IMF's function to involve itself in the economics of any industrial sector.

This is the IMF "position." In fact, we were told, the IMF is concerned with the issue. The problem could not be avoided when the last Zambian loan was made by the CFF (90% of Zambia's export revenues are attributable to copper and its by-products) and again last December when the second Zairian CFF loan was approved. The pragmatic response of the IMF, we are told, is to bring the issue to the attention of the World Bank and the other Multilateral Development Banks (MDB's).

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The Commercial Banks

The commercial banks have contributed substantially to the flow of funds to the LDC copper producers.

On February 15, 1984, less than two months ago, we read in the Wall Street Journal that "Chile is asking its creditor banks to lend it as much as \$1 billion this year . . . to help the country offset weak world prices for its principal export, copper."

Bear in mind that many of us believe that Chile's decision to increase production and sales in a time of reduced demand is a principal cause of the low price of copper.

The following week, we read in the same paper:

"Chile to get \$780 million in new loans from its creditor banks."

At the time, we read in the Financial Times (London):

"The amount of the new loan is at the lower end of the expected range, partly because Chile now hopes to receive a loan from the IMF's Compensatory Financing Facility to offset its lower earnings from copper exports."

Did the banks press the issue of Chile's copper production and marketing policy?

I would suggest that to do so would have helped assure the creditworthiness not only of the borrower, but also of all other copper producer creditors, both public and private. A number of us here today are in that category.

I was told that the issue was mentioned at the meeting of the creditor banks with the delegation from Chile, but that there was no disposition by

the banks to defer action on the loan application in order to provide an opportunity to discuss the issue with the borrower.

That is the reality. The commercial banks look to the deemed profitability of the immediate transaction. In the present context, they consider also the importance to the lenders of Chile's having access to cash to pay this year's interest on its large outstanding debt. In my experience -- with rare exceptions on the part of individual banks -- the commercial banks do not concern themselves with issues other than the risk and the price of the loan. In the case of loans to or guaranteed by a sovereign government, the banks seem to have relied more on sovereign risk, than the economic merits of the activities or projects to be financed by the credit. That is why it appears we must look primarily to the multilateral financial institutions for leadership in helping the LDC copper producers to advance along the learning curve of prudent industrial and commercial behavior.

The Longer Term Issues

I turn now to the longer term issues relating to the financing of new capacity for the major metals. The issues are different today than they have been during the banking experience of most credit officers now active. That is because the prospect during the rest of this century is for a relatively low rate of growth in consumption.

I can illustrate by reference to copper. From 1950 to 1975, consumption of copper in the free world grew on average over four percent per year compounded. For the decade just prior to 1974, the growth rate averaged just under five percent per year. Then came the oil shock, worldwide conservation measures to reduce energy use, downsizing of automobiles

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and the electronics revolution. The Bureau of Mines and the industry reduced their estimates of future growth. Still, a Bureau of Mines study published in the late 70's anticipated three percent growth of consumption to the end of the century, as did most of us in the industry. We anticipated above average growth in the developing world, focusing particularly on Latin America and Southeastern Asia. Then in August 1982 came the financial collapse in Mexico and the full force of the LDC debt crisis described by Dr. Kuczynski emerged with stunning force.

The Bureau of Mines has since reduced its estimate of free world growth of consumption of copper to 1 - 1-1/2 percent per year. A recent study by The Rio Tinto Zinc Corporation projected annual average growth of consumption during the rest of the 1980's at somewhere between 1-1/2 and 2 percent. RTZ also examined existing and soon to be available capacity and found it sufficient for six to ten years average additional requirements. One can argue with the details of the projections, but not the message. The free world debt crisis has led to a dramatic reassessment of growth expectations. The message is that it is time for restraint in committing finance to still additional capacity, at least until we have a basis for a more confident view of future growth of consumption of copper.

Mining in the developing world is an export-oriented industry. For a generation development officers in the multilateral development banks and credit officers in the commercial banks have looked on development of mineral deposits which met the current engineering criteria for profitable operating mines as an attractive lending opportunity. If the engineering

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assumptions proved out but the additional capacity was premature, worldwide growth in consumption within a few years accommodated the new capacity and financial expectations were realized.

Given current flat growth expectations, the industry faces an entirely new situation. Prudent timing of decisions to finance new capacity has become more critical to the longer term health of the free world industry. Where the new capacity is to be managed by government entities, the adverse consequences of premature additional capacity will be the greater. The proclivity of such producers, if recent experience is any guide, will be to maintain output at capacity during periods of reduced demand.

With this perspective, I will comment on two recent loans to public sector copper producers.

In late November, 1983, the Inter-American Development Bank approved a \$268 million loan to Codelco, an instrumentality of the Chilean Government and the world's largest producer of copper. It related to projects at El Teniente and Chuquicamata, two of the lowest cost mines in the world. Three of the four components of the program related to projects designed to maintain capacity. Such projects must be undertaken periodically to maintain production at aging mines or to modernize processing capacity. A serious question of timing could be raised with respect to the fourth item, a new dump leaching project at Chuquicamata. It will yield significant additional production of copper - 53,000 tpy. It is expected to earn a satisfactory rate of return. These projects meet the usual engineering criteria.

But there are some serious issues.

Why should a country owning two of the premier copper mines in the world have access to subsidized finance? Terms are 15 years with five years grace at the established IADB rate, currently 12-1/4 percent. Comparable terms are not available to private sector producers.

Why should a government-owned producer have access to concessional finance for deferable long-term capital projects when its owner cannot handle its existing debt commitments? Those of us in the private sector would have to curtail capital commitments and defer major new projects until our finances were in order.

Why should concessional finance be made available for investment in the copper industry of a country which aggressively increases production during a period of severe recession, thus contributing to oversupply and loss of economic rents for all the world's producers? One would hope that the officials of the IADB discussed this question of production management with the Chilean authorities when Codelco's loan application was submitted. Should the financing not be conditioned upon the presentation by Codelco of a responsible business plan?

In this instance, when the loan was presented to the IADB Board for approval, the United States Government director voted "no" and the Canadian director abstained. This suggests, I hope, that these issues are now receiving some overdue attention.

Two weeks ago the World Bank approved a \$75 million credit for Zambia Consolidated Copper Mines, (ZCCM), Zambia's state-owned mining company. This is part of a \$300 million financing to support the rehabilitation

of Zambia's copper industry. The African Development Bank and the Minerals System Facility of the European Economic Community are contributing another \$70 million. The World Bank release adds, curiously, that ZCCM will contribute about \$152 million. Presumably these funds will be borrowed directly by Zambia and made available to ZCCM. I say this because ZCCM in recent years has been starved of cash by its Government owner, maintenance has been neglected and its mining properties have seriously deteriorated.

Zambia is the world's third largest producer of copper. Revenues from copper in 1983 provided 83% of export revenues; if byproducts of copper mining are added, the total exceeds 90%. See Annex A. Historically, Europe has looked to Zambia for a significant proportion of its copper requirements. The reasons for the loan are obvious, but one must address a number of questions.

Did the World Bank establish conditions to assure effective management for ZCCM. Recent history would suggest that this would be required if the funds are to achieve the intended results. There is evidence that the issue of production policy during periods of reduced demand was addressed. I will quote from the World Bank release:

"The World Bank this week approved a loan of \$75 million to support a rehabilitation project designed to raise the efficiency of Zambia's copper industry. The project will help establish capacity and production levels which can be justified from an economic, financial, and market point of view." (Emphasis added)

The reference to "market point of view" suggests that the World Bank officials believe that ZCCM will have greater flexibility to

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adjust production to demand in order to protect its economic rents during periods of reduced demand. The American Metal Market headline writer put it bluntly: "O.K. \$75 Million Loan to Trim Zambia Copper Output."* The story quotes a World Bank official as stating that the goal "is to reduce ZCCM's copper production." One has to be skeptical, but it is appropriate that the market issue was addressed.

Those of us in the private sector portion of the copper industry confront a new environment. Those of us who are survivors may have to learn to live with public sector producers who do not respond to the economic imperatives of reduced demand. Our challenge may be to survive, until free world growth in demand for copper once again brings about a better balance between supply and demand.

In the meantime, restraint by the international financial institutions in financing producers who do not respond to market realities could be a moderating influence on the supply of copper to the market, both in the short and longer term. The IMF and the multilateral financial institutions in both their lending and consultative roles, can assist the LDC's to advance along the learning curve in dealing with cyclical markets to the end of moderating the loss of economic rents which occurs when market realities are ignored. The financial institutions should not be part of the problem; then can be part of the solution.

*American Metal Market, March 28, 1984

INTERNATIONAL MONETARY FUND

Drawings of Copper Producing Countries Under
Compensatory Financing Facility, 1982-84
(millions of SDRs)

	Quota (1)	Maximum (2) Available Under CFF	Drawings Under CFF (3)			Total borrowed 12/31/83	Balance Available Under CFF	Total use of Fund credit 12/31/83	Prod. of Copper (4) (000 M.T.)		CU % of Export Rev.(6) 1982
			Year Ended April 30 1982	1983	1984				1982	1983(E)	
CHILE	440.5	365.6		295	295	70.6	579	1241	1210	45.3	
ZAMBIA	270.3	224.3	59.3	34	97.2	190.5	33.85	635.7	530	520	82.9
ZAIRE	291	241.5	106.9		114.5	221.4	20.1	487.2	503	495	40.5
PERU	331	274.5		199.9	199.9	74.6	666.3	356	320	14.0	
PHILIPPINES	440	365.2		188.5	258 (5)	107.2	899	375	365	6.2	
PNG	65.9	54.7	45		45	9.7	45	170	185	53	

(1) As of 4/1/84. Quotas were increased December 1983, except for Peru. Peru consented to the increase in February 1984.

(2) 83% of quota. In effect, the SDR's available under the CFF program were capped when quotas were increased in December 1983.

(3) Source: IMF Annual Reports.

(4) World Bureau of Metal Statistics.

(5) Total includes borrowings under CFF in fiscal years prior to year ending 4/30/82.

(6) Source: International Financial Statistics.

April 2, 1984. (CFB)

WOLZ

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TUCSON ARIZONA

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January 4, 1990

Mr. J.D. Sell
Manager-SW USA Division
1150 N. 7th Ave.
P.O. Box 5747
Tucson, AZ 85703

ASARCO Incorporated

JAN 10 1990

SW Exploration

Dear Mr. Sell:

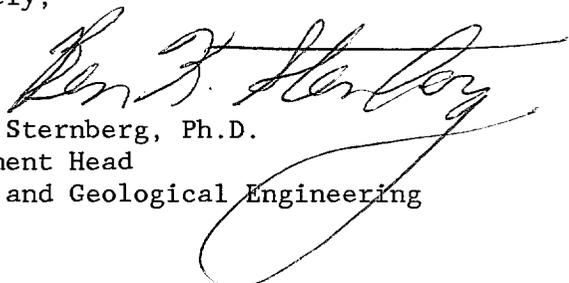
Enclosed are three copies of our new brochure describing the University of Arizona, Department of Mining and Geological Engineering. We are placing considerable emphasis in our department on recruiting students to our programs. We will not have a single B.S. Degree, mining graduate this year and probably just two (2) geological B.S. graduates. We could probably place 50-to-100 students in high-paying jobs this year if we had the graduates. Clearly, we need to get the word out to high school students, as well as potential university transfer students, that earth engineering is an exciting field with lots of rewards.

Even if you are not presently hiring Mining or Geological Engineers, I am sure you can appreciate the need for a continuing supply of these engineers. Several employees of mining and geological engineering companies have already offered to take brochures to their local high schools and talk to students about the opportunities in Mining and Geological Engineering. If you would like more brochures, I would be happy to send as many as you wish.

I wrote to you some time ago about displays of high-tech mining and geological engineering projects to use as an additional recruiting tool. There are several superb displays presently under construction which we hope to have installed in the Mines Building in the next couple of months. There is still room for more displays in the hallway. If you have an idea for a display, I would love to receive a proposal from you.

If you are in the Tucson, area, I hope you can stop in and see all the developments in our department. Thank you for your support.

Sincerely,



Ben K. Sternberg, Ph.D.
Department Head
Mining and Geological Engineering

BKS/ggr
Enclosures: 3 MGE Brochures



EARTH *Engineering*

The University of Arizona

Tucson

The Catalina Mountains

The Rincon Mountains

The Tucson Mountains

Earth Engineering students at the University of Arizona benefit from the close proximity of major mining operations south of the campus, where field trips and student projects are conducted.

The university's San Xavier Experimental Mine is an important center of research activity and class work.

The Catalina, Rincon and Santa Rita Mountains are major recreational areas where students enjoy hiking, skiing, and picnicking among the green pine forests.



A student analyzes subsurface data on one of the many computers available to students in the Department of Mining and Geological Engineering.



Students use state-of-the-art equipment such as this geophysics receiver during field camps. This group was working at Twin Buttes Mine, south of Tucson.

A Landsat satellite image of southeastern Arizona.

MINING ENGINEERING GEOLOGICAL ENGINEERING

Undergraduate Studies in Mineral Resources, Geotechnology, and the Environment. Department of Mining and Geological Engineering.

THE UNIVERSITY OF
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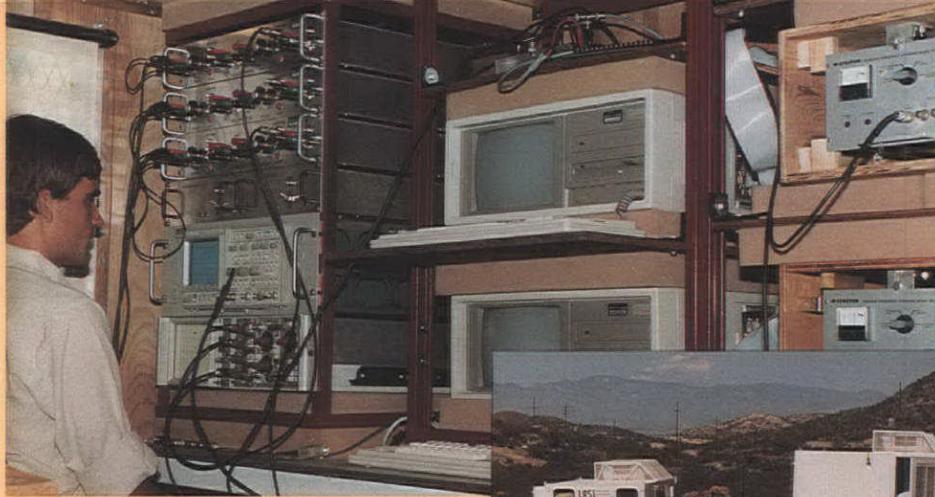
Latch onto the challenge of Earth Engineering fields

If you want to work on challenging projects in exotic places, earn a substantial salary and benefit society while doing so, Earth Engineering is for you.

At The University of Arizona Department of Mining and Geological Engineering, we are among the world leaders in preparing students for rewarding and high paying careers in Earth Engineering. Undergraduate students in our department work with the latest advances in high technology, from complex computer hardware to sophisticated satellite images.

At the same time, they have opportunities to be actively involved in cutting edge research. And they learn the latest techniques for protecting the environment today and for healing the damage caused by development in the past.

Earth Engineering is an expanding and rapidly changing discipline in which our department currently offers undergraduate degrees in two important Earth Engineering areas: Mining Engineering and Geological Engineering.



The Laboratory for Advanced Subsurface imaging includes a mobile lab for data analysis at field sites. Undergraduate students use this equipment during field classes.



Mining Engineering goes high-tech

Mining Engineering students get hands-on experience in both the new high-tech and traditional aspects of the profession. The computer image in the background was constructed by students in a mine planning and design class.

Students in Earth Engineering take many of the same courses, but mining engineers ultimately are concerned with extracting and processing minerals on Earth and beyond. Programs now underway at the university are concerned with mining and processing minerals on the moon and other planets in our solar system.

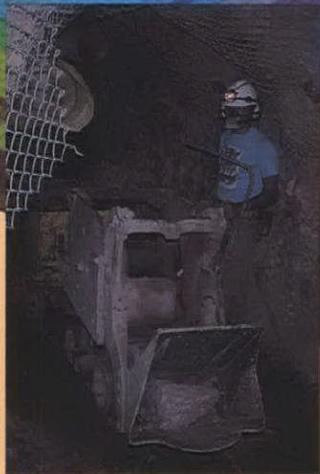
Such work is part of the revolutionary change now taking place in Mining Engineering. Mining now includes robotics, sophisticated tunneling machines and computer software development as part of the effort to make resource extraction both profitable and environmentally responsible.

Mining engineers evaluate plans for new mines, use computer simulation to test various designs before excavation begins and employ sophisticated mine scheduling software to control activities once operations are underway.

The revolution in mining technology extends from Arizona's open pit operations to under-sea mineral exploration to NASA programs that focus on subsurface exploration and mineral development on extraterrestrial bodies.

One of the most exciting new techniques being worked on by researchers in our department is called solution mining.

Minerals are dissolved into solution and pumped out of the ground.



At the San Xavier Experimental Mine (upper left) students study underground mining techniques (lower left), and learn how to safely handle explosives (above).

Earth engineers build a safer world

Whether our students graduate as mining engineers or geological engineers they often solve the same kinds of problems — those of Earth Engineering.

Floods, landslides that destroy buildings, earthquakes that level cities or toxic wastes that seep into residential water supplies are all serious problems that Earth engineers deal with daily. They look for ways to build structures and store materials that will be safe under the most adverse geologic conditions. They help save lives and minimize damage to property by finding the best locations for power plants, hazardous waste dumps and earthquake-resistant structures.

Earth engineering students get a high-quality education

As an undergraduate student at The University of Arizona, you will receive a solid grounding in the fundamentals of engineering and applied science at one of the top 20 research institutions in the country. That means first-class facilities and top-flight instructors, who are active in major developments in the geological sciences.

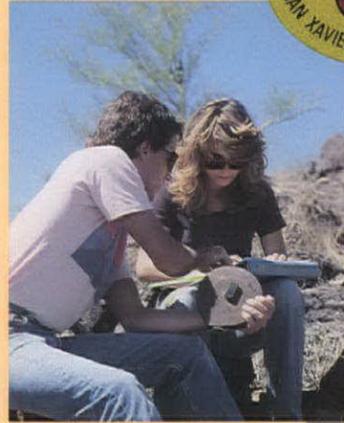
Mathematics, engineering science and engineering mechanics, as well as physics and chemistry, are part of the core program. In addition, you will learn about underground environments, materials science, geomechanics and minerals processing.

The department's San Xavier Experimental Mine, a 40-acre desert facility near campus, is the center of much research activity and class work. At the mine you will get hands-on experience in rock mechanics, blasting techniques, tunneling, applied geophysics and rock mass stability.

This mine is one of the many benefits our program enjoys because it is located in a mining state. Mining is a multi-billion dollar industry in Arizona, which produces more than half of all the copper mined in this country.

Besides the San Xavier Mine, laboratories for remote sensing, rock testing, digital image processing and high-resolution geophysics also are available to students in the department.

Beyond the core curriculum, every student in our department is given maximum freedom to pursue individual interests and to tailor course work to specific interests and career choices.



Students analyze data during a field mapping and mineral exploration course. An important part of that work involves map-and-compass survey work.

Geological engineers tackle the big jobs

Geological engineers are helping to solve some of the most important problems facing our society and are working hard to improve the quality of life for people here and abroad. They help to build dams in developing countries, design tunnels and subways and develop safer ways to store toxic and radioactive wastes. They also use cutting edge techniques in geological exploration and remote sensing to search for new mineral and petroleum deposits around the globe.

As the world's population continues to expand, geological engineers are improving the quality of life for us all by developing natural resources while minimizing adverse environmental impacts.



Geological engineering students, like those working with this drill, do a lot of class work in the field. They also have opportunities to work on research projects. The students in the center photograph are collecting samples as part of an environmental reclamation project at a mine tailings pond.



This rock was tested to failure during a laboratory class to determine its strength. Students subject such samples to loads of thousands of pounds to study how rocks fail.

Financial aid is available through research positions and scholarships

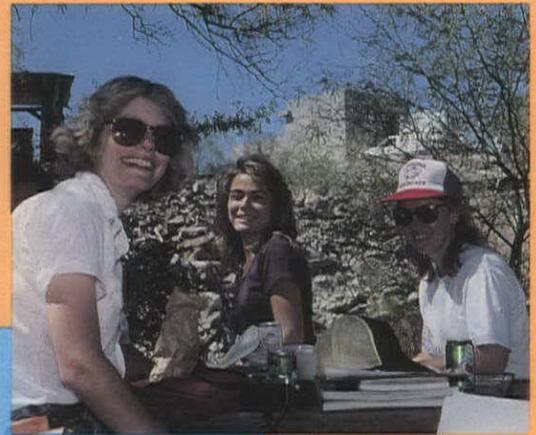
Besides its excellent academic environment, The University of Arizona Department of Mining and Geological Engineering offers undergraduates substantial financial aid through undergraduate research programs and scholarships.

The faculty is committed to providing meaningful roles for undergraduates in research, including co-authorship of technical reports. This involvement in major state-of-the-art advances adds excitement and valuable experience to any undergraduate degree program.

Undergraduate projects have included stabilization of tailings ponds, geophysical target identification, dust monitoring from explosions and site investigations for major development projects.

Vacation employment also can often be arranged with industrial supporters of our program.

The San Xavier Experimental Mine is an ideal setting for both class work and departmental recreational activities. These students enjoy a lunch break during a class in field surveying and underground mining techniques.



The campus mall, with its lush vegetation, is an ideal place to study or to just lie back and catch the rays. The mountains in the background provide students with many weekend recreational opportunities.

The University of Arizona has it all

Since The University of Arizona is located in a major Southwestern city surrounded by millions of acres of open mountains and desert, it combines the amenities of a large metropolitan area and the recreational opportunities common to the wide open West — hiking in the sunny desert or swimming in warm outdoor pools, followed by skiing on the snow covered slopes of nearby mountains.

This spectacular natural setting draws students from all parts of the world, who enjoy the university's year-long program of entertainment and cultural events.

Our high standing among the nation's universities also draws more than 600 job recruiters each year from business, industry, government and education.

The warm climate and casual Western lifestyle combine with the high-quality academic environment to provide one of the most pleasant atmospheres for higher education found anywhere in the nation.



Here's how to apply

For information about the Earth Engineering programs, contact:

**The Department of Mining
and Geological Engineering
Building 12
The University of Arizona
Tucson, AZ 85721**

Letters, telephone calls (602/621-6063) and visits are invited and encouraged. Information also is available concerning our M.S. and Ph.D. programs.

Funding for this brochure provided by the Mining Club of the Southwest

No. 87-1661

In The
Supreme Court of the United States
October Term, 1987

— 0 —
ASARCO INCORPORATED, et al.,
Petitioners,

v.

FRANK KADISH, et al.,
Respondents.

— 0 —
On Petition for Writ of
Certiorari to the Arizona Supreme Court

— 0 —
**MOTION FOR LEAVE TO FILE BRIEF AMICUS
CURIAE AND BRIEF AMICUS CURIAE OF ALASKA
MINERS ASSOCIATION, SOUTHWESTERN
MINERALS EXPLORATION ASSOCIATION, AND
GSA RESOURCES, INCORPORATED,
IN SUPPORT OF PETITIONERS**

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**MOTION FOR LEAVE TO FILE
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INTRODUCTION

ASARCO Incorporated petitioned this Court for a writ of certiorari in the above captioned case. Movants, Alaska Miners Association, GSA Resources, Incorporated,

and Southwestern Minerals Exploration Association (movants hereinafter are referred to as Miners), have obtained permission from petitioners to file this brief amicus curiae in accordance with Supreme Court Rule No. 36.1. A letter of consent has been lodged with the Clerk of the Court. Miners have attempted to obtain permission from the State of Arizona and the respondents to file the attached brief amicus curiae in support of petitioners. This permission has not been forthcoming.

Because of the serious impacts that the Arizona Supreme Court's decision has had on the Arizona miners, because of the serious implications this case has in the interpretation of *Alaska's* Statehood Act, and because of the contribution Miners can make to the Court's understanding of these issues, this motion is filed. Miners seek leave of this Court to file the attached brief amicus curiae pursuant to Supreme Court Rule No. 36.1.

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ARGUMENT

LEAVE TO FILE THE ATTACHED BRIEF AMICUS CURIAE SHOULD BE GRANTED BECAUSE AMICI HAVE CRUCIAL INTERESTS IN THE OUTCOME OF THE CASE AND CAN AID THIS COURT'S UNDERSTANDING OF THE ISSUES

Miners represent a coalition of mine owners, leaseholders, and potential leaseholders or owners of prospecting permits from both Arizona and Alaska who have joined together to demonstrate to this Court the serious adverse consequences that will result if the decision of the Arizona Supreme Court is not overturned. Miners represent a

range of interests that have a vital stake in the proper interpretation of the New Mexico-Arizona Enabling Act of 1910, Pub. L. No. 219, ch. 310, 36 Stat. 557, and the Jones Act of 1927,¹ Pub. L. No. 570, ch. 57, 44 Stat. 1026 (codified as amended at 43 U.S.C. § 870). The interests of Miners are described in more detail below. By receiving the accompanying brief amicus curiae this Court will better understand why the petition for writ of certiorari should be granted.

A. The Alaska Miners Association

The Alaska Miners Association (AMA) is a nonprofit, membership, industry association. AMA has approximately 1,500 members, most of whom reside throughout the State of Alaska. Some reside in the western United States or Canada. It is the stated policy of AMA to support environmentally sound mining operations throughout the State of Alaska. AMA is active in supporting and defending a balanced approach towards the regulation and leasing of mining claims. Towards this end, the Alaska Miners Association previously filed in this Court a petition for writ of certiorari in *Alaska Miners Association v. Trustees for Alaska*, as did the State of Alaska in *State of Alaska v. Trustees for Alaska*, Case Nos. 87-205 and 87-206. These petitions are presently pending before this Court and concern the proper interpretation of the Alaska Statehood Act.

Many individual members of AMA own leasehold interests in mineral lands in the State of Alaska. The statutory framework for the state's leasing system is controlled

¹ Also known as the School Lands Act of 1927.

by the Alaska Statehood Act, Pub. L. No. 85-508, 72 Stat. 339 (1958) (codified at note preceding 48 U.S.C. § 21). Because both the Alaska Statehood Act and the Jones Act, granting mineral lands to Arizona and imposing a leasing system, contain nearly identical language, it is imperative that there be a proper interpretation of these statutes. By granting ASARCO's petition in this case, this Court will help all leaseholders in Alaska, as well as the Alaska courts, to better understand the actual meaning and applicability of the Alaska Statehood Act's leasing language that was first used in the Jones Act.

Until the uncertainty over the proper interpretation of the Jones Act type leasing language is resolved, leaseholders in Alaska are caught in an extremely difficult position. They have no way of determining whether or not a mineral property can be economically mined because they have no way of determining what the lease terms will be. About all that is certain is that if this Court does not correct the decisions of the Alaska and Arizona Supreme Courts, and if the legislatures of these respective states are usurped of their ability to set up leasing statutes, then leaseholders will be injured.

Unfortunately, the resolution of just one of these cases will not solve the legal ambiguities faced by the mining communities in Arizona and Alaska. The Alaska Statehood Act case will not resolve the difficulties that stem from that portion of the Arizona Court's decision that interpreted the 1910 Enabling Act. Nor will a resolution of the Arizona case resolve issues surrounding the unique legislative history of the Alaska Statehood Act. Together, however, a resolution of both cases should once and for all

end the dispute over the applicability and meaning of leasing requirements for lands that are mineral in character.

B. Southwestern Minerals Exploration Association

The Southwestern Minerals Exploration Association is a group of mineral exploration professionals who are actively involved in the shaping of natural resource development public policy. Southwestern Minerals Exploration Association has been active in promoting and supporting legislation at the state level and in fostering better relationships with state land user groups. The association believes that the Arizona Supreme Court's decision will result in higher royalty rates and highly uncertain maximum levels of lease payments. This in turn will discourage mineral exploration and production from state mineral lands in Arizona. Instead, the emphasis for exploration would shift towards the remaining federal lands in Arizona and lands in other states and nations.

Increased royalty payments, combined with state corporate income taxes, severance taxes, sales and use taxes, and property taxes will result in the closing of some productive mines resulting in a decline in tax revenues and lost economic opportunities. In the surviving mines, the "cutoff grade," the lowest grade of mineral produced, will be increased meaning that mines will have a shorter life and more low grade ore will be left in the ground.

In order to foster a successful state land minerals exploration program, there must be an incentive to explore on state lands. Specifically, there must be some assurance that if a prospector actually finds a mineral deposit the

prospector will have a preferential right to lease that prospect and that the royalty payments will guarantee not only a fair return to the state, but also a fair and *predictable* return to the miner. The Arizona Supreme Court's assertion that there must be an appraisal and auction of all mineral lands would foreclose this opportunity.

As a direct result of the Arizona court's decision at least one member of the Southwestern Minerals Exploration Association has lost substantial business when an outside investor withdrew from a lease development program because of the uncertainties created by the court's decision.

C. GSA Resources, Incorporated

GSA Resources, Incorporated (GSA), is a small family owned and operated mineral consulting and mining company. In terms of finances and resources, it is an entirely different class of mining company compared to ASARCO. The impacts from an adverse interpretation of the Arizona leasing laws will be felt much more directly by small companies like GSA. GSA is operating leases on 1,659.26 acres from the State of Arizona.² GSA first applied for prospecting permits in 1982 and it has mined some of these leases for industrial minerals since 1986. A substantial commitment of resources has been expended to develop and operate these leases. Continued operation of these leases is crucial to the company's ability to utilize these investments and quite possibly to its very existence.

² In order to obtain financing and bonding, the leases are personally owned by the family owners of GSA who are personally liable for any financial obligations.

In addition to the acres under lease, GSA's owners have 255.72 acres covered by prospecting permits for which it is attempting to convert to leases pursuant to Arizona Revised Statute § 27-254 (Supp. 1987). It has already paid for the right to prospect on this land anticipating that if its exploration efforts were successful, it would have a right to lease the land. GSA would not have pursued any exploration on these lands without assurances that it would also have the right to mine the minerals it had located. Nor could GSA have prudently explored on the state lands without knowing what its royalty payments would be in advance.

Because the Arizona Supreme Court has determined these leases to be in violation of the Enabling Act of 1910, GSA Resources cannot determine its rights and is in a state of turmoil. The Arizona Supreme Court remanded the case to the trial court to grant "such relief as may be appropriate." GSA, like all leaseholders in the state, has no way of knowing, for example, whether or not it must pay retroactive fees and royalties to make up for the difference between the previous leasing system and whatever system is formulated in conformance to the court's order. It has no way of knowing whether its contractual leasing obligations with the state are still valid, or whether they have been voided by the Supreme Court's decision.

GSA has no assurance that, if it continues to comply with the preexisting statutory duties with regard to these leases and prospecting permits, that it will be permitted to retain any interest in these leases, or if they must be auctioned to the highest bidder as implied by the Supreme Court. Finally, GSA has no way of knowing whether it has any property rights left in its leases or if those leases

are a complete nullity. About all that is certain is that the royalty rate, found by the Arizona Supreme Court not to be based on fair market value, will rise with an adverse effect on the viability of GSA's mining operations. In short GSA is in the untenable position of having to meet its obligations on its leases while not knowing what return, if any, it will receive from those leases.

CONCLUSION

There is a growing tendency for state courts to assume the prerogatives of legislative decision making for state land mineral leasing systems. Unfortunately, without the benefit of the legislative process, the consequences of this judicial legislation have been harsh for citizens who depend on mineral leasing on state lands. Movants for amicus curiae status represent a varied class of individuals in the mining community, both inside and outside of Arizona, who will be affected by the adverse precedent established by the Arizona decision. Furthermore, Miners have substantial expertise in the field of mineral leasing practices and statutes that will be of benefit to this Court's understanding of the case.

For these reasons, Miners respectfully request leave to file the attached brief amicus curiae.

DATED: May 24, 1988.

Respectfully submitted,

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**BRIEF AMICUS CURIAE OF ALASKA MINERS
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EXPLORATION ASSOCIATION, AND GSA
RESOURCES, INCORPORATED, IN SUPPORT
OF PETITIONERS**

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INTERESTS OF AMICI

The interests of amici are outlined in the motion for leave to file brief amicus curiae.

— o —

OPINIONS BELOW

The decision of the Supreme Court of Arizona is reported in *Kadish v. Arizona State Land Department*, 747 P.2d 1183 (Ariz. 1987). The decision was issued on December 10, 1987, and reconsideration denied February 2, 1988. The Arizona Supreme Court's decision was from an appeal of a ruling by the Maricopa County Superior Court in *Kadish v. Arizona Land Department*, Case No. G433745. Both opinions are reproduced in ASARCO's appendix to its petition for writ of certiorari.

JURISDICTION

This Court has jurisdiction pursuant to 28 U.S.C. § 1257(3) as explained in ASARCO's petition at 1-2.

STATUTES INVOLVED

Amici adopt petitioner ASARCO's statement of the statutes involved found in ASARCO's petition at 2. The relevant statutes are reproduced in appendix E of ASARCO's petition.

STATEMENT OF THE CASE

Amici adopt the statement of petitioners at 2-7 of ASARCO's petition for writ of certiorari.

REASONS FOR GRANTING THE WRIT

A. The Leasing of State Mineral Lands Is Subject To Complete Legislative Jurisdiction

The Arizona Supreme Court has eliminated the distinction between mineral and nonmineral lands in the New Mexico-Arizona Enabling Act of 1910, 36 Stat. 557, and the Jones Act of 1927, 43 U.S.C. § 870. To put it succinctly, Congress granted the new State of Arizona only *non-mineral* lands in the 1910 Enabling Act; while it granted *mineral* lands in the 1927 Jones Act. The nonmineral lands are and always have been the subject of the appraisal and auction requirements found in the 1910 Act; the mineral lands were made expressly subject to the leasing provisions in the 1927 Act. No subsequent amendment to the Enabling Act encumbered the leasing of mineral lands with any appraisal and auction requirements.

1. The Distinction Between Mineral and Non-mineral Lands is Critical to Understanding the Scope of the Legislature's Discretion

The distinction between mineral and nonmineral lands is crucial not only in Arizona, but in other western states as well. Alaska is a prime example. In *Trustees for Alaska v. State of Alaska*, 763 P.2d 324 (Alaska 1987), the Alaska Supreme Court correctly found that nonmineral lands, *i.e.*, those lands not known to have been of mineral character at the time they were selected by the State of Alaska are *not* subject to the mineral leasing provisions of Section 6(i) of the Alaska Statehood Act, 72 Stat. 339 (1958), codified at the note preceding 48 U.S.C. § 21. Such nonmineral lands are subject to the same provisions for

all general land grant lands found in Sections 6(a) and 6(b) of the Alaska Statehood Act just as nonmineral lands in Arizona are subject to the special 1910 Enabling Act requirements that include appraisal and auction.¹

Mineral lands, on the other hand, are subject to the express leasing provisions of the Jones Act which are repeated in the Alaska Statehood Act. Virtually identical language in both Acts calls for mineral lands to be leased "as the State legislature may direct." Herein lies the problem.

2. The Language "to be leased as the State legislature may direct" Provides the Arizona Legislature and Other State Legislatures Such as Alaska's with Broad Discretion in Fashioning Leasing Systems for Mineral Lands

Both the Arizona and Alaska Supreme Courts ignored the "as the State legislature may direct" provision, albeit for different reasons. The Arizona Supreme Court thought that the provision was superseded by a more general reference in the Jones Act to the state's earlier Enabling Act. The Alaska Court thought that the state legislature was required to follow an example of a federal statute, the Mineral Leasing Act of 1920, ch. 85, 41 Stat. 437, 30 U.S.C. § 181. In other words both courts thought Congress had

¹ Lands on which minerals were found after they were acquired by Arizona (or Alaska) are not transformed into "mineral" lands; they remain nonmineral. See, e.g., *Wyoming v. United States*, 255 U.S. 489, 498 (1921); *United States v. Sweet*, 245 U.S. 563, 572-73 (1918).

somehow limited the unambiguous language "as the State legislature may direct." Congress, however, had not.²

The legislatures of both states had distilled their mineral leasing statutes into systems that maximized incentives to develop the state's mineral lands while ensuring a fair return, measured in both direct revenues and gross economic activity to the states. The legislative process is never simple, and it never satisfies all the parties. Nevertheless, because the systems were created "as the State legislature may direct," and because the legislatures have been careful to balance competing interests, any attempt to second-guess these legislative decisions must be carefully scrutinized.

3. Subsection (b) of the Jones Act Provides the Complete Mechanism for Leasing Mineral Lands

The language in the Jones Act is not empty of meaning. Words in statutes should not be read to be mere formalism without substance. See, e.g., *Inhabitants of Montclair Township v. Ramsdell*, 107 U.S. 147, 152 (1883) (interpretation of bonding statute); 2A *Sutherland Statutory Construction* § 46.06 (4th ed. 1984). The Arizona Supreme Court ignored the crucial fact that the Jones Act followed the Enabling Act of 1910 and therefore must take precedence over that earlier Act. Because the Jones Act

² There also remains the issue of whether the mineral lease provisions were made applicable to all mineral lands or only a subset of the mineral lands. Both the Alaska Statehood Act and the Jones Act require that "such" lands be leased. "Such" lands can mean all mineral lands or just those lands referred to in the immediate preceding sentence—mineral lands where the surface estate has been "sold, granted, deeded or patented."

provides a mechanism for administering the newly granted mineral lands that mechanism should be used.

Subsection (a) of the Jones Act provides that "the grant of numbered mineral sections under this section shall be of the same effect as prior grants." Subsection (b) of the Jones Act contains the clause that gives the state legislatures authority to lease minerals as they direct. The Arizona court interpreted the general provisions of Subsection (a) of the Jones Act to have imposed certain Enabling Act requirements upon mineral leases thereby eviscerating the liberal leasing provisions of Subsection (b). This is incorrect for several reasons.

First, while the 1927 Act granted mineral land to the states, it did not provide an actual mechanism for transfer of title to the states. That was accomplished in 1934. See Act of June 21, 1934, 48 Stat. 1185, 43 U.S.C. § 871 (repealed by Pub. L. No. 94-579, 40 Stat. 2792). It is significant that Congress provided in the 1934 legislation that all patents shall show "the extent to which the lands are subject to prior conditions, limitations, easements, or rights, if any." This sort of language is the logical consequence of Subsection (a) of the Jones Act. Furthermore, without evidence that any mineral land patents contain the leasing restrictions discovered by the Arizona court, such restrictions should not be implied.

Second, when Congress amended the Enabling Act in 1936 the legislative history plainly demonstrated that Congress knew that the nonmineral lands granted in the Enabling Act were not subject to any lease provisions. In S. Rep. No. 90, 70th Cong., 1st Sess. 4 (1928), Secretary of the Interior Hubert Work stated "but no provision

was made in the [enabling] Act for the development or protection of minerals on state lands." In other words, there was no mechanism to lease minerals found on non-mineral lands that had been granted by the Enabling Act. Nor could such nonmineral lands be subject to the lease provisions of the Jones Act: "The provisions of this Act of 1927 would not apply to lands or minerals therein that might be granted under the Act of June 20, 1910." *Id.*³

In order to remedy this situation, the 1936 amendments were passed which provided a mechanism for the leasing of such nonmineral lands that contained minerals. See Act of June 5, 1936, ch. 517, 49 Stat. 1477 (providing for the leasing "as the State legislature may direct" of said lands for mineral purposes"). This amendment did not set up a lease system for these lands with an appraisal and auction requirement. It set up a lease system for these nonmineral lands just like the lease system found in the Jones Act, with the legislature directing the leasing. Nor did the 1936 Act affect in any way the provisions of the Jones Act. It did not impose any new lease conditions upon the mineral lands granted in the Jones Act. In fact, there is no evidence that Congress intended the 1936 amendments to apply to the Jones Act mineral lands. Congress simply provided the identical method for all classes of mineral bearing lands: "as the State legislature may direct."

There are fundamental differences between the leasing of buried mineral deposits and the leasing of ordinary

³ Work also discussed what the provisions of the Jones Act leasing provisions were, namely leasing as "the State legislature may direct," the creation of a trust, and a provision for forfeiture. *Id.* Notably absent is any discussion of appraisal or auction.

land. Values for mineral deposits cannot be accurately determined until a suspected deposit is actually drilled and bulk sampling is performed. No one would go through the expense of drilling and sampling unless there was a *guaranteed* right to a lease and the lease terms were known in *advance*. In the minerals industry, the normal practice is to lease potential mineral lands for a set term of years with a fixed rental, and a net smelter return in case any minerals are discovered. See generally Rocky Mtn. Min. L. Inst., 3 *American Law of Mining* (2d ed. 1987). An appraisal and auction requirement for the leasing of mineral deposits would be extremely illogical. An appraisal and auction system would stifle incentives for exploration and development. Moreover, there is no indication that Congress meant to impose such a system on the leasing of mineral deposits.

Furthermore, a contemporaneous reading of the 1936 amendment is provided by the 1940 mineral leasing statute enacted by the Arizona legislature. Long continued and contemporaneous and practical interpretations of a statute by the executive officers charged with its administration and enforcement and by the public constitutes an invaluable aid in determining the meaning of a doubtful statute. 2A *Sutherland Statutory Construction* § 49.03; *Edwards' Lessee v. Darby*, 25 U.S. 206, 210 (1827). That 1940 statute, Laws of Arizona, ch. 78, § 4(b), established a royalty rate of "five percent of the net smelter or mint returns." This has been the long-standing law for nearly a half century. It has provided stability to the Arizona mineral exploration and development industries. It has worked well, and is fully consistent with the Jones Act and the 1936 amendments to the Enabling Act.

Finally, there is also no evidence that the 1951 Enabling Act amendments, Pub. L. No. 82-44 (1951), had any effect whatsoever on the leasing of any minerals, whether the minerals were on mineral lands originally granted by the Jones Act or nonmineral lands granted by the Enabling Act. The amendment was designed to facilitate oil and gas development by increasing the length of time that an oil deposit could be leased. The legislation was all encompassing and designed to make it absolutely clear that such leases would be practical and without unnecessary bureaucratic hindrances. That it expressly excluded auction and appraisal requirements was probably from an overabundance of caution. It is *not* an indication that such requirements were applicable to other mineral deposits.

B. Legislatively Derived Mineral Leasing Systems Provide Maximum Returns to the States

Congress declined to dictate specific leasing provisions for minerals granted under the Jones Act. The only requirement found in the applicable federal statutory law is that the minerals on such lands be leased "as the State legislature may direct." In Arizona the legislature interpreted this to allow it to set up a leasing system with 5% royalties and provisions to reward prospectors with the fruits of their exploration labors. The Arizona provision for a 5% net royalty lease provides incentive to the development of a small minerals industry for the maximum benefit of the school trust.⁴

⁴ In Alaska the state legislature interpreted this to be a broad grant of authority, and the legislature enacted a lease location

(Continued on following page)

The Arizona Supreme Court examined a report in evidence from the Arizona auditor general and decided that if Arizona raised its lease rates, it could gain higher state revenues. The report was flawed. For example, it neglected to account for the differences between different mineral commodities. It neglected to note that states with higher royalty rates often had the lowest overall revenues from mineral leases. The *Kadish* dissent by Justice Cameron recognized some of these fallacies when he noted that "the Legislature has properly determined that a fixed-royalty rate appropriately maximizes the revenues to be generated by mineral leases on the school lands." *ASARCO* appendix at 36a, *Kadish*, 747 P.2d at 1200.

Courts are *not* appropriate economic policy decision making bodies. It is not the role of courts to determine what particular leasing scheme will provide for the maximum benefit to the State of Alaska or the school trust of Arizona. The courts are simply ill-equipped to deal with this sort of complex problem that is the province of the state legislative bodies. That is precisely why Congress provided that the leasing systems for mineral lands in the western states should be as the *legislatures* may direct. Congress did not provide any role for the state courts to second-guess these legislative decisions.⁵

(Continued from previous page)

provision designed to encourage the exploration and development of mineral resources in Alaska. This has provided a substantial boost to the stated goal in the Alaska constitution of settling the lands of Alaska while providing an economic base and production license revenues.

⁵ In addition it must be noted that under both the Alaska Statehood Act and the Jones Act only the attorney general is

(Continued on following page)

C. Congress Did Not Intend To Infringe upon Arizona's Sovereignty

The creation of the State of Arizona was not a case where the federal government has merely granted a favor or gift to an individual with strings attached, in which the strings must be taken, as the "bitter with the sweet." *Arnett v. Kennedy*, 416 U.S. 134 (1974). Rather, it is a case where the federal government is imposing conditions on one of the most fundamental of attributes of sovereign state government, the state's right to exercise unfettered jurisdiction over all of its property no matter what the source. The hyperspecific conditions on the leasing of state lands found in the Arizona Enabling Act, as interpreted by the Arizona Court, would be repugnant to the concept of independent sovereign state government. The original Enabling Act restrictions were, perhaps, enacted because of the federal government's legitimate paternalistic concern over the way certain states managed their lands. This concern, however, does not necessarily justify the infringement on independent state decision making as found in the 1910 Enabling Act.

Fortunately, the issue of the objectionability of the 1910 Act need not concern this Court. Because the 1910 Enabling Act appraisal and auction requirements do not govern the disposition of mineral lands, only the much less

(Continued from previous page)

empowered to bring suit to enforce the provisions of the Act. Here, *Kadish* brought suit under the authority of the Enabling Act. However, if this Court finds that the Jones Act alone affects the leasing of mineral lands, and that the Enabling Act is not applicable to this question, then it must find that *Kadish* has no jurisdiction to maintain the suit.

intrusive conditions of the Jones Act and the amended Enabling Act are of concern to mineral leasing. Congress wisely left it to the state legislature to establish a mineral leasing system.

○

CONCLUSION

The United States Congress gave to the legislatures of the western states, including Alaska and Arizona, the discretion to create their own mineral leasing systems. These systems are designed by the state legislatures to best meet state needs. They are tailored for local concerns. The Arizona Supreme Court incorrectly determined that Congress placed additional strictures on the mineral leasing requirements. This, naturally enough, has implications for a number of western states. This Court should grant ASARCO's petition for writ of certiorari in order to determine what, if any, restrictions Congress placed upon the leasing of state mineral lands and deposits.

DATED: May 24, 1988.

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PROPOSED LEGISLATIVE LANGUAGE
RELATING TO MINERAL ROYALTIES
ON STATE TRUST LANDS
2/6/89

1 Be it enacted by the Legislature of the State of Arizona:

2 Section 1. Repeal

3 Section 27-234, Arizona Revised Statutes, is repealed.

4 Sec. 2. Title 27, chapter 2, article 3, Arizona
5 Revised Statutes, is amended by adding a new section 27-234, to
6 read:

7
8 27-234. Rent; royalty; appeal; interest; penalty;
9 lien

10
11 A. THE COMMISSIONER SHALL ESTABLISH THE ANNUAL LAND
12 RENTAL FOR MINERAL LEASE OF STATE LANDS. THE RENTAL SHALL BE
13 BASED ON AN APPRAISAL WHICH SHALL CONSIDER ONLY NON-MINING USES
14 OF COMPARABLE LANDS. IN NO CASE WILL THE RENTALS FOR A MINERAL
15 LEASE BE LESS THAN SEVENTY-FIVE CENTS PER ACRE. THE RENTAL
16 AMOUNT IS PAYABLE IN ADVANCE OF EXECUTING THE MINERAL LEASE BY
17 THE COMMISSIONER AND AT THE BEGINNING OF EACH ANNUAL PERIOD
18 THEREAFTER.

19 B. IN ADDITION TO THE ANNUAL LAND RENTAL PAYMENT, EACH
20 MINERAL LEASE OF STATE LAND SHALL PROVIDE FOR PAYMENT OF A

1 ROYALTY FEE TO THE STATE BY THE LESSEE IN AN AMOUNT SET BY THE
2 STATE LAND COMMISSIONER BASED ON THE VALUE OF THE LEASEHOLD
3 INTEREST AND THE VALUE OF THE MINERALS PRODUCED. IN THE FIRST
4 YEAR OF MINERAL PRODUCTION, THE ROYALTY RATE SHALL BE AT LEAST
5 ONE PERCENT OF THE GROSS VALUE OF ALL OF THE RECOVERED MINERAL
6 ORES OR MINERAL PRODUCTS SOLD BY THE LESSEE. THE ROYALTY RATE
7 SHALL BE ASSESSED FOR ORES OR MINERAL PRODUCTS BASED ON THE
8 AVERAGE MONTHLY PUBLISHED UNIT PRICE OF THE REFINED METAL OR
9 MINERAL PRODUCT AS CITED IN COMMERCIAL COMMODITIES OR TRADING
10 INDEXES OR TRADE JOURNALS AS DETERMINED BY THE COMMISSIONER AND
11 ADOPTED BY ADMINISTRATIVE RULE. IF A MINERAL PRODUCT DOES NOT
12 HAVE A PUBLISHED PRICE OR IS NOT PROCESSED FOR COMMERCIAL USE,
13 THE GROSS VALUE SHALL BE ESTABLISHED BY REFERENCE TO THE TOTAL
14 PAID AT THE FIRST POINT OF SALE.

15 C. THE COMMISSIONER SHALL MAKE AN APPRAISAL OF THE
16 MINERAL DEPOSIT PRIOR TO ISSUING THE MINERAL LEASE, TO DETERMINE
17 IF A ROYALTY RATE GREATER THAN THE MINIMUM REQUIRED IN SUBSECTION
18 B IS JUSTIFIED IN ORDER TO OBTAIN FAIR VALUE. AFTER THE FIRST
19 YEAR OF COMMERCIAL PRODUCTION, THE LEASEHOLE INTEREST AND MINERAL
20 DEPOSIT SHALL BE REAPPRAISED BY THE DEPARTMENT IN ORDER TO INSURE
21 THE TRUST IS RECEIVING FAIR VALUE AND IF NECESSARY, TO ESTABLISH
22 A SCHEDULE FOR FUTURE APPRAISALS. THE ROYALTY RATE SHALL BE
23 APPRAISED ACCORDING TO STANDARD APPRAISAL METHODOLOGY, ADOPTED BY
24 RULE, TO ARRIVE AT AN APPROPRIATE ROYALTY VALUATION TO ACHIEVE A
25 TRUE VALUE RATE OF RETURN TO THIS STATE, BUT THE ROYALTY RATE
26 SHALL NOT BE LESS THAN THE MINIMUM FIRST YEAR ROYALTY RATE AS
27 PRESCRIBED BY SUBSECTION B.

28 D. TO FACILITATE THE APPRAISAL OF ROYALTY RATES THE
29 DEPARTMENT SHALL REVIEW ALL STATE AND COUNTY PROPERTY TAX
30 ASSESSMENT INFORMATION RELEVANT TO THE MINERAL LEASE. THE
31 DEPARTMENT SHALL MAINTAIN SUCH INFORMATION ON A CONFIDENTIAL
32 BASIS AS PROSCRIBED BY SECTION 42-108.

33 D. EVERY MINERAL LEASE OF STATE LAND SHALL REQUIRE THE
34 LESSEE TO MAKE THE FOLLOWING RECORDS AVAILABLE ON A ANNUAL BASIS:

35 (a) ITEMIZED STATEMENTS OF MINERAL PRODUCTION

1 (b) COSTS OF SMELTING OR PROCESSING MINERAL ORES OR
2 PRODUCTS

3 (c) TAX RECORDS

4 (d) ADDITIONAL RECORDS DEEMED NECESSARY BY THE
5 COMMISSIONER AND PRESCRIBED BY RULE.

6 E. MINERAL LESSEES SHALL MAKE MONTHLY ROYALTY
7 PAYMENTS BASED ON THE MINERAL SALES ACTIVITY OF THE PREVIOUS
8 MONTH.

9 F. THE LESSEE MAY APPEAL THE APPRAISAL DECISION OF THE
10 COMMISSIONER PURSUANT TO TITLE 12, CHAPTER 7, ARTICLE 6. AS A
11 CONDITION OF THE APPEAL, THE LESSEE MUST CONTINUE TO MAKE ALL
12 RENTAL AND ROYALTY PAYMENTS DUE BASED ON THE COMMISSIONER'S FINAL
13 APPRAISAL DECISION, AND THE COURT SHALL NOT STAY THE
14 COMMISSIONER'S DECISION, IN WHOLE OR IN PART, PENDING A FINAL
15 DISPOSITION OF THE CASE. THE STATE TREASURER SHALL SEGREGATE
16 RENTS AND ROYALTIES PAID WHILE AN APPEAL IS PENDING AND SHALL NOT
17 DISTRIBUTE SUCH MONIES TO THE STATE GENERAL FUND OR TO THE TRUST
18 BENEFICIARIES UNTIL THE APPEAL IS COMPLETED.

19 G. IF A LESSEE FAILS TO PAY RENT OR ROYALTY ON OR
20 BEFORE THE DATE THE PAYMENT IS DUE, THE AMOUNT ACCRUES INTEREST
21 AT THE RATE AND IN THE MANNER DETERMINED PURSUANT TO SECTION 42-
22 134. IN ADDITION, IF IT IS DETERMINED THAT THE FAILURE TO PAY IS
23 NOT DUE TO REASONABLE CAUSE, A PENALTY OF FIVE PERCENT OF THE
24 RENT OR ROYALTY FOUND TO BE REMAINING DUE SHALL BE ADDED TO THE
25 RENT OR ROYALTY FOR EACH MONTH OR FRACTION OF A MONTH ELAPSING
26 BETWEEN THE DUE DATE AND THE DATE ON WHICH IT IS PAID. THE TOTAL
27 PENALTY SHALL NOT EXCEED ONE-THIRD OF THE RENT OR ROYALTY
28 REMAINING DUE. THE PENALTY SO ADDED TO THE RENT OR ROYALTY IS
29 DUE AND PAYABLE ON NOTICE AND DEMAND FROM THE STATE LAND
30 COMMISSIONER.

31 H. IF ANY RENT, ROYALTY, INTEREST OR PENALTY IS NOT
32 PAID BY THE LESSEE WHEN DUE, THE UNPAID AMOUNTS CONSTITUTE A LIEN
33 FROM THE DATE THE AMOUNTS BECAME DUE ON ALL PROPERTY AND RIGHTS
34 TO PROPERTY BELONGING TO THE LESSEE THAT ARE LOCATED ON STATE
35 LAND.

1 Sec. 3. Section 27-235, Arizona Revised Statutes, is
2 amended to read:

3 27-235 Offering leases at auction; terms of lease:

4 A. AT THE DISCRETION OF THE STATE LAND COMMISSIONER,
5 MINERAL LEASES OF STATE LANDS MAY BE OFFERED AT PUBLIC AUCTION.
6 THE COMMISSIONER MAY ESTABLISH BY RULE THE PROCEDURE FOR
7 CONDUCTING THE PUBLIC AUCTION, BUT BIDDING IS LIMITED TO A CASH
8 BONUS TO BE PAID IN FULL BEFORE THE COMMISSIONER EXECUTES THE
9 LEASE DOCUMENTS. THE LAND RENTAL AND ROYALTY RATE IS NOT SUBJECT
10 TO BIDDING.

11 ~~A.~~ B. Every mineral lease of state lands shall be for
12 a term ~~of~~ NOT TO EXCEED twenty years.

13 ~~B.~~ C. The lease shall confer the right:

14 1. To extract and ship minerals, mineral compounds and
15 mineral aggregates from the claim located within planes drawn
16 vertically downward through the exterior boundary lines thereof.
17 In case of leases made pursuant to locations under subsection-A
18 of section 27-232, SUBSECTION A, the lease shall confer
19 extralateral rights in the discovery vein similar to those given
20 locators upon the public domain of the United States under the
21 provisions of ~~title--30,~~ United States Code, section 26 (U.S.
22 revised statutes, section 2322).

23 2. To use as much of the surface as required for
24 purposes incident to mining.

25 3. Of ingress to and egress from other state lands,
26 whether or not leased for purposes other than mining.

27 ~~C.~~ D. Every mineral lease of state lands shall
28 provide for:

29 1. The performance of annual labor, as required by the
30 laws of the United States, upon each claim or group of claims in
31 common ownership, commencing at the expiration of one year from
32 the date of location, and for furnishing proof thereof to the
33 commissioner.

34 2. the fencing of all shafts, prospect holes, audits,
35 tunnels and other dangerous mine workings for the protection of

1 live stock.

2 3. The construction of necessary improvements and
3 installation of necessary machinery and equipment with the right
4 to remove it upon expiration, termination or abandonment of the
5 lease, of all monies owing to the state under the terms of the
6 lease have been paid.

7 4. The cutting and use of timber and stone upon the
8 claim, otherwise appropriated, for fuel, construction of
9 necessary improvements, or for drains, roadways, tramways,
10 supports, or other necessary purposes.

11 5. The right of the lessee and his assigns to transfer
12 the lease.

13 6. Termination of the lease by the commissioner upon
14 written notice specifically setting forth the default for which
15 the forfeiture is declared, and preserving the right to cure the
16 default within a stated period not to exceed thirty days.

17 E. THE LESSEE OF ANY MINERAL LEASE, IF NOT DELINQUENT
18 IN THE PAYMENT OF RENT OR ROYALTY TO THE DATE OF TERMINATION, MAY
19 TERMINATE THE LEASE AT ANY TIME DURING ITS TERM BY GIVING THE
20 COMMISSIONER THIRTY DAYS' WRITTEN NOTICE OF THE TERMINATION.

21 Sec. 4. Title 27, chapter 2, article 3, Arizona
22 Revised Statutes, is amended by adding section 27-239 to read:

23 27-239. Inspections, investigations and audits

24 A. THE STATE LAND COMMISSIONER OR THE COMMISSIONER'S
25 AUTHORIZED REPRESENTATIVE MAY ENTER AT REASONABLE TIMES TO:

26 1. INSPECT THE WORKINGS, IMPROVEMENTS, AND OTHER
27 FACILITIES USED TO EXTRACT OR SEVER MINERALS, COMMON MINERAL
28 PRODUCTS, MATERIALS OR PROPERTY FROM STATE LANDS.

29 2. OBTAIN FACTUAL DATA OR ACCESS TO RECORDS REQUIRED
30 TO BE KEPT UNDER THERM OF THE LEASE.

31 3. OTHERWISE ASCERTAIN COMPLIANCE WITH LAW AND THE
32 TERMS OF THE LEASE.

33 B. INSPECTIONS, INVESTIGATIONS AND AUDITS UNDER
34 SUBSECTION A SHALL BE ON A REASONABLE NOTICE TO THE LESSEE UNLESS
35 REASONABLE GROUNDS EXIST TO BELIEVE THAT NOTICE WOULD FRUSTRATE

1 THE ENFORCEMENT OF LAW OR THE TERMS OF THE LEASE. THE
2 COMMISSIONER MAY, AND OF REQUIRED BY LAW SHALL, APPLY FOR AND
3 OBTAIN WARRANTS FOR ENTRY AND INSPECTION. THE COMMISSIONER SHALL
4 ADOPT RULES FOR CONDUCTING INSPECTIONS, EXAMINING RECORDS AND
5 OBTAINING WARRANTS PURSUANT TO THIS SECTION.

6 C. THE COMMISSIONER MAY REQUIRE A LESSEE TO APPEAR AT
7 REASONABLE TIMES AND ON REASONABLE NOTICE AT THE COMMISSIONER'S
8 OFFICE AND PRODUCE SUCH RECORDS AND INFORMATION AS ARE SPECIFIED
9 IN THE NOTICE TO DETERMINE COMPLIANCE WITH THE TERMS OF THE
10 LEASE.

11 D. THE COMMISSIONER SHALL PROVIDE THE LESSEE A WRITTEN
12 REPORT OF EACH INSPECTION, INVESTIGATION AND AUDIT UNDER THIS
13 SECTION.

14 Sec. 5. Section 27-251, Arizona Revised Statutes, is
15 amended to read:

16 27-251 Application for mineral exploration permit

17 A. Any natural person over eighteen years of age and
18 any other person qualified to transact business in this state may
19 apply to the commissioner for a mineral exploration permit on the
20 state land in one or more of he rectangular subdivisions of
21 twenty acres, more or less, or lots, in any one section of the
22 public land survey. Such application shall be in writing and
23 signed by the applicant, or an authorized agent or attorney for
24 the applicant, a description according tot he public land survey
25 of the state land for which the applicant seeks a mineral
26 exploration permit, and such other information as the
27 commissioner may ~~by--regulation~~ prescribe BY RULE. The
28 application shall be filed with the department and shall be
29 accompanied by payment to the department of a filing fee of
30 twenty-five dollars. Each applicant meeting the requirements of
31 this section shall be stamped by the department with the time and
32 date it is filed with the department. The applicant shall have
33 priority over any other application for a mineral exploration
34 permit involving the same state land which may be filed with the
35 department subsequent to such time and date, and such land shall

1 be deemed withdrawn for location of mineral claims so long as the
2 application is pending.

3 B. Not less than thirty days nor more than forty-five
4 days form the filing of the application with the department,
5 provided there is no prior application for a mineral exploration
6 permit involving the same state land then pending before the
7 department, or of such application is the pending but is
8 subsequently cancelled, not more than fifteen days after it is
9 cancelled, the department shall mail to the applicant by
10 ~~registered--or--certified~~ mail, at the address shown on the
11 application which, at the time of the application was filed with
12 the department, was open to entry and locations a mineral claim
13 or claims upon discovery of a valuable mineral deposit thereon,
14 the amount of rental required to be paid for the mineral
15 exploration permit as herein provided, and whether a bond will be
16 required under the provisions of section 27-255 as a condition of
17 issuance of such permit. If within fifteen days after the
18 mailing of such notice the applicant pays to the department as
19 rental for the permit the amount of two per acre for each acre of
20 state land designated in the notice and files with the department
21 the bond, if any, required under section 27-255, AND OF THE
22 COMMISSIONER FINDS THAT ISSUANCE OF THE PERMIT IS IN THE BEST
23 INTEREST OF THE TRUST, the commissioner shall issue the applicant
24 a mineral exploration permit for the state land designated in the
25 notice.

26 C. During the period such mineral exploration permit
27 is in ~~force--and~~ effect no person except the permittee and the
28 authorized agents and employees of the permittee shall be
29 entitled to explore for minerals in the state land covered by the
30 permit, and no mineral claim or mineral lease shall be located or
31 issued on such land except as provided in this article. If the
32 applicant fails to make payment or furnish the bond within the
33 period of fifteen days, the application shall be deemed cancelled
34 and of no further effect.

35 Sec. 6. Section 27-254, Arizona Revised Statutes, is

1 amended to read:

2 27-254. Mineral lease

3 A. Following the discovery of a valuable mineral
4 deposit of sufficient quantity and quality which makes extraction
5 profitable on state land covered by a mineral exploration permit
6 within a rectangular subdivision of twenty acres, more or less,
7 or lot, of the public land survey, the permittee may apply to the
8 commissioner for a mineral lease upon the state land within such
9 rectangular subdivision, or lot, and such land shall, for the
10 purpose of the application and any mineral lease issued pursuant
11 to such application, constitute a mineral claim without extra-
12 lateral EXTRALATERAL rights, and shall be deemed to have been
13 located as of the date of the filing of the application for the
14 mineral lease. Upon receipt of an application from the permittee
15 for a mineral lease, and satisfactory proof of discovery of a
16 valuable mineral deposit of sufficient quantity and quality which
17 makes extraction profitable, AND IF THE COMMISSIONER FINDS THAT
18 ISSUING THE LEASE IS IN THE BEST INTEREST OF THE TRUST, the
19 commissioner shall issue a mineral lease to the applicant for the
20 mineral claim or claims covered by the application. THE
21 COMMISSIONER MAY DENY THE APPLICATION BASED ON ANY OF THE
22 FOLLOWING:

23 (a) THE APPLICANT HAS FAILED TO PROVE THE EXISTENCE OF
24 A VALUABLE MINERAL DEPOSIT OF SUFFICIENT QUANTITY AND QUALITY
25 WHICH MAKES EXTRACTION PROFITABLE.

26 (b) THE COMMISSIONER DETERMINES THAT MINING ACTIVITIES
27 WILL HAVE AN ADVERSE IMPACT ON THE VALUE AND INCOME POTENTIAL OF
28 SURROUNDING TRUST LANDS AND THAT ADVERSE IMPACT IS GREATER THAN
29 WHAT CAN REASONABLY BE EXPECTED TO BE REALIZED FROM THE PROPOSED
30 MINING ACTIVITIES.

31 (c) THE COMMISSIONER DETERMINES THAT THE PROPOSED
32 MINING ACTIVITIES WILL CREATE A LIABILITY TO THE STATE GREATER
33 THAN THE INCOME FROM THE PROPOSED MINING ACTIVITIES.

34 (d) THE COMMISSIONER DETERMINES THAT THE PROPOSED
35 MINING ACTIVITY WILL DEGRADE CULTURAL OR HISTORIC RESOURCES AS

1 DEFINED IN _____.

2 B. From and after the date of issuance of a mineral
3 lease, the mineral claim or claims covered by such mineral lease
4 shall be deemed to be excluded from the prospecting permit. Upon
5 application to the commissioner, not less than thirty or more
6 than sixty days prior to the expiration of the lease, the lessee,
7 if not delinquent in the payment of rental or royalty on the date
8 of expiration of the lease, shall have a preferred right to renew
9 the lease bearing even date with the expiration of the old lease
10 for a term of UP TO twenty years.

11 Sec. 7. Title 27, chapter 2, article 5, Arizona
12 Revised Statutes is amended by adding section 27-276, to read:

13 27-276. Enforcement

14 LEASES ISSUED AND EXECUTED UNDER THIS ARTICLE ARE
15 SUBJECT TO THE ENFORCEMENT PROVISIONS PRESCRIBED BY SECTION 27-
16 239.

Mining Club of the Southwest
Annual Dinner - Dec. 3, 1988

6th Annual American Mining
Hall of Fame Awards Banquet

FILE

MINING - A CALLING OF PECULIAR DIGNITY

To be selected by the Mining Club of the Southwest as a member of its Hall of Fame is a great honor. I am deeply grateful that your organization has considered ~~me~~^I to merit this distinction. It is now more than sixty years since I began my career in mining-related activities. Indeed, as my father was a mining engineer, in a sense mining has been part of my entire life.

Not every one regards mining favorably. In some quarters and among some people, mining is looked on as a major threat to the environment and its contributions to human society are overlooked. For those who hold such a negative attitude towards our industry I would like to quote from "De Re Metallica," the encyclopedic description of mining written by Georgius Agricola in 1556 and translated into English in 1912 by Herbert and Lou Henry Hoover. The concluding paragraph of the first chapter reads as follows:

"To bring this discussion to an end, inasmuch as the chief callings are those of the moneylender, the soldier, the merchant, the farmer and the miner, I say, inasmuch as usury is odious, while the spoil of war cruelly captured from the possession of the people innocent of wrong is wicked in the sight of God and man, and inasmuch as the calling of the miner excels in honour and dignity that of the merchant trading for lucre, while it is not less noble though far more profitable than agriculture, who can fail to realize that mining is a calling of peculiar dignity?"

If any bankers, military personnel or merchants are present, I hope they will take due note of Agricola's comments. As for any farmers who may be here, I trust they will recognize that in the twentieth century it is not necessarily always the case that mining is far more profitable than agriculture - whatever may have been true in the sixteenth century.

I feel I must make a confession. I did not deliberately choose a career in mining. Perhaps, after hearing how I came to be involved in the industry, you may want to reconsider the honor you have bestowed on me.

At age five, fascinated with the vivid scarlet uniforms then worn by the ~~hombres~~ ^{firemen} in Valparaiso, Chile, where I lived with my family, I decided to be a fireman. Three years later, having read a biography of Horatio, Lord Nelson, who commanded the British Navy during the Napoleonic Wars, I changed plans and opted instead to become an admiral. That ambition foundered in heavy seas off Cape Hatteras when I was ten years old - a prolonged attack of seasickness convinced me I was not qualified for life on the bounding waves. In my early teens I became a bookworm. Booth Tarkington and Joseph Conrad were my models. I was convinced that I was destined to write the great American novel and that my future lay in journalism or literature.

Thus when I entered college it was with the intention of going on to a school of journalism, where I could hone my writing skills. Late in my freshman year a telephone call caused a change in plans. The caller was Arthur Allen, a distinguished English mining engineer, who had collaborated with my father in Chile on development of a process for treating nitrates.

Mr. Allen had just been named editor of the Engineering & Mining Journal at McGraw-Hill. He was aware of my ambitions and had read some things I had written, shown him by my mother. Although aware I planned to study journalism at college, Mr. Allen said he thought I would learn more through a writing working experience than I would learn at school. He had decided to expand the E. & M.J. staff and astonished me by offering me a job at \$25 a week as an editorial assistant, unheard-of riches for a teenager in 1927. The offer was too good to refuse. I became a college drop-out.

Lacking a technical background, I was assigned to the news desk. A year later I was made assistant editor and asked to report on the metal markets. The copper market was then steadily improving in the era of Coolidge prosperity. Prices rose from 12¢ a pound to the unlikely heights of 18¢ a pound in the spring of 1929, just after President Hoover took office. In 1988 dollars that was the equivalent of \$2 a pound.

The intricacies and constant changes in the metal markets fascinated me. I became hooked. When he had hired me, Mr. Allen had said that if at any time I decided I didn't like the job I could always quit and return to college. No way.

And that's how I came to cast my lot with the mining industry - a decision I have never regretted. In more than sixty years of observing the mineral industries and their markets, no two days have been alike. Mining's links to the world economy, the effects of political developments, the ebb and flow of mineral discoveries that regularly revolutionize the geographical distribution of production, the competition among the several mineral commodities for market share - all this I have found endlessly fascinating. Perhaps my most challenging assignment

was the five years before and during World War II I spent as a government servant in Washington dealing with problems of procuring and allocating minerals for the defense effort. At Metals Reserve Company we dealt with more than sixty mineral commodities - from aluminum and antimony to zinc and zirconium. Each had its own pattern of production and consumption; each presented unique problems technical and commercial; and each played its own part in the successful prosecution of the war.

I have probably told you more than you wanted to know about my personal experiences. It is time to turn to a discussion of the metal that plays such a vital role in the economy of the Southwest. Obviously I mean copper.

Six years ago Charlie Brown of Pinto Valley invited me to speak about copper at the annual December AIME session here in Tucson. All of you will remember 1982. It was a grim year for the domestic copper industry.

Domestic mine production of copper in 1982 was 26% below the level of 1981. Domestic consumption of refined copper had dropped by 18% from 1981. Visible stocks of copper at Free World refineries and in the warehouses of the two metal exchanges had risen 54% in a single year - from 771,000 tons to 1,184,000 tons. And the average price for 1982 as quoted by U.S. producers had fallen to 74¢ a pound from the averages of \$1.02 in 1980 and of 85¢ in 1981.

What was particularly galling to U.S. mine producers was the fact that foreign copper producers in the aggregate had not cut back. In the face of dwindling demand, the copper miners of the Western World other than those in the U.S., had actually increased output by

3%. The major source of increase was Chile, where the mines had increased output in 1982 by 15%, despite the poor level of world consumption and the falling price. Indeed, in 1982, for the first time in a century, Chilean copper production exceeded that of the United States.

Nevertheless, as the year drew to a close, there were signs of an improvement in the business climate. Walter Wriston, then chairman of the country's largest bank, Citicorp, predicted a pronounced recovery in 1983. Drawing comfort from his remarks and subconsciously anxious to cheer-up my audience, my presentation here in Tucson in December, 1982 was upbeat. I stuck out my chin and ^o ~~forecast~~ [^] that demand would recover and copper prices would improve.

Mr. Wriston proved to be an accurate prophet. The recovery that began in 1983 has persisted since then - the longest period of sustained economic gains both in the U.S. and the entire Free World economies that has been ^{seen} ~~sustained~~ in this century.

My forecasts were less successful. It is true that in 1983 consumption was up and the price did advance modestly to an average of 79¢ a pound. However, the rise in consumption was insufficient to close the gap between supply and demand in the Free World. Visible stocks rose by another 124,000 tons that year to exceed 1,300,000 tons. And the price rise was insufficient to prevent further attrition in U.S. mine production as many operations sustained substantial losses.

Economic recovery in the years 1984, 1985, and 1986 caused further gains in copper consumption. ~~The~~ Demand actually exceeded supply in each of these years. Stocks gradually dwindled from the 1983 yearend peak. For the aggregate of the three years the drop in stocks was

over 600,000 tons. At the end of 1986 the reported total of 712,000 tons was the lowest in any year since 1973, when copper prices were soaring.

And yet in the face of this marked improvement in the industry's statistics, the price of copper remained under pressure. It actually declined from the 1983 level. The average U.S. copper price of under 65¢ a pound in 1986 was, after adjustments for inflation, the lowest price experienced since the depression years of 1932 and 1933.

How does one explain this apparent anomaly that ~~existed~~ ^{prevailed} for so long a time - actually ~~four~~ ^{three} years? An important factor, in my opinion, was the prevalent opinion that there existed a vast amount of unused capacity in the copper industry. Market observers knew of course that a good deal of the U.S. industry had been shut down by the low prices. It was believed this could be rapidly brought back into production in the event of a price rise. Additionally, there was a widespread conviction that in the developing countries production could be rapidly expanded. In addition to existing mines, more than a score of substantial deposits had been discovered and explored in the sixties and early seventies that were only awaiting financing to be added to the roster of producing mines.

The copper industry itself contributed to this impression of surplus capacity. ~~From~~ ^{In} ~~one~~ ~~reads~~ the annual reports of the major companies for 1985 and 1986 the recurrent theme ~~is~~ ^{was} that managements recognize ^d that prices ~~are~~ ^{were} likely to remain at the then prevailing level in the years to come and that therefore steps needed to be taken to reduce costs. As we know, this effort was extremely successful.

A combination of productivity improvements, technological innovation and wage restraints resulted in sharp reductions in per-pound costs of producing copper at surviving U.S. mines. By the end of 1986 most U.S. companies claimed their properties were fully cost competitive with copper producers in the developing countries.

Confident that the copper industry had abundant low-cost capacity that would keep prices low and stable, copper consumers resorted to the inventory policy they identified as "just in time." This meant reducing stocks of raw material ^{at their} plants to the absolute minimum. To accomplish this, purchasing managers scrutinized daily computer runs listing raw material stocks at each facility, production schedules for each, and the level of feed required to fill incoming orders for finished product. Their hand-to-mouth purchasing policy assumed that suppliers could be called at the last possible moment and would be eager to book orders for prompt delivery.

This "just in time" policy reduced tie-up of corporate cash and effected substantial savings in interest costs. The policy was not confined to copper. It was applied to most industrial raw materials - steel, aluminum, nickel, zinc and forest products. It contributed to the prolonged and widespread weakness in commodity prices at a time of worldwide economic recovery during the years 1983 through 1986.

For those three years, copper buyers were complacent, confident they had hit on the correct buying strategy because prices remained low even as the level of copper stocks at producing plants and in exchange warehouses was being reduced. But then, in early 1987, came a dramatic change. Almost overnight, consumers found that when they called their normal suppliers to place orders for prompt

shipment in some instances the suppliers were unable to fill the orders. The sellers explained they were fully committed for their current production and had exhausted their reserve stocks. The alternative for the buyers was to turn to the London or New York exchanges and obtain metal from the exchange warehouses.

As demand for these exchange holdings rose, the price for prompt metal increased sharply to a premium over the price for future deliveries, a situation that in exchange parlance is called a backwardation. In copper the backwardation ^{first} developed in April, 1987. It has persisted for the ensuing twenty months - the longest period of consistent backwardation that experienced traders can recall. ^{The} normal position in commodity trading ^{is} ~~being~~ a contango, that is a higher price for forward sales than for prompt sales.

For buyers it is an expensive proposition to pay a premium for spot delivery. Whatever savings may have been achieved during the years prior to 1987 by the "just in time" policy have been far outweighed by the added costs of paying premiums for spot metal over the last twenty months. Much of this time the premium has been in double digits in cents per pound.

There have been two previous periods of sharply rising copper prices in the last two decades. One was in 1973-1974 and the other was in 1979-1980. In both cases a short period of high prices of copper was quickly followed by steep and prolonged periods of low prices. In the language of the market analyst, the high prices were called spikes. How likely is it that the present price of copper will show up as a spike in price charts compiled three or four years from now?

There are substantial differences between the current position and the markets of 1973-1974 and 1979-1980. In 1973-1974 copper prices in the United States were subject to government-imposed price ceilings of 60¢ a pound through early December, 1973, reluctantly increased to 68¢ a pound through May, 1974. While domestic miners were subject to these controls, mines outside the United States were free of restraint. Sharply rising demand in London pushed the price above \$1 a pound in the third quarter of 1973 and it reached a peak of \$1.50 a pound in early April, 1974. In May of that year the U.S. ceilings were removed and the price here began to rise.

What were the root causes of this price strength? Of course while ceilings held the domestic price far below the world market, domestic consumers eagerly acquired all the tonnage offered by U.S. mines. In the world market buyers were fearing prolonged shortages - because the Club of Rome had warned that world economic growth would be limited by impending depletion of mineral resources. Also there was concern about a copper cartel, that would emulate the success of the OPEC organization in tripling oil prices overnight. In early 1974 at a special session of the United Nations, developing-country spokesmen warned the industrialized world to expect higher commodity prices. And adding to the concerns of copper buyers was the fear that when U.S. wage contracts expired in mid 1974, protracted strikes might ensue. The combined effect of this atmosphere was that consumers accumulated large amounts of copper, far above their normal carry.

By mid summer, the position changed radically. While some strikes did occur in the United States, they proved short lived. The most significant development was a massive economic recession. The energy

crisis was causing enormous dislocations in the world economy. Construction activities were sharply reduced and automobile sales plummeted. Public confidence was shaken.

Copper sales fell precipitately as consumers decided to draw down their swollen inventories. The price receded rapidly. At the end of 1974 the London price, which had been \$1.50 a pound in April, was down to 57¢.

In 1973-1974 the sharp rise in price had been fed by fears of shortages, cartels, and strikes. In 1979-1980 the market rose on the strength of good demand plus political and military instability and the inflationary trends exemplified by enormous speculation in precious metals.

Prior to this second spike in copper prices, the market had been depressed despite economic recovery. In spite of reduced output in the United States, copper production in the rest of the world was increasing. Thus, even though consumption was rising, surplus stocks reached unprecedented levels. At the end of 1977 the aggregate of stocks at the refineries and in the exchange warehouses was 1,672,000 tons - more than three months' shipments at then rates of consumption.

The statistical position improved in 1978. Shipments of refined copper that year were 8% greater than in 1977. The consequence was a pronounced reduction in visible stocks but (just as was to be the case in 1984-1986) the price remained depressed. An even sharper drop in visible stocks occurred in 1979 as shipments rose by another 4%. This time the price responded. In December, 1978, the price in current dollars had been less than 70¢ a pound. By the end of 1979 it

was above \$1 a pound and in the first quarter of 1980 it averaged over \$1.20.

Part of the cause were ~~the~~ military and political developments - the hostage crisis in Iran followed by the Soviet invasion of Afghanistan. To many it appeared war might result if the Soviet pushed on into Pakistan. At the same time frenzied speculation drove the prices of gold and silver to incredible levels. As silver prices rose above \$40 an ounce, copper above \$1 a pound did not seem unreasonable.

Then in March, 1980, the precious-metal price boom collapsed. The price of copper also began a retreat then, although not of the same order of magnitude as the drop in gold and silver. By December, 1980 the average London price had dropped to 85¢ a pound, compared with the February average of \$1.32. The decline continued in 1981 and 1982.

Why is the current situation different from these two previous episodes of high prices?

First of all, inventories today are far lower than they were in either 1974 or 1980, when the price declines began. Not only are the stocks at refineries and in exchange warehouses substantially less than they were then, but - most significant - consumers today have very limited holdings compared with stocks they carried in 1974 and 1980. Even if faced with a downturn in their own business, copper consumers will not be able to stay out of the market. To the extent they have any business at all, they will have to buy copper.

And on the supply side there is also a significant difference. The year 1988 has been unusual in that production in the United States is up sharply, responding to higher prices, but is little changed in the rest of the Free World. Indeed, several of the major producing countries have mined less copper this year than in 1987, despite the rise in prices. Peru has had severe labor problems which have cut ~~S~~harply into output. Zambia and Zaire suffer from shortages of expatriate technicians, not to mention spare parts, and from the failure to maintain equipment or perform adequate development. In Chile the two largest mines - Chuquicamata and El Teniente - have not met their production targets. Chuquicamata is struggling with high arsenic content in its ore, while severe rockbursts in late 1987 have hampered operations at El Teniente. Depletion of some mines in Australia and South Africa has offset rising output at other properties.

Indeed, when final mine output figures for 1988 become available, it may well be that the United States has, at least temporarily, once again surpassed Chile as the Free World's premier copper miner. This will cause ironic satisfaction for an industry that was described by a leading business journal three years ago as on the point of dying.

In the long run there will be no shortage of copper. In many corners of the globe exist major identified copper deposits that have been sufficiently explored to list them as world-class resources. They lie unexploited because of the low price of copper ^{until recently} and the pessimism that long prevailed over the level of future copper demand. These factors precluded efforts to finance them.

There are some exceptions. The Ok Tedi mine in Papua New Guinea began operating its copper circuit in late 1987, but failed to meet

its 1988 target for shipping concentrates due to logistical problems and some labor difficulties. In due course it should be shipping more than 100,000 tons of contained metal ^{of year} to smelters in Japan, Korea and Europe. Two new mines have started up late this year - Olympic Dam in Australia and Neves Corvo in Portugal. Together they will perhaps contribute as much as 150,000 tons of copper annually. The mammoth among the new mines is Escondida in Chile, on which financing arrangements were completed in mid-summer this year. It will not be feeding metal into the market before late 1991, but then its annual output will be close to 350,000 short tons.

In recent years market observers have tended to focus on these and other prospective additions to supply, thereby concluding that surplus capacity will exist in the industry. Somewhat ignored has been the impact on capacity of inadequate development and insufficient plant maintenance at existing mines, ^{in recent years,} the consequence of the industry's unfavorable financial position. Yet the failure of production outside the United States to respond to higher prices in 1988 makes clear that this is a real constraint. Moreover, a number of significant producers are faced with closing mines where reserves have been depleted - in some cases the result of mining the better-grade reserves during the years of the industry's difficulties. In tabulating the effective capacity of the Free World copper industry, the minuses have to enter into the calculation as well as the plusses.

The outlook for prices is clearly a crucial element in appraising the industry's future. In making such appraisals, all of us are guilty of being unduly influenced by the immediate past. Thus yesterday's closing prices equivalent to ^{\$}2.45 a pound in London and ^{\$}1.50 a pound on

Comex in New York look high in comparison with prices that prevailed between 1982 and 1987. Over the next few weeks participants in the copper market would do well to keep their seat belts fastened. We may have a bumpy ride.

As of Tuesday, there were 11,658 open contracts for December delivery on Comex. This represents 145,725 tons of copper. Comex warehouses held about 5,800 tons. There are somewhat larger stocks in London warehouses, but how much could be shipped in time to make U.S. December delivery is questionable. The short sellers must be prepared either to deliver metal or to buy in their positions. If not they face the fate described in this shortest of English language poems:

"He who sells what isn't his'n
Pays the price or goes to prison."

Once the December position has been liquidated, possibly or even probably the price of copper will decline. This happened early in 1988 after a similar price run-up in December, 1987. But do not look for a drastic fall comparable with 1974, when copper's price dropped by over 60% in eight months.

For most copper producers under present conditions a price of \$1 a pound is satisfactory. They recognize that very high prices encourage substitution and may also overstimulate capacity expansion.

Copper prices need to be restated in constant dollar terms to provide a proper perspective. The yearbook of the American Bureau of Metal Statistics tabulates the U.S. producer price over a 50-year period converted into 1987 dollar equivalents. Between 1947 and 1981 the average annual price of copper, in 1987 dollar equivalents, was consistently above \$1 a pound, except for 1949 when it averaged 91.5¢.

If 1949 marked the lowest price in the last fifty years, 1974 had the highest average - \$1.76 a pound. At times early in that year the price was well above \$2 a pound in 1987 dollars. Since 1981 the average annual prices have been below \$1 a pound. The low point was 1980 when the average was 67¢ a pound, the lowest price in the whole 50-year span. Last year, 1987, saw the price recover somewhat, but the average of 81¢ a pound compares with \$1.37 in 1972, \$1.34 in 1975, and 85¢ in 1982. All three of those years saw declining demand and all three were then regarded as extremely low prices.

Six years ago when I spoke at the A.I.M.E. dinner here in Tucson I provided an optimistic scenario that failed to materialize. Perhaps you will choose to have reservations about my analysis today. But at least allow me to outline the premises on which I make my diagnosis.

First, I do not anticipate a major business recession. After six years of rising economic activity, however, a slowdown is probable and it may turn into a mild recession. Given this broad perspective, world copper consumption over the next two or three years is unlikely to exceed a growth of better than 1½% annually. Eventually, if some formula can be found to stimulate industrialization in the developing world, a more dynamic rate of expanding copper markets is possible. But that possibility has been with us a long time. During the great depression of the thirties it was argued that an increase of a pound in the annual per-capita consumption of copper in China and India would solve the problems of surplus copper. That is still true today.

It did not happen then and it is not happening now. The problem is how to finance the infrastructure needed to industrialize the developing world. In this era of high interest rates and floating currency exchange rates, raising the needed funds seems unlikely, if not impossible.

In the industrialized world, since 1950 there has been a substantial divergence in the growth of copper consumption. In the United States growth has been limited. It has been greater in Japan and Western Europe because these countries rebuilt their industrial plant and raised living standards. Today their markets for durable consumer goods - automobiles, refrigerators, telephones and the like - are close to the levels of the U.S. market. In my opinion one cannot expect copper consumption in the industrialized countries to repeat the high rates^{growth} experienced during the third quarter of this century.ⁿ

If rapid growth of consumption appears unlikely, neither is supply likely to expand at a fast rate. The new capacity that will come on stream before 1992 is already known. Four substantial projects have already been cited. There may be some smaller ones, but these will be offset by declining production from established sources. The net gain in output will be modest.

Hence one should not expect an early massive increase in stocks overhanging the market. Of course, some increase is inevitable because in fact stocks have been drawn down to an extent that

makes efficient operation difficult. Visible stocks in the U.S. and elsewhere can be expected to rise from the 351,000 tons reported at the end of the third quarter. A normal level would be between 500,000 and 600,000 tons. This is equivalent to an average month's shipment in 1988. Stocks of that magnitude are needed for normal industrial operations. They provide a sounder basis for hedging on the two metal exchanges. Hedging, after all, is the avowed purpose for which commodity exchanges were created.

In my opinion a reasonable equilibrium price for copper is a range between 80¢ and \$1.25 a pound. To base production plans or capital expenditures on prices above \$1.25 a pound would involve excessive risk. Prices consistently below 80¢ a pound would mean the industry would not be generating sufficient cash flow to maintain adequate effective capacity. The feeble response of the copper industry outside the United States to this year's improved market demonstrates the enervating effect of a prolonged period of low prices.

In defining what looks to me to be a reasonable price range, I am not implying that the price of copper will actually remain within those limits. In this world of instant communication of information worldwide, commodity markets have become increasingly volatile. Prices move violently on the basis of current developments, ignoring in some cases the longer-term factors. And it needs to be remembered that copper is not alone in its volatility. Prior to 1974, the aluminum and nickel industries had a reputation for stable prices which served them well in expanding markets at a rate above the average of world economic growth. Currently, however, their prices

are as volatile as the price of copper. This has improved copper's competitive position in relation to aluminum and nickel. All three, however, are at a disadvantage in relation to materials such as plastics that are not subject to comparable price volatility.

To summarize, the extremely low level of stocks held by producers, consumers, and the exchange warehouses means that there will not be a buyers' strike. Purchasing of copper will continue, although perhaps at a slower rate if business activity falters. Thus the kind of precipitate price drop that followed the previous spikes in copper prices in 1974 and 1980 is unlikely. Although ^{long-term} growth in copper demand should continue, the rate of increase will be lower than in the post-war years of 1950-1974, when on a global basis it averaged 4% compounded annually. As for prices, an equilibrium range of 80¢ to \$1.25 a pound would provide a sound basis for the industry. However, one cannot rule out the likelihood that at times both floor and ceiling~~s~~ will be penetrated.

Simon D. Strauss