UNWROUGHT COPPER

Report to the President on Investigation No. TA-201-52 Under Section 201 of the Trade Act of 1974

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UNITED STATES INTERNATIONAL TRADE COMMISSION

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Note.--Information which would reveal the confidential operations of individual concerns may not be published and therefore has been deleted from this report. These deletions are indicated by asterisks.

REPORT TO THE PRESIDENT ON
INVESTIGATION NO. TA-201-52,
UNWROUGHT COPPER
July 16, 1984

Determination

On the basis of the information developed in the course of investigation No. TA-201-52, the Commission determines that black copper, blister copper, and anode copper, provided for in item 612.03 of the Tariff Schedules of the United States (TSUS), and unwrought copper, other than alloyed, provided for in TSUS item 612.06, are being imported into the United States in such increased quantities as to be a substantial cause of serious injury 1/ to the domestic industry producing articles like or directly competitive with the imported articles.

Findings and recommendations

Chairwoman Stern and Commissioner Rohr find and recommend that in order to prevent 2/ or remedy 3/ such serious injury it is necessary to impose a 5-cent-per-pound duty in addition to the present rate on imports of copper provided for in TSUS items 612.03 and 612.06. The increased duty would remain in effect for 5 years.

Commissioners Eckes and Lodwick find and recommend that in order to remedy the serious injury found to exist—

(1) it is necessary to impose quantitative restrictions for the 5-year period beginning July 1, 1984, as follows—

(a) For unwrought copper, other than alloyed, provided for in TSUS item 612.06, not more than 375,000 short tons, of which 25,000 short tons are to be allocated for wire bar;

1/ Chairwoman Stern determines that increased imports are a substantial cause of a threat of serious injury.

2/ Chairwoman Stern, having found a threat of serious injury, finds and recommends relief necessary to prevent such threatened injury.

3/ Commissioner Rohr, having found serious injury, finds and recommends relief necessary to remedy such injury.

(b) For black, blister, and anode copper, provided for in TSUS item 612.03, 50,000 short tons.

(2) The period 1978-82 is the most recent period representative of imports of these articles.

(3) No more than 25 percent of each of the respective aggregate quantities specified in (1) above, for each class of articles may be entered during any calendar quarter.

(4) In order to provide for a more equitable distribution of imports among supplying countries, the quantities specified in (1), above, for each class of articles should be allocated on a country-by-country basis.

Vice Chairman Liebeler finds that no increase in duty or imposition of import restrictions will remedy the injury to this industry and therefore recommends that no relief be provided. If the President decides to impose import relief, the Vice Chairman recommends he impose a tariff of no more than five cents a pound.

Background

On January 26, 1984, the United States International Trade Commission instituted investigation No. TA-201-52, under section 201(b)(1) of the Trade Act of 1974 (19 U.S.C. 2251 (b)(1)), to determine whether black copper, blister copper, and anode copper, provided for in TSUS item 612.03, and unwrought copper, other than alloyed, provided for in TSUS item 612.06, are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industry producing articles like or directly competitive with the imported articles.

The investigation was instituted following receipt of a petition filed on behalf of Anaconda Minerals Co., ASARCO Inc., Copper Range Co., Cyprus Mines Corp., Duval Corp., Inspiration Consolidated Copper Co., Kennecott Corp., Magma Copper Co., Phelps Dodge Corp., Pinto Valley Copper Corp., and Ranchers Exploration & Development Corp. On April 30, 1984, Copper Range Co. informed the Commission that it was financially unable to continue as a petitioner to the investigation and was therefore withdrawing from the investigation.

Notice of the institution of the investigation and the scheduling of a public hearing to be held in connection with the investigation was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, D.C., and by publishing the notice in the Federal Register of February 15, 1984 (49 F.R. 5842). A public hearing was held on May 15-17, 1984, at which time all persons were afforded the opportunity to be present, to present evidence, and to be heard. On June 14, 1984, the Commission, meeting in public session, announced its affirmative injury determination. The Commission announced its remedy findings and recommendations in a public meeting held June 27, 1984.

This report is being furnished to the President in accordance with section 201(d)(1) of the Trade Act. The information in the report was obtained from fieldwork and interviews by members of the Commission's staff and from other Federal agencies, responses to Commission questionnaires, information presented at the public hearings, briefs submitted by interested parties, the Commission's files, and other sources.

VIEWS OF COMMISSIONERS ECKES, LODWICK, AND ROHR

On the basis of the record in this investigation, we have determined that black copper, blister copper, and anode copper, provided for in item 612.03 of the Tariff Schedules of the United States and unwrought copper, other than alloyed ("refined copper"), provided for in item 612.06 of the Tariff Schedules of the United States, are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industry producing an article like or directly competitive with the imported articles.

The purpose of section 201 of the Trade Act of 1974 1/ is to prevent or remedy serious injury to the domestic productive resources 2/ that is substantially caused by imports while facilitating adjustment to import competition. 3/ Before the Commission can make an affirmative determination and recommend import relief, however, the Commission must find:

> (1) that imports of articles concerned are entering the United States in increased quantities;
>
> (2) that the domestic industry producing an article like or directly competitive with the imported article is being seriously injured or threatened with serious injury; and
>
> (3) that increased imports are a substantial cause of the serious injury or threat thereof to the domestic industry.

As will be discussed in greater detail below, the conditions of the domestic industry in this investigation satisfy the statutory criteria and the domestic industry is, therefore, entitled to an affirmative injury determination under section 201.

1/ 19 U.S.C. § 2251 ("section 201").
2/ H. Rep. No. 93-571, 93rd Cong., 1st Sess. 46 (1973).
3/ S. Rep. No. 1298, 93rd Cong., 2nd Sess. 119 (1974).

Background

This is the second investigation that the Commission has conducted under section 201 concerning imports of copper. Thus, in our analysis of the condition of this industry and the impact of imports, we examined both the industry's current condition and the changes that have occurred since the previous investigation. In the earlier copper investigation, 4/ the Commission found that increased imports were a substantial cause of serious injury to the domestic industry. The depressed conditions affecting the industry at that time are comparable to the conditions experienced by the industry today. Decreased demand for copper, high inventories, high domestic production costs, and a depressed world price were all apparent in 1978.

Then, as now, the Commission had to assess the conditions of trade given the nature of copper as a fungible commodity. Copper is a commodity which is generally freely traded in a transparent world market. World prices are established through buying and selling on two exchanges, the London Metal Exchange and the New York Commodity Exchange. The prices on these exchanges and the fluctuation in those prices are fundamentally determined by the relative levels of world supply and world demand.

The current depressed state of the domestic copper industry reflects existing world market conditions, and, therefore, is predominantly due to the low level of world prices which are transmitted to the U.S. industry through imports. Current world prices have been driven low by a combination of world overproduction and a decline in demand. In particular, a number of developing countries, with copper as their main source of foreign exchange, are continuing to produce and market increasing quantities of copper despite a

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4/ Unalloyed, Unwrought Copper, inv. No. TA-201-32, USITC Pub. 905 (1978) ("Copper").

worldwide glut, with plans to expand capacity even further in the near future. At the same time, much of the world continues in a recession and world-wide demand for copper remains depressed.

Domestic producers are forced to compete at or near this low world price, as foreign producers are willing and able to supply copper to any market at the prevailing price level. Domestic producers who fail to meet the world price as adjusted for transportation and other costs cannot compete effectively with imports.

World price is an exogenous condition under which all producers of commodity products must compete. Thus, these world-wide supply, demand, and price factors are conditions of trade and set the background for this investigation.

The domestic industry

Before addressing the three statutory criteria, it is appropriate to define the industry which is being injured. Section 201(b)(1) defines the term "industry" in terms of producers of articles "like or directly competitive" with the imported articles. The report of the House Committee on Ways and Means on the bill which became the Trade Act stated that the Commission was to consider "the question of serious injury to the productive resources (e.g., employees, physical facilities, and capital) employed in the divisions or plants in which the article in question is produced." 5/

In previous cases, the Commission has implicitly described an industry as being like a pyramid and as including all of the productive resources

5/ H. Rep. No. 93-571, 93rd Cong., 1st Sess. 46 (1973).

employed in the production of a given article. 6/ In the present case the petition focuses on injury to the domestic industry producing refined copper. The primary production of refined copper consists of four principal stages: (1) mining, (2) milling, (3) smelting, and (4) refining. 7/ We recognize however that another important source of copper is secondary production whereby copper is recovered by recycling copper scrap material. 8/ Secondary copper is substitutable for primary copper in most applications. 9/ In view of the above, we find there to be one industry producing refined copper and find that this industry includes the domestic productive resources at all four stages used to produce refined copper, whether from primary sources, i.e., ores to concentrates to blister, or secondary sources, i.e., scrap. 10/

Increased imports

The increased imports test is satisfied when imports have increased either in actual terms or relative to domestic production. 11/ There is no question that imports of copper have increased within the meaning of section 201. In absolute terms, 1983 imports of blister and refined copper exceed their 1979 levels by almost 24,000 12/ and 282,000 13/ short tons, respectively. In percentage terms, 1983 imports of blister copper and refined

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6/ Unalloyed, Unwrought Zinc, inv. No. TA-201-31, USITC Pub 894 (1978) at 5 and "Copper," supra note 4, at 4.

7/ Report of the Commission ("Report") at A-4-A-6.

8/ Id. at A-6.

9/ Id. at A-2.

10/ While we could technically find a second partially overlapping industry producing blister copper and copper ores and concentrates, we do not do so in this case because blister and refined copper operations are closely related, and are generally carried on by the same firms.

11/ 19 U.S.C. § 2251(b)(2)(C) and S. Rep. No. 1298, 93rd Cong., 2d Sess. 121 (1974). See Stainless Steel Table Flatware, inv. No. TA-201-49, USITC Pub. 1536 (1984), p. 9, note 29.

12/ Report at A-19, Table 1.

13/ Id. at A-20, Table 2.

copper exceed their 1979 levels by 88 percent 14/ and 125 percent, 15/ respectively.

These growing import volumes resulted in an increasing share of domestic consumption being supplied by imports and a declining domestic market share supplied by domestic suppliers. The ratio of refined copper imports to domestic consumption rose dramatically from 9.5 percent in 1979 to 25.8 percent in 1983. 16/ First quarter 1984 data show these trends continuing. 17/

Serious injury to the domestic industry

In determining whether the industry is experiencing serious injury, section 201 requires that we consider all relevant economic factors, including (but not limited to): (1) the significant idling of productive facilities in the industry, (2) the inability of a significant number of firms to operate at a reasonable level of profit, and (3) significant unemployment or underemployment within the industry. 18/

Domestic copper mine, smelter, and refinery production all declined significantly between 1979 and 1983. 19/ The sharpest production declines were experienced in mining and smelting. Mine output fell 27.6 percent from 1979 to 1983 while smelter production slid 29.3 percent. 20/ Refinery output followed a similar trend dropping 21.3 percent between 1979 and 1983. 21/

14/ Id. at A-19.
15/ Id. at A-20.
16/ Id. at A-54. Table 25.
17/ Id. at A-102, Table D-3.
18/ 19 U.S.C. § 2251(b)(2)(A).
19/ Report at A-23.
20/ Id.
21/ Id.

Similarly, capacity utilization of mines, smelters, and refineries declined between 1979 and 1983. 22/ For mines, the decline was from a 78.5 percent utilization rate in 1979 to 59.8 percent in 1983. For smelters, the drop was from 77.7 percent to 56.8 percent, and for refineries, the decrease was from 86.8 percent to 62.0 percent. 23/

These declines in production and capacity utilization are reflected in the domestic industry's unemployment figures. Between 1979 and 1983 the total number of employees in the domestic industry declined nearly 40 percent 24/ while total wages paid during the same period dropped 21.6 percent. 25/

Low production and capacity utilization is also reflected in a negative financial performance by almost the entire domestic industry. Net sales decreased almost 24 percent while gross profits deteriorated from $820 million in 1979 to a loss of $523 million in 1982 and a loss of $211 million in 1983. 26/ This lack of profitability has stymied the domestic copper industry's ability to generate funds to move toward production cost reductions and modernization projects which would enhance its ability to adjust. Thus, we conclude that the domestic industry is seriously injured.

Substantial cause of serious injury to the domestic industry

Section 201(b)(4) of the Trade Act defines the term "substantial cause" as an "important" cause of injury, "not less than any other cause." In examining this industry, we have already noted that the statute's required tests of increased imports and eroding market share have been met. In addition, the sophisticated dynamics of the international copper market require us to examine additional economic factors, such as: (1) decline

22/ Id. at A-21-A-26.
23/ Id.
24/ Id. at A-28-A-29, Table 7.
25/ Id. at A-29.
26/ Id. at A-34, Table 11.

in demand; (2) cyclical changes related to the business cycle as well as labor contract negotiations; and (3) world price and factors of comparative advantage. Based upon our evaluation of all these relevant economic factors 27/ we determine that the increased imports under investigation are a substantial cause of serious injury to the domestic industry. 28/

Decline in demand--U.S. consumption of refined copper has trended down since 1973. By 1983 it had fallen 19.3 percent to 2.0 million tons. 29/ Three basic long term factors are acting to reduce copper consumption. These are (1) substitution of other materials for copper, (2) declining intensity of copper use in products containing copper, and (3) relatively slower growth in industries using copper than in the overall economy. Our investigation shows that the primary reason for the reduced consumption has been the large energy price increases which have caused manufacturers to search for lightweight alternatives to heavy metals. Copper consumption also has declined because of technological improvements such as satellite and microwave communications equipment, which have displaced copper-intensive wires and resistors with semi-conductors, and the replacement of copper by spun glass in fiber optics. Other consumer-preference changes have occurred which have reduced the intensity of copper use. The downsizing of vehicles and smaller radiators required in the growing number of four and six cylinder engines resulted in a decline in copper usage per car from 32 pounds in 1976 to 28 pounds in 1980. Finally, the movement to a more service oriented economy is acting to reduce per capita copper consumption.

27/ 19 U.S.C. § 2251(b)(2).

28/ Commissioner Eckes notes that the Senate Finance Committee warned the Commission against a mathematical weighing of causes. The report states: "It is not intended that a mathematical test be applied by the Commission." S. Rep. No. 1298, 93rd Cong., 2nd Sess. at 120 (1974).

29/ Report at A-54, Table 25.

In our view, while a declining demand has probably accelerated the decline of the domestic producers' U.S. market share, when compared to other causes of injury, we find that the decline in demand is not a more important cause of injury than increased imports.

Cyclical changes—Among the other causes of injury considered are cyclical changes resulting from economic recession and labor contract negotiations. Copper is an intermediate good used in the production of semifabricated products that are in turn used as inputs in the production of many durable manufactured goods. 30/ Because these goods are durable, buyers can exercise a large degree of discretion in timing their purchases. Since buyers can delay their purchases when general economic conditions are poor, copper consumption to a degree reflects general economic trends. We do not believe that Congress intended that a cyclical downturn per se be a cause of injury. 31/ If this were the case, the Commission probably would be compelled to make a negative finding whenever our finding was made during a cyclical downturn. Rather, we believe that Congress intended that we examine the impact of imports in the course of the business cycle.

Another cyclical phenomenon experienced by the domestic copper industry relates to labor contract negotiations and what some of the parties have called the "strike cycle." The copper industry is heavily unionized and labor contracts are renewed every three years. It is not uncommon for labor and management to fail to reach an agreement before the existing contract expires and for a strike to occur. In anticipation of such strikes domestic producers and their customers increase their imports to ensure their ability to meet

30/ Id. at A-65-A-69.

31/ See Heavyweight Motorcycles, Engines, and Power Train Subassemblies, inv. No. TA-201-47, USITC Pub. 1342 (1983), p. 15, Views of Chairman Eckes. Indeed, it may be argued that the problems associated with this industry and imports become most acute during recessionary periods.

their contractual obligations. We have examined this cyclical phenomenon and it is our belief that rather than a cause of serious injury, this is a normal operating condition of the industry.

In view of the above, we conclude that cyclical changes are not a more important cause of serious injury to the domestic copper producers than increased imports.

World price and factors of comparative advantage— 32/

The respondents have alleged that the injury to the domestic industry is primarily due to the inability of the domestic industry to compete at the world price because of a lack of comparative advantage.

During the period of investigation world copper prices fell from 85 cents per pound to 63 cents per pound 33/ while average U.S. production costs have decreased from 88 cents to 82 cents. 34/ In our view market pressures resulting from this relatively low world price have had a significant negative impact on the domestic copper industry's ability to compete with foreign copper producers. The world price, however, cannot be viewed as an isolated cause of injury existing independent of the overall world supply and demand picture as well as factors of comparative advantage. Indeed,

> [s]uch a line of reasoning would result in the entire U.S. market being taken over by imports . . . . It must be clearly understood that imports are the vehicle by which the effects of low world prices are transmitted to the U.S. industry. Increased imports in particular are the cause of those negative effects previously detailed. 35/ 36/

32/ Neither of these factors can be viewed in a vacuum. In fact to view factors such as ore grades, wage rates, transportation costs, environmental costs and the cost of investment capital as individual causes would require the Commission to assess the adequacy of the very resources it is required to protect under section 201.

33/ LME price of cathodes, Report at A-63, Table 27.

34/ Posthearing Brief in Support of the Petition, May 23, 1984, at 72.

35/ Sugar, inv. No. TA-201-16, USITC Pub. 807 (1977) at 32-33.

36/ We note that while we find this to be true in the subject case, such a transmission of world price may not be true as a general premise for all commodity products.

Factors of comparative advantage relate to the differing costs and conditions of production experienced by producers in supplying countries. In the copper industry these differing costs across supplying countries include variance in ore grades, transportation costs, wage rates, environmental costs, and the cost of investment capital. It is the interaction of these conditions of production that makes the world price look low from our perspective and perhaps profitable from Chile's. It is also this same interaction, as reflected in low prices, that makes imports attractive and affects their flow into the United States.

Of all the conditions of production affecting the domestic copper industry, declining ore grades have been characterized as an irreparable cause of injury. While we recognize that ore grades are a natural bounty subject to depletion we disagree that the rising costs associated with depletion are irreparable. The domestic industry has already demonstrated that through improved technology domestic producers have improved their production efficiencies and reduced the cost per pound of production. 37/ 38/

Moreover, ore grades must be evaluated in their proper context and not just compared across the board. Indeed, if we take into account the coproduction of other metals 39/ which are found with copper deposits, even high-cost producers may be viewed as competitive. In addition, the economies associated with a developed country's infrastructure may make copper production in the United States more viable than in certain developing

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37/ Petitioner's Posthearing Brief at 72.

38/ As we have previously noted, further progress in improving these efficiencies appears to have been hampered by the inability of the domestic industry to generate greater revenues due to the low level of world copper prices.

39/ Petitioner's Posthearing Submissions, Appendix J, lists U.S. ore grades and their by-products by mine. Included among the by-products are precious metals such as gold, silver, and platinum group metals as well as molybedenum, lead, zinc, and nickel.

countries with far higher ore grades but significantly greater costs to develop and maintain the necessary infrastructure. 40/ Clearly, competitive conditions such as ore grades, wage rates, transportation and environmental costs, and the cost of investment are not immutable.

We reject the notion that the Commission must determine whether the domestic industry has a comparative advantage in a product before making an affirmative recommendation. 41/ Such a requirement would thwart the purpose of section 201. It would also ignore the reality that costs and conditions of production change and that section 201 is intended to enable an industry to use a period of shelter in order to adjust to shifts in these costs and conditions.

The relative costs and conditions of production do influence the ability of foreign producers to continue to compete at very low world prices. However, these relative advantages can be offset or limited by technological advances and improved efficiencies or can be subject to changing conditions. Thus, in light of the foregoing discussion, these factors and the relative advantage they currently give some foreign producers are not a substantial cause of serious injury.

Conclusion

As previously stated, the Commission must examine carefully the factors which influence world price, i.e., global supply, demand, and the shifts in

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40/ Infrastructure facilities such as rail lines and docks contribute to higher incremental costs abroad and off-set rich ore grades.

41/ Commissioner Rohr notes that although comparative advantage is a factor that is regularly examined in the course of Commission investigations, judgments on the adequacy of domestic resources goes beyond the Commission's statutory role.

comparative advantage. The world price is meaningless unless we understand how and why it is set at a particular level. In a true global commodity market, imports and world price have a unique relationship.

World-wide demand has decreased and production has reached a level of substantial oversupply. Thus, the world price for copper has plummeted, with little sign of recovery. Because of the commodity nature of copper and the presence of increasing import volumes, domestic producers are not able to raise the U.S. price to a level which would allow them to recover and adjust. Imports are the vehicle transmitting this depressed world price into the U.S. market, requiring producers to peg their prices to the world price. Thus, we determine that the increased imports are the substantial cause of serious injury to the domestic industry.

Views of Commissioners Alfred E. Eckes and Seeley G. Lodwick on Remedy

Under section 201(d)(1), if the Commission finds that the domestic industry is seriously injured and that increased imports are the substantial cause of injury, the Commission shall--

> (A) find the amount of the increase in, or imposition of, any duty or import restriction on such article which is necessary to prevent or remedy such injury, or
>
> (B) if it determines that adjustment assistance under chapters 2, 3 and 4 can effectively remedy such injury, recommend the provision of such assistance. 1/

Having made an affirmative injury determination, we have considered the alternative remedies available to us. Fashioning an effective remedy poses particular problems in this case due to certain characteristics of the copper industry. These characteristics are (1) the nature of copper as a world commodity and the consequent difficulty of addressing the world price directly, and (2) the fact that extensive trade exists in both upstream and downstream products and the possibility that relief, if not fashioned carefully, could be counterproductive by harming particular downstream producers and reducing their demand for refined copper.

In considering what relief to provide, we considered tariffs (including tariff-rate quotas), quotas, and adjustment assistance which are remedies the President has authority to impose. We did not consider orderly marketing agreements or other bilateral arrangements, because these would have to be negotiated with foreign governments. We rejected adjustment assistance at the

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1/ 19 U.S.C. 2251(d)(1).

outset because of limitations in the amount of relief which can be provided. The maximum adjustment assistance which can be provided to firms, $1 million in loans and $3 million in loan guarantees, "would not even be a drop in the bucket," to quote two of our colleagues who considered the issue in the earlier copper case. 2/

We considered and rejected tariffs. While we generally prefer tariffs over quotas because tariffs tend to be less distortive of trade, there is very little certainty regarding the results of a tariff. Specifically, we had difficulty estimating what effect a tariff would have on both import volumes and price. The record of this investigation indicates that non-U.S. production of refined copper continued to expand throughout the 1979-83 period even though non-U.S. consumption steadily declined, and the world price fell to extremely depressed levels. Additionally, some foreign suppliers of copper to the United States (in particular the dominant foreign supplier, Chile) produce copper at substantially less than the present world market price. 3/ It stands to reason that these particular suppliers would be likely to absorb a tariff if it were necessary in order to sell their output. We also found that a tariff of any significant size might have an adverse effect on fabricators and other downstream users, might cause them to lose market share to imported fabricated products, and thus result in decreased purchases of domestically produced refined copper. Finally, a tariff would not provide a yardstick to estimate the quantity of future imports that could be used to facilitate the adjustment of the domestic industry. The application of a tariff would not provide any predictable shelter from imports in an economic downturn when the domestic industry is particularly vulnerable.

2/ Views of Commissioners Alberger and Minchew in Unalloyed, Unwrought Copper, Report to the President on Investigation No. TA-201-32 . . ., USITC Publication 905 (1978), at 24.

3/ Hearing statement of Patrick Cussen, Vice President for Codelco, May 15, 1984, p. 31.

We concluded that a quota, despite its potential rigidity, provides the most certain and predictable form of relief. Three facts were key in our selection of quotas. First, domestic demand for copper remains low and has increased only slightly from its most depressed levels despite the economic recovery. Even during the most recent period for which data are available, the first quarter of 1984, U.S. apparent consumption of refined copper is up by only 1.5 percent from the same period in 1983, while full-year 1983 apparent consumption trailed the 1979-81 average by more than 10 percent. 5/ Second, the excess of world production over world consumption of refined copper increased steadily from 1980 to 1983, with world production exceeding consumption by 785,000 metric tons in 1983. 6/ Third, there are currently high levels of world stocks, which have risen by over 50 percent from 1980 to 1983. 7/

In particular we recommend a quota for a 5-year period in an aggregate amount of 425,000 short tons per year on imports of black copper, blister copper, and anode copper, provided for in item 612.03 of the TSUS, and unwrought copper, other than alloyed, provided for in item 612.06 of the TSUS. The 425,000 short tons should be allocated to allow for 375,000 short tons of unwrought copper, 8/ including a separate allocation of 25,000 short tons of wire bar; and for 50,000 short tons of black, blister, and anode copper. 9/ The aggregate quota is roughly in line with average import levels during the period 1978-82, which period we find to be the most recent period representative of imports. Imports of blister as well as refined copper are covered, as blister is only one processing step away from refined and

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5/ Report at A-54.
6/ Report at A-17.
7/ Report at A-101, Table D-2.
8/ Other than alloyed as provided for in item 612.06 of the TSUS.
9/ As provided for in item 612.03 of the TSUS.

exclusion would likely result in circumvention of the refined quota. The blister and refined quotas are separate to protect secondary refiners dependent on imported blister. Without this separate allocation, imports of the higher value refined copper could dominate the quota. A separate allocation for wire bar is provided as some fabricators still require this product and domestic production no longer exists. In addition, in recognition of the positions of the various importers, we recommend that these quotas be administered on a country-by-country basis in a manner to be determined by the President. Further, to minimize distortions resulting from the filling of a quota early in the quota period, we also recommend that no more than 25 percent of a country's annual allocation be permitted to enter in any calendar quarter. Finally, to prevent a surge of imports while minimizing retroactive controls, we suggest that the quotas be put into effect as of July 1, 1984.

VIEWS OF CHAIRWOMAN PAULA STERN

In this investigation, the Commission has been asked to apply section 201 to a very unique set of facts and circumstances. A domestic industry which produces a world commodity with a relatively uniform international price, traded in an open and depressed global commodity market, has successfully argued that imports are the most important cause of its serious injury. I agree with my colleagues that an affirmative determination is warranted. However, I do not agree that this industry's serious injury is caused primarily by the increased imports in the most recent years. Rather, the immediate threat of rapidly increasing imports is the substantial cause of the industry's serious injury.

There are two major conclusions: (1) the certainty of increased imports should the U.S. price of copper ever diverge from the declining world price has caused serious injury to U.S. producers in the most recent period; and (2) increasing imports threaten to cause further serious injury to this industry.

The first conclusion, which follows from the peculiar world commodity status of copper, does not precisely match the statutory language. The language of section 201 apparently does not contemplate threat of imports as a cause of present, rather than future, injury. The second conclusion, however, does correspond directly to the statute and compels an affirmative finding.

The criteria regarding the traditional statutory interpretation of "threat of serious injury" have been met in this investigation. Imports have increased, sales have declined, inventories have doubled, and the trend in production, profits, and employment is unmistakably down. However, my finding is based more fundamentally on the fact that the world price of copper has fallen well below U.S. producers' costs of production, and that the threat of increased imports into the U.S. market, should the U.S. price deviate from that low price, has rendered and will continue to render U.S. producers impotent to change this situation. U.S. imports alone have not caused the world price to fall, or kept it at its current level. But immediately increasing imports are inevitable in any situation in which the U.S. price exceeds by more than a small margin the seriously depressed world price.

It is true that U.S. producers suffer from a comparative disadvantage vis-a-vis their foreign competitors. U.S. ore grade is lower quality than that of many foreign suppliers, and it therefore costs more for U.S. producers to extract the same amount of copper from a given quantity of ore. Energy costs are higher for U.S. producers, both because these costs have risen and because U.S. mines are necessarily more energy intensive. Environmental costs are higher in the United States. And, wages for U.S. copper workers are higher than those of their foreign counterparts.

Some foreign copper suppliers, unlike U.S. producers, can therefore continue to produce copper at a profit, despite a falling world price, because their costs of production are so much lower. When the price of a world commodity falls, particularly for an extended period, it is the higher cost producers of that commodity who are hit first and hardest.

These factors explain both why some foreign producers have been able to maintain production despite a low world price of copper, and why some foreign copper producers have a comparative advantage over U.S. copper producers. However, these are relatively permanent, structural factors which only explain the long-term presence of imports in the U.S. market. Domestic industry costs are high, but there have been no unusual cost increases that would substantially explain the industry's injury. Domestic cost factors, neither individually nor in totality, adequately explain the recent phenomena of increased copper imports and a severely injured domestic copper industry.

The primary reason why U.S. producers have suffered serious injury within the past three years is because global supply has increased, and world demand has fallen. The resulting low world price has been transmitted through the threat of imports to the U.S. market. In sum, this industry is suffering principally from the effects on the world price of foreign copper exports to the world.

Domestic Industry

For purposes of this investigation, I have found one industry producing refined copper, comprised of those productive resources which refine copper from its blister state, as well as those resources which produce blister copper and copper ores and concentrates. I believe such a finding is consistent with other Commission determinations concerning vertically integrated industries 1/ and that such a finding, given the scope of this investigation, provides for the most

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1/ See, for example, Unalloyed and Unwrought Copper, Inv. No. TA-201-19, USITC Pub. No. 808 (March 1977), Unalloyed and Unwrought Zinc, Inv. No. TA-201-31, USITC Pub. No. 894 (June 1978), and Television Receivers, Inv. No. TA-201-19, USITC Pub. No. 808 (March 1977).

Also note that some parties in opposition to relief for this industry contend that the integrated nature of the industry requires a finding which also includes downstream fabricators. See posthearing brief of the National Electrical Manufacturers Association (NEMA), at 36-37, and compare with petitioner's arguments to exclude downstream fabricators from the definition of the industry, Posthearing brief at 20. I have not included fabricated products in my definition of the domestic industry because I do not find these products to be "like" or "directly competitive with" refined and blister copper.

meaningful analysis of the data under the statutory criteria. 2/ Furthermore, a finding of a single domestic industry producing refined copper is consistent with the fact that most blister copper is captively consumed, and that blister and refined copper are produced for the most part by the same firms.

Increased Imports

Copper imports into the U.S. market have fluctuated considerably for the past ten years, 3/ and reveal a consistent pattern of peaking every third year because of

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2/ For a discussion of how consideration of a vertically integrated industry as a "pyramid" allows for the most meaningful evaluation of the data, see Views of Commissioner Stern in Certain Motor Vehicles and Certain Chassis and Bodies Therefor, Inv. No. TA-201-44, USITC Pub. No. 1110 (Dec. 1980) wherein she stated at 97:

> [T]he "industry" in a section 201 investigation can be like a pyramid . . . included in the pyramid are all the productive resources (both capital and labor) employed in the production of the article. The primary purposes of section 201 is the protection of domestic resources engaged in the production of goods. The protection extends beyond the corporate structure (and resources employed therein) performing the final work on a product.

In this case, however, the petitioners represented the downstream industries to the extent the component parts were included as part of the final manufactured product (assembled automotive vehicles). The present case is therefore easily distinguishable.

3/ See Figure 3 of staff submission, "Remedy Considerations," Inv-H-142, June 22, 1984.

actual and anticipated labor strikes. 4/ Hence, any analysis of the question of increased copper imports must take into account such trends which are largely attributable to structural characteristics of the domestic industry. 5/ Also, because imports tend to increase every third year due to labor strikes or the threat of strikes, it is most appropriate to look at imports beyond the most recent three- to five-year period, in order to avoid distortions.

Even when such factors are taken into account and import levels are not compared solely to the unusually low level of imports in 1979, 6/ both refined and blister imports have generally increased. In 1975-77, imports of refined copper averaged 279,000 tons a year. In 1978-80, they averaged 344,000 tons; and in 1980-83, they averaged 350,000 tons. Imports of blister also have increased steadily since 1975, from an average of 31,000 tons a year in 1975-77, to an average

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4/ Thus, imports were considerably higher in 1974, 1977-78, 1980 and 1983 than in the intervening years.

5/ In this regard several parties have also made references to imports by domestic producers during each year of the period under investigation. See report at A-18, A-19. While exact figures are confidential, these imports were not of such quantities to warrant considering these imports separate from all other imports.

6/ See Zambian posthearing brief at 18-19, Codelco's posthearing brief at 34-35, posthearing submission by the Independent State of Papua New Guinea and Bougainville Copper Ltd. at 4, petitioner's posthearing brief at 15.

of 48,000 tons in 1978-80, to an average of 58,000 tons in 1981-83. 7/

Imports have also increased relative to domestic production. 8/ When blister and refined imports are aggregated, and compared to domestic blister and refined production, the ratio has fluctuated but generally increased. 9/ When strike years are examined, imports have increased relative to domestic production. In the strike year of 1980, imports were 16.9 percent of domestic production. In the most recent strike year of 1983, the ratio was 19.7. The average ratio of

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7/ Respondent Codelco argued that these recent levels of blister imports are actually lower than previous levels in the mid 1960s. Codelco posthearing brief at 34. Both refined and blister import figures are taken from p. 5 of staff submission on remedy considerations, Inv-H-142, June 22, 1984.

The parties addressed the issue of "increased imports" in the following submissions, inter alia: Petition at 11-15; petitioner's posthearing brief at 1-3; Codelco's posthearing brief at 1, 34-36, and 40; Mexican posthearing brief at 15-17; Zairian prehearing brief at 13; Zairian posthearing brief at 1 and 18-27; NEMA's posthearing brief at 13-17.

8/ The language "actual or relative to domestic production" is contained in section 201(b)(2)(C), a provision addressed to the question of substantial cause. The Commission consistently has taken the view that increases in imports, either absolutely or relative to production, would satisfy the requirement for increased imports as well as be relevant to causation.

9/ These ratios are 15.84 percent in 1978, 6.7 percent in 1979, 16.9 percent in 1980, 10.5 percent in 1981, 13.1 percent in 1982, and 19.7 percent in 1983. These calculations are based on figures presented in the Report at A-18. 1978 figures were obtained from staff submission on remedy considerations, Inv-H-142, June 22, 1984, pp. 18-19.

imports to domestic production for 1978-80 was 13.7, while the average ratio for 1981-83 was approximately 15.0. 10/

Serious injury and threatened serious injury

I adopt the finding of my colleagues that the domestic copper industry is suffering serious injury having met the statutory criteria that, inter alia, (1) a significant portion of productive facilities have been idled; (2) a significant number of firms are unable to operate at a profitable level; and (3) significant unemployment or underemployment exists throughout the industry.

When 1979 and 1983 production, capacity utilization, employment, and profitability data are compared, it is clear that the industry has experienced a decline in its economic health over the course of the investigation. However, a closer look at the indicators, particularly profitability, reveals that the domestic industry's "serious" injury occurred after 1981, when the world price of copper began to decline.

Production at the mining, smelting, and refinery levels fell moderately from 1979 to 1980, but recovered in 1981, only to fall abruptly in 1982, and continue to decline in

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10/ This analysis is further supported by looking at import penetration ratios, or the relationship between imports and apparent consumption. This ratio also increased irregularly from 1977-83, reaching a record 25.8 percent in 1983. This most recent figure is higher than the previous 1980 strike year figure of 22.9 percent.

This could also be influenced by the slight but consistently downward trend in copper consumption since 1973. 28 See discussion of secular and cyclical declines in demand, infra.

1983. 11/ Mine capacity utilization similarly fell moderately from 1979 to 1980, but rose to 89 percent in 1981 -- its highest level since 1973. But in 1982 capacity utilization dove to 65 percent, and continued its decline to 60 percent in 1983. Smelter and refinery capacity utilization exhibited similar trends. 12/

Employment in 1981 was at the same level as 1979, but declined significantly in 1982, and substantially between 1982 and 1983. 13/

Although profit margins fell significantly in 1980, the domestic industry did not show losses in its aggregate profitability data until 1981. In 1982, however, losses were considerable, representing 33.5 of net sales. While losses were less pronounced in 1983, they were nevertheless substantial. 14/

Thus, all of the economic indicators relevant to injury demonstrate that while the domestic industry has experienced injury since 1979, this injury was clearly "serious" only in the most recent years of the period under review.

Moreover, it is clear this trend of serious injury will certainly continue. The world price of copper has continued to fall from approximately 68 cents in March 1984, to approximately 58 cents at this writing.

11/ See Report at A-23.

12/ See Report at A-25.

13/ Report at Table 7, p. A-29.

14/ Report at Table 11, p. A-34.

The threat of increased imports are a substantial cause of the present serious injury to the domestic industry and threaten further serious injury

An affirmative finding in this investigation cannot be made unless there is a causal link between the increased imports and the threat of serious injury that I have found to exist. 15/ Moreover, imports must be an important cause of the industry's serious injury, and not less important than any other cause. I am required to consider all possible causes of the domestic industry's injury, and such an analysis also aids in determining the most appropriate relief available to the Commission to remedy properly the industry's injury.

I have considered and weighed each of the following causes of injury in reaching my determination: (1) the increasingly noncompetitive cost structure of U.S. producers; (2) an unusual short-term (cyclical) decline in demand; (3) a long-term (secular) decline in demand; and (4) imports. In my analysis of how imports have caused or threaten to cause injury, I have examined three separate factors: (a) the effect of the recent increase in imports, (b) the effect of recent changes in global demand, and (c) the effect of recent changes in global supply.

15/ Section 201(b)(4).

(1) Increasingly noncompetitive cost structure 16/

A major argument proffered by the parties in opposition to a recommendation of relief for the domestic copper industry is that the much higher costs of production of U.S. copper producers is a cause of injury more important than the recent increase in imports. 17/ Indeed, when total average operating costs per pound of refined copper are calculated for U.S. producers and all other foreign producers, the difference is about 23 percent. 18/ Most U.S. producers need a price of 80 to 95 cents to cover costs, 19/ while copper producers in Chile, the major source of imports, require a price of only 45-50 cents per pound to break even. 20/

16/ The purpose of section 201 is to permit an industry seriously injured by imports to obtain a temporary period of shelter in order to reduce its costs or otherwise adjust to import competition. While the import relief I have recommended to the President will not enable the industry to overcome permanent cost disadvantages, it should also be noted that, under this statute, comparative disadvantage does not preclude an affirmative determination. However, as petitioners point out (posthearing submission at Appendix P), it is a factor which is relevant to my consideration of an appropriate remedy.

17/ Codelco's posthearing brief at 43-45; 45-93; Copper and Brass Fabricators prehearing brief at 6-8; Minpeco's prehearing brief at 7-17; Zambian prehearing brief at 12-18; Papua New Guinea posthearing submission at 5. Petitioner's posthearing brief at 46, 69-77 and petitioner's posthearing submissions, Appendices A and J.

18/ Report at A- 75 . In 1981, the average cost per pound of refined copper from the mine to the refinery was $1.01 for U.S. producers. The comparable price for foreign producers is $0.82.

19/ This figure is estimated by George Munroe of Phelps Dodge in interview regarding "The Bid to Cut Copper Imports," New York Times, Tuesday, June 19, 1984. Petitioners estimate U.S. producers' average costs of production to be $0.82 in 1983. Petitioner's posthearing brief at 72.

20/ Chart II of Codelco's prehearing brief.

The principal reason for this disparity lies in the poorer quality of U.S. ore. Since the average grade of U.S. copper ore is 35 percent below the average grade in foreign countries, U.S. copper mines, to yield the same quantity of copper, must mill and concentrate more than half as much ore as their foreign competitors. 21/ Relative costs for U.S. producers will continue to increase over the coming decades, and by the year 2000, it is projected that the amount of ore that will have to be mined and milled to produce a pound of refined copper will further increase by one-half. 22/

The low quality of U.S. copper ores are clearly a primary reason why U.S. producers are less competitive than foreign copper producers. However, this cost disadvantage is not a new problem for U.S. producers. U.S. ore grades have followed a declining trend for years, 23/ and must be considered a long-term structural factor, unrelated to the industry's relatively recent injury.

21/ Report at A-71. U.S. milling costs are 55 percent above the average in foreign countries, and almost all of this difference is attributable to the lower grade of domestic ores.

22/ Ibid. It is probable that the richest near-surface copper deposits in the United States, with the exception of Alaska, have already been found.

23/ Ibid. In the 1920s, ore grade was measured at 2 percent; in the 1980s, .65 percent. In the year 2000 ore grade is projected to fall as low as .45 percent.

Although many of the industry's higher costs are attributable to low ore grade, we examined each of the domestic industry's cost components to determine whether these costs have risen during the most recent representative period beyond their structurally high level. We determine that while some of the industry's costs have increased over the period of investigation, these increases have for the most part been gradual rather than sudden, and are less important explanations of the large financial losses and other injury experienced by the industry over the past three years. Moreover, domestic producers have recently succeeded in reducing significantly their costs of production per pound of copper. 24/ Thus, any increases in some individual cost components were apparently offset by declines in other costs, or by an overall decline in production which lowered unit costs. 25/ Therefore, an increasingly noncompetitive cost structure has not caused and does not threaten to cause serious injury to this industry.

24/ See petitioner's posthearing brief at pp. 71-77. Data submitted by petitioner indicated that in 1983 the average U.S. cost of production was 82 cents per pound of copper compared to 88.4 cents in 1979.

25/ The most inefficient mines are closed first during slack periods, thereby raising the efficiency of the industry as a whole. This trend must be balanced against the general tendency for productivity to decline as production declines.

Labor costs -- Wage costs per worker to U.S. copper producers increased an average of 10 percent annually from 1979-1983. This is primarily because hourly wages for copper workers increased 9.5 percent each year during the period under investigation, consistent with their trend over the last decade. 26/ Annual compensation paid to production and related workers similarly increased 47 percent from 1979 to 1983. Total labor expenditures, however, declined 33 percent from 1981 to 1983, as the number of copper workers employed by the industry declined. Thus total labor costs fell over the period of investigation despite the increase in wage rates.

Environmental costs -- The cost to U.S. firms of compliance with government regulations required to improve and maintain environmental quality or to insure worker health and safety increased significantly over the course of the investigation as a share of capital expenditures. 27/ This cost component did recently become a more significant portion of capital expenditures and total costs, and did in fact rise, mostly in 1982 and 1983, when the industry's injury was greatest. However, at most, the increase in environmental

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26/ Report at A- 76. Average hourly earnings increased from $10.33 in 1973 to $14.92 in 1983. This increase is not substantially higher than the average annual hourly wage increases of construction workers (6.4 percent) and manufacturing workers (7.2 percent).

27/ The increase was 17.1 percent of total capital expenditures in 1979 to 46.2 percent in 1983. See Report at A- 44 Table 19. It should be noted that capital expenditures fluctuated, over the course of the investigation, and declined overall.

costs had a 6-cent price effect on the cost per pound of copper from 1979 to 1983. 28/

Energy costs -- Energy costs for U.S. copper producers increased in both absolute terms and as a share of total copper production costs from 1979-1983. 29/ Electrical costs increased over 15 percent between 1977 and 1981, and natural gas prices have doubled since 1978. Moreover, this cost component has been relatively unaffected by recent declines in production because long-term contracts between U.S. copper producers and utilities result in continued significant energy costs even when facilities are shut down. 30/

Decline in Domestic Copper Consumption 31/

Because copper consumption in the U.S. is strongly related to the business cycle, and is also affected by technological developments in copper consuming industries and industries employing substitute products, most parties addressed the question of whether a cyclical or secular decline in copper demand was primarily responsible for the industry's

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28/ Petitioner's estimates of the impact of the 1979-1983 increase in environmental costs on the cost per pound of copper from 1979-83 range from 1.3 cents to 6.2 cents. See petitioner's posthearing brief at 76.

29/ See Report at A-75-76.

30/ See petitioner's posthearing brief at 77.

31/ This discussion relates only to domestic consumption, and not to the role played by U.S. demand in the decline in global consumption. See discussion of world demand, infra.

injury. 32/ I considered these causes individually, and found that while each contributed to the problems currently confronting the industry, their impact on the industry's performance was indirect during the period of the industry's serious injury.

(2) Unusual short-term (cyclical) decline in demand -- Since 1973, when copper consumption peaked, consumption has trended downward at an average annual rate of 1.6 percent. 33/ However, within this overall decline several peaks and troughs which have occurred coinciding with the cyclical performance of durable manufactured goods. 34/ Consumption dropped by over one-third from 1973-75, and then increased annually until 1978. Consumption declined again between 1978 and 1980 by about 15 percent. After an increase in 1981, consumption once again declined 18 percent in 1982. It is not apparent that the cyclical portion of the decline in consumption of copper during the last recession was particularly unusual. Furthermore, it is curious that there has been no improvement in the industry's

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32/ Codelco's posthearing brief at 12, 15-16, and statement of Robert S. Pindyck; Copper and Brass prehearing brief at 5-6, 9-10; Canadian prehearing brief at 9-10; Minpeco's posthearing brief at 2-9, prehearing brief at 7-17; Zambian prehearing brief at 12, Zambian posthearing brief. Petitioner's posthearing brief at 29-34, 46, 57-65, 66-67.

33/ See Report at A-69 . Refined copper consumption has decreased at an average annual rate of 3.5 percent.

34/ See Report at A-68 , Figure 8.

condition to match the increase in copper consumption which occurred in 1983, 35/ coincident with a general economic recovery. I must, therefore, conclude that unusual cyclical changes in demand have not played an important role in contributing to the domestic industry's injury. 36/

(3) Long-term (secular) decline in demand -- Although demand for copper has experienced fluctuations related to the business cycle, copper consumption has never recovered from the severe recession of 1974-75 and the increase in energy prices that occurred after the 1973 oil crisis. Copper intensity 37/ has declined and is projected to decline in all major consuming industries, 38/ primarily because of technological changes and a heavy emphasis on energy efficiency. 39/ Product substitution has also affected copper demand as aluminum has

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35/ U.S. copper consumption increased 7.5 percent in 1983. See Report at A-54.

36/ See discussion regarding unexpected cyclical declines in demand in Stainless Steel and Alloy Tool Steel, Inv. No. TA-201-48, USITC Pub. No. 1377 (May 1983).

37/ Copper intensity is the consumption of copper per unit of consuming industry output.

38/ See Report at A-69. In 58 of the 77 industries which are end-users of copper, the ratio of copper consumption to constant dollar shipments declined over the period 1972 to 1980. The intensity of demand for copper fell 40 percent between 1964 and 1982 in copper's largest market -- the electrical and electronics sector. See Minpeco's posthearing brief at 8.

39/ Such technological improvements affecting long-term demand for copper are the use of satellites and fiber optics in telecommunications, and the replacement of copper intensive wires and resistors with semiconductors. Energy savings have come from a reduction in the quantity of copper used per unit in refrigeration and heating equipment, and in the downsizing of automobiles. See Report at A-69.

replaced copper in air conditioners and heat exchangers, and as other metals have taken copper's place in coinage. 40/

The secular decline in demand for copper is therefore clearly a cause of injury which has had and will continue to have a long-term effect on U.S. copper firms. However, while it is a major problem facing this industry, it is not a major reason for the industry's injury since 1981.

Thus, factors related to comparative advantage and the cyclical and secular decline in U.S. demand have indeed influenced the recent performance of U.S. copper producers, but U.S. producers have been exposed to these factors for at least a decade, and their impact has not been unusual or unforeseen.

(4) Imports, World Demand, and World Supply -- Although there is a distinct market for copper in the United States, the price in the U.S. market is largely determined by global forces of supply and demand. 41/ U.S. producers'

40/ See Report at A-69-71.

41/ See discussion of "Prices" in Report, pp. A-56-65, particularly Figure 6 at A-64.

prices for copper are directly tied to prices on the Comex 42/ and prices on the Comex tend to move in tandem with those on the LME. 43/ The LME, in turn, reflects the interrelationship between the worldwide supply and demand for copper. 44/

What is unique about the period when the domestic industry experienced serious injury is that the price of copper has declined from its unusually high level in 1979-80 of $1.02 to less than 60 cents a pound in 1984. 45/ Not only has the price remained depressed, but it has fallen even further 46/ despite an economic recovery in the United States. 47/

42/ The New York Commodity Exchange. Prior to 1978, U.S. producers' prices were set by the major copper producers within a range above or below open market prices, at a point low enough to prevent product substitution and high enough to earn a reasonable profit. Within this range, U.S. copper producers had relative control over the U.S. price of copper. In the late 1970's, however, this situation changed when copper imports increased into the U.S. market at the lower world price. Consequently, in May 1978, Kennecott began basing its prices more directly on Comex prices. Other producers followed suit shortly thereafter. This reflected both a new lack of control by domestic producers over import levels and the worldwide nature of the copper market.

43/ London Metal Exchange.

44/ See Report at A-62-63. Other factors also influence the LME price, particularly changes in interest rates and exchange rates, price changes in other commodity markets and political factors.

45/ As measured in producers' prices. See Report at A-60, Table 26.

46/ After a brief rise to about 70 cents in March 1984, prices fell again to below their previous low level of 60 cents.

47/ Although the United States has recently experienced an economic upturn, this has not been the case throughout the rest of the world. Hence, the world price of copper has remained at its low level.

(a) The price effect of the recent increase in U.S. imports -- The ability for any one producer or consumer of copper to influence the world price is limited. 48/ Although the U.S. is both a major consumer and producer of copper, the U.S., like all other market participants, is essentially a "price taker."

However, the question nevertheless presents itself as to whether the recent increase in copper imports into the U.S. market has had a substantial effect on the world copper price, and hence the industry's injury. In fact, if the recent increase in U.S. imports were excluded from the U.S. market, the world price of copper would be relatively unaffected. 49/ Imports have not caused the world price to fall, nor have imports kept the world price at its low level.

48/ In April 1975, CIPEC (Intergovermental Council of Copper Exporting Countries, at that time, Chile, Peru, Zaire, and Zambia), was unsuccessful in its attempt to influence prices by reducing copper production by 15 percent.

49/ According to staff calculations using an increase of 150,000 tons, the effect on the world price would be between one- and two-cents.

However, increases in copper imports into the U.S. market do have some effect on the U.S. price of copper. 50/ When calculations are made of the price effect of recent import increases from all possible base periods between 1977 and 1982, the U.S. price of copper in 1983 would have been between 5 and 7 percent higher, had the increase in imports from the base period not occurred. 51/ The average price effect of increases in imports from all possible base periods between 1977 and 1982 is 5.8 percent. This is only a small part of the 30 percent decline in the world price since 1980.

Thus, we must look beyond imports to the major determinants of the world price: global supply and demand. While the world price behaves as a single phenomenon, it is in fact governed by these two independent forces. In a free market a decline in price occurs when supply exceeds demand at the previous price. Price is the variable which brings supply and demand into balance.

50/ While the U.S. price is determined by the world price, there is a slight differential between the two.

51/ This analysis and the analysis that follows concerning the price effect of changes in world demand and world supply are based on staff calculations submitted to the Commission on June 11, 1984, "Effect of Changes in World Production, Consumption and U.S. Imports on the Price of Copper."

(b) The price effect of recent changes in world demand -- World copper consumption fell during 1973-75, increased sharply during 1976-79, and then declined moderately during 1980-83. This recent decline in global copper consumption, probably attributable to a worldwide recession, has depressed the price of copper. 52/ Had this decline in the level of world consumption not occurred, prices in 1983 would have been between 3 and 6 percent higher, depending upon the base period used between 1977 and 1982 to calculate the relative consumption decline. If an average is taken for all possible base periods between 1977 and 1982, 1983 prices would have been 4.5 percent higher had no decline in consumption occurred.

(c) The price effect of recent changes in world supply -- World production of copper increased steadily between 1973-1983, at an annual rate of 1.6 percent. Had world production not increased, the world copper price would have been between 6.7 percent and 15.7 percent higher, depending on the base period chosen. If an average of each percentage effect on price is taken for all base periods between 1977 and 1982, the world price would have been an average of 11.66 percent higher, had world supply remained at its base level.

52/ Copper consumption in most developed countries has leveled off, but is increasing in developing countries.

Thus, global overproduction has had the strongest influence on the world price of copper and is the major reason the price of copper has fallen and injured U.S. producers.

Conclusion

The World Price Mechanism and the Threat of Serious Injury

Global overproduction in the world copper commodity market is the major source of the domestic industry's serious injury, since the recent increases in world supply account for the major portion of the decrease in the world price of copper over the period of investigation. A decline in world demand has also been an important factor. Furthermore, recent increases in imports into the U.S. market have had some price suppressing effect on the U.S. copper price. 53/ But the injury to U.S. producers results from the fact that they have

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53/ It is this price effect of increased imports that I have sought to remedy in my recommendation of relief. See p. 47, infra.

no choice but to follow the depressed and declining world price of copper lest they face a flood of imports at a lower world price. 54/

Indeed, the fact that world supply has had a greater effect on the world price of copper than the recent increases in imports in the U.S. market helps explain the curious absence of a correlation between changes in the level of imports and changes in U.S. copper prices over the past several years. For instance, imports doubled from 1979 to 1980, yet the price rose 10 cents per pound. In 1981, imports fell over 20 percent, yet prices also fell 17 cents. In 1982 imports were stable, while the price dropped another 9 cents. In 1983 imports increased over 40 percent, yet the price rose 4 cents. 55/ The dominant world market forces also help explain why the domestic industry experienced serious injury prior to the large increase in imports in 1983.

54/ This analysis does not mean that an affirmative finding would be automatic in each case a domestic industry producing a commodity was faced with a declining world price. If other domestic factors, such as unusual cost increases, were a greater cause of injury to the domestic industry, a negative finding could be made.

55/ Comparison of Table 2 with Table 26, Staff Report at A-20 and A-60.

Global supply and demand -- not imports alone -- determine the world price of copper. 56/ And because of the nature of world commodity markets, this low world price inevitably and immediately threatens any domestic producers who do not follow it.

56/ Thus, it is possible, even when copper imports into the U.S. market fall, for the threat of increased imports to cause injury to the domestic industry by transmitting declining world prices to the U.S. Had the domestic industry brought this case before the Commission in 1982, when imports into the U.S. market were in decline, the industry would not have met the statutory requirement for imports to be increasing absolutely or relatively. The industry was nevertheless injured by the threat of increased imports at the low world price then prevailing.

REMEDY VIEWS OF

CHAIRWOMAN PAULA STERN

AND

COMMISSIONER DAVID B. ROHR

Having made an affirmative determination that increased imports are the substantial cause of the domestic copper industry's serious injury or the threat of serious injury, and having thoroughly considered all causes of this serious injury, we must recommend a remedy which will provide the most effective relief. 1/ We recommend that a tariff in the amount of 5 cents per pound in addition to the existing rate of duty is the most appropriate remedy available under the statute.

The domestic industry suffers -- and will continue to suffer -- serious injury and the threat of serious injury because it operates within the confines of a global commodity market with a world price which continues to decline to ever more depressed levels due to world oversupply and a decline in

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1/ Under section 202(d)(1) we are to
(A) find the amount of the increase in, or imposition of, any duty or import restriction which is necessary to prevent or remedy such injury, or

(B) recommend the provision of adjustment assistance under chapters 2, 3 and 4, if we determine that adjustment assistance can remedy such injury.

world demand. At the current price level, the domestic industry cannot cover costs, and has thus chosen to cut back on production. 2/ Therefore, in order for the industry to benefit from an increase in production, the price of copper must increase.

Although the key to solving the profitability problems of the domestic industry is raising the price of copper, devising a completely effective remedy to accomplish this poses a dilemma. First, the U.S. price of copper needs to rise between 25 and 30 cents per pound in order for U.S. producers just to break even. Second, global overproduction is responsible for much of this 30-cent price decline; imports into the U.S. market are estimated to have a much smaller, 5- to 7-cent price suppressing effect on U.S. copper prices. Third, should the U.S. price rise significantly above the world price, thereby creating a two-tiered market for copper, we believe imports of semifabricated products made with copper bought at the lower world price would flood the U.S. market. 3/ This process has the potential to destroy 98 percent of the demand for domestically-produced copper. This leakage through

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2/ In this condition, it is obviously unable to generate funds to move toward modernization, increase productivity and reduce costs.

3/ Because the cost of importing wire rod from Europe is about 10 cents per pound, any increase in the price of U.S. wire rod above 10 cents would create a flood of imported wire rod into the U.S. market. However, because of transportation cost variations among foreign producers, some U.S. fabricators would begin to feel the effects of increased wire rod imports when the U.S. price was only 5 cents per pound.

fabricated imports sets an absolute upper bound on the extent to which any relief program under this Act can raise the U.S. copper price above the world price. 4/ 5/

Thus, our options for a recommendation of appropriate relief are necessarily limited: we are only able to remedy the amount of injury caused or threatened by the actual imports (despite the fact that substantial injury has resulted in the most recent years from the threat of imports); 6/ and we must choose a remedy with a predictable price effect that does not futilely try to exceed the price differential at which considerable leakage ensues through fabricated imports.

4/ Any flood of imported semifabricated products would also injure U.S. copper consuming industries and encourage their relocation offshore. Since these semifabricated firms constitute 98 percent of U.S. copper consumption, this result would also harm U.S. primary copper producers by forcing dramatic cuts in production.

5/ The only extant methods of effectively insulating the U.S. market from the price vicissitudes of globally traded commodities are found in the agricultural price-support programs. These in general establish potentially huge buffers of government financed stocks. U.S. prices are carefully controlled by manipulation of the price-support levels. Even with such complex mechanisms, import relief under section 22 is provided as a back-up to protect the programs from interference. No such price support buffer exists for any non-agricultural product. Very few U.S. industrial products like copper enjoy a world commodity status.

6/ In Commissioner Rohr's view, imports are the substantial cause of injury, since, in addition to their price suppressing effect, they transmit the depressed world price into the U.S. market.

We have therefore chosen relief in the form of a tariff. 7/ While a quota would guarantee a certain level of imports and hence greater market share for domestic producers, a tariff would guarantee an immediate and certain increase in price. Because the world copper market has heretofore been an open market, with no import restrictions, we have no way of ascertaining the price effect of a quota. Petitioners estimate that the maximum effect of the quota they recommend (of 385,000 short tons) is 5 cents per pound. However, other estimates range from 2- to 20-cents per pound. Under a quota the price effect will ultimately depend on how U.S. producers and fabricators react to a copper market which is segmented from the world copper market.

Since we have determined the domestic industry can only increase or maintain its current level of production if the U.S. price of copper rises, a remedy which provides the industry with price relief, rather than guaranteed market share, seems most appropriate. Moreover, predictability is essential to an effective remedy, because of the influence of imports of downstream semifabricated products, and the long-term effect on domestic demand, and hence U.S. production.

7/ Chairwoman Stern notes that the choice of adjustment assistance, in lieu of a tariff, would not provide the industry with the most economically beneficial remedy.

A tariff also has other advantages when compared to a quota. Under a tariff, copper will always be available for a price, thus lessening the possibility of disruption of supply. This is particularly important in light of the pattern of labor strikes every third year in this industry. Because copper would always be available under a tariff, the COMEX could function normally without fear of default. Although opponents of a tariff argue that foreign suppliers are capable of absorbing the tariff and can therefore render it ineffective, we believe that absorption is unlikely to occur in this case. The U.S. price would rise above the world price by the size of any tariff. To absorb a tariff, foreign producers would have to accept a lower net price for copper sold in the United States than sold elsewhere in the world. Such behavior would run contrary to sound business judgment. There is no information on the record which suggests that foreign suppliers do not sell at the highest available price.

Thus while there is no available remedy which will solve all of the problems confronting the domestic industry, import relief can help remedy a portion of the industry's injury caused by its exposure to international copper market

conditions. 8/ To treat those unique problems confronted by this industry due to the imbalance in the world commodity market, a world commodity agreement, or other negotiated arrangement would directly address the industry's preeminent problem: world oversupply.

8/ Commissioner Rohr notes that the magnitude of injury facing the copper industry results from a variety of interrelated factors, i.e., world oversupply, depressed demand, U.S. costs of production, imports, and others. Our recommendation, however, relates to the single major problem facing the industry: imports. It is estimated that five years of increased prices through tariffs should offer the domestic copper industry increased revenues and an opportunity to invest to improve efficiency, lower unit production costs and assist the industry in adjusting to import competition.

INJURY AND REMEDY

VIEWS OF VICE CHAIRMAN SUSAN LIEBELER

A. Introduction

The purpose of the import relief sections of the Trade Act of 1974 is found in the first sentence of section 201. It is to "facilitat[e] orderly adjustment to import competition." Congress in drafting the statute was aware of our treaty obligations under the General Agreements on Tariffs and Trade (GATT), the sorry history of retaliatory tariffs in the 1930's, and the delicate nature of our relations with our trading partners. The system of agreements under GATT has led to a progressive decline in import barriers. It is clear that section 201 was not intended to protect domestic industries from the rigors of the marketplace. Congress was aware that Americans as a whole would be better off under a system of free trade than otherwise. If the primary purpose of section 201 were to insulate domestic firms from foreign competition, Congress would have enacted a different statute. 1/ Industries, and firms within those industries, are always under attack from competitors. Our economy is based on the principle that competition, whether domestic or foreign, increases efficiency and enhances consumer welfare.

1/ Presumably, such a statute would provide permanent rather than temporary relief to any domestic firm being injured by imports. The statute would require neither serious injury nor that imports be as large a cause of the injury as any other cause. Also the statute would not require that imports be increasing.

GATT, along with sections 201-203, permit the President to provide a temporary escape for a domestic industry under a narrow set of circumstances, and for a specific purpose. Section 201 is not intended as a general protectionist measure designed to shift wealth from consumers to producers.

B. The Domestic Industry

Congress has charged the Commission to determine whether a domestic industry is being seriously injured or threatened with serious injury by rising imports. Section 201 defines a domestic industry as one "producing an article like or directly competitive with the imported article." Though there may be cases where much hinges on the question of industry definition, this is not such a case. I concur with my fellow Commissioners in defining the domestic industry to include the productive resources used to refine blister copper and produce blister copper from copper ores, concentrates and scrap.

C. Increased Imports

The threshold question in every section 201 case is whether imports have increased in absolute amount. If not, the Commission must make a negative determination. The statute requires that the Commission "determine whether an article is being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof . . ." . 2/

2/ 19 U.S.C. section 2251(b)(1)(1982)(emphasis added). The increased quantity requirement may be satisfied by increases in volume or, in appropriate cases, by increases in the value of imports.

While several Commission opinions contain language suggesting that the 'increased quantities' requirement can be satisfied by an increase in the relative market share of imports, 3/ the clear language of the statute is to the contrary. 4/ When Congress wanted the Commission to consider the share of imports relative to domestic production, it used precise language to convey its intent. 5/ Once an absolute increase in imports has been found, the Commission can examine both the absolute and the relative amount of the increase to determine whether the increased quantity of imports has been a substantial cause of serious injury. In requiring that imports be increasing in quantity, and not simply in relation to domestic production, Congress delicately balanced domestic and foreign policy considerations. This Commission may not substitute its judgment for that of Congress.

3/ See, e.g., Stainless Steel and Alloy Tool Steel: Report to the President on Investigation No. TA-201-48, USITC publication 1377, 1983, p. 16; Sugar: Report to the President on Investigation No. TA-201-16, USITC publication 807, 1977, p. 11.

4/ Former Vice Chairman Michael B. Calhoun has recently stated that his prior interpretation of "increased quantities" was erroneous and that §201 requires imports to increase absolutely. Import Relief for the U.S. Non-Rubber Footwear Industry: Hearing Before the Subcommittee on International Trade of the Senate Committee on Finance, 98th Cong., 2d Sess. (June 22, 1984) (Statement Michael B. Calhoun, former Vice-Chairman, ITC).

5/ For example, Congress directed the Commission to consider both relative and absolute increases in imports in determining substantial cause. In subsection 201(b)(2)(C), Congress directed that:

> the Commission shall take into account all economic factors which it considers relevant, including (but not limited to)
>
> * * *
>
> (c) with respect to substantial cause, an increase in imports (either actual or relative to domestic production) and a decline in the proportion of the domestic market supplied by domestic producers.

19 U.S.C. section 2251(b)(2)(c)(1982)(emphasis added).

Imports of copper have increased within the meaning of section 201. In absolute terms, 1983 imports of blister copper exceeded their 1979 levels by almost 24,000 short tons, or 88 percent. Similarly, 1983 imports of refined copper exceeded their 1979 levels by almost 282,000 short tons, or 125 percent.

D. Serious Injury

No relief can be granted to the copper industry unless it has been seriously injured by the increased imports. The initial question is whether the serious injury must be to the existence of the industry, or the economic well-being of those who provide the factors of production to the industry (i.e., labor and capital). It is my opinion that it is appropriate to consider injury to the viability of the industry, rather than injury to the returns earned by labor and capital.

The difference in the injury can be illustrated by examining the effect of increased imports on two hypothetical industries, A and B. Assume that the labor and capital ("the factors of production") in Industry A can readily be moved to other uses without significant losses. Assume that the productive factors in Industry B cannot readily be moved to other uses. Assume also that rates of return in each industry are at competitive levels.

An increase in imports lowering the price of the output from these industries would have quite different effects. Any decrease in the wage rate of labor or in the return on capital in Industry A would cause these factors of production to move rapidly to their next best alternative use. The result is that Industry A would disappear quickly. Workers will find alternative employment at comparable wages and suppliers of capital will shift their investment from one industry to another by either moving the machinery itself

(we have assumed the machinery is not product-specific) or selling the machinery and reinvesting their capital. Thus, neither suppliers of capital nor suppliers of labor will be injured. However, the industry itself will disappear; this business will no longer be conducted in the United States.

A different situation will result in Industry B, where increased imports may cause a significant drop in the price of the product but only a negligible decrease in the quantity of the product supplied by domestic producers. Industry B will not shrink. The suppliers of labor and capital, however, will suffer. Because the next best use of the factors in Industry B would involve a large decrease in the return to these factors of production, labor and capital will not shift to another industry. The lack of an alternative comparable return renders these factors less mobile. Industry B might be able to remain intact for a considerable length of time, depending on the life of the capital involved and any development of an alternative use into which labor and capital may shift.

These two extreme examples illustrate a difference in the meaning of injury to the industry. In the first case, Industry A is so severely affected that it disappears, but the workers and suppliers of capital are not adversely affected. In the second case, Industry B continues to produce, but the suppliers of the capital and labor are severely injured.

Which form of injury to the industry was Congress concerned with when it enacted section 201? First, it is important to note that the statute speaks in terms of injury to the industry rather than to the participants. 6/

6/ Section 201 provides in relevant part that the Commission shall investigate whether increased imports are "a substantial cause of serious injury, or the threat thereof, to the domestic industry. . . . 19 U.S.C. section 2251(b)(1)(1982)(emphasis added).

Section 201 lists a variety of factors that the Commission is to "take into account" in determining whether a domestic industry is seriously injured or threatened with serious injury. Those factors are not offered as a definition of serious injury, but rather as evidence of injury or threat. 7/

Also the losses suffered by suppliers of labor and capital are no different than those resulting from domestic competition and they are more than offset by the gain to consumers. Therefore, there is no reason to conclude that the protection of the economic well being of those providing capital and labor was what Congress intended in enacting section 201.

It is important to focus on the unique harm posed to the nation by competition from imports -- the disappearance of a domestic industry. In deciding whether to implement import relief, the President must consider the national economic interest. In so doing, he must weigh, among other things, the importance of preservation of a domestic industry in the national economy against the cost of such relief to consumers and other industries and the amount of compensation which the United States may become obligated to pay under international agreements. 8/ Therefore, I conclude that the Commission's role is to focus on injury to the existence of an industy since it is the importance of the existing industry which the President must consider under section 202.

7/ The factors that the Commission is to consider as evidence of serious injury are set forth in Section 201(b)(2)(A) and include "significant idling of productive facilities in the industry, the inability of a significant number of firms to operate at a reasonable level of profit, and significant unemployment or underemployment within the industry..." The factors which the Commission must consider as evidence of threat of serious injury are spelled out in subsection 201(b)(2)(B) and include "a decline in sales, a higher and growing inventory, a downward trend in production, profits, wages or unemployment."

8/ See section 202, 19 U.S.C. section 2252

Using this injury analysis, I determine that the domestic copper industry has been seriously injured within the meaning of section 201. Total U.S. copper production has dropped 25.9 percent from 5.4 million short tons in 1979 to 4 million short tons in 1983. The sharpest production declines were experienced by mines and smelters which both declined between 1979 and 1980, increased in 1981, and then fell to record lows in 1983, yielding a net loss in mining and smelting production of 27.6 and 29.3 percent, respectively. Refinery output followed a similar trend with the period 1979 to 1983 representing a net loss of refined production of 21.3 percent.

Similarly, capacity utilization of mines, smelters, and refineries declined between 1979 and 1983. The decline in mining and smelting capacity utilization was accelerated in 1982 and 1983 by facility closings. Mine and smelter capacity utilization ratio dropped to ten-year lows of 59.8 percent and 56.8 percent, respectively. The capacity utilization of refineries peaked briefly in 1981 at 87.1 percent, up slightly from the 1979 level of 86.8, but then dropped to 62.0 percent in 1983.

These declines in production and capacity utilization are reflected in the domestic industry's unemployment figures. Between 1979 and 1983 the total number of employees in the domestic industry declined nearly 40 percent while total wages paid during the same period dropped 21.6 percent. Low production and capacity utilization are also reflected in the domestic industry's financial performance. Net sales decreased almost 24 percent while gross profits deteriorated from $820 million in 1979 to a loss of $523 million in 1982 and $211 million in 1983. As is evident from the factors discussed above, the domestic copper industry has been seriously injured.

E. Substantial Cause

Increased imports must be a substantial cause of the serious injury or threat thereof to the industry. Subsection 201(b)(4) defines "substantial cause" as a cause "which is important and not less than any other cause." The question is what is a separate "cause?" One must be careful not to compare a genus with a species or subspecies. It is important that one compare increases in imports with concepts of the same level of generality.

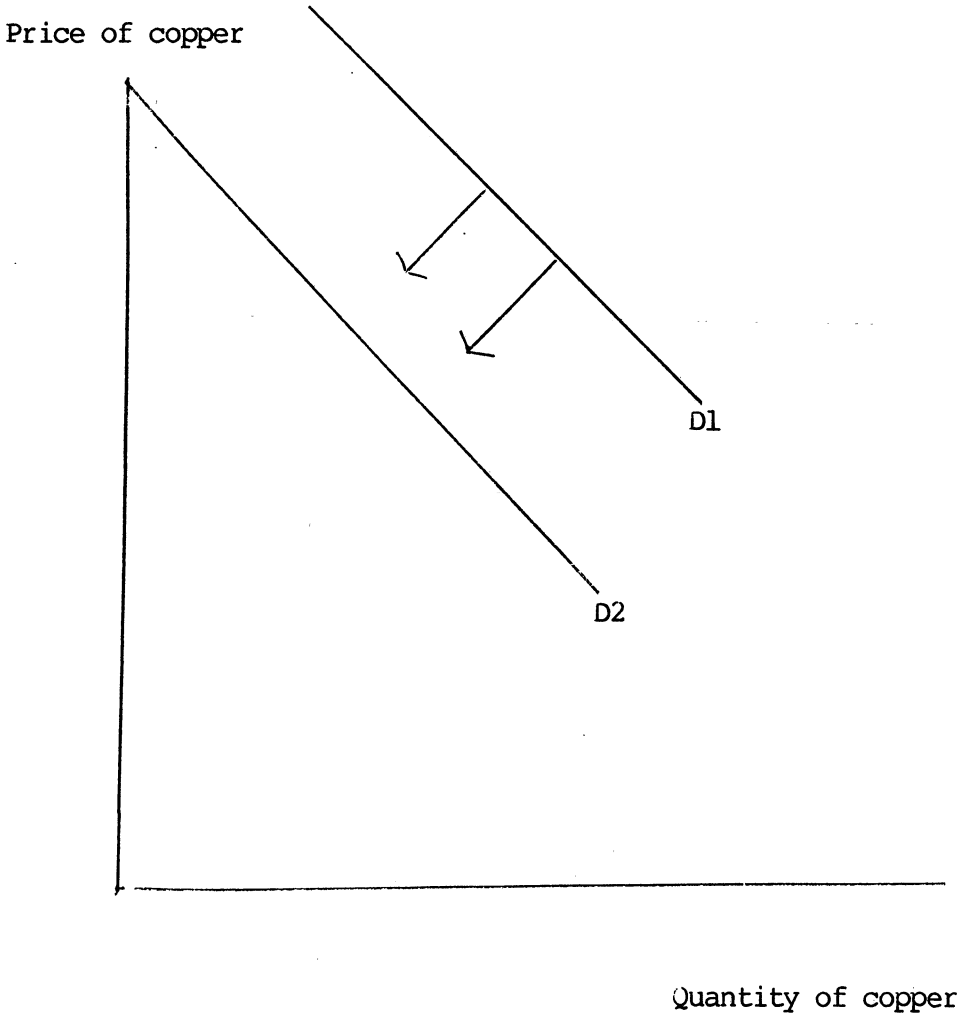
There are only three types of causes at the level of generality which can inflict injury or threat of it on the domestic industry. They are: 1) a decline in demand; 2) a decline in domestic supply; and 3) an increase in foreign supply. These changes in the market for copper can be expressed through shifts in the supply and demand curves. 9/ A decrease in domestic demand is represented by an inward and leftward shift of the demand curve [Figure A]; a decrease in domestic supply is represented by an inward and leftward shift of the domestic supply curve [Figure B]; and an increase in supply is represented by an outward and rightward shift of the foreign supply curve [Figure C].

The consequence of these adverse shifts will result in either a fall in the price that the domestic producers can charge for their product or a fall in the quantity of copper which they sell, or both.

9/ I acknowledge the help provided by the F.T.C. on this question in their informative brief.

FIGURE A

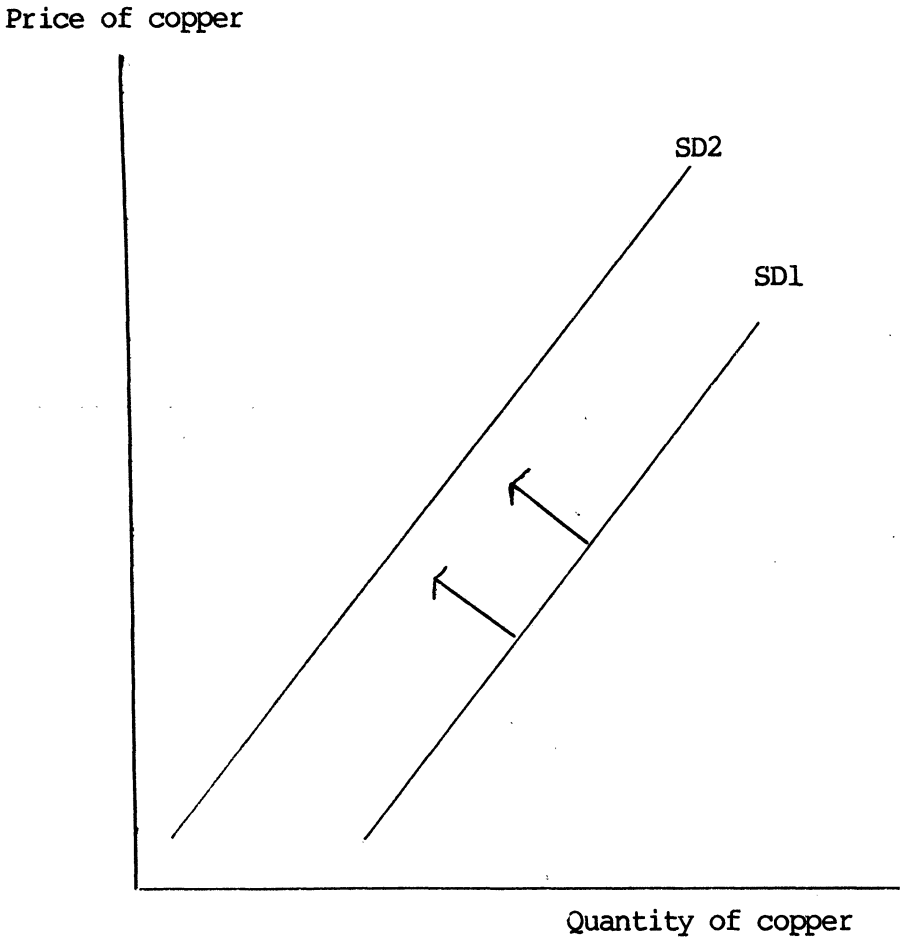
DECREASE IN DEMAND



In Figure A, D1 is a demand schedule. As one moves along the demand curve from upper left to lower right, price is falling and the quantity the market is willing to purchase increases. The movement of the demand curve inward and to the left from D1 to D2 represents a fall in demand indicating that at each price the market is willing to purchase less copper.

FIGURE B

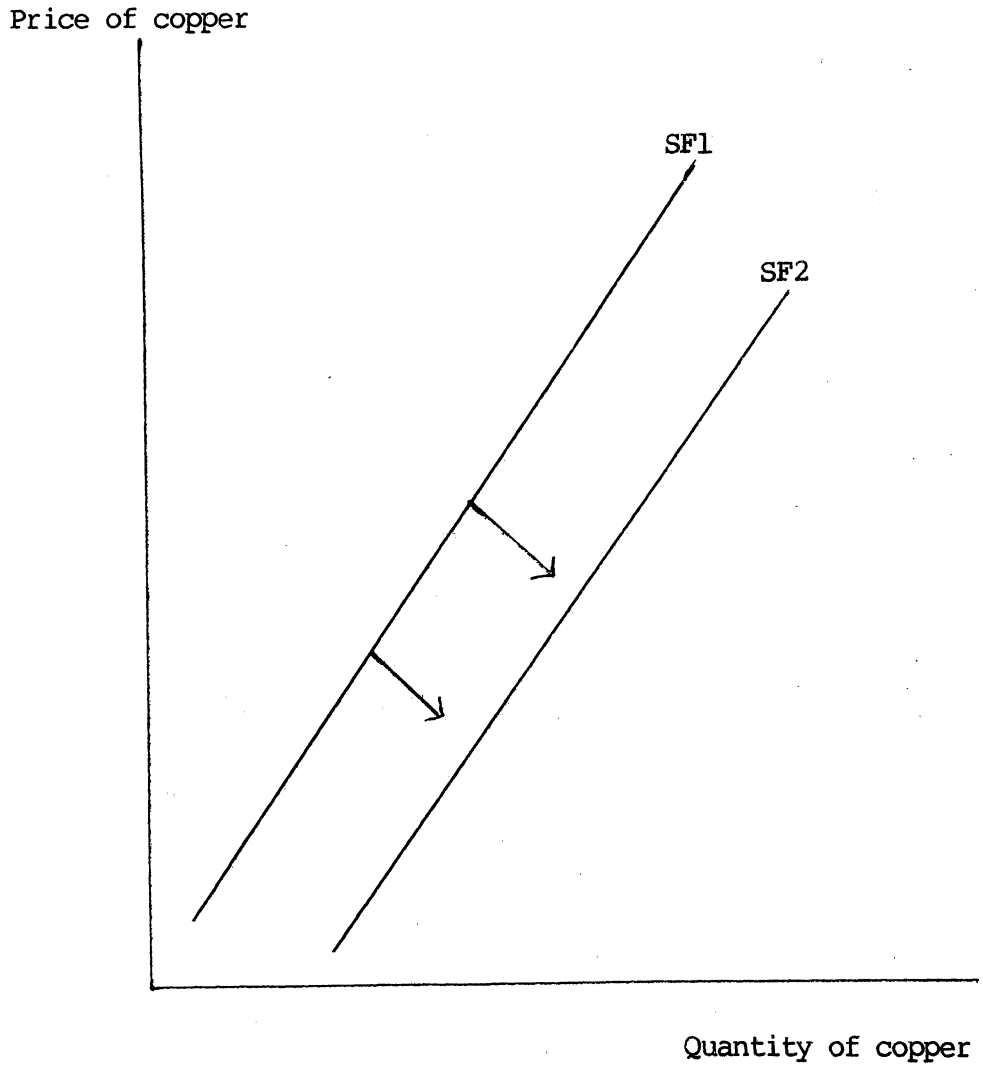
DECREASE IN DOMESTIC SUPPLY



In Figure B, SD1 is a domestic supply schedule. As one moves along the supply curve from lower left to upper right, price is rising and the domestic suppliers are willing to sell more copper. The movement of the supply curve inward and to the left from SD1 to SD2 represents a fall in domestic supply, indicating that at each price the domestic suppliers are willing to sell less copper. This downward shift in domestic supply results from an increase in the domestic producers' cost of producing their product.

FIGURE C

INCREASE IN FOREIGN SUPPLY TO THE DOMESTIC MARKET



In Figure C, SF1 is an import supply schedule. As one moves along the supply curve from lower left to upper right, price is rising and the foreign suppliers are willing to sell more copper. The movement of the supply curve outward and to the right from SF1 to SF2 represents a rise in foreign supply, indicating that at each price the foreign suppliers are willing to sell more copper.

A decline in demand simply means that at any given price less copper will be purchased. It can result from changes in tastes, technology, income, or the price of substitutes. A decline in domestic supply means that at any given price domestic producers will be willing to supply less to the market. That decline in supply may be caused by a variety of factors, including increased labor costs, increased capital costs or diminishing ore sources.

Shift in foreign supply is the cause on which the statute focuses. The presence of foreign supply and its effect on the market for the domestic product are the raison d'etre of the statute. An adverse shift, or increase, in foreign supply can occur for various reasons, including changes in foreign technology; changes in the amount of capital available; or simply from the opening of new foreign copper mines.

Shifts in foreign supply have been handled with a great deal of confusion, primarily because of an inability to understand the role of exchange rates and their effect on imports. If exchange rates change only because inflation is higher in another country than in the United States, the supply curve of copper from the foreign country will be unaffected. The foreign currency will have fallen in value just enough to compensate for the increase in the cost of that country's copper in terms of its own currency. However, a change in exchange rates can be caused by other factors; such as changes in the demand for foreign products, or changes in the demand by foreigners for American products. These types of changes will also cause changes in exchange rates as well as cause shifts in the supply curve.

If the copper industry is injured because the copper producers are selling copper at lower prices than previously, or because they are selling

less copper than they were before, this can be caused only by a shift in the demand for the goods, a shift in the domestic supply curve or a shift of the foreign supply curve. The Commission's responsibility under section 201 is to determine whether the shift in the foreign supply curve is at least as responsible for the distress of the industry as either shifts in the domestic demand curve or in the domestic supply curve.

In the domestic copper industry, all three causes of the industry's distress are present. There has been a slight decline in the U.S. demand for copper since 1973. There have been both increased labor costs and declining ore sources causing a shift of the industry supply curve to the left. This shift has been dampened by changes in technology which have operated to reduce costs. However, the single largest explanatory variable of the distress in the copper industry has been an increase in imported copper (represented by an outward and rightward shift in the import supply curve as in Figure C). Foreign producers have opened richer mines than exist in the U.S. Also, they have learned to apply more advanced technology. Thus, increased imports are a substantial cause of injury to the copper industry.

F. Remedy

The determination that increased imports are a substantial cause of serious injury to the domestic industry triggers our search for a remedy. The Commission is called upon to recommend an increase or imposition of duty or import restriction necessary to prevent or remedy the injury. Alternatively, the Commission may recommend adjustment assistance if such assistance can

effectively remedy the injury. The Commission's remedy and recommendation must facilitate an orderly adjustment of the industry to its place in a competitive world economy.

The Federal Trade Commission has provided the Commission with a well-reasoned brief pointing out the vast loss to society as a whole from the imposition of import relief in this case. This theme has been echoed by various other branches of government and by the media. Others have argued that the national defense interest of the United States would be served by granting relief to the copper industry. Section 201 does not permit the Commission to consider these factors in recommending relief.

Although the statute characterizes the Commission's views as "recommendations," they are not the considered judgment of the Commission based on a weighing of all the relevant factors. The imposition of import relief should entail a consideration of such questions as consumer welfare and national defense, and those are concerns that the statute mandates as proper for the President to consider. The Commission's mandate is far narrower. It must determine whether a domestic injury has suffered or is threatened with serious injury from imports, and what remedy, if any, is necessary to prevent or remedy the injury. Whether such a remedy would be consistent with the broader national interest is not within our province to determine. 10/

10/ If we were to have the authority to make such a judgment, however, we would be persuaded by the Federal Trade Commission brief and the other economic evidence that the loss to consumers resulting from the import relief recommended by my fellow Commissioners far exceeds any economic benefits to the domestic copper industry.

The remedy tools at our disposal are quotas, tariffs, tariff rate quotas and adjustment assistance. 11/ Each is intended as a short-term measure. The question is whether any of these tools either individually or in combination will facilitate an adjustment by this industry to import competition.

A temporary remedy, in order to be effective, must act in some fashion to cure the problem. Our problem in fashioning a remedy under the statute is analogous to someone with a torn cartilage in his knee, who could gain some relief by wearing an ace bandage for a period of time. From a long-run perspective, however, he would be worse-off. The surrounding muscle would weaken and he would be more prone to injury. Our task is not to give a temporary respite which would weaken the industry, but rather to recommend a form of relief, if one is possible, that facilitates an orderly adjustment by the industry to import competition.

The Commission has determined that the domestic copper industry is seriously injured. The major firms are losing a great deal of money; many former copper workers are unemployed; and capacity is underutilized. Each of these facts is evidence of an injury to the copper industry. In addition we have determined that an increase in imports is a substantial cause of this injury.

11/ 19 U.S.C. section 2251(d)(1)(1982).

We are now faced with the problem of crafting a form of relief which will facilitate an adjustment to import competition. In that regard, we must ask whether we can devise a remedy which will leave the industry closer to its long-run position vis-a-vis imports at the end of the relief period than it would have been otherwise.

I do not believe any such relief exists. The future condition of the copper industry is not dependent on import relief, but rather on the future cost and revenue prospects of this industry.

The copper industry has declined because of three factors: a decline in demand for copper, increased imports and decreased ability of domestic producers to supply copper at prevailing prices. The shift of the demand curve is caused by a decrease in the world demand for copper. I hesitate to make any prediction of whether and when it will shift back to the right. More to the point, shifts in world demand are beyond the control of the United States International Trade Commission. Actions which the Commission can recommend, such as imposition of quotas and tariffs, would raise the price of copper and therefore may result in a shift of the short-run demand curve and a movement along the long run demand curve to the left. Such an effect would be perverse, if the intended goal is the intermediate and long-run health of the domestic copper industry.

To the extent that the injury to the copper industry is caused by increasing costs of production (or a failure to decrease costs), this problem too will either be unaffected, or exacerbated by import relief. Protected by a tariff or quota barrier, unions in the copper industry may be even less inclined to grant labor concessions. Though there are thousands of unemployed

copper workers, and thousands of other individuals willing to work in this industry at less than the union wage, wages have not declined. If the goal is to encourage this industry and the workers employed in it to adjust to world competition, import relief would send the wrong signal to the market.

Finally we are left with the imports themselves. Paradoxically the increase in imports that we determined in the injury phase of these proceedings to be a substantial cause of serious injury to the industry, because it results from fundamental cost advantages abroad, precludes a finding of any temporary relief that will remedy the injury to the industry. 12/ What would be the expected effect on the relationship between the supply curves of foreign and domestic copper that would result at the end of a period of import relief? To the extent that we could craft a "remedy" that would raise the price of copper in the U.S. during the existence of the remedy, it would induce greater production of copper than would occur otherwise. This could result in the reopening of marginal facilities and a further depletion of the ore grade in this country beyond what would have occurred otherwise. At the end of the relief period, there would be understandably greater pressure to impose new and greater restrictions on copper imports to protect the jobs and investments of those involved with these marginal deposits.

12/ I decline to recommend adjustment assistance because the fate of the American copper industry is so dependent on shifts in world demand. Three years ago this industry was making money. It is quite possible that as the world economy follows that of the U. S. out of the recession, the domestic copper industry will recover.

The injury to this industry is not a temporary aberration that short-term import relief measures can prevent or remedy. Since I can recommend no relief that will "facilitate an orderly adjustment to import competition," I recommend that the President impose no additional import relief and allow this industry to take its normal course, whatever that may be.

G. Tariffs versus Quotas

Since my fellow Commissioners are evenly divided on the question of whether tariffs or quotas are preferable, I will provide my views on that question.

Economists generally agree that tariffs are usually less harmful than quotas. Tariffs generally provide the same benefit to a domestic industry at a smaller cost to the rest of society than a quota, 13/ in part because tariffs do not result in a windfall to foreign producers. 14/ In addition to the general superiority of tariffs over quotas, there are particular reasons to favor a tariff in this case.

There are peculiar adverse effects that can result from a quota or poorly chosen tariff when a product is used "downstream" by other domestic producers. Copper becomes more valuable per pound after it has been further

13 As the Federal Trade Commission in its brief has pointed out, the social welfare loss of a quota is considerably greater than that of a tariff, while yielding the same benefit to the industry.

14/ This windfall results from the fact that quotas or orderly marketing agreements permit foreign producers to sell less on the American market at a higher price. This higher price results in a pure wealth transfer from American consumers to foreign producers. A tariff would not result in such a wealth transfer. Neither would a quota assigned by the United States to importers by auction. In either of these latter circumstances, the wealth transfer from consumers would go to the U. S. Treasury instead of to foreign producers.

processed. For that reason, transportation costs are even less significant in importing semi-fabricated and fabricated copper products than importing blister and refined copper.

There is vigorous competition among foreign and domestic brass and wire mills who are not part of the domestic industry in this proceeding. If domestic copper prices rise more than five cents per pound above the world price, it appears that American brass and wire mills would not be able to withstand foreign competition. Many would be driven out of business. This would further diminish the market for the domestic copper producers who sell 98 percent of their output to these mills.

A quota on copper could benefit copper producers only by raising prices at which they can sell their copper. A quota that raises the price of domestic copper less than five cents per pound would be less helpful than a five cent per pound tariff. A quota which causes the domestic price of copper to exceed the world price by more than five cents per pound would adversely affect domestic producers of fabricated and semi-fabricated products, driving some out of business, and thereby decreasing the domestic demand for refined copper.

Thus, in addition to the general efficiency and wealth transfer advantages of a tariff over a quota, in the instant case a tariff is also a much more subtle and precise tool. Therefore, although I do not recommend the imposition of either a tariff or a quota, I conclude that if the President decides to impose one or the other, a five cents per pound tariff would be less harmful.

INFORMATION OBTAINED IN THE INVESTIGATION

Introduction

On January 26, 1984, the United States International Trade Commission instituted investigation No. TA-201-52, under section 201(b)(1) of the Trade Act of 1974 (19 U.S.C. 2251 (b)(1)), to determine whether black copper, blister copper, and anode copper, provided for in item 612.03 of the Tariff Schedules of the United States (TSUS), and unwrought copper, other than alloyed, provided for in TSUS item 612.06, are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industry producing articles like or directly competitive with the imported articles.

The investigation was instituted following receipt of a petition filed on behalf of Anaconda Minerals Co., ASARCO Inc., Copper Range Co., Cyprus Mines Corp., Duval Corp., Inspiration Consolidated Copper Co., Kennecott Corp., Magma Copper Co., Phelps Dodge Corp., Pinto Valley Copper Corp., and Ranchers Exploration & Development Corp. On April 30, 1984, Copper Range Co. informed the Commission that it was financially unable to continue as a petitioner to the investigation and was therefore withdrawing from the investigation.

Notice of the institution of the investigation and the scheduling of a public hearing to be held in connection with the investigation was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, D.C., and by publishing the notice in the Federal Register of February 15, 1984 (49 F.R. 5842). 1/ A public hearing was held on May 15-17, 1984, at which time all persons were afforded the opportunity to be present, to present evidence, and to be heard. 2/

Past Section 201 Investigation

In 1978, the Commission conducted an investigation on unalloyed, unwrought copper under section 201 of the Trade Act of 1974. In that investigation (No. TA-201-32), 3/ the Commission determined that unwrought copper, other than alloyed, provided for in TSUS item 612.06, was being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industry producing an article like or directly competitive with the imported article. To remedy the serious injury found to exist, the Commission recommended that the President impose quantitative restrictions on imports of unwrought copper in the amount of 300,000 short tons per year for the 5-year period beginning January 1, 1978. On October 20, 1978, the President announced that the granting of import relief to the U.S. copper industry would not be in the national economic interest of the United States. Therefore, the Commission's remedy recommendation was not imposed. 4/

1/ A copy of the Commission's notice is presented in app. A.

2/ A calendar of witnesses who appeared at the public hearing is presented in app. B.

3/ Unalloyed Unwrought Copper: Report to the President on Investigation No. TA-201-32 under Section 201 of the Trade Act of 1974, USITC Publication 905, August 1978.

4/ A copy of the President's determination is presented in app. C.

The Products

Description

The products which are the subject of this investigation are black, blister, and anode copper, and unalloyed, unwrought refined copper. Black, blister, and anode copper are names given to products produced during the smelting phase of copper production. Black copper is the impure, metallic copper produced in blast furnaces using oxide ores or roasted sulfide material. It generally contains 1 to 3 percent sulfur and several percent iron, lead, and other impurities. Blister copper is an impure, intermediate copper product produced by blowing copper matte in a converter, the name being derived from the large blisters on the surface that result from the liberation of sulfur dioxide and other gases. Anode copper is a special-shaped copper slab, resulting from the processing of blister copper in a reverberatory furnace, used as anodes in electrolytic refinement. For the purposes of this report, black, blister, and anode copper will hereinafter be referred to as blister copper, since blister is the most widely traded commodity of the three. Commercial grades of blister copper generally contain over 98 percent copper.

Unalloyed, unwrought refined copper contains 99.9 percent or more copper and is produced in forms such as cathodes, wirebars, continuous cast rods, billets, and cakes. 1/ It is frequently classified according to the method by which it is refined, i.e., fire-refined copper, and electrolytic or electrowon copper.

Fire-refined copper is produced from crude copper by a pyrometallurgical process. Some grades of fire-refined copper can be used for electrical conductors, but most is used for alloying. Most electrolytic copper is produced by the electrolytic anode-to-cathode transfer of metal through a copper sulfate solution. The impurities in the anode copper dissolve but remain in the solution or precipitate and collect on the bottom of the electrolytic cell. Electrowon copper is formed by electrodeposition of copper onto a cathode from an acid copper solution which has been obtained by first leaching copper concentrate and then increasing the copper concentration in the leachate by solvent extraction.

Production processes

Although the petition in this investigation focuses on injury to the domestic industry producing primary copper (copper produced from ore) (fig. 1), there is another important source of copper, that which is recovered by recycling scrap (secondary copper). Since secondary copper is a perfect substitute for primary copper in most applications, a brief discussion of the production processes for both types of copper follows.

1/ Cathodes represented 82 percent of all refined copper sold in the United States in 1983. Cakes and slabs accounted for 6.5 percent; wirebars, 2.3 percent.

THE WORLD COPPER INDUSTRY

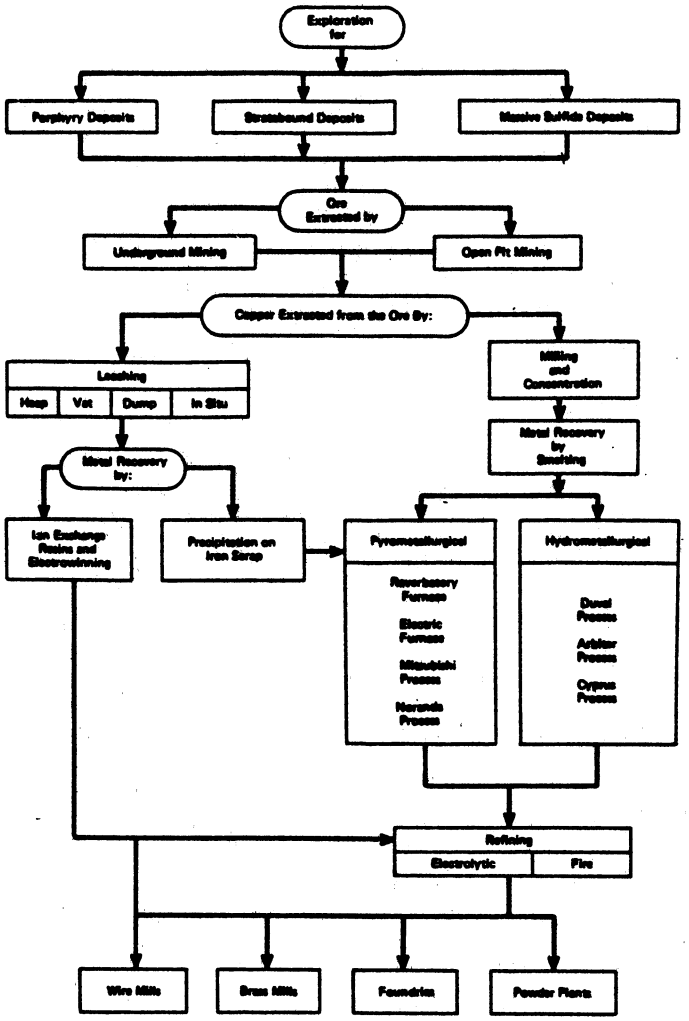


Figure 1.--Technology of primary copper production.

Source: Raymond F. Mikesell, The World Copper Industry, 1979

Primary copper

The four principal production stages of the primary copper industry as shown in figure 2, are (1) mining, in which ore is extracted from the ground either by underground operations or from open pits; (2) milling, which includes crushing and grinding the ore and removing the bulk of the waste material to produce concentrates and mattes which may contain 20 to 40 percent copper; (3) smelting, which involves feeding the concentrate into furnaces from which flow molten material (blister) that is about 98.5 percent copper; and (4) refining, either by an electrolytic process or by a pyrometallurgical process, with the former process yielding somewhat higher purity. The last two stages have been combined in some of the new chemical smelting-refining processes. Most of the world's primary copper is electrolytically refined.

Mining.--Copper, contained in various minerals, is widely distributed in nature; however, only a few copper-bearing minerals are important commercially. There are only a few large copper-producing areas, several of which have been developed only in recent years. The most important of the commercial copper minerals are sulphide and oxide compounds, approximately 80 percent of which lie in porphyry or strata-bound deposits. Open-pit mining methods, accounting for approximately 90 percent of the ore and about 82 percent of the recoverable copper in the United States, allow the successful development of low grade porphyry deposits. These methods include blasthole drilling; stripping by pit-slope engineering techniques; materials handling--moving ore and overburden by self-propelled scalpers or crushers, conveyor belts, or electric mining shovels; and haulage to mill by large trucks or rail. Underground mining methods involve shafting and tunneling, drilling and blasting for extraction purposes, block caving, delivery to shafts, and subsequent surface transportation by hoisting to ground level.

Milling.--This process concentrates or beneficiates the mined copper so that the resulting material has the higher metal content needed for smelting. The procedure usually involves crushing, grinding, and classification of the resulting material. Further treatment depends on the type of ore being handled. If sulphides predominate, flotation (chemicals condition certain minerals to separate and adhere to air bubbles and thus to float) is employed. If oxides predominate, a combination of flotation and leaching (separation of copper from other minerals using sulfuric acid) processes are used.

Smelting.--The separation of copper from the other metals and waste associated with it in the concentrate is accomplished by smelting. Roasting of the concentrate is sometimes performed initially in order to regulate sulphur content and promote efficient melting. Next, roasted and unroasted materials are melted to form a slag containing copper and a mixture of sulphur, base metals, and precious metals. This material is then converted (impurities are oxidized) to eliminate the sulphur and iron contents. Smelting is accomplished by several different methods: standard reverberatory furnace, flash furnace, or electric furnace; Pierce-Smith converter, Hoboken converter, or top-blown rotary converter; the Noranda process (a single continuous operation which combines the smelting and converting steps); and the Mitsubishi process (produces copper directly and continuously in three furnaces interconnected by a gravity flow and eliminates the converter aisle). The blister copper produced by the smelting process contains impurities which must be removed before the material can be used for fabricating.

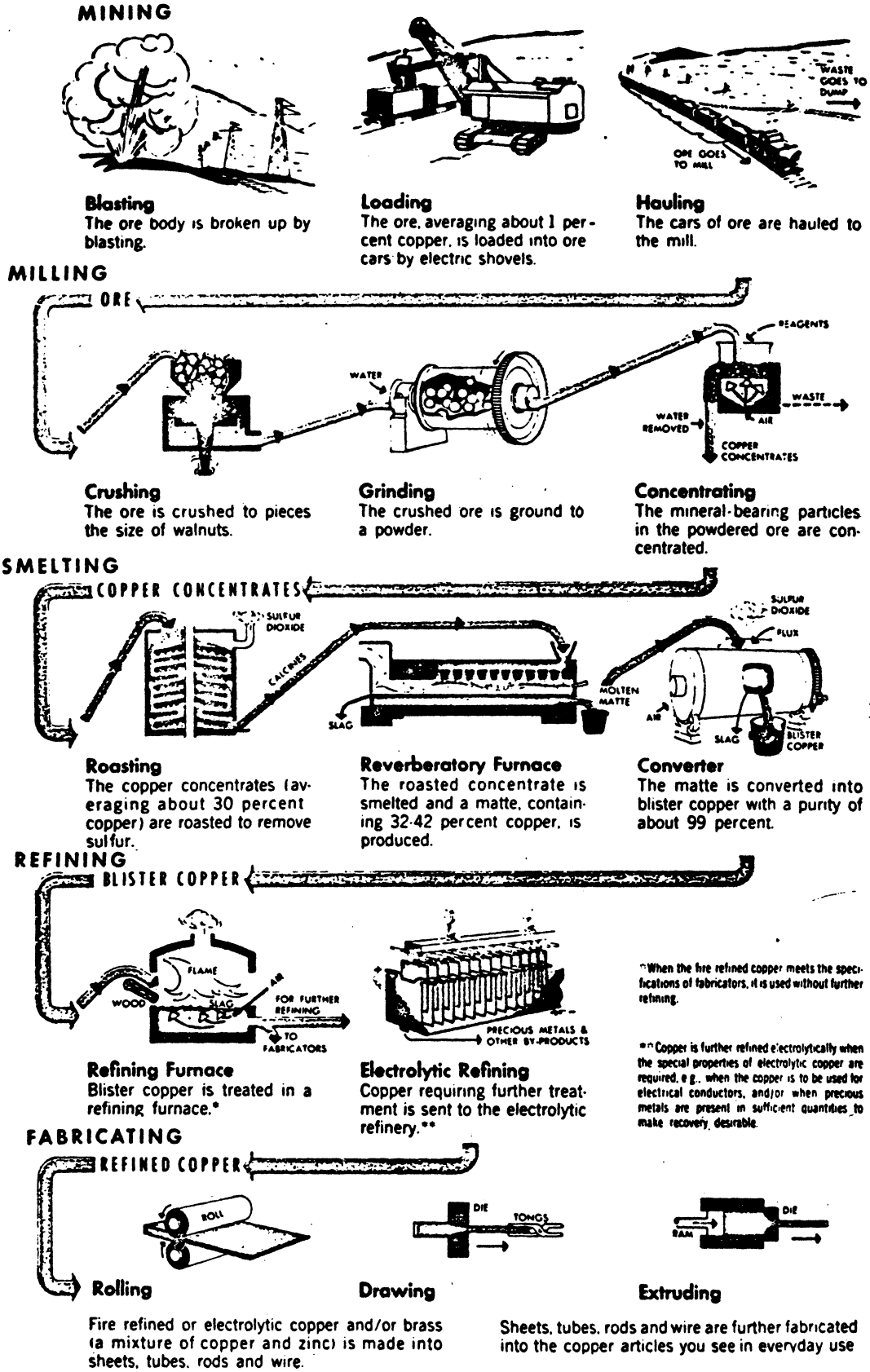


Figure 2—Basic Steps—Copper Ore to Finished Product.

Source: Kennecot Copper Corp.

Refining.--The final removal of impurities is accomplished either by refining the material in a fire-refined process, by electrolysis, by electrowinning, or by a chemical process. This step results in nearly pure (99.9 percent) copper which is ready for conversion into a semifinished or finished product.

Secondary copper

Refined copper may also be produced from copper scrap, which can be of any of several grades ranging from virtually pure copper to alloys with a relatively low copper content. Copper produced from scrap is referred to as secondary refined copper, but its quality may be just as high as that of copper produced from newly mined ore. The inputs to the industry are either new scrap generated in plants producing copper mill products or manufacturing finished copper products; or old scrap consisting of copper articles discarded at the termination of their useful life. Ingotmakers and secondary smelters convert copper and copper alloy scrap into refined copper and brass ingots. Ingotmakers lack the physical plant to upgrade low grades of scrap. They are basically remelters and adjust the composition of scrap they consume by diluting it with virgin copper or high-grade scrap. In 1983, secondary copper accounted for 25 percent of total refined copper produced in the United States.

U.S. tariff treatment

Tariff provisions and duty rates applicable to copper and copper products are found in part 2, subpart C, and part 3, subpart C, schedule 6 of the TSUS. U.S. imports of unwrought blister copper are entered under TSUS item 612.03, and U.S. imports of unwrought refined copper are entered under item 612.06. 1/ Item 612.03, covering black copper, blister copper, and anode copper, is divided for statistical reporting purposes into three numbers (annotations): Tariff Schedules of the United States Annotated (TSUSA) item 612.0330 for the dutiable copper content, 612.0360 for the gold content, and 612.0380 for the silver content. TSUS item 612.06, covering other unwrought copper (except cement, precipitate, black, blister, and anode copper and nickel silver), is divided for statistical purposes into three numbers (annotations): TSUSA item 612.0610 for beryllium copper, 612.0630 for other alloyed unwrought copper, and 612.0640 for other unwrought copper (unalloyed unwrought copper or refined copper). The scope of this investigation, as defined by the petitioners and the Commission's notice of investigation, does not include TSUSA item 612.0610, beryllium copper, a high-value copper alloy, used for only limited applications, or TSUSA item 612.0630, other alloyed copper.

1/ The U.S. Customs Service is currently studying the question of the appropriate classification of fire-refined copper (primarily from Chile). The options are to continue its classification in TSUS item 612.06 or to reclassify it in TSUS item 612.03, with item 612.06 to be used for electrolytically refined copper only.

The column 1 rates of duty 1/ applicable to copper were negotiated during the 1979 Tokyo round of the Multilateral Trade Negotiations (MTN); the resulting concessions, in the form of staged duty reductions, apply to imports from those countries having most-favored-nation (MFN) or column 1 status; under TSUS item 612.06, preferential rates were afforded to least developed developing countries (LDDC's). 2/ For copper, column 1 has been further divided into two columns, 1-a and 1-b. The rates of duty in column 1-a apply when the market price of copper is 24 cents or more per pound, and the rates of duty in column 1-b apply when the market price of copper is under 24 cents per pound. 3/ Inasmuch as the market price for copper has not been under 24 cents per pound since the early 1950's, the current column 1 rate of duty under column 1-a is 1.2 percent ad valorem of the copper content for blister copper (TSUS item 612.03) and 1 percent ad valorem for refined copper (TSUS item 612.06). The current LDDC rate of duty under TSUS item 612.03 is 1 percent ad valorem.

The column 2 rates of duty for copper are applicable to imported products of communist countries as enumerated in general headnote 3(f) of the TSUSA. The current column 2 rate of duty is 6 percent ad valorem for both blister and refined copper.

The column 1 effective (that is, the duty assessed on the copper content) rate of duty on blister copper will be reduced to 1.1 percent ad valorem on January 1, 1985, and to 1 percent ad valorem on January 1, 1987, under the agreement reached at the MTN. There are no staged duty reductions for refined copper following the initial reduction in 1980.

On January 1, 1976, copper classifiable under TSUS items 612.03 and 612.06 from countries designated as beneficiary developing countries (BDC's) for the purposes of the Generalized System of Preferences (GSP) became eligible for duty-free treatment. From the beginning of the GSP to the present, certain copper products from some BDC's have been excluded from the GSP, because these BDC's had exceeded the "competitive need" limitations on imports under any one tariff item during the previous year. The countries that exceeded the "competitive need" limits on imports of blister and refined copper are as follows:

1/ The rates of duty in col. 1 are MFN rates and are applicable to imported products from all countries except those Communist countries and areas enumerated in general headnote 3(f) of the TSUSA. The People's Republic of China, Hungary, Romania, and Yugoslavia are the only Communist countries currently eligible for MFN treatment.

2/ The preferential rates of duty in the "LDDC" column reflect full MTN concession rates implemented without staging for particular items and apply to covered products of the LDDC's enumerated in general headnote 3(d) of the TSUSA. Imports under item 612.03 from such countries are eligible for preferential rates.

3/ The market price of copper is the average market price per pound for 1 calendar month of electrolytic copper in standard shapes and sizes, delivered Connecticut Valley, as determined by the U.S. International Trade Commission and reported to the Secretary of the Treasury in accordance with procedures set forth in subpt. C, headnote 5 of the TSUSA.

Year	Product	Country
1976	Blister	Chile
		Peru
	Refined	Chile
1977	Blister	Chile
	Refined	Chile
		Peru
		Yugoslavia
		Zambia
1978	Blister	Mexico
	Refined	Chile
		Peru
		Zambia
1979	Blister	Chile
		Peru
	Refined	Chile
		Peru
		Zambia
1980	Blister	Peru
	Refined	Chile
		Peru
1981	Blister	Chile
	Refined	Chile
		Peru
		Zambia
1982	Refined	Chile
		Peru
		Zambia
1983	Blister	Chile
	Refined	Chile
		Peru
		Zambia

Proposed legislation

Three bills aimed at assisting domestic producers of copper by increasing the customs duties on copper articles and excluding them from GSP (duty-free) treatment have been introduced in the 98th Congress. These bills are currently in committee for consideration, and no action has been taken on them to date. S. 2340, introduced by Senator Dennis De Concini (D-Ariz.), proposes to increase the duty on imported copper by an amount (an additional 15¢ per

pound on the copper content) which offsets the cost incurred by copper producers in the United States in meeting domestic environmental requirements. H.R. 2413, introduced by Congressman Morris Udall (D-Ariz.) for himself and Congressman James McNulty (D-Ariz.), proposes to increase the duty on imported copper by an amount (an additional 10 cents per pound on the copper content) which offsets the cost incurred by copper producers in the United States in meeting domestic environmental requirements. H.R. 2594, introduced by Congressman Robert Davis (R-Mich.), would restrict the importation of copper, copper-bearing ores and materials, and copper alloys and their so-called basic shapes and forms by increasing the duties on these articles by an additional 10 cents per pound on the copper content and by making them ineligible for designation as eligible articles under the GSP.

In addition, on May 22, 1984, Senator Dennis DeConcini (D-Ariz.) introduced S. 2696, a bill to impose quotas on the importation of certain copper articles during 1984-86 at not more than 300,000 metric tons per year. The bill was referred to the Committee on Finance.

Domestic Producers

The domestic copper industry's structure is predominantly influenced by its technology and its sources of raw materials. Thus, the industry is generally segmented into primary and secondary sectors on the basis of whether the producer used ores or scrap as raw material.

Primary producers

The primary copper sector is characterized by relatively high degrees of integration and concentration of ownership. Although ownership of copper-mining, smelting, refining, and semifabricating facilities is diffused horizontally, there is a significant degree of vertical integration. In 1983, 21 mines together accounted for 98 percent of domestic copper production. There were 15 primary copper smelters, 13 electrolytic refineries, 9 fire refineries, and 11 electrowinning plants. Most of the large U.S. copper-mining companies own smelting, refining, and semifabricating facilities.

The primary sector of the U.S. copper industry consists of eight fully integrated copper-producing companies (AMAX, Asarco, Copper Range, Duval, Inspiration, Kennecott, Magma, and Phelps Dodge), 6 of which are petitioners. In addition, one company (Tennessee Chemical) only mines and smelts copper, nine companies (Anaconda, Bethlehem Mines Corp., Cominco American Inc. & Dresser Minerals, Day Mines Inc., Hecla Mining Co., Idarado Mining Co., Noranda Lakeshore Mines Inc., Quincy Mining Co., and Ranchers) two of which are petitioners (two others are subsidiaries of Canadian companies) only mine copper; and two companies (Cyprus and Pinto Valley) both of which are petitioners, only smelt and refine copper.

The following list shows, by stages of processing, the activities of each of the major firms (including all of the petitioners) in the primary sector:

Firm	Mining	Smelting	Refining
AMAX	Yes	Yes	Yes.
Anaconda	Yes 1/	Yes 1/	Yes.
Asarco	Yes	Yes	Yes.
Cyprus	Yes	Yes 2/	Yes.
Duval	Yes	Yes	Yes.
Inspiration	Yes	Yes	Yes.
Kennecott	Yes	Yes	Yes.
Magma	Yes	Yes	Yes.
Phelps Dodge	Yes	Yes	Yes.
Pinto Valley (formerly Cities Service)	Yes	No 3/	Yes.
Ranchers	Yes	No	No.
Tennessee Chemical 4/	Yes	Yes	No.

1/ Through 1980, operations are currently closed.
2/ ***.
3/ ***.
4/ ***.

Eight firms (AMAX, Asarco, Copper Range, Duval, Inspiration, Kennecott, Magma, and Phelps Dodge) possess virtually all of the U.S. primary smelting and refining capacity. Practically all domestic copper mine production is smelted in the United States, and domestic copper smelters are the principal source of the blister copper that is refined in U.S. copper refineries.

The copper industry's degree of integration into fabricating is less than in mining, smelting, and refining. Large proportions of the refined copper produced by U.S. copper smelting/refining companies are sold to their own mills for further processing. U.S. copper refiners operated 5 wire rod mills and 7 brass-producing facilities out of the industry total of 20 wire rod mills and 43 brass mills that were in operation in 1983. 1/

The domestic copper industry is dispersed throughout several regions of the country. Copper-mining, processing, and fabricating facilities are located in the Southwest, Northeast, Mid Atlantic, Northwest and Great Lakes regions. In terms of current operations, however, most copper-mining and processing facilities are concentrated in the Southwest, especially in Arizona (copper mining and smelting). In 1983, the principal mining States were Arizona (66 percent) and Utah (17 percent), but 10 other States also yielded copper.

The geographic distribution of copper-smelting capacity in the U.S. closely tracks that of mining, due to the relatively high cost of transporting copper concentrates. There is a wider geographic distribution of copper-refining capacity, although the Southwest is still the predominant location. The two largest domestic refineries are located in Texas and

1/ U.S. Bureau of Mines, Minerals Commodity Summaries, 1984.

together account for almost one-third of domestic capacity. Four smaller refineries are located in Arizona, New Mexico, and Utah and together account for about one-quarter of U.S. capacity. Most of the remaining copper-refining capacity is located in the Midwest, East, and Northwest. Most of the fabricating facilities of the copper industry are located in the East. About 75 percent of brass mill production occurs in 10 States, the most important of which are Connecticut, Illinois, and Pennsylvania. Wire mills are heavily concentrated in New York, New Jersey, and Connecticut.

Energy-related companies have made major investments in the domestic copper industry in the past decade. A number of major oil companies became involved in metals activities in the early 1970's, when metals prices skyrocketed concurrent with oil prices, and the metals business was viewed as compatible with their existing corporate activities and philosophies. Oil companies now have large holdings in five of the larger U.S. copper companies, either directly or indirectly. Four of these firms are petitioners in this investigation (Atlantic Richfield Co./Anaconda, Louisiana Land & Exploration Co./Copper Range, Standard Oil Co. of Indiana-Amoco Minerals Inc./Cyprus Mines, Pennzoil Corp./Duval, and Standard Oil Co. of Ohio/Kennecott).

A substantial portion of domestic copper producers are companies that are part of large, often multinational corporations with diverse activities or interests in firms which produce a variety of other products in addition to other metals. Because of the nature of the industry, most domestic copper producers produce significant quantities of coproduct and byproduct metals which are obtained from/in association with the mining of copper ores, including gold, silver, molybdenum, nickel, uranium, lead, and zinc. Some foreign firms have interests in segments of the U.S. copper industry. Three domestic primary copper producers, all of which are petitioners, are partly foreign owned (Inspiration, Kennecott, and Newmont (owner of Magma and Pinto Valley).

Likewise, many U.S. copper firms have interests in foreign mining, milling, and processing operations through subsidiaries, mutual shareholdings, interlocking directorships, and other minority and majority interest arrangements. Five domestic copper producers, four of which are petitioners, have ownership interests in foreign copper operations and properties (AMAX, Anaconda, ASARCO, Newmont [owner of Magma and Pinto Valley], and Phelps Dodge).

Secondary producers

In contrast with the concentration levels of the primary sector, the secondary copper sector is characterized by its wide diffusion of firms. In 1983, there were 43 secondary smelters in operation. Of the total copper recovered from scrap, smelters and refiners recovered 47 percent; brass mills, 48 percent; and miscellaneous manufacturers, foundries, and chemical plants, 5 percent.

Today's secondary sector of the U.S. copper industry is dominated by six companies (Chemetco Metals, Essex Group, Marmon Group/Cerro Sales, Nassau Recycle, Reading Industries, and Southwire), none of which are petitioners. All of these firms are producers of fabricated copper products, including

cable, pipe, tubing, and wire. The majority of refined copper produced by these firms is used within their own fabricating facilities, although some material is made available to consumers. In total, the secondary copper industry includes several smelters (some of which are owned/operated by primary copper producers), and several hundred copper, brass, and bronze foundries. Most secondary copper-smelting and refining capacity is located in the Midwest and the East. Like the copper and brass mills, copper and copper-alloy foundries are most heavily concentrated along the Northeast and North Central industrial axes.

U.S. Importers

Unwrought copper is not only a raw material for fabricated products, such as pipe and brass, but also an internationally traded commodity. Because of the product's dual nature, a number of different types of firms are engaged in importing copper into the United States. Importers can generally be divided into three distinct groups: (1) end-users; (2) metal traders or speculators; and (3) domestic copper producers.

In the U.S. market, large end users of unwrought copper products (blister and refined) import directly. Examples of such firms would be ***.

Metal traders or speculators perform a dual function in the U.S. market. As speculators, these firms purchase contracts for future delivery on the metal exchanges in New York and London. According to fluctuations in the price of copper and other metals, the speculator will either sell its contracts before delivery or take delivery and then resell the material. In addition, several firms act as sales agents for foreign producers. Examples of such firms are ***.

The third group of importers are domestic copper producers. These firms import blister copper to feed their refineries or refined copper to feed their affiliated wire and rod mills. Purchases of imported blister and refined copper by U.S. primary copper producers, as reported in response to Commission questionnaires, are shown in the following tabulation (in short tons):

Year	Blister	Refined
1979	***	***
1980	***	***
1981	***	***
1982	***	***
1983	***	***

The bulk of blister imports during 1979-81 was accounted for by ***.

*** of the 12 primary producers reported purchases of imported refined copper during 1979-83. ***.

Secondary copper producers, such as ***, also purchase substantial amounts of foreign copper. Purchases of imported copper (primarily from Chile) by these *** firms are shown in the following tabulation (in short tons):

Year	Blister	Refined
1979	***	***
1980	***	***
1981	***	***
1982	***	***
1983	***	***

Purchases of imported copper by U.S. primary and secondary producers as a share of total U.S. imports are shown in the following tabulation (in percent):

Year	Blister	Refined
1979	***	***
1980	***	***
1981	***	***
1982	***	***
1983	***	***

Channels of Distribution and Uses of Products

The flow of copper from mine to end-use market is shown in figure 3. Only a small amount of the copper ore and concentrate produced enters trade, with the balance being further processed to some degree within the producing company. Most of the copper ores and concentrates traded are sold under long-term contracts of 1 to 10 years duration at a price which is a portion of the price at which refined copper is quoted on the commodity exchange.

Most blister copper is sold in the same manner to copper refineries. Most sales of refined copper (the first major category of commercially traded copper) are transacted between refineries and end users, either directly or indirectly, and on official metals exchanges. The most frequent form of trade in refined copper is based on contracts of 1 year's duration that specify monthly delivery limits, within which the buyer may decide each month on the volume desired. The price is usually based on the price quoted on the exchanges at or about the time of physical delivery.

When large quantities of copper are sold, sales arrangements are usually made under a "framed contract." The terms of sale are specified and include total tonnage to be delivered in the year, maximum and minimum tonnages to be delivered each month and at whose option, point of delivery, packing, and so forth. The only item not specified in a framed contract is the price. The contract becomes valid only when the seller and the buyer agree, by negotiation, on a price for deliveries over the period the contract specifies. When producers prefer to have no direct link with the ultimate consumers of their products, they utilize the services of agents, metals

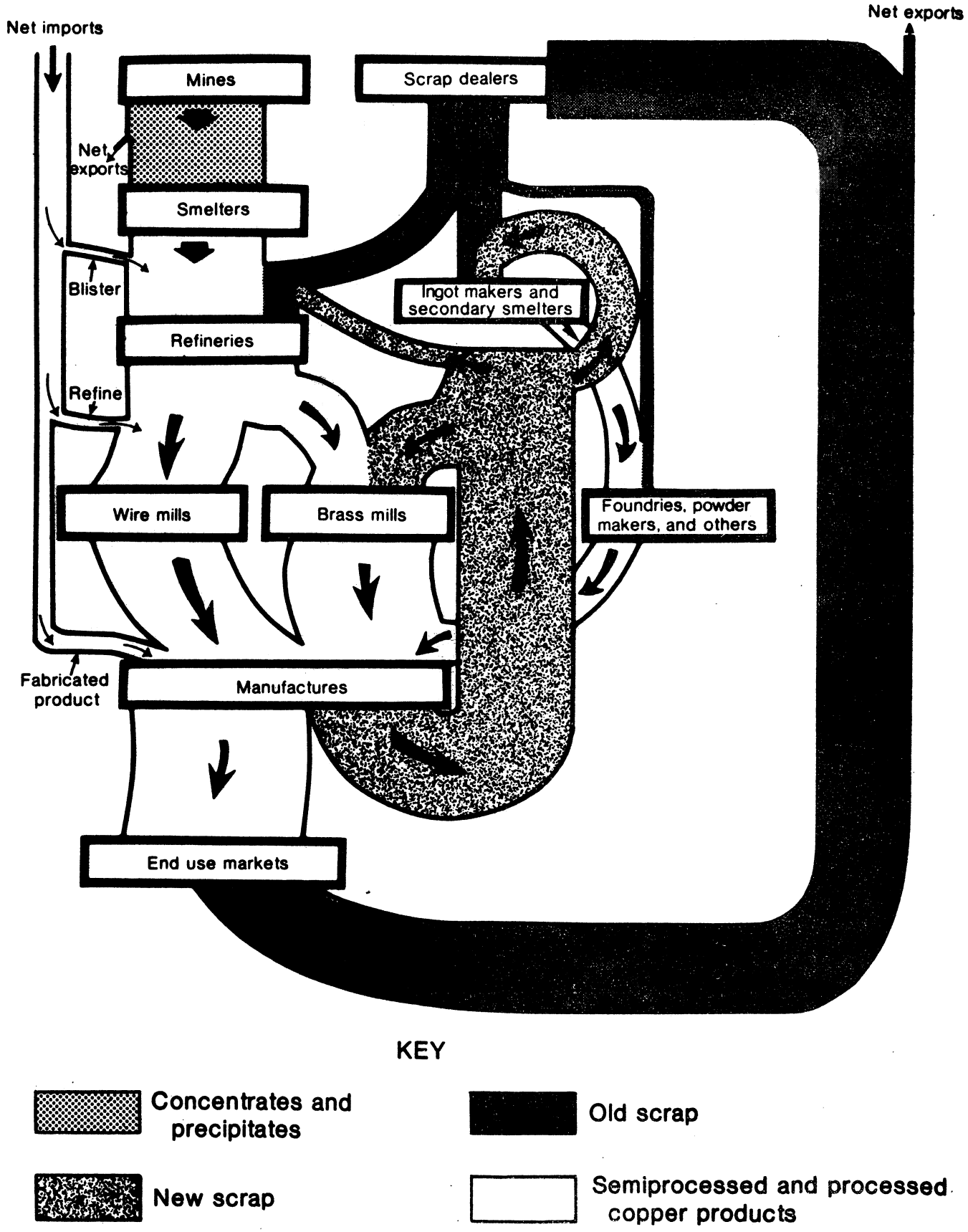


FIGURE 3.—U.S. copper system, 1979.

Source: The U.S. Copper Industry-Problems, Issues and Outlook, Bureau of Mines.

merchants, and brokers for product distribution. Agents usually have specialized knowledge of both the product and its market and are therefore capable of negotiating with customers. Some agents act only in behalf of certain producers, but most are themselves merchants or consumers of the material concerned. Agents usually work on a commission which represents a percentage of the value of the material sold.

Metals merchants purchase metals directly from a producer, usually at the cheapest levels, and then sell the product to the highest bidder. Metals merchants can often offer the producer better terms than could be achieved by selling directly to consumers or through agents. A growing aspect of merchant activity is the toll conversion of base products into refined or semifabricated products and swaps.

Tolling occurs when one company's mine produces more material than it can conveniently refine while another company's refinery cannot find enough raw material to meet its refining capacity. Through a merchant's constant communication with buyers and sellers in the marketplace, he/she is often able to toll convert (pay for the conversion of the material) at the underutilized refinery on profitable terms. Swaps occur when one producer is unable to satisfy the requirements of one of its customers because of logistics, timing, and so forth and a second producer has the same problem with one of its customers; however the second producer can satisfy the requirements of the first producer's customer. Knowing this, a merchant can satisfy the first customer's requirements with the second producer's supply, and, if the first producer's metal can be easily sold by the second producer, make arrangements to satisfy the second customer's requirements and be paid a commission for the service performed.

Brokers act on behalf of producers, consumers, and investors and operate on the active metals exchanges. Many of the buying and selling orders they receive can be matched against each other. For instance, a producer selling 100 tons of copper at 3 months' future price will be offset with a consumer buying 100 tons of copper at the same 3 months' future price. The broker will receive commissions for both sales.

In the secondary market, copper scrap is generated at thousands of points throughout the industrial infrastructure and end-use markets. Scrap dealers act as centralized points for the collection of scrap. These dealers ship copper scrap to secondary smelters for the production of copper alloy ingots.

Refined copper is shipped largely to brass mills, wire mills, and foundries. These establishments convert refined copper into a variety of shapes which form the basis for a myriad of manufacturing applications. Brass mills, which produce the major copper alloy metals, brass and bronze, as well as other copper-bearing alloys, accounted for 28 percent of the consumption of refined copper in 1983. Wire mills, which shape refined copper into a form that enables electricity to be transmitted efficiently and conveniently, accounted for 70 percent of consumption. Brass and wire mills use rolling, drawing, extruding, and continuous casting production methods to produce copper in the following forms: bars, plates, sheets, strips, rods, wires, angles, shapes, sections, pipes, tubes, blanks, fittings, and foils. Copper alloy ingots are shipped largely to foundries, where they are used in the production of copper alloy castings. 1/

1/ Trade in all forms of copper is presented in app. D, table D-1.

The final step in the transformation of copper from a raw material to finished products is the manufacturing of copper-bearing industrial and consumer goods. In terms of the quantity of copper utilized, the most important end users, by industrial sectors, were the building construction (32 percent), electrical and electronic products (26 percent), industrial machinery and equipment (19 percent), consumer and general products industries (13 percent), and transportation (10 percent). Copper is used by the building construction industry in roofing, plumbing, and hardware; uses in electrical and electronic products include wiring and power cables; uses in the industrial machinery and equipment industry include valves and fittings; and uses in transportation products include radiators of road transport vehicles, propellers of ships, and the electrification systems of railways. Copper is used in consumer and general products in a host of applications from ordnance to jewelry.

International Copper Situation

Copper ranks third in worldwide metal consumption after steel and aluminum. It is mined in 64 countries, in about 200 principal mines, 150 of which are located in market economy countries. During 1979-83, 80 percent of world mine production came from market economy countries, with developing and the developed nations each accounting for about one-half of the production. The developing countries convert about 75 percent of their mine production to smelted copper within their own boundaries. However, their share of world smelter production declined over the past decade, but the share of developed countries has increased commensurately.

Developed market economy countries also were the dominant producers of refined copper in the past decade, although the developing countries' share of world refined copper production increased slowly. The socialist countries of Eastern Europe experienced a rapid growth in production during this period.

Most of the world's copper is used by the industrialized countries, and 75 percent, in the market economy countries. The end uses and patterns of end-use consumption are similar in all of the industrial nations; world trading patterns in copper show a flow of copper raw materials from the developing countries to the industrialized countries. The top four refined copper consumers, with their market shares in 1983, were the United States (18 percent), Soviet Union (15 percent), Japan (14 percent), and West Germany (8 percent).

The world copper industry has been depressed since 1974. Because of low copper prices throughout the 1970's, many mines curtailed production, and some new developments were postponed or canceled. In early 1980, copper and copper byproduct prices temporarily improved. This upturn was short lived, however, as reflected by recent decreases in copper prices.

The following tabulation shows world copper production and consumption, by stages of processing (in thousands of metric tons) during 1979-83:

Year	Mine production	Smelter production	Refined production	Refined consumption
1979-------	7,926.5	8,121.5	9,367.0	9,825.8
1980-------	7,863.7	7,942.2	9,389.8	9,385.1
1981-------	8,302.6	8,347.1	9,690.2	9,500.1
1982-------	7,222.5	8,301.2	9,556.1	9,075.8
1983-------	8,089.1	8,398.9	9,786.5	9,001.8

A chronological review of the world copper industry follows.

World copper production in 1979 improved slightly from 1978 levels, demand continued to increase, and world stocks were reduced. 1/ World mine production in 1979, however, remained less than in 1977, despite improved market demand and rising prices. A number of new mines began operating in 1979, and excess capacity at some operations began to be utilized. Labor strikes adversely affected Canadian copper production in early to mid-1979, and production in central Africa was curtailed due to political, economic, and transportation problems. The major copper-producing and consuming countries held meetings in 1979 under the United Nations' Conference on Trade and Development (UNCTAD) to examine the causes of copper market instability and to consider possible ways to correct the problem.

In 1980, world mine production of copper fell by about 1 percent, refined copper production increased by 0.2 percent, and refined copper consumption dropped by 4.5 percent. Most of the decline in world mine production was caused by a 5-month labor strike in the United States. Essentially no progress was made by UNCTAD on the question of copper market instability.

World mine production recovered in 1981, and world refined copper consumption rose by 1.2 percent.

In 1982, world copper consumption trended downward but world refined copper inventories increased. Inventories rose partly as a result of continued high levels of production at both mine and copper refineries in several countries outside of the United States despite decreased demand and declining prices. Significant mine production increases were registered by Australia, Chile, Iran, Morocco, Peru, Poland, and the Soviet Union. Chile became the top world producer of mined copper by surpassing the United States. The world's copper mines were operated at about 82 percent of rated capacity.

In 1983, worldwide oversupply conditions and increased world refined copper inventories retarded price recovery. Early in 1983, copper prices recovered from the depressed 1982 levels due to a slight improvement in demand, heavy Chinese buying in Europe, and renewed speculative interest. However, prices stalled in June and declined thereafter. Several countries that relied heavily on copper as a major source of foreign exchange increased output as prices fell in an effort to stem the erosion of needed currency. In 1983, the International Monetary Fund (IMF) agreed to help several foreign producers offset 1982 revenue declines. This support by the IMF and other loan and financing policies caused U.S. producers to lodge strong protests with Congress. The world oversupply situation caused foreign producersto aggressively seek an outlet for their material.

1/ World copper stocks are presented in app. D, table D-2.

The Question of Increased Imports

U.S. imports

Blister copper.--Imports of blister copper increased in an erratic fashion from 1979 to 1982 before experiencing a sharp decline in 1983 (table 1). Imports peaked in 1982 at 107,337 short tons, valued at $142.2 million. In 1983, imports of blister declined by 52 percent to 51,095 short tons, valued at $66 million, as the average unit value of imports steadily declined. Chile and Peru together accounted for approximately 93 percent of total blister imports during 1979-82. In 1983, Mexico became the second largest import source.

Refined copper.--Imports of refined copper followed the same trend as blister copper from 1979 to 1981 and then declined in 1982 in contrast to the sharp increase in blister imports (table 2). Imports of refined copper almost doubled in 1983, but blister imports were cut in half. Chile and Canada were the most significant sources of refined copper imports, accounting for 54 and 20 percent, respectively, of total imports in 1983. In contrast to other principal sources, refined copper imports from Chile increased steadily throughout the period, rising by 88 percent from 1979 to 1982, and then increasing again in 1983 by almost 69 percent. The value of refined copper imports increased sharply from 1979 to 1980 then declined to $394.7 million in 1982. Imports in 1983 were valued at $700.6 million. The average unit value of imports declined from a peak of $1,987 per ton, or 99.4 cents per pound, in 1980 to $1,383 per ton, or 69.2 cents per pound, in 1983.

Ratio of imports to production

The increase in the quantity of imports of unwrought copper over the 5-year period has resulted in an increase in imports relative to domestic production. The ratio of imports of refined copper to production increased sharply, from 10.1 percent in 1979 to 24.8 percent in 1980. Imports declined in relation to production in 1981 and 1982 and then rose once again in 1983 to a level equal to 29.0 percent of domestic production, as shown in the following tabulation.

Year	Imports (1,000 short tons)	Production (1,000 short tons)	Ratio of imports to production (percent)
1979-------	225	2,219	10.1
1980-------	471	1/ 1,903	24.8
1981-------	364	2,247	16.2
1982-------	285	1,868	15.3
1983-------	507	1,746	29.0

1/ U.S. industry experienced a 5-month strike.

Imports of blister copper also increased relative to domestic production, reaching a peak of 9.5 percent in 1982, as shown in the following tabulation:

Table 1.--Blister copper: U.S. imports for consumption, by principal sources, 1979-83

Source	1979	1980	1981	1982	1983
	Quantity (short tons)				
Chile	12,669	45,059	12,676	89,648	39,648
Mexico	266	50	3,733	4,586	6,892
Peru	14,039	997	15,364	10,686	3,571
Egypt	0	0	0	0	854
Austria	0	0	0	0	97
Canada	5	13	7	1,154	15
West Germany	0	0	38	115	19
United Kingdom	0	0	0	0	1/
Belgium	133	35	24	1,147	0
All other	1/	1,710	1,121	0	0
Total	27,112	47,865	32,964	107,337	51,095
	Value (1,000 dollars)				
Chile	19,150	79,949	20,449	118,956	52,223
Mexico	290	474	6,311	4,985	7,570
Peru	19,743	2,238	21,838	13,764	4,581
Egypt	-	-	-	-	1,289
Austria	-	-	-	-	221
Canada	15	51	24	2,564	59
West Germany	-	-	127	316	44
United Kingdom	-	-	-	-	2
Belgium	358	87	81	1,665	-
All other	-	3,480	1,798	-	-
Total	39,556	86,279	50,627	142,249	65,989
	Unit value (per short ton, contained weight)				
Chile	1,512	1,774	1,613	1,327	1,317
Mexico	1,090	9,403	1,690	1,087	1,098
Peru	1,406	2,245	1,421	1,288	1,283
Egypt	-	-	-	-	1,510
Austria	-	-	-	-	2,275
Canada	3,307	3,878	3,519	2,221	3,928
West Germany	-	-	3,259	2,738	2,283
United Kingdom	-	-	-	-	15,706
Belgium	2,695	2,468	3,333	1,451	-
All other	62,000	2,035	1,604	-	-
Total	1,459	1,803	1,536	1,325	1,291

1/ Less than 1,000 pounds.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 2.—Refined copper: U.S. imports for consumption, by principal sources, 1979–83

Source	1979	1980	1981	1982	1983
	Quantity (short tons)				
Chile	85,605	108,469	137,835	160,859	271,125
Canada	70,353	144,263	93,547	72,047	100,547
Zaire	1,622	5,515	27,214	21,595	32,081
Peru	26,326	32,219	37,686	8,819	35,011
Zambia	17,477	71,093	48,593	11,526	27,219
Japan	0	98,930	7,062	15	10,120
Republic of South Africa	2,206	519	0	0	15,113
Belgium	803	1/	2,134	1,165	6,364
Ghana	0	0	0	0	3,816
Republic of Korea	0	0	0	2,205	3,307
All other	20,319	9,622	10,382	6,650	1,883
Total	224,711	470,630	364,452	284,881	506,586
	Value (1,000 dollars)				
Chile	144,776	212,688	216,287	213,549	383,229
Canada	130,021	286,909	156,383	105,239	146,651
Zaire	3,000	11,201	37,443	30,520	45,301
Peru	42,091	61,034	60,032	12,437	39,568
Zambia	28,571	136,938	80,124	18,931	37,671
Japan	0	206,591	10,962	19	14,714
Republic of South Africa	1,886	917	0	0	11,658
Belgium	1,451	4	3,464	1,615	8,636
Ghana	0	0	0	0	5,641
Republic of Korea	0	0	0	3,004	4,756
All other	35,774	18,979	17,390	9,339	2,738
Total	387,570	935,262	582,085	394,654	700,564
	Unit value (per short ton, contained weight)				
Chile	1,691	1,961	1,569	1,328	1,413
Canada	1,848	1,989	1,672	1,461	1,459
Zaire	1,850	2,031	1,376	1,413	1,412
Peru	1,599	1,894	1,593	1,410	1,130
Zambia	1,635	1,926	1,649	1,642	1,384
Japan	–	2,088	1,552	1,294	1,454
Republic of South Africa	855	1,769	–	–	771
Belgium	1,807	26,447	1,624	1,386	1,357
Ghana	–	–	–	–	1,478
Republic of Korea	–	–		1,363	1,438
All other	1,761	1,973	1,675	1,404	1,455
Total	1,725	1,987	1,597	1,385	1,383

1/ Less than 1,000 lbs.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Year	Imports (1,000 short tons)	Production (1,000 short tons)	Ratio of imports to production (percent)
1979---------	27	1,539	1.8
1980---------	48	1,161	4.1
1981---------	33	1,518	2.2
1982---------	107	1,125	9.5
1983---------	51	1,088	4.7

The Question of Serious Injury 1/

The U.S. copper-producing industry reacted to adverse market conditions and import competition during 1979-83 by closing numerous mines, smelters, and refineries. According to the U.S. Bureau of Mines, 21 small mines, having 150,000 short tons of copper capacity, have been closed permanently since the mid 1970's. In addition, of the approximately 80 mines in operation in 1981, 23 mines, having 750,000 short tons of copper capacity, were closed in 1983. In total, 900,000 tons of domestic copper capacity has been closed or idled since 1974. A chronological review of the condition of domestic copper production facilities follows:

In 1979, the leading 25 mines together produced 97 percent of the domestic mine output; of these, 5 together produced 45 percent. Four companies together accounted for 58 percent of mine output. Nine companies operated a combined total of 17 primary smelters, and 17 companies operated a combined total of 22 refineries and electrowinning plants. The Carr Fork mine in Utah began production in August. A number of domestic mines that had closed following the slump in demand in 1975 were reopened during the latter part of 1979.

In 1980, the leading 25 mines together produced 96 percent of the domestic mine output; of these, 5 produced 50 percent. Four companies accounted for 66 percent of mine output. Nine companies operated a combined total of 17 primary smelters, and 17 companies operated a combined total of 22 refineries and electrowinning plants. The labor strike at U.S. mines caused temporary plant closures and a decline in production.

In 1981, 40 mines yielded copper as the principal product, and 39 others yielded it as a byproduct. The leading 25 mines together accounted for more than 95 percent of the domestic production; of these, 6 mines produced a combined total of 50 percent. Four companies together produced two-thirds of the mine output. There were 15 primary smelters, 12 refineries, and 10 electrowinning plants in operation. There were planned shutdowns at several large mines in the last weeks of the year; however, production was at its highest level in 8 years.

In 1982, the leading 25 mines together accounted for about 95 percent of domestic production; of those, 5 mines produced a combined total of 50 percent.

1/ Official statistics presented in this section include data for both primary and secondary producers. Data compiled from questionnaire responses ***. Data concerning production, imports, stocks and consumption for the January-March 1984 period are presented in app. D, table D-3.

Six companies together produced two-thirds of the mine output. There were 15 primary smelters, 12 refineries, and 10 electrowinning plants in operation. U.S. copper mine production dropped substantially in 1982, as about one-half of the large mines were closed for periods of several months and, in a few instances, all year. Most of the remaining operating mines curtailed production. In October-December the mining sector operated at about two-thirds capacity. Several smelters closed also, and refineries operated at reduced rates.

Of 35 principal mines, 14 remained closed all year in 1983. The other 21 mines together accounted for 98 percent of production; of these, 11 operated at a reduced rate and/or were closed part of the year. There were 15 primary copper smelters, 13 electrolytic refineries, 9 fire refineries, and 11 electrowinning plants. Of these, three primary smelters and two electrowinning plants were not operated; one electrolytic refinery closed at midyear. U.S. mine production dropped in 1983 because of depressed copper and byproduct prices and as a result of labor strikes at some mines. Cost-saving efforts were made by domestic producers, including increased adoption of flash smelting technology, solvent extraction-electrowinning processes, and use of in-pit portable crushing systems. Reduction of labor costs was also undertaken in an effort to trim operational costs.

A review of the recent long-term closures 1/ of domestic copper production facilities, by companies, as indicated in Commission questionnaire responses and by the Bureau of Mines, for 1979-83 follows:

Company	Plant	When closed
AMAX	Anamax mine and refinery (Sahuarita, Ariz.)	September 1983 (refinery) January 1983 (mine)
Anaconda	Butte, Mont., mine	July 1983
	Carr Fork, Utah mine	November 1981
	Anaconda, Mont., smelter	November 1980
	Great Falls, Mont., refinery	November 1980
	Anamax properties (Tucson, Ariz.)	January 1983 (mine) September 1983 (refinery)
Asarco	Sacaton Mine	February 1984
Cyprus	Cyprus Pima plant	October 1982
	Cyprus Baghdad mine	February 1984
Duval	Esperanza mine	December 1981
	Mineral Park mine	December 1981
	Sahuarita, Ariz., smelter	April 1982

1/ These closures were announced as permanent closures. Some facilities are being physically dismantled or otherwise rendered inoperable. Others are not expected to return to onstream operations unless current operating conditions drastically change. In addition to these closures, many copper facilities were temporarily closed and then reopened during the 1979-83 period.

Company	Plant	When closed
Inspiration---------	Christmas mine	January 1982
Kennecott----------	Ray smelter	May 1982
	Nevada smelter	November 1982
	Baltimore refinery	June 1983
Magma/----------	Superior mine and mill	August 1982
Pinto Valley------	Copper Cities precipitation plant	July 1982
Phelps Dodge--------	Laurel Hill refinery	December 1983
Ranchers----------	Blue bird mine	November 1982
Tennessee----------	Calloway mine	May 1983
	Open-pit mine	October 1983

U.S. production

U.S. mine, smelter, and refinery production followed a downward trend during 1979-83, as shown in table 3. Production declined from 1979 to 1980, 1/increased in 1981, and then fell to the lowest levels in 1983.

Table 3.--Unwrought copper: U.S. mine, smelter, and refinery production, 1979-83

(In thousands of short tons)

Year	Mine	Smelter	Refinery
1979----------	1,592	1,539	2,219
1980----------	1,302	1,161	1,903
1981----------	1,695	1,518	2,247
1982----------	1,256	1,125	1,868
1983----------	1,153	1,088	1,746

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Annual average U.S. production trends over a longer period are shown in the following tabulation (in thousands of short tons):

Period	Mine	Smelter	Refinery
1963-67----------	1,239	1,328	1,945
1968-72----------	1,531	1,612	2,103
1973-78----------	1,558	1,586	1,996

Mine.--Domestic mine production of recoverable copper in 1983 totaled 1.2 million tons, representing a decline of 8 percent compared with that in 1982.

1/ In 1980, the U.S. industry experienced a 5-month labor strike.

Mine production in 1983 was below the average for the last 20 years. As shown in table 4, four States together accounted for 96 percent of total production in 1981-- Arizona (68 percent), Utah (14 percent), New Mexico (10 percent), and Montana (4 percent). Because of mine closures, data on mine production in New Mexico were not separately reported by the Bureau of Mines in 1982 and 1983. Open-pit mines accounted for over 80 percent of mine output in 1983, with underground mines accounting for the remainder.

Smelter.--Output of recoverable copper in 1983 totaled 1.1 million short tons, a 20-year record low level. Ninety percent of the total was produced from primary (new) domestic materials, and the remainder came from imported concentrates or precipitates (4 percent) and scrap (6 percent).

Refinery.--Production of refined copper in 1983 totaled 1.7 million pounds, a slight increase from the total produced in 1982. Over 60 percent of all refined copper was produced from primary domestic materials, but imported blister copper has grown in importance since 1979. In 1980, such imported material accounted for about 6 percent of refinery feedstocks. By 1983, the share had increased to over 11 percent. Production from scrap accounted for the remaining 25 percent.

Table 4.--U.S. mine production of recoverable copper, by States, 1979-83

(In thousands of short tons)

State	1979	1980	1981	1982	1983
Alaska	0	0	0	1/	0
Arizona	1,043	849	1,147	849	755
California	1/	1/	1/	1/	1/
Colorado	2/	1	1/	1	1/
Idaho	4	3	5	3	4
Michigan	1/	1/	1/	1/	1/
Missouri	14	15	9	9	9
Montana	77	42	69	63	38
Nevada	1/	1/	1/	1/	1/
New Mexico	181	165	170	1/	1/
Oregon	2/	0	1/	0	0
South Carolina	0	0	1/	0	0
Tennessee	1/	1/	1/	1/	1/
Utah	213	174	233	208	187
Washington	1/	0	1/	1/	0
Total	1,592	1,302	1,695	1,256	1,153

1/ Data withheld to avoid disclosing proprietary company information; included in " total."

2/ Less than 500 short tons.

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Capacity utilization

U.S. copper mine capacity has fluctuated between 1.9 million and 2.0 million tons since 1973, as shown in the following tabulation of Bureau of Mines data:

Year	Production (1,000 short tons)	Capacity (1,000 short tons)	Capacity utilization (percent)
1973	1,719	1,995	86.2
1974	1,597	1,995	80.1
1975	1,413	1,995	70.8
1976	1,606	1,995	80.5
1977	1,504	1,995	75.4
1978	1,497	1,995	75.0
1979	1,592	2,028	78.5
1980	1,302	2,023	64.4
1981	1,695	1,907	88.9
1982	1,256	1,929	65.1
1983	1,153	1,929	59.8

U.S. mine capacity remained static from 1973 to 1978, with utilization ranging from 71 to 86 percent. In 1979, capacity was slightly expanded, with a slight increase in utilization. In 1980, production and utilization declined.

U.S. copper producers' capacity to produce blister copper in smelters, as reported in response to the Commission's questionnaires, 1/ declined from 1979 to 1983. As smelters closed in 1982 and 1983 and production declined, capacity utilization dropped to a 10-year low of 56.8 percent, as shown in the following tabulation:

Year	Production (1,000 short tons)	Capacity (1,000 short tons)	Capacity utilization (percent)
1979	1,613	2,077	77.7
1980	1,193	2,030	58.8
1981	1,538	1,863	82.6
1982	1,121	1,861	60.2
1983	1,058	1,863	56.8

U.S. capacity to produce refined copper increased slightly, from 2.1 million tons in 1979 to 2.2 million tons in 1980, and then declined to 2.1 million tons in 1983 according to responses to the Commission's questionnaire. 2/ Utilization of refinery capacity peaked at 87 percent in 1981 and then declined to 62 percent in 1983, as shown in the following tabulation

1/ Producers responding to the Commission's questionnaires accounted for 97 percent of U.S. smelter production, as reported by the Bureau of Mines.

2/ Producers responding to the Commission's questionnaires accounted for 74 percent of U.S. refinery production in 1983, as reported by the Bureau of Mines.

Year	Production (1,000 short tons)	Capacity (1,000 short tons)	Capacity utilization (percent)
1979	1,857	2,140	86.8
1980	1,418	2,158	65.8
1981	1,767	2,028	87.1
1982	1,356	2,080	65.2
1983	1,293	2,086	62.0

U.S. producers' shipments

Data on the quantity of U.S. producers' shipments of copper concentrates and precipitates, blister, and refined copper, as reported in response to the Commission's questionnaires, are shown in table 5. Such data were developed for (1) domestic market shipments, (2) domestic captive shipments (those to subsidiaries and affiliated firms), and (3) export shipments. As shown in the table, all three classes of shipments declined from 1979 to 1980, increased in 1981, and then declined again in 1982. Shipments of concentrates and precipitates declined further in 1983, but blister copper and refined copper shipments increased slightly.

Table 5.--Unwrought copper: U.S. producers' shipments, 1979-83

(In thousands of short tons)

Item	1979	1980	1981	1982	1983
Domestic market shipments:					
Concentrates and precipitates	66	50	57	30	68
Blister copper	2	10	2	3	7
Refined copper	1,435	1,056	1,151	856	927
Domestic captive shipments:					
Concentrates and precipitates	1,212	932	1,112	770	869
Blister copper	1,396	989	1,168	773	812
Refined copper	330	206	332	132	251
Export shipments:					
Concentrates and precipitates	41	76	166	216	74
Blister copper	0	0	0	0	0
Refined copper	64	73	1/ 244	1/ 281	1/ 153
Total:					
Concentrates and precipitates	1,319	1,058	1,335	1,016	1,011
Blister copper	1,398	999	1,170	776	819
Refined copper	1,829	1,335	1,727	1,269	1,331

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

As noted earlier, most commercial open-market sales of copper take place following the refining stage of production. The reported market shipments of concentrates and precipitates were evenly divided between actual sales and the shipment of tolled materials. Market shipments of blister copper were almost entirely the result of toll arrangements. The reported exports of concentrates and precipitates were primarily accounted for by ***. In 1983, almost 90 percent of blister copper exports were to the Republic of Korea; approximately 75 percent of refined copper exports went to the Netherlands.

U.S. inventories

Commercial stocks.--Yearend inventories of refined copper, as reported by the U.S. Bureau of Mines, are shown in table 6. Stocks held by primary producers declined from 1978 to 1980 and then increased sharply to 295,000 short tons in 1982, equivalent to 21 percent of producers' total shipments of refined copper in that year. In 1983, producers' stocks fell to 170,000 short tons.

Table 6.--Refined copper: U.S. yearend inventories, 1978-83

(In thousands of short tons)

Item	1978	1979	1980	1981	1982	1983
Primary producers	169	71	54	166	295	170
New York Commodity Exchange	180	99	180	187	274	409
Wire rod mills	69	49	55	120	138	125
Brass mills	31	28	24	29	28	29
Other 1/	8	10	11	10	10	32
Total	457	257	324	512	746	764

1/ Includes secondary smelters, chemical plants, foundries, and miscellaneous plants.

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Stocks of refined copper held by the New York Commodity Exchange (COMEX) show a different trend, declining in 1979, remaining stable in 1980 and 1981, and then increasing sharply to 409,000 short tons in 1983. As summarized in the following tabulation, total stocks at the end of 1983 were almost 70 percent higher than those reported in 1978 and were equivalent to 37 percent of average annual reported U.S. consumption in 1979-83:

As of Dec. 31--	Quantity (1,000 short tons)	Share of consumption (percent)
1978----------	457	18.9
1979----------	257	10.8
1980----------	324	15.8
1981----------	512	22.9
1982----------	746	40.8
1983----------	764	38.9

U.S. Government stockpile program.--On October 1, 1976, the Federal Preparedness Agency of the General Services Administration (GSA) announced new national policies and goals concerning the U.S. stockpile of strategic and critical materials, including a goal of 1,299,000 tons of refined copper. At that time, 20,261 tons of copper that were being held by various other Government agencies were transferred into the new stockpile. In 1980, the Federal Emergency Management Agency (FEMA) set a new goal of 1.0 million short tons, and in October 1982, Public Law 97-276 provided $120 million for the purchase of materials for the National Defense Stockpile, of which $85 million was to be available for the purchase of copper mined after September 30, 1982. At yearend 1982, the stockpile held 29,048 tons of copper. As of November 30, 1983, the stockpile contained 22,046 short tons of refined copper, with a stockpile goal still set at 1.0 million short tons.

On June 27, 1983, Senators DeConcini, Bingaman, Domenici, and Melcher introduced the National Defense Stockpile Copper Acquisition Act of 1983. The bill directs the immediate purchase of 85 million dollars' worth of copper for the stockpile. The bill is currently in committee. FEMA officials have indicated ***.

U.S. employment

Number of workers and hours worked.--The average number of employees engaged in the mining, smelting, and refining of copper and the hours worked by such employees are shown in table 7. The majority of copper operations are unionized, with up to a dozen different unions representing employees at the same locations. Union contracts are usually negotiated on a 3-year basis, with most contracts expiring in June. The industry experienced a 5-month strike in 1980; however, contract agreements were reached in 1983 with a minimum of work stoppages.

About 60 percent of all production and related workers engaged in copper operations in 1983 were employed in mining and milling operations. Over 20 percent of the workers were engaged in smelting operations, and about 16 percent, in refining. From 1979 to 1983, the number of employees engaged in the mining and milling of copper, the most labor-intensive sector, declined by over 40 percent. Hours worked by these employees also declined steadily from 45 million in 1974 to 23 million in 1983. The number of production and related employees engaged in copper-smelting and refining operations also declined throughout the period, as did hours worked by such employees.

Table 7.--Unwrought copper: Average number of employees, total and production and related workers and hours worked by the latter, by stages of processing, 1979-83

Item	1979	1980	1981	1982	1983
	Average number of employees				
All persons	43,400	41,702	43,010	33,881	26,292
Production and related workers engaged in--					
Production of all products	35,123	33,309	34,181	25,260	20,266
Copper mining/milling	22,634	22,838	23,328	15,496	11,957
Copper smelting	6,708	5,670	5,645	4,508	4,208
Copper refining	5,262	4,332	4,721	3,896	3,197
	Production and related workers' hours worked (thousands)				
Production of all products	74,134	61,890	73,171	48,451	40,263
Copper mining/milling	45,317	39,676	46,750	28,125	22,596
Copper smelting	13,669	10,304	12,313	9,069	8,212
Copper refining	10,452	7,754	9,125	7,326	6,041

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Wages and total compensation.--Total wages paid to production and related workers in the U.S. copper industry declined from a peak of $956 million in 1981 to $601 million in 1983 as the number of workers in the industry declined (table 8).

As shown in the following tabulation, average annual compensation paid to production and related workers increased from $25,892 in 1979 to $38,106 in 1983.

Year	Average number of employees	Total compensation (1,000 dollars)	Compensation per worker
1979	35,123	909,394	$25,892
1980	33,309	896,756	26,922
1981	34,181	1,145,190	33,504
1982	25,260	884,111	35,000
1983	20,266	772,264	38,106

Table 8.--Unwrought copper: Wages and total compensation 1/ paid to production and related workers, by stages of processing, 1979-83

(In thousands of dollars)

Item	1979	1980	1981	1982	1983
	Wages				
Production of all products	766,074	731,172	955,900	695,709	600,727
Copper mining/milling	471,288	460,957	604,916	405,382	340,264
Copper smelting	143,320	131,801	171,642	136,304	126,057
Copper refining	100,794	89,470	115,647	97,709	86,272
	Total compensation				
Production of all products	909,394	896,756	1,145,190	884,111	772,264
Copper mining/milling	553,934	554,704	707,577	508,019	432,035
Copper smelting	170,165	158,355	203,289	169,923	159,747
Copper refining	129,088	119,578	152,242	131,424	117,258

1/ Includes fringe benefits.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Productivity.--Mine, smelter, and refinery output of copper per hour worked by production and related workers is shown in table 9.

Productivity in the smelting and refining operations reached peak levels in 1983 as only the most efficient operations continued to be utilized.

Table 9.--Unwrought copper: Productivity, by stages of processing, 1979-83

(Pounds per hour)

Year	Mining 1/	Smelting 2/	Refining 3/
1979	63	236	355
1980	55	233	366
1981	58	250	387
1982	72	247	370
1983	87	258	428

1/ Production of concentrates and precipitates per hour worked.
2/ Production of blister copper per hour worked.
3/ Production of refined copper per hour worked.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Adjustment assistance.--Since July 1, 1978, the U.S. Department of Labor has instituted 62 investigations in response to petitions from workers engaged in copper production for certification of eligibility to apply for adjustment assistance under chapter 2 of the Trade Act of 1974. In 17 of these cases, Labor certified the workers as being eligible to apply for assistance; the petition was denied or the investigation terminated in the remaining cases. The estimated number of workers involved in these investigations are shown in the following tabulation:

Year	Certified	Denied
1978----------	54	0
1979----------	0	450
1980----------	0	35
1981----------	0	1,347
1982----------	0	1,662
1983----------	2,398	10,494
Total----------	2,452	13,988

U.S. producers' operating performance on their overall operations

*** U.S. copper-producing companies provided financial information on their overall domestic operations. Because of the diversity of their noncopper operations, only a general discussion of their performance and financial condition is appropriate.

The domestic gross sales of these companies increased from $22.5 billion in 1979 to $33.2 billion in 1981 (table 10), or by 47 percent, and then began a downward slide to $30.2 billion in 1982 and to $29.7 billion in the fiscal year ended (FYE) in 1983, representing a 10.5 percent reduction from the 1981 peak. The aggregate gross margin for these firms improved over the past 5 years as the cost of goods sold decreased from 82.5 percent of sales to 80.4 percent of sales. However, the improvement in the gross margin was offset by an increase in the level of operating expenses, which rose from 2.8 percent of sales in 1979 to 6.2 percent in 1983. This, coupled with an increase in the level of other expenses to sales, resulted in a declining profit margin. Net profits fell from $2.0 billion (8.8 percent of sales) in 1979 to $1.3 billion (4.2 percent of sales) in 1983, or by 37 percent.

Financial condition.--The financial statements of the copper producers indicate a slight deterioration in the quantitative coverage of current liabilities by current assets as manifested by the current ratio (current assets divided by current liabilities) which has decreased from 1.7 times at FYE 1979 to 1.3 times at FYE 1983. At the same time, the liquidity of current assets, in particular, receivables and inventories has improved. The turnover of receivables improved from 8.7 times per year in 1979 to 16.6 times per year in 1983, an improvement of 90.8 percent. At the same time inventories which turned over 8.6 times per year in 1979 accelerated to 10.2 times per year by FYE 1983.

Table 10.--U.S. producers' aggregate operating performance 1/ (including domestic copper and noncopper operations), 1979-83

Item	1979	1980	1981	1982	1983
Net sales-----1,000 dollars--	22,534,619	31,677,357	33,222,212	30,206,268	29,739,499
Cost of goods sold-----do----	18,601,703	24,877,201	25,864,784	24,412,748	23,910,306
Gross profit ----------do----	3,932,916	6,800,156	7,357,428	5,793,520	5,829,193
Operating expenses-----do----	633,151	2,010,095	2,292,247	2,060,632	1,845,988
Operating income-------do----	3,299,765	4,790,061	5,065,181	3,732,888	3,983,205
Interest expense-------do----	162,443	422,787	459,411	655,713	559,481
Other expenses---------do----	186,165	854,259	1,833,127	1,455,834	1,556,640
Other income-----------do----	78,521	318,551	341,072	146,270	163,279
Income before taxes----do----	3,029,678	3,831,566	3,113,715	1,767,611	2,030,363
Income taxes-----------do----	1,046,732	1,280,013	1,073,563	593,930	775,136
Net income-------------do----	1,982,946	2,551,553	2,040,152	1,173,681	1,255,227
Extraordinary credits--do----	158,438	253,348	49,555	6,958	0
Extraordinary (charge)-do----	0	0	22,100	175,087	365,221
Net income after extraordinary items-------do----	2,141,384	2,804,901	2,067,607	1,005,552	890,006
As a share of sales:					
Cost of goods sold-percent-	82.55	78.53	77.85	80.82	80.40
Gross profit----------do---	17.45	21.47	22.15	19.18	19.60
Operating expenses----do---	2.81	6.35	6.90	6.82	6.21
Operating income------do---	14.64	15.12	15.25	12.36	13.39
Interest expense------do---	0.72	1.33	1.38	2.17	1.88
Income before taxes---do---	13.44	12.10	9.37	5.85	6.83
Taxes----------------do---	4.64	4.04	3.23	1.97	2.61
Net income-----------do---	8.80	8.85	6.14	3.89	4.22
Cash flow from operations:					
Net income after extraordinary items 1,000 dollars--	2,141.384	2,804,901	2,067,607	1,005,552	890,006
Depreciation---------do----	945,960	1,158,129	1,415,946	1,501,876	1,775,328
Depletion------------do----	6,854	6,468	18,654	17,279	20,334
Cash flow from operations--------------do----	3,094,198	3,969,498	3,502,207	2,524,707	2,685,668

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The amount of borrowed funds increased at a faster pace than equity funds which caused a slight increase in the debt-to-equity ratio, which is an indicator of the amount of leverage employed by a company. The debt-to-equity ratio grew from .80 times to 1 at FYE 1979 to .85 times to 1 at FYE 1983. The capitalization ratio which reflects the percentage of equity employed within a company decreased slightly from 55 percent of the total asset base at FYE 1979 to 53 percent at FYE 1983.

Cash flow from operations.--The single most significant aspect of the cash flow generated from operations for the firms on an aggregated basis has been the transition between net profits and depreciation as the major contributor to cash flow for operations. At FYE 1979 net profits contributed 69.2 percent of cash flow. By FYE 1983, net profits contribution to cash flow had diminished to 33.1 percent, and depreciation grew from 30.6 percent at FYE 1979 to 66.1 percent at FYE 1983. In the case of these producers, net fixed assets increased by $9.7 billion over the 5-year period in consonance with the introduction of the Accelerated Cost Recovery System (ACRS), a major change in the computation of depreciation allowed by the 1981 Economic Recovery Tax Act, which increased the rate of write-down on qualifiable assets. This explains the higher contribution of depreciation in part. Of course, the other factor has to be the reduction in profitability over the past 5 years.

Operating performance of the establishments within which copper products are produced

*** companies provided financial data on their domestic copper operations. For these *** companies, aggregate sales dropped 24.0 percent from $4.85 billion in 1979 to $3.69 billion in 1983 (table 11). From 1979 to 1983, the level of cost of goods sold in relation to sales increased from 83.1 percent of sales to 105.7 percent. Consequently, the gross margin declined from profitability to losses. The first loss occurred in 1981 as the level of product costs exceeded sales by 1.5 percent; in 1982, product cost levels exceeded sales by 15.2 percent, and they continued to surpass sales in 1983, although the level declined to 5.7 percent.

Two changes occurred in the cost of goods sold. First, as previously mentioned, the level of product costs to sales moved upward from 83 percent of sales in 1979 to exceed sales by 5.7 percent in 1983. At the same time, there was growth in the absolute amounts of two of the four components of total product costs--energy and other product costs. Energy costs in 1983 exceeded the 1979 amount by 31 percent, and other product costs increased by less than one percent during the same period.

Although sales declined by 24 percent, the cost of goods sold declined by a mere 3 percent from 1979 to 1983. Not one of the four categories of product costs decreased at a comparable rate with sales. Raw materials and direct labor showed some variability but decreased by only 13 and 12 percent, respectively, from the amounts expensed in 1979. Other costs in 1983 were slightly more than the amount expensed in 1979. It is apparent from the real growth in energy and other costs, compared with the 3 percent decline in product costs, that product costs increased in real terms. Since sales declined by 24 percent, it would appear that management did not pass along these cost increases by raising the price of copper.

Table 11.--U.S. producers' aggregate operating performance 1/ of the establishments within which copper products are produced, 1979-83

Item	1979	1980	1981	1982	1983
Net sales----1,000 dollars--	4,853,126	4,679,741	4,425,368	3,438,695	3,689,648
Cost of goods sold:					
Raw materials					
1,000 dollars--	1,218,827	1,497,548	1,288,297	919,717	1,058,613
Energy----------do----	363,902	443,583	548,335	463,692	475,791
Direct labor--------do----	751,257	728,335	919,256	735,273	661,380
Other factory-------do----	1,699,127	1,397,982	1,738,498	1,842,679	1,704,787
Total cost of goods sold----------do----	4,033,113	4,067,448	4,494,386	3,961,361	3,900,571
Gross profit or (loss)----------do----	820,013	612,293	(69,018)	(522,666)	(210,923)
Operating expenses----do----	186,103	267,012	268,055	280,909	203,660
Operating income or (loss)----------do----	633,910	345,281	(337,073)	(803,575)	(414,583)
Interest expense------do----	58,074	78,082	98,176	174,805	70,564
Other expenses--------do----	12,807	256,133	51,215	237,326	177,475
Other income---------do----	50,014	160,803	75,945	61,960	57,836
Income or (loss) before taxes----------do----	613,043	171,869	(410,519)	(1,153,746)	(604,786)
As a share of sales:					
Cost of goods sold:					
Raw materials--percent--	25.1	32.0	29.1	26.7	28.7
Energy----------do----	7.5	9.5	12.4	13.5	13.0
Direct labor------do----	15.5	15.6	20.8	21.3	17.8
Other costs-------do----	35.0	29.9	39.3	53.5	46.2
Total cost of goods sold----do----	83.1	87.0	101.6	115.0	105.7
Gross profit--------do----	16.9	13.1	(1.5)	(15.2)	(5.7)
Operating expenses--do----	3.8	5.7	6.1	8.1	5.5
Operating income----do----	13.1	7.3	(7.6)	(23.3)	(11.2)
Interest expense----do----	1.2	1.7	2.2	5.1	1.9
Income before taxes do----	12.6	3.6	(9.3)	(33.5)	(16.4)

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

The gross loss of $69 million in 1981 increased to $523 million in 1982 and declined to $211 million in 1983. The reduction in losses between 1982 and 1983 is attributable to the reduction in the level (from 53.5 percent to 46.2 percent) of other costs to sales, which amounted to a $138 million reduction in absolute terms. Also, there was a reduction in the level of direct labor to sales of 21.3 percent in 1982 to 17.8 percent in 1983, which amounted to a $74 million cost reduction. In light of the size of the reductions, it would appear that the companies' efforts to cut labor and other costs resulted in the reduction in losses between 1982 and 1983, rather than an improvement in sales.

Operating expenses increased in relation to sales from 3.8 percent in 1979 to 5.5 percent in 1983, and they also experienced real growth in absolute terms of 9.4 percent. Operating income, which was equal to 13.1 and 7.3 percent of sales in 1979 and 1980, respectively, turned to operating losses of 7.6, 23.3, and 11.2 percent of sales in 1981, 1982, and 1983, respectively.

Pretax income or loss has been volatile over the past 5 years. In 1979 the pretax income margin was 12.6 percent of sales. By 1980, the margin fell to 3.6 percent of sales. In 1981 it declined further to a negative 9.3 percent of sales and dropped to a negative 33.5 percent of sales in 1982 before moving upward to a negative 16.4 percent of sales in 1983.

Mining and/or milling production costs

As reported by the producers in questionnaire responses, the costs associated with the mining and milling of copper are shown in tables 12 and 13. Table 12 shows aggregate mining and milling production costs for ***, which are the only copper producers that assign a value to raw materials at the mining or milling stage. Table 13 reflects the aggregate cost of the *** companies who do not assign a value to raw materials during the mining and milling stage. ***.

Consistent with the situation found during an examination of the costs of goods sold in producing copper products, energy costs grew in absolute terms from *** in 1979 to *** in 1983 for the *** companies that compute raw-material costs, and from $152.2 million in 1979 to $156.4 million in 1983 for the other firms. The only other significant aggregated cost item was the ***

Table 12.--Aggregated costs of *** copper-mining and milling operations 1/ that assign values to raw materials, 1979-83

Item	1979	1980	1981	1982	1983
Raw materials-1,000 dollars--	***	***	***	***	***
Transportation---------do----	***	***	***	***	***
Energy----------do----	***	***	***	***	***
Direct labor----------do----	***	***	***	***	***
Depreciation and amort-					
ization----------do----	***	***	***	***	***
Depletion----------do----	***	***	***	***	***
Other costs----------do----	***	***	***	***	***
Total costs----------do----	***	***	***	***	***
As a share of total costs:					
Raw materials-----percent--	***	***	***	***	***
Transportation-------do----	***	***	***	***	***
Energy----------do----	***	***	***	***	***
Direct labor---------do----	***	***	***	***	***
Depreciation and amort-					
ization----------do----	***	***	***	***	***
Depletion----------do----	***	***	***	***	***
Other costs----------do----	***	***	***	***	***
Indexes of cost items					
(1979=100):					
Raw materials-----percent--	***	***	***	***	***
Transportation-------do----	***	***	***	***	***
Energy----------do----	***	***	***	***	***
Direct labor---------do----	***	***	***	***	***
Depreciation and amort-					
ization----------do----	***	***	***	***	***
Depletion----------do----	***	***	***	***	***
Other costs----------do----	***	***	***	***	***

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 13.--Aggregated costs of *** copper-mining and milling operations 1/ that do not assign values to raw materials, 1979-83

Item	1979	1980	1981	1982	1983
Raw materials-1,000 dollars--	0	0	0	0	0
Transportation---------do----	19,285	21,904	31,632	26,786	19,19
Energy----------do----	152,203	155,282	190,006	149,662	156,44
Direct labor----------do----	237,319	238,227	315,019	214,285	178,39
Depreciation and amortization----------do----	83,098	74,478	75,491	62,117	65,17
Depletion----------do----	10,557	10,345	11,316	10,963	6,60
Other costs----------do----	402,616	433,851	543,386	376,502	362,95
Total costs----------do----	905,078	934,087	1,166,850	840,315	788,77
As a share of total costs:					
Raw materials-----percent--	-	-	-	-	-
Transportation-------do----	2.1	2.3	2.7	3.2	2.4
Energy----------do----	16.8	16.6	16.3	17.8	19.8
Direct labor---------do----	26.2	25.5	27.0	25.5	22.6
Depreciation and amortization----------do----	9.2	8.0	6.5	7.4	8.3
Depletion----------do----	1.2	1.1	1.0	1.3	1.0
Other costs----------do----	44.5	46.5	46.6	44.8	46.0
Indexes of cost items (1979=100):					
Raw materials-----percent--	-	-	-	-	-
Transportation-------do----	100.0	113.6	164.0	138.9	99.5
Energy----------do----	100.0	102.0	124.8	98.3	102.8
Direct labor---------do----	100.0	100.4	132.7	90.3	75.2
Depreciation and amortization----------do----	100.0	89.6	90.9	74.8	78.4
Depletion----------do----	100.0	98.0	107.2	103.8	62.6
Other costs----------do----	100.0	107.8	135.0	93.5	90.2

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Smelting production costs

*** companies which provided financial information do not operate smelting operations, and *** smelting production costs data are not meaningful because raw materials, energy and other costs are grouped together into one cost category; consequently, tables 14 and 15 are based upon information provided by *** companies. *** do not associate a cost to raw materials when provided from their own mining and milling operations. These *** companies' combined smelting production costs are shown in table 14. Throughout the 5-year period under review, energy costs and other costs have constituted *** percent or more of total smelting costs. However, there has been a gradual change in the relative importance of these two cost items over the 5-year period. As shown in table 14, energy costs grew from *** percent of smelting costs in 1979, peaked to *** percent of smelting costs in 1982, and declined to *** percent in 1983. Although other costs peaked during the 5-year period in 1979 at *** percent of smelting costs, other costs began a steady decline to *** percent of smelting costs in 1982 and increased to *** percent of smelting costs in 1983. Energy costs' impact on smelting costs is dramatized by the fact that it is the only cost item that grew in absolute terms between 1979 and 1983, from ***. Table 15, which indicates the aggregate production costs of the *** companies which compute a cost to raw materials at the smelting stage, reflects nominal changes in the relative importance of the various cost items to total smelting costs. Those changes which did occur are the result of the growth in absolute terms of raw materials, transportation, and energy costs and the rate of growth of these cost items. Although raw materials and transportation costs grew in absolute terms, the significant factor in this table is the continuation of the growth trend in energy costs which was manifested in the three preceding tables (tables 12, 13, and 14).

Refining production costs

*** copper producers which provided financial information do not conduct refining operations, and *** refining costs are not meaningful because of the grouping of raw materials and energy into the other costs category; therefore, the data shown in tables 16 and 17 are for *** firms. *** firms, whose refining production costs are reflected in table 16, assign a cost to raw materials during the refining stage. The energy and direct labor costs of the *** firms grew relative to total refining cost and in absolute terms between 1979 and 1983. Energy costs increased from $32.3 million in 1979 to $ 42.3 million in 1983, or by 31 percent in absolute terms, and rose from 4.3 percent of total refining costs in 1979 to 8.2 percent in 1983.

*** copper companies do not assign a cost to raw materials at the refining stage. The refining costs of these *** companies are shown in table 17. Consistent with the findings in the other copper production areas, energy costs experienced growth relative to total refining costs and in absolute terms when it increased from $17.6 million in 1979 to $21.2 million in 1983, or by 20.7 percent.

In conclusion, it is apparent that transportation and direct labor costs have experienced growth in certain stages of the copper production process; however, the one cost item which has grown in every process, no matter the

Table 14.--Aggregated costs of *** copper-smelting operations 1/ that do not assign values to raw materials, 1979-83

Item	1979	1980	1981	1982	1983
Raw materials-1,000 dollars--	***	***	***	***	**
Transportation---------do----	***	***	***	***	**
Energy----------do----	***	***	***	***	**
Direct labor----------do----	***	***	***	***	**
Depreciation and amortization----------do----	***	***	***	***	**
Depletion----------do----	***	***	***	***	**
Other costs----------do----	***	***	***	***	**
Total costs----------do----	***	***	***	***	**
As a share of total costs:					
Raw materials-----percent--	***	***	***	***	**
Transportation-------do----	***	***	***	***	**
Energy----------do----	***	***	***	***	**
Direct labor---------do----	***	***	***	***	**
Depreciation and amortization----------do----	***	***	***	***	**
Depletion----------do----	***	***	***	***	**
Other costs----------do----	***	***	***	***	**
Indexes of cost items (1979=100):					
Raw materials-----percent--	***	***	***	***	**
Transportation-------do----	***	***	***	***	**
Energy----------do----	***	***	***	***	**
Direct labor---------do----	***	***	***	***	**
Depreciation and amortization----------do----	***	***	***	***	**
Depletion----------do----	***	***	***	***	**
Other costs----------do----	***	***	***	***	**

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 15.--Aggregated costs of *** copper-smelting operations 1/ that assign values to raw materials, 1979-83

Item	1979	1980	1981	1982	1983
Raw materials-1,000 dollars--	301,834	241,247	346,466	231,899	362,945
Transportation---------do----	6,738	7,241	11,478	11,626	8,023
Energy----------do----	81,032	76,489	111,068	102,924	95,131
Direct labor----------do----	143,735	133,060	157,848	150,425	135,447
Depreciation and amortization----------do----	39,658	43,620	45,295	41,549	38,297
Depletion----------do----	0	0	0	0	0
Other costs----------do----	79,361	100,900	68,989	28,980	2,263
Total costs----------do----	652,358	602,557	741,144	567,403	637,580
As a share of total costs:					
Raw materials-----percent--	46.3	40.0	46.8	40.9	56.9
Transportation-------do----	1.0	1.2	1.6	2.1	1.3
Energy----------do----	12.4	12.7	15.0	18.1	14.9
Direct labor----------do----	22.0	22.1	21.3	26.5	21.2
Depreciation and amortization----------do----	6.1	7.2	6.1	7.3	6.0
Depletion----------do----	0.0	0.0	0.0	0.0	0.0
Other costs----------do----	12.2	16.8	9.3	5.1	0.4
Indexes of cost items (1979=100):					
Raw materials-----percent--	100.0	79.9	114.8	76.8	120.2
Transportation-------do----	100.0	107.5	170.3	172.5	119.1
Energy----------do----	100.0	94.4	137.1	127.0	117.4
Direct labor----------do----	100.0	92.6	109.8	104.7	94.2
Depreciation and amortization----------do----	100.0	110.0	114.2	104.8	96.6
Depletion----------do----	0.0	0.0	0.0	0.0	0.0
Other costs----------do----	100.0	127.1	86.9	36.5	(2.9)

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

accounting for raw materials, is energy. It is apparent that the companies are consuming more energy to process larger quantities of a decreasing grade of ore, and that the cost of energy has increased, and that these two situations have occurred simultaneously.

Table 16.--Aggregated costs of *** copper refining operations 1/ that assign values to raw materials, 1979-83

Item	1979	1980	1981	1982	1983
Raw materials-1,000 dollars--	435,748	498,529	421,200	246,942	312,074
Transportation---------do----	23,194	19,579	21,868	17,148	15,444
Energy----------do----	32,291	37,477	50,821	47,705	42,258
Direct labor----------do----	67,227	64,292	88,777	79,444	75,102
Depreciation and amortization----------do----	25,074	21,712	24,187	21,760	20,429
Depletion----------do----	0	0	0	0	0
Other costs----------do----	165,488	103,784	14,888	53,790	52,981
Total costs----------do----	749,022	745,373	621,741	466,789	518,288
As a share of total costs:					
Raw materials-----percent--	58.2	66.9	67.8	52.9	60.2
Transportation-------do----	3.1	2.6	3.5	3.7	3.0
Energy----------do----	4.3	5.0	8.2	10.2	8.2
Direct labor---------do----	9.0	8.6	14.3	17.0	14.5
Depreciation and amortization----------do----	3.4	2.9	3.9	4.7	3.9
Depletion----------do----	0.0	0.0	0.0	0.0	0.0
Other costs----------do----	22.1	13.9	2.4	11.5	10.2
Indexes of cost items (1979=100):					
Raw materials-----percent--	100.0	114.4	96.7	56.7	71.6
Transportation-------do----	100.0	84.4	94.3	73.9	66.6
Energy----------do----	100.0	161.1	157.4	147.7	130.9
Direct labor---------do----	100.0	95.6	132.1	118.2	111.7
Depreciation and amortization----------do----	100.0	86.6	96.5	86.8	81.5
Depletion----------do----	0.0	0.0	0.0	0.0	0.0
Other costs----------do----	100.0	62.7	9.0	32.5	32.0

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 17.--Aggregated costs of *** copper refining operations 1/ that do not assign values to raw materials, 1979-83

Item	1979	1980	1981	1982	1983
Raw materials-1,000 dollars--	0	0	0	0	0
Transportation---------do----	717	756	915	937	847
Energy----------do----	17,616	19,298	24,964	22,942	21,255
Direct labor----------do----	17,420	15,475	22,954	16,882	14,996
Depreciation and amortization----------do----	3,226	3,039	3,470	3,901	3,386
Depletion----------do----	0	0	0	0	0
Other costs----------do----	96,805	101,092	157,999	105,624	104,756
Total costs----------do----	135,784	139,660	210,302	150,286	145,240
As a share of total costs:					
Raw materials-----percent--	0.0	0.0	0.0	0.0	0.0
Transportation-------do----	0.5	0.5	0.4	0.6	0.6
Energy----------do----	13.0	13.8	11.9	15.3	14.6
Direct labor---------do----	12.8	11.1	10.9	11.2	10.3
Depreciation and amortization----------do----	2.4	2.2	1.7	2.6	2.3
Depletion----------do----	0.0	0.0	0.0	0.0	0.0
Other costs----------do----	71.3	72.4	75.1	70.3	72.1
Indexes of cost items (1979=100):					
Raw materials-----percent--	0.0	0.0	0.0	0.0	0.0
Transportation-------do----	100.0	105.4	127.6	130.7	118.1
Energy----------do----	100.0	109.5	141.7	130.2	120.7
Direct labor---------do----	100.0	88.8	131.8	96.9	86.1
Depreciation and amortization----------do----	100.0	94.2	107.6	120.9	105.0
Depletion----------do----	0.0	0.0	0.0	0.0	0.0
Other costs----------do----	100.0	104.4	163.2	109.1	108.2

1/ ***.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Capital expenditures

Total expenditures on copper facilities experienced a downward trend between 1979 and 1983 as expenditures dropped from $311.8 million to $308.7 million.

A majority of the copper-producing companies are wholly owned subsidiaries of large diversified corporations. As such, expenditures on capital facilities are based in large part upon how well the subsidiary has performed in the recent past and the potential for profits. Since the copper companies were poor performers, their share of the total corporate expenditures declined consistently from 8.7 percent of total corporate expenditures in 1979 to 4.7 percent of total corporate expenditures in 1983.

Expenditures for mining and milling, shown in table 18, represent the major portion of expenditures by U.S. producers for copper-producing assets. However, the proportion of mining and milling expenditures to total copper expenditures declined from 61.9 percent in 1979 to 51.2 percent in 1983, and such expenditures decreased by 18 percent in absolute terms. During the same period, smelting expenditures increased by 87 percent in absolute terms and by 1983 represented a 42-percent share of total capital expenditures by copper producers. Expenditures on copper-refining facilities decreased by 56.8 percent from 1979 to 1983 in absolute terms and as a share of total copper expenditures declined from 16.0 percent of the total to 6.9 percent.

An important trend with respect to capital expenditures by the copper industry in recent years is the increasing share of the decreasing total copper expenditures which are required by Government regulations to improve and maintain environmental quality or to insure worker safety and health (table 19). Between 1979 and 1983 the copper companies spent an aggregated average of $88 million per year on environmental expenditures alone. Expenditures for environmental, safety, and health considerations have grown from 17 percent of all copper expenditures at FYE 1979 to 46 percent by FYE 1983. This growth results from the simultaneous increase in the amounts budgeted for these purposes and the declining amounts of total copper capital expenditures.

Table 18.--Capital expenditures for facilities and equipment used principally in copper mining/milling, smelting, and refining, 1979-83

Item	1979	1980	1981	1982	1983
Copper mining/milling 1,000 dollars	192,930	208,517	409,493	236,076	157,925
Copper smelting--------do----	68,970	52,076	64,605	148,446	129,247
Copper refining--------do----	49,940	59,455	43,593	35,033	21,553
Total expenditures-do----	311,840	320,048	517,691	419,555	308,725
As a share of total expenditures:					
Copper mining/milling percent	61.9	65.2	79.1	56.3	51.2
Copper smelting------do----	22.1	16.3	12.5	35.3	41.9
Copper refining------do----	16.0	18.5	8.4	8.4	6.9

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 19.--U.S. copper producers' capital expenditures resulting from efforts to comply with various Government regulations and total capital expenditures, 1979-83

Item	1979	1980	1981	1982	1983
	Expenditures (1,000 dollars)				
Expenditures resulting from efforts to comply with regulations of:					
Environmental Protection Agency	47,800	45,638	68,988	142,671	135,129
Occupational Safety and Health Administration	2,314	576	1,633	8,487	401
Mine Employment Safety Administration/Mine Safety and Health Administration	2,982	2,557	3,034	3,048	2,752
All other	126	209	308	649	4,331
Total	53,222	48,980	73,963	154,855	142,613
Total capital expenditures	311,840	320,048	517,691	419,555	308,725
	Percent of total				
Regulatory expenditures	17.1	15.3	14.3	36.9	46.2

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Research and development expenditures

Domestic producers reported the following research and development expenses which relate to the production of copper.

Item	1979	1980	1981	1982	1983
Mining research and development---1,000 dollars	44,699	39,970	59,368	35,242	26,979
Smelting research and development---do	4,588	5,018	5,893	6,093	4,162
Refining research and development---do	3,019	3,308	4,387	3,474	2,315
Other research and development---do	0	0	0	0	0
Total research and development---do	52,306	48,296	69,648	44,809	33,456
Total research and development as a share of sales---percent	1.0	1.0	1.6	1.3	0.9

As indicated, research and development expenditures were sharply curtailed from 1981 to 1983 as production and profits fell. Such expenditures declined both in absolute terms and as a share of total sales.

The Question of the Threat of Serious Injury

Foreign producers' and their capacity, production, capacity utilization, and export markets

The top five world copper producers, by stages of production, with their shares of market in 1983, are shown in the following tabulation (in percent):

Country	Mine production	Smelter production	Refinery production
Chile	15	13	12
U.S.S.R	14	15	16
U.S.A	14	12	18
Canada	7	4	-
Zambia	6	7	6
Zaire	7	6	-
Japan	-	-	15
Belgium	-	-	5

Of the products specified in the petition (blister and refined copper) the top U.S. import sources in 1983 were Chile (56 percent), Canada (18 percent), Peru (7 percent), Zaire (6 percent), and Zambia (5 percent).

The Conseil Intergouvernemental des Pays Exportateurs de Cuivere (Intergovernmental Council of Copper Exporting Countries)(CIPEC) represents eight copper-producing countries, several of which are the source of significant imports of copper into the United States. CIPEC members account for 40 percent of world copper mine production. The organization is headquartered in Paris, France. Four countries, Chile, Peru, Zaire, and Zambia, joined to establish the organization in 1967. Indonesia entered as a full member in 1975, and Australia and Papua New Guinea joined as associate members at the same time. Recently, Mauritania became a full member. Procedural mechanics to undertake collective action on prices by these countries resides with CIPEC. The organization conducts marketing studies and disseminates reports on world copper developments, but its most important function is to act as a consultative body for policy coordination. Its recent activities have been directed toward the establishment of an international commodity agreement in copper to operate as a part of the United Nations Conference on Trade and Development Integrated Commodity Program. CIPEC has also been active in attempts to form a producer cartel. A summary of the copper industry in each of the major U.S. import source countries is given below.

Chile.--Chile took first place among world copper mine producers in 1982 because of consistent production increases. Increases in production were possible because of the completion of several expansion and modernization projects and were in harmony with attempts to maximize sales and increase

market shares in the face of continued depressed copper prices, severe financial pressures domestically, and reduced international competition as copper mines in the developed countries closed.

Chile's copper industry is divided according to the size of the mining company. The largest segment (83 percent of production) is composed of the State-owned Corporacion Nacional del Cobre de Chile (Codelco), which was created April 1, 1976, as a consortium of the nation's four leading copper mines. Codelco operates as an autonomous business enterprise and trades internationally. It is one of Chile's principal taxpayers and must turn over all its profits to the State. Codelco is one of the Government's chief sources of revenue, and its total export earnings roughly equal the interest Chile pays annually on its national debt. It receives no direct Government subsidies. Codelco has a number of programs to benefit its workers (it employs 27,000 persons) which in other countries are performed by Government entities. Production inputs are obtained on open markets or at arm's length from other State-owned enterprises.

The medium and small sectors (17 percent of production) is composed of Empresa Nacional de Mineria (ENAMI), Empresa Mineria Mantos Blancos S.A. (Mantos Blancos), Compania Mineria Disputada de Las Condes (La Disputada), Sociedad Minera Pudahel (Pudahel), and others (such as El Indio and Carolina de Michilla). ENAMI is the second largest Chilean copper refiner (7 percent of production) and is also State-owned. It does not carry out any mining activity of its own, but rather purchases ore from any available foreign or domestic source, including CODELCO and other Chilean small mining companies and individual miners. Mantos Blancos is the largest private-sector copper producer in Chile (5 percent of production). It was formed in 1955 by Consolidated Mining and Industries S.A., and is now 40 percent owned by Anglo American. La Disputada (3 percent of production) is owned by Exxon Minerals. Pudahel, a privately owned Chilean company (1 percent of production), was formed in 1969 by Chile's two largest business groups, the Cruzat-Larrain Group and BHC (or Vial) Group, which are equal partners in the project.

Chilean copper production, capacity, utilization, and exports are shown in table 20. Chile's top five export markets, by stages of production, with their market share in 1983, are shown below:

Country	Mine production	Smelter production	Refinery production
Japan	36	-	-
Canada	17	-	-
Brazil	16	-	-
Finland	11	-	-
Republic of Korea	7	-	-
United States	-	37	34
Spain	-	11	-
United Kingdom	11	-	-
West Germany	-	10	15
Turkey	-	7	-
Italy	-	-	11
France	-	-	10
Netherlands	-	-	6

Table 20.--Unwrought copper: Chilean production, capacity, utilization, and exports, 1979-83

Item	1979	1980	1981	1982	1983
Mine:					
Production					
1,000 metric tons	1,063	1,068	1,081	1,240	1,213
Capacity---do	1,097	1,333	1,150	1,332	1,289
Utilization---percent	97	80	94	93	94
Exports to--					
U.S.--1,000 metric tons	1/	11	1/	7	2
All other---do	99	114	113	194	191
Total---do	99	125	113	201	193
Smelter:					
Production					
1,000 metric tons	949	953	954	1,047	1,058
Capacity---do	2,626	2,626	2,626	2,589	2,562
Utilization---percent	36	36	36	40	41
Exports to:					
U.S.--1,000 metric tons	32	26	42	56	72
All other---do	133	125	131	143	152
Total---do	165	151	173	199	224
Refinery:					
Production					
1,000 metric tons	780	811	776	852	833
Capacity---do	763	765	765	910	927
Utilization---percent	102	106	101	94	90
Exports to--					
U.S.--1,000 metric tons	93	123	135	184	250
All other---do	653	646	617	625	580
Total---do	746	769	752	809	830

1/ Less than 500 metric tons.

Source: Production and export data, World Bureau of Metal Statistics, compiled from World Metal Statistics, April 1984. Smelter and refinery capacity data, American Bureau of Metal Statistics, compiled from Non-Ferrous Metal Data, 1979-83. Mine capacity data, compiled from International Wrought Copper Council, Survey of Planned Increases in World Copper Mine, Smelter, and Refinery Capacity, 1980-87 (mine capacity data for 1979 estimated by the staff of the U.S. International Trade Commission).

Canada.--Canada's domestic copper industry consists of approximately 85 mines, 7 smelters, and 3 refineries. Ownership of the Canadian copper industry is widely diffused in the mining sector, which involves roughly 35 companies. Ownership is highly concentrated in the smelting and refining sector of the Canadian copper industry; however, 7 of the 35 companies (Afton Mines Ltd., Canadian Copper Refiners Ltd., Falconbridge Ltd., Hudson Bay Mining & Smelting Company Ltd., Inco Ltd., Kidd Creek Mines Ltd., and Noranda Mines Ltd.) own all of Canada's smelting capacity, and 3 of these companies (Canadian Copper Refiners, Inco, and Kidd Creek Mines) own all of Canada's refining capacity. In the copper mining sector, three companies (Lornex Mining Corp. Ltd., Noranda, and Inco), two of which are fully integrated,

together account for 42 percent of Canada's mine capacity. The top 10 companies together account for approximately 80 percent of Canada's copper mine capacity.

Canadian copper production, capacity, utilization and exports are shown in table 21. Canada's top five export markets, by stages of production, with their market share in 1983, are shown below:

Mine production	Refinery production
Japan - 64	United States - 34
Republic of Korea - 12	Netherlands - 16
Taiwan - 10	United Kingdom - 16
Norway - 7	China - 16
United States - 5	West Germany - 9

Table 21.--Unwrought copper: Canadian production, capacity, utilization, and exports, 1979-83

Item	1979	1980	1981	1982	1983
Mine:					
Production					
1,000 metric tons--	636	716	691	612	615
Capacity----------do----	894	838	873	883	898
Utilization-------percent--	71	85	79	69	68
Exports to:					
U.S.--1,000 metric tons--	9	3	2	20	12
All other----------do----	309	283	275	233	301
Total----------do----	318	286	277	253	313
Smelter:					
Production					
1,000 metric tons--	385	493	479	367	376
Capacity----------do----	7,417	4,514	4,514	4,514	4,514
Utilization 1/----percent--	5	11	11	8	8
Refinery:					
Production					
1,000 metric tons--	397	505	477	338	464
Capacity----------do----	615	615	615	674	674
Utilization-------percent--	65	82	78	50	69
Exports to:					
U.S.--1,000 metric tons--	71	127	84	93	73
All other----------do----	120	208	179	140	226
Total----------do----	191	335	263	233	299

1/ 3,630,000 metric tons of this capacity cannot be fully utilized because of Ontario Government sulphur dioxide emission regulations.

Source: Production and export data, compiled from World Bureau of Metal Statistics, World Metal Statistics, April 1984. Smelter and refinery capacity data, compiled from American Bureau of Metal Statistics, Non-Ferrous Metal Data, 1979-83. Mine capacity data, compiled from International Wrought Copper Council, Survey of Planned Increases in World Copper Mine, Smelter, and Refinery Capacity, 1980-87 (mine capacity data for 1979 estimated by the staff of the U.S. International Trade Commission).

Zaire.--Zaire's copper industry is for the most part nationalized. However, the Government of Zaire has foreign partners in two of its copper-mining enterprises. Zaire's investment code does not distinguish between foreign and domestic investors; however, a standard mining convention established by the Department of Mines requires 10 percent Government equity in all ventures. Zaire's mining sector is held responsible for providing foreign-exchange earnings and for providing countless social services. The Government has recognized the importance of rehabilitation of the mining sector, for much of its equipment is by international standards clearly obsolete. The Mobutu Plan, a medium-term Government development plan, calls for emphasis on this sector.

There are two companies producing copper in Zaire: La Generale des Carrieres et des Mines (Gecamines), and Societe de Developpement Industriele et Minier du Zaire (Sodimiza). Gecamines, the predominant copper producer (80 percent of production), is a Zairian Government-owned company created on January 2, 1967, to assume the mining functions of its Belgian-owned predecessor. Crucial to Gecamines' operations are the marketing conditions faced by Sozacom, the exclusive international marketer of Gecamines' output. Sodimiza (20 percent of production), was founded in April 1969 with an initial participation by Codemiza, a consortium of six Japanese mining companies. In 1974, Zaire's participation increased to 20 percent and two more Japanese companies entered the consortium. In mid-1977, Sodimiza reached a new agreement with the Zairian Government governing its operations for the next 10 years which permitted exploration for a new mine and continued previously accorded tax advantages.

Zairian copper production, capacity, utilization, and exports 1/ are shown in table 22. Zaire's top 5 export markets, by stages of production, with their market share for 1983, are shown below:

Mine production	Refinery production
Belgium - 88	West Germany - 27
France - 4	United States - 16
West Germany - 3	Netherlands - 16
Yugoslavia - 2	Italy - 9
China - 2	Belgium - 8

Peru.--The Peruvian mining sector has undertaken a vigorous effort to increase production and reduce operating costs. Although Peru has a large number of mines producing copper, almost all of which are privately owned, three corporations are dominant in the industry and control all smelter and refinery capacity. In addition, a State-owned minerals marketing company, MINPECO, accounts for the majority of Peruvian minerals exports.

Peru's copper industry can also be divided according to the size of the mining company. Large producers which together accounted for 87 percent of production are Southern Peru Copper Corp. (SPCC), Minero Peru, and Empresa

1/ Counsel for Zaire have requested that imports from Zaire be excluded from any relief, because such imports are in the form of wirebars. Counsel contend, and domestic producers concur, that U.S. wirebar demand cannot be satisfied from domestic production.

Table 22.--Unwrought copper: Zairian production, capacity, utilization, and exports, 1979-83

Item	1979	1980	1981	1982	1983
Mine:					
Production					
1,000 metric tons	400	460	505	503	503
Capacity---do	614	667	702	641	659
Utilization---percent	65	69	72	78	76
Exports to:					
U.S.--1,000 metric tons	-	-	-	-	-
All other---do	30	34	35	36	36
Total---do	30	34	35	36	36
Smelter:					
Production					
1,000 metric tons	370	426	468	466	467
Capacity---do	1/	1/	1/	1/	1/
Utilization---percent					
Exports to:					
U.S.--1,000 metric tons	-	-	-	-	-
All other---do	266	273	277	323	232
Total---do	266	273	277	323	232
Refinery:					
Production					
1,000 metric tons	103	144	151	175	227
Capacity---do	250	250	250	250	250
Utilization---percent	41	58	60	70	91
Exports to:					
U.S.--1,000 metric tons	2	5	26	15	35
All other---do	68	149	125	141	183
Total---do	70	154	151	156	218

1/ Valid capacity data are not available.

Source: Production and export data, compiled from World Bureau of Metal Statistics, World Metal Statistics, April 1984. Smelter and refinery capacity data, compiled from American Bureau of Metal Statistics, Non-Ferrous Metal Data, 1979-83. Mine capacity data, compiled from International Wrought Copper Council, Survey of Planned Increases in World Copper Mine, Smelter, and Refinery Capacity, 1980-87 (mine capacity data for 1979 estimated by the staff of the U.S. International Trade Commission).

Minera del Centro de Peru (Centromin). SPCC, which is wholly owned by four U.S. copper producers (ASARCO, 52.3 percent; Marmon Group, 20.7 percent; Phelps Dodge, 16.3 percent; and Newmont, 10.7 percent), three of which are petitioners, is the country's largest copper producer, accounting for approximately one-half of the country's copper ore output and three fourths of its copper. Both Minero Peru and Centromin are State- or Government-owned. The medium sector (12 percent of production) is composed of nine important producers, including Pativilca, El Aguila, Condoroma, Nor Peru, Chapi, Madrigal, Atalaya, Locumba, and Condestable. Pativilca is the largest privately owned (by Peruvians) copper producer in Peru.

Peruvian copper production, capacity, utilization, and exports are shown in table 23. Peru's top five export markets, by stages of production, with their market share for 1983, are shown below:

Smelter production	Refinery production
United Kingdom - 33	Netherlands - 25
Japan - 22	United States - 19
China - 15	Italy - 16
West Germany - 8	Japan - 11
Belgium - 7	United Kingdom - 10

Zambia.--Zambia is critically dependent on copper for its livelihood. Copper provides over 90 percent of its export revenue. This economic situation was a factor leading to a reorganization of its copper industry. In April 1982, Zambia's two copper-mining companies were merged to form Zambia Consolidated Copper Mines (ZCCM). The company's ownership is as follows: Zambian Government, 60.3 percent; U.S. entities, 11.1 percent (AMAX, 6.9 percent; private American shareholders, 4.2 percent); a South African company, 28.6 percent (Anglo-American Corp.); and private United Kingdom shareholders, 1.3 percent. Since the Zambia copper industry is fully integrated to the refining stage, exports of unrefined copper (ores, concentrates, or blister) are negligible.

Zambian copper production, capacity, utilization, and exports are shown in table 24. Zambia's top five export markets for refined copper, with their market share in 1983, are shown below:

Market	Share (percent)
Japan ------	16
France -----	13
Italy ------	10
United Kingdom--	9
India ------	9

Table 23.--Unwrought copper: Peruvian production, capacity, utilization, and exports, 1979-83

Item	1979	1980	1981	1982	1983
Mine:					
Production					
1,000 metric tons--	397	367	328	356	322
Capacity----------do----	412	385	385	389	428
Utilization-------percent--	96	95	85	92	75
Exports to:					
U.S.--1,000 metric tons--	2	2	4	9	4
All other----------do----	29	16	21	29	29
Total----------do----	31	18	25	38	33
Smelter:					
Production					
1,000 metric tons--	371	349	302	328	296
Capacity----------do----	1,270	1,270	1,270	1,270	1,270
Utilization-------percent--	29	27	24	26	23
Exports to:					
U.S.--1,000 metric tons--	29	9	19	6	7
All other----------do----	111	117	86	91	82
Total----------do----	140	126	105	97	89
Refinery:					
Production					
1,000 metric tons--	230	231	209	225	196
Capacity----------do----	200	190	190	238	238
Utilization-------percent--	115	122	110	95	82
Exports to:					
U.S.--1,000 metric tons--	29	36	44	6	33
All other----------do----	183	173	148	198	125
Total----------do----	212	209	192	204	158

Source: Production and export data, compiled from World Bureau of Metal Statistics, World Metal Statistics, April 1984. Smelter and refinery capacity data, compiled from American Bureau of Metal Statistics, Non-Ferrous Metal Data, 1979-83. Mine capacity data, compiled from International Wrought Copper Council, Survey of Planned Increases in World Copper Mine, Smelter, and Refinery Capacity, 1980-87 (mine capacity data for 1979 estimated by the staff of the U.S. International Trade Commission).

Table 24.--Unwrought copper: Zambian production, capacity, utilization, and exports, 1979-83

Item	1979	1980	1981	1982	1983
Mine:					
Production					
1,000 metric tons	588	596	587	530	515
Capacity---do	745	720	720	700	705
Utilization---percent	79	83	82	76	73
Smelter:					
Production					
1,000 metric tons	595	601	572	581	575
Capacity---do	2,310	2,310	2,310	2,310	2,310
Utilization---percent	26	26	25	25	24
Exports to:					
U.S.--1,000 metric tons	-	-	-	-	-
All other---do	21	3	-	--	-
Total---do	21	3	-	-	-
Refinery:					
Production					
1,000 metric tons	564	607	564	587	598
Capacity---do	770	770	770	770	770
Utilization---percent	73	79	73	76	77
Exports to:					
U.S.--1,000 metric tons	23	65	37	14	41
All other---do	603	549	519	589	529
Total---do	626	614	556	603	570

Source: Production and export data, compiled from World Bureau of Metal Statistics, World Metal Statistics, April 1984. Smelter and refinery capacity data, compiled from American Bureau of Metal Statistics, Non-Ferrous Metal Data, 1979-83. Mine capacity data, compiled from International Wrought Copper Council, Survey of Planned Increases in World Copper Mine, Smelter, and Refinery Capacity, 1980-87 (mine capacity data for 1979 estimated by the staff of the U.S. International Trade Commission).

The Question of Imports as a Substantial Cause of Serious Injury or the Threat Thereof

U.S. consumption

Reported consumption of refined copper in the last decade has been characterized by cyclical fluctuations as shown in table 25 and figure 4.

Table 25.--Refined copper: U.S. imports for consumption and reported consumption, 1973-83

Year	Imports	Reported consumption	Ratio of imports to consumption
	1,000 short tons	1,000 short tons	Percent
1973	206	2,437	8.4
1974	304	2,194	13.9
1975	142	1,534	9.3
1976	381	1,992	19.1
1977	387	2,182	17.7
1978	444	2,413	18.4
1979	225	2,379	9.5
1980	471	2,053	22.9
1981	364	2,232	16.3
1982	285	1,828	15.6
1983	507	1,966	25.8

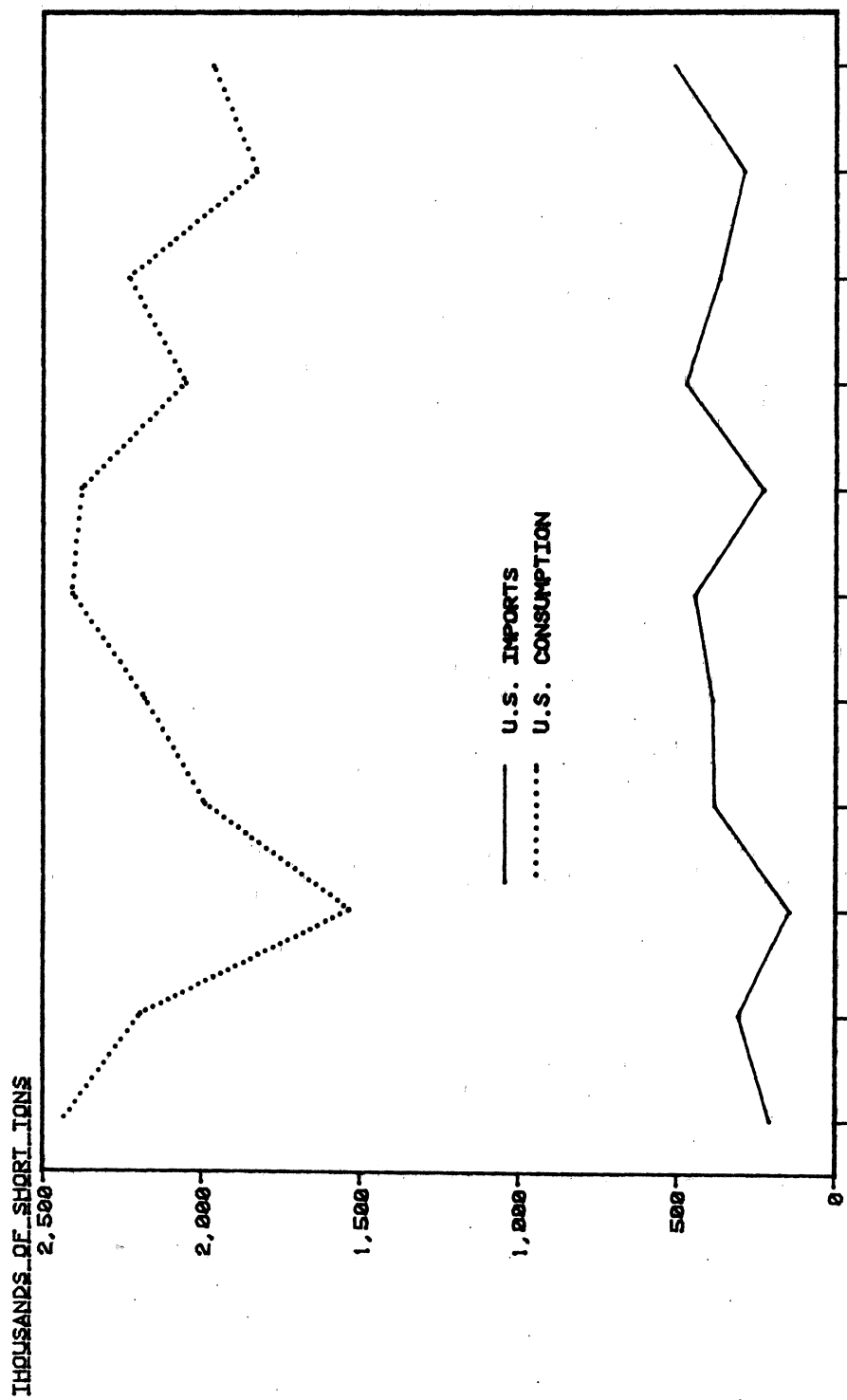
Source: Compiled from official statistics of the U.S. Bureau of Mines and the U.S. Department of Commerce.

Consumption since 1973 has trended downward at an average annual rate of 1.6 percent. Consumption dropped by over one-third from 1973 to 1975 and then increased annually to 2.4 million tons in 1978. Consumption declined again between 1978 and 1980 by about 15 percent. After an increase in 1981, consumption once again declined to 1.8 million tons in 1982. In 1983, reported consumption increased by 7.5 percent.

Imports of refined copper fluctuated during 1973-83 but showed an upward trend, increasing at an average annual rate of 8.5 percent. The ratio of imports to consumption increased from 8.4 percent in 1973 to 18.4 percent in 1978 and then dropped sharply to 9.5 percent in 1979 as the volume of imports declined almost 50 percent. The ratio increased sharply in 1980 as imports rebounded and then declined in 1981 and 1982 as imports declined. In 1983, the ratio of imports to consumption rose to 25.8 percent as imports increased by 78 percent. 1/

1/ Imports from Chile and Canada accounted for 13.8 and 5.1 percent, respectively, of the U.S. market in 1983.

FIGURE 4.--REFINED COPPER, U.S. IMPORTS FOR CONSUMPTION, REPORTED CONSUMPTION, 1973-83.



Source: Official statistics of the U.S. Bureau of Mines and the U.S. Department of Commerce.

Prices

In a broad sense, the copper market is a world market. Both tariffs and transportation costs are small compared with the value of copper. As a result, arbitrage keeps the price of copper relatively the same throughout the world. 1/

Copper prices fluctuate considerably because of cyclical changes in demand. Because supply is relatively stable in the short run, although demand is highly related to changes in the business cycle, demand is usually a more important factor in determining the price of copper in the short run than supply. Throughout the world, high startup costs tend to discourage shutting down mines for a short time. In addition, in developing countries, political factors limit the degree to which workers can be laid off to reduce production. In the United States and Canada, however, cutbacks in mine production in the face of depressed prices are fairly common. Worldwide supply is more variable in the long run than in the short run, because copper producers are more willing to close down unprofitable mines and lower production.

The price of refined copper provides the basis for the pricing of most other copper products. Some products, such as wire rod, are generally quoted at a premium above the price of refined copper, whereas others, such as copper concentrate, are quoted at a discount below the price of refined copper. Because the prices of most copper products are based on the price of refined copper, the focus of this section is on the price of refined copper.

In the United States, refined copper is sold at prices based on two different systems --producers' prices and prices based on open-market prices. Producers' prices are essentially list prices that are set by copper producers and that change at the initiative of the producers.

Some copper producers, however, do not have list prices for their products. These producers allow the prices they charge to be directly related to the open-market price of copper. Open-market prices are quoted on the major copper exchanges, the London Metal Exchange and the New York Commodity Exchange. Producers that base their prices on open-market prices sell their copper at a fixed premium above the open-market price. 2/ Producers will generally change the premium several times a year in response to market conditions. Because prices on the commodity exchanges change continuously, prices based on open-market prices also change continuously.

1/ U.S. Government controls have at times kept U.S. copper prices substantially below prices in the rest of the world.

2/ Differences in the terms of delivery help keep open-market prices below producers' prices. Producers prices are for delivery anywhere in the continental United States the buyer wants (presumably the plant where the purchaser will use the copper), whereas open-market prices are for delivery at the exchange warehouse of the seller's choice (which may be nowhere near the plant where the purchaser will use the copper).

Most U.S. copper producers sell at producers' prices, although a few sell at prices based on open-market prices. Scrap copper and imported copper are almost always sold at prices based on open-market prices.

Producers' prices.--Unlike most of the rest of the world, copper prices in the United States are generally set by the major producers of refined copper. Prices are quoted delivered, to any destination within the continental United States.

Producers' prices for all items are based on the prices that are set for electrolytic-grade cathode. 1/ Prices for most other refined copper products (wirebar, cakes, ingots, and billets) are higher than cathode prices, reflecting the additional casting costs involved.

U.S. producers generally sell most of their production under annual contracts that specify monthly delivery limits, within which the buyer decides how much to buy each month. Some producers, however, sell on a spot basis. Prices for sales made under annual contracts are not set until shortly before delivery.

The pricing clauses in contracts used to be quite simple; prices were determined by the producers' price on the date of delivery. Purchasers, therefore, would contract for delivery months in advance, but would not know the price until the date of delivery. The large variability in the price of copper meant that when purchasers entered into a contract to purchase copper, they had little idea what the price of copper would be when they took delivery. To try to give purchasers an idea what the approximate cost of the purchase would be, copper producers developed a number of fairly complicated pricing formulas. Each copper producer has several different formulas for determining the selling price of copper. Using these formulas allows purchasers to know a month or two in advance what price they will have to pay for the copper they ordered.

Before 1978, U.S. producers set their prices at levels that they thought were low enough to prevent purchasers from substituting other products for copper, but that were high enough so that they would earn a reasonable return on their investment. Producers' prices were fairly uniform among the major copper producers.

Producers' prices for copper tended to be much less volatile than copper prices based on open-market prices. At times, producers' prices would be much higher than open-market prices, and at other times they would be much lower. In periods when producers' prices were lower than prices based on open-market prices, there was an excess demand for copper at the going producers' price. Copper producers tended to ration available supply rather than raise prices and curtail demand.

In periods when producers' prices were higher than prices based on open-market prices, there was an excess supply at the going producers' price. Copper producers added to their inventories or cut back on production rather than lower prices to stimulate demand.

1/ Until the late 1970's, producers' prices were based on the price of electrolytic wirebar. In recent years, however, the introduction of continuous casting of wire rod has made cathodes a much more important product than wirebar.

Copper producers did not raise prices to the level of open-market prices and increase their profits when their prices were below open market prices for the same reason that customers continued to purchase copper from producers when producers' prices were higher than open-market prices; they both preferred long-term certainty over short-term benefits. By keeping prices low, producers gave up temporary extra profits rather than risk a customer substituting another product for copper. Consumers, on the other hand, gave up immediate savings rather than risk not getting a fair share of the rationed copper supplies in periods of excess demand.

The degree to which producers' prices differed from open-market prices was limited by the possibility of arbitrage in copper. The influx of imported copper in the late 1970's illustrated the worldwide nature of the copper market and the vulnerability of a pricing system based on administered producers' prices.

In May 1978, Kennecott began selling copper at the daily COMEX price for the spot month plus an add-on, generally 2.5 cents, for delivery and other services. Kennecott took this action partly to offset the inroads made by lower priced imported copper that was being sold at prices based on open-market prices. In August 1978, Anaconda adopted the Kennecott pricing system.

Although other U.S. copper producers did not copy the action taken by Anaconda and Kennecott, they were forced to tie their producers' prices of copper much more closely to the open-market prices. 1/ Some U.S. producers still use prices based on open-market prices.

Nearly all U.S. producers still use producers' prices, 2/ but they now change their prices quite frequently --daily if necessary-- in response to price changes on the COMEX. As a result, producers' prices have become nearly as volatile as open-market prices. 3/

Commodity exchange prices.--Prices based on open-market prices are related through various formulas to prices prevailing on the LME or the COMEX. Both commodity exchanges allow buyers and sellers to hedge themselves against losses resulting from price changes. By using the exchanges, producers selling copper for delivery in the future and fabricators making contracts for the delivery of their products in the future are able to eliminate most of the risk of price changes wiping out their profits.

Prices on the COMEX and on the LME tend to move together and to influence one another. Arbitrage limits the difference in prices of refined copper that may arise between the two exchanges. The difference in transportation costs of about 4 cents a pound, however, allows the LME and COMEX prices to differ.

1/ In April 1978, the difference between the producers' price of copper and the LME price was 5.5 cents per pound. In December 1978, after U.S. producers began adjusting their prices more often, the difference was 1.4 cents per pound.

2/ It is believed that only Anaconda and Phelps Dodge tie their prices directly to COMEX prices. Anaconda uses COMEX-plus pricing for all sales. In January 1984, Phelps Dodge began using COMEX prices for wire rod sales.

3/ The correlation coefficient between the LME price of cathodes and the producers' price of cathodes was .99 from January-March 1979 to October-December 1983.

Because the bulk of the world's refined copper is sold directly by the refiners to fabricators, only marginal amounts are sold through the copper exchanges. About 10 to 20 percent of the total trade in copper is sold through the LME and the COMEX.

Only a small portion of the contracts traded on these exchanges, about 2 percent, are carried through to delivery. Producers and fabricators generally will close any open positions they may have on the exchanges before delivery is required. If used properly, the profits they make from their transactions on the exchanges will offset any losses that they may incur because of changes in the price of copper. Producers and fabricators generally do not want to sell or buy any copper on the exchanges; they just want to protect themselves against unforeseen price changes.

London Metal Exchange.--The LME is far more important in the world copper market than the physical volume of copper that actually goes through its warehouse indicates. Outside the United States and Canada, most sales of refined copper are made at prices that are in some manner based on LME prices. The COMEX price is generally not used as the base price for sales made outside North America.

LME prices are established on a bid-and-ask basis. LME contracts may be traded for any day within 90 days of the current day.

Although only a fraction of total trade in refined copper passes through the LME, the exchange provides an equilibrating mechanism for the entire copper market. The LME handles the excess supplies of copper producers and the excess demands of copper fabricators. The interrelationship between excess supply and excess demand reflects the overall worldwide supply and demand for copper. As a result, LME prices are extremely sensitive to changes in the delicate balance between supply and demand.

LME prices can be influenced by a number of factors that would ordinarily not exert a direct influence on copper prices such as changes in interest rates and interest rate differences, exchange-rate changes, price changes in other commodity markets, and political factors. These other factors help keep LME prices fluctuating widely.

Because LME prices are quoted in British pounds, the dollar value of the LME price depends on the exchange rate between the pound and the dollar. A change in the dollar value of the LME price may simply reflect in part a change in the value of the pound vis-a-vis that of the dollar rather than a change in the fundamental demand and supply forces in the world market for copper. On a broader scale, changes in the LME price of copper can reflect changes in the pound's relationship with all the other major currencies of the world.

New York Commodity Exchange.--Like prices on the LME, prices on the COMEX are set on a bid-and-ask basis. Trading is done in one contract, for example, 25,000 pounds of electrolytic cathodes, with other products, such as wirebar, priced at fixed differentials from the price of electrolytic cathodes. In 1983, 3.2 million copper contracts were traded on the COMEX, twice as many as were traded in 1981. Deliveries of copper through the COMEX in 1982 amounted to 46,291 short tons.

Contracts are written for delivery in the current month, the following 2 months, and several of the next 20 months. Price changes on the COMEX generally have a daily limit of 5 cents per pound for all trading months except the current month.

Fabricators do not like to purchase copper through the COMEX, because they have no say in when, where, and how the copper will be delivered. Sellers unilaterally decide on what day of the month to deliver the copper, in which of 17 cities to deliver the copper, 1/ and in what grade (cathode, wirebar, and so forth) the copper will be. Buyers have no say in the matter. 2/

Price trends.--In the last 15 years, the open-market price of refined copper has fluctuated greatly because of speculative pressures and short-run shifts in copper demand and supply (table 26, fig. 5). Partly because of U.S. Government price controls, producers' prices have fluctuated less than open-market prices.

Table 26.--Average annual LME and producers' price of copper wirebar, 1969-83

(In cents per pound)

Year	LME price	Producers' price
1969	66.24	47.43
1970	62.96	58.07
1971	48.49	52.09
1972	48.55	51.44
1973	80.81	59.53
1974	93.10	77.06
1975	56.11	64.53
1976	64.05	69.62
1977	59.38	66.72
1978	61.88	66.53
1979	90.11	92.75
1980	99.25	102.42
1981	1/ 79.35	85.12
1982	67.17	74.31
1983	72.13	79.26

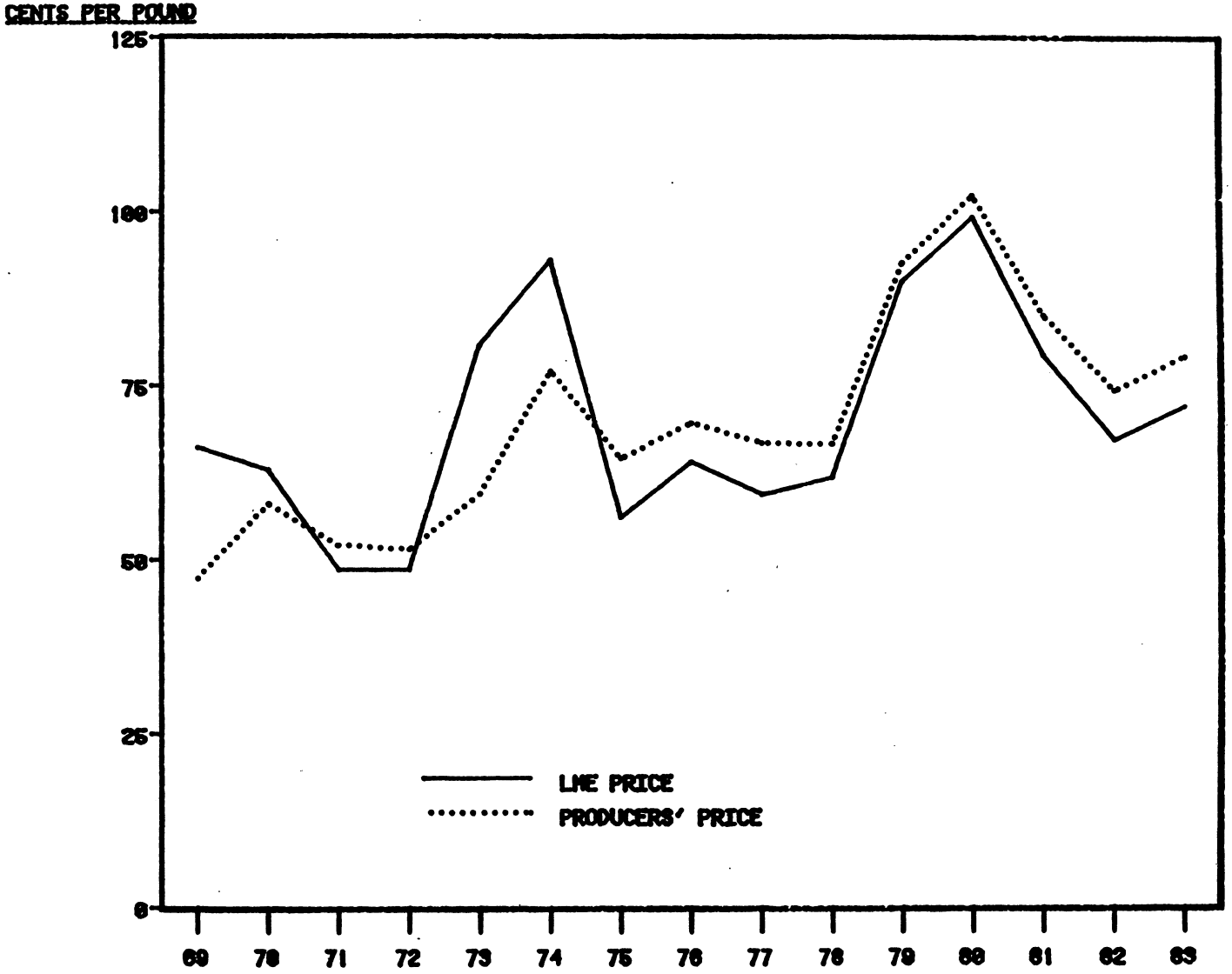
1/ On Dec. 1, 1981, the wirebar contract on the LME was replaced by a high-grade contract. The 1981 LME price in this table is based on January-November monthly averages. The 1982 and 1983 LME prices are for the high-grade contract.

Source: Compiled from official statistics of the Bureau of Mines.

1/ Any sale of copper made through the COMEX must occur at one of the 17 warehouses the COMEX operates throughout the country.

2/ Brokerage houses can arrange for fabricators to trade unwanted copper purchased through the COMEX for the grade desired and at a more convenient location. There is, of course, a charge for this service.

FIGURE 5.--LME AND PRODUCERS' PRICES OF WIREBAR, 1969-83.



Source: Compiled from official statistics of the Bureau of Mines.

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From 1969 to 1972 the LME price of copper drifted down from $0.66 per pound to $0.49 per pound. In 1973, however, the demand for copper increased sharply because of worldwide economic growth. In addition, the overthrow of the Allende government in Chile and a strike in Peru introduced an element of uncertainty into the world copper market. As a result, the LME price of copper rose to $0.81 per pound in 1973.

On April 1, 1974, the LME price of copper reached an alltime high of $1.52 per pound. For 1974 as a whole, the LME price of copper was $0.93 per pound. Partly because of U.S. Government price ceilings, U.S. producers' prices were only $0.60 per pound in 1973 and $0.77 per pound in 1974. 1/

With the beginning of a recession in the second half of 1974, copper prices fell dramatically. In January-June 1974, the average LME price of copper was $1.16 per pound; in July-December 1974, the average LME price was $0.70 per pound.

In April 1975, as copper prices were falling, the CIPEC 2/ members took their first concerted action to influence copper prices. They announced that they would reduce production of copper by 15 percent. Some CIPEC members reduced their production, but all did not. 3/

The worldwide recession in 1975 kept demand low and copper stocks high; the average LME price of copper fell to $0.56 per pound in 1975. Low demand and high stocks kept copper prices low from 1976-78 as prices drifted over a fairly narrow range.

In 1979, demand increased significantly, but production fell. As a result, the large excess of copper stocks built up in the previous 3 years was eliminated and prices increased. The LME price of copper rose from $0.62 per pound in 1978 to $0.90 per pound in 1979. High inflation, the revolution in Iran and the subsequent doubling of the price of oil helped push the prices of most natural resources substantially higher. In particular, the prices of precious metals soared: the price of gold reached $800 an ounce, and the price of silver reached $50 an ounce. Some of the excess demand for precious metals spilled over into the copper market and helped pull the LME price of copper up to almost $1.45 per pound in February 1980 (table 27, fig. 6).

The speculative surge in commodity prices broke in February 1980. By March 1980, the LME price of copper was down to around $0.90 per pound and stayed at that level throughout the remainder of the year.

1/ As part of Phase III of President Nixon's inflation fighting program, the price of copper was controlled in the United States from June 13, 1973 to Apr. 30, 1974.

2/ In June 1967, Chile, Peru, Zaire, and Zambia combined to form the Intergovernmental Council of Copper Exporting Countries. Indonesia joined in November 1975. Australia, Papua New Guinea, and Yugoslavia have since joined as associate members and Mauritania recently became a full member.

3/ Most members of CIPEC find it difficult to lower copper exports for a very long period because of the importance of copper to their national economies. For example, over one-half of the total export earnings of Chile, Papua New Guinea, Zaire, and Zambia come from copper. In addition, cutbacks in production would result in sharply higher unemployment in these countries.

Reduced economic activity helped push the price of copper down in both 1981 and 1982. By October-December 1982, the LME price of copper was down to $0.66 per pound. LME prices moved up to $0.78 per pound in April-June 1983 before falling to $0.64 per pound in October-December 1983. In January-March 1984, the LME price of copper was $0.66 cents per pound.

Table 27.--LME and producers' prices of cathodes and wirebar, by quarters, 1979-83

(In cents per pound)

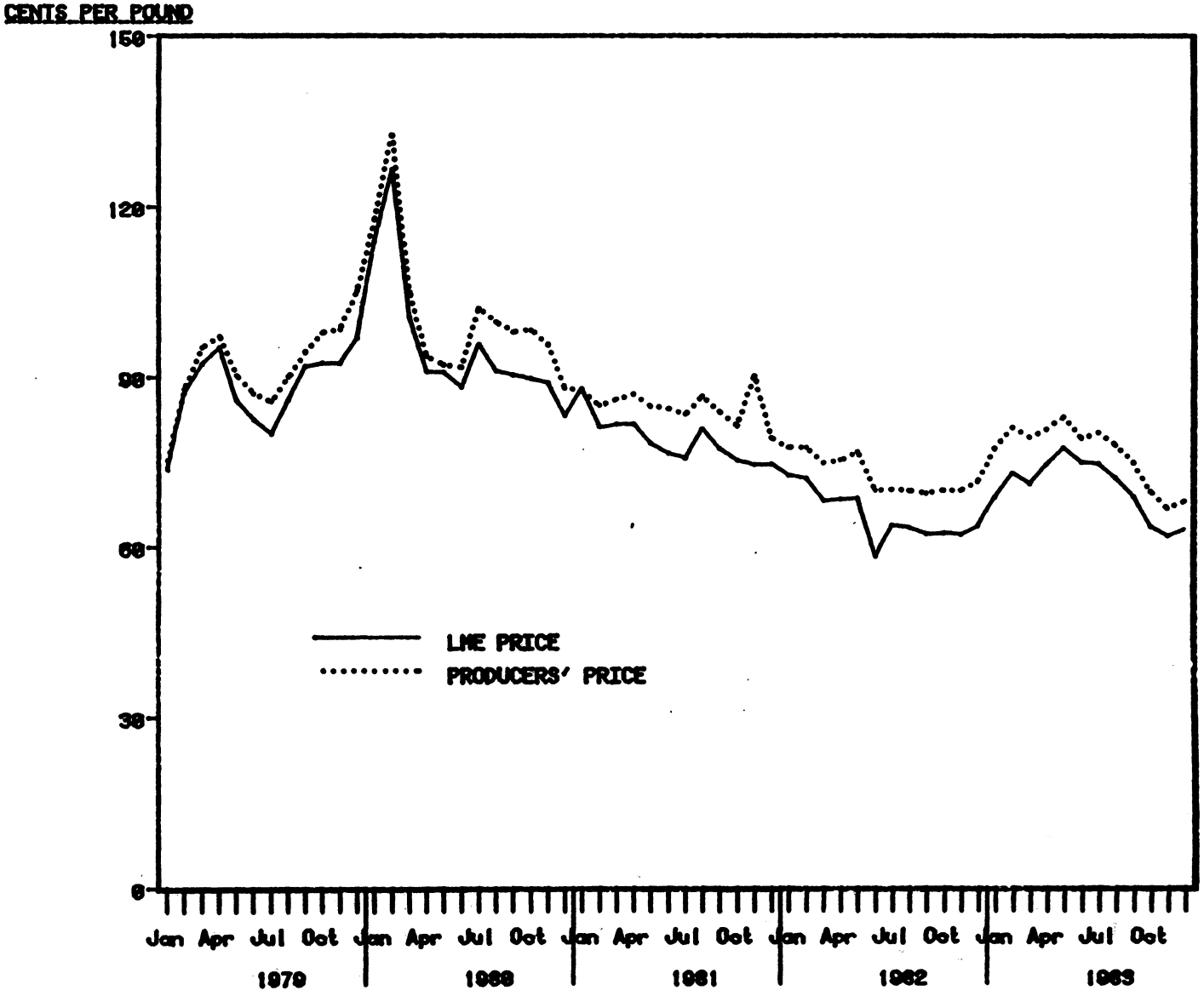
Period	Cathode		Wirebar	
	LME price	Producers' price	LME price 1/	Producers' price
1979:				
Jan.-Mar--	84.52	86.31	85.47	86.74
Apr.-June-	87.92	91.65	89.26	92.45
July-Sept-	86.09	90.16	89.00	90.34
Oct.-Dec--	94.08	100.65	96.46	101.12
1980:				
Jan.-Mar--	113.72	118.66	118.24	119.75
Apr.-June-	90.00	92.48	92.56	93.68
July-Sept-	92.40	99.98	95.49	101.04
Oct.-Dec--	87.30	94.12	89.69	95.19
1981:				
Jan.-Mar--	83.75	86.28	82.95	87.34
Apr.-June-	78.94	85.48	79.56	86.35
July-Sept-	78.07	84.72	78.28	85.51
Oct.-Dec--	74.85	80.35	2/ 75.22	81.27
1982:				
Jan.-Mar--	71.11	76.69	71.29	77.76
Apr.-June-	65.18	74.11	65.75	75.24
July-Sept-	63.22	69.85	65.27	71.04
Oct.-Dec--	62.79	70.56	66.18	73.20
1983:				
Jan.-Mar--	71.03	79.28	72.81	82.11
Apr.-June-	75.65	80.98	77.72	83.65
July-Sept-	71.84	77.67	74.14	80.36
Oct.-Dec--	62.84	68.19	64.08	70.93

1/ On Dec. 1, 1981, the wirebar contract on the LME was replaced by a high-grade contract. A high-grade contract includes all wirebars and certain name brands of high-grade cathodes (99.97 percent copper or higher). For the January-March 1979 to October-December 1981 period, this table reports the price of the LME wirebar contract; for the January-March 1982 to October-December 1983 period, this table reports the price of the LME high-grade contract.

2/ Based on the October and November monthly averages.

Source: Compiled from official statistics of the Bureau of Mines.

FIGURE 6.--LME AND PRODUCERS' PRICES OF CATHODES, JANUARY 1979-DECEMBER 1983.



Source: Compiled from official statistics of the Bureau of Mines.

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Related market prices.--The market for scrap is highly competitive and constitutes a significant obstacle to attempts at stabilizing the price of copper. Generally, scrap is traded at discounts on the open-market refined-copper price that reflects the cost of collecting, sorting, and converting scrap into cathode or cast shapes. Although scrap prices tend to move with the prices on the commodity exchanges, they have a cycle of their own, depending on the supply of, and demand for, scrap.

Because copper competes with other materials such as aluminum and plastic, the price of copper is affected by changes in the prices of its substitutes. 1/ Studies have found that a 1-percent decrease in the price of aluminum causes a 0.42-percent increase in the short-run price of copper and a 1.97-percent increase in the long-run price. 2/

Competition from most other materials, particularly aluminum, which is copper's most important competitor in terms of volume, is primarily price related. As shown in figure 7, the price of copper was substantially higher than the price of aluminum from 1964 to 1976. Only since 1977 has the price of copper been reasonably close to the price of aluminum.

Copper prices in both the short- and long-term have fluctuated a great deal more than the price of aluminum. Producer pricing is the basis for sales of aluminum. As a result, price instability is curtailed, and aluminum producers can follow a consistent pricing policy. The existence of open markets like the LME and the COMEX are major obstacles to stabilizing copper prices. As a result of the volatility of copper prices and the stability of aluminum prices, some consumers have switched from using copper to using aluminum. 3/

Other Factors Affecting Supply and Demand in the U.S. Market

Cyclical and secular trends in consumption

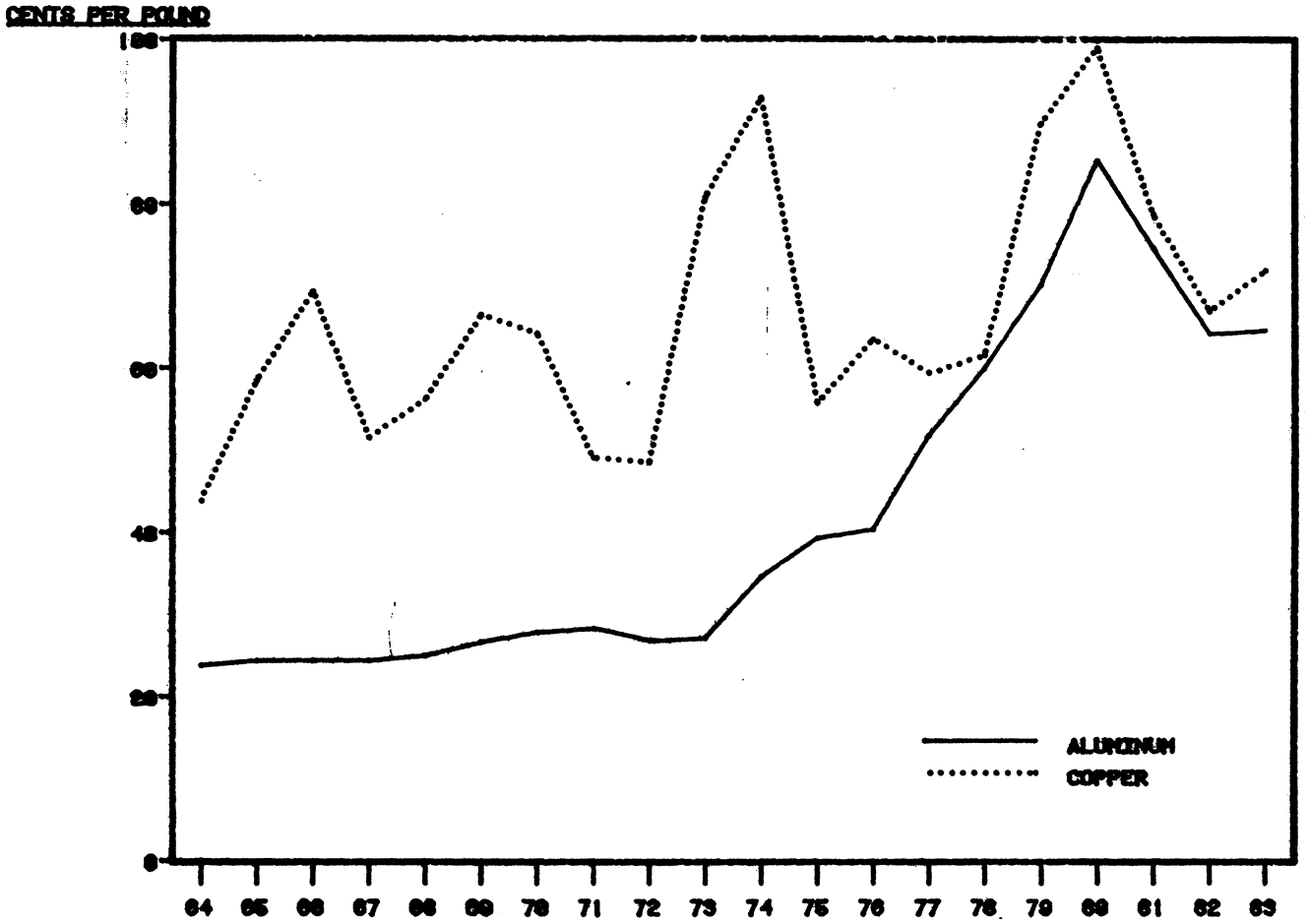
U.S. consumption of copper has both cyclical and secular trends. In the short run, copper consumption is strongly related to the business cycle. In the long run, copper consumption is affected by the relative price of copper and its substitutes, primarily aluminum. In addition, in the long run, copper consumption is affected by technological developments. Some developments, such as solar energy, increase copper consumption, and others, such as fiber optic communications, decrease copper consumption.

1/ The correlation coefficient between the price of aluminum and the price of copper was .60 from 1964 to 1983.

2/ Based on elasticity estimates presented in Raymond F. Mikesell, The World Copper Industry, 1978, p. 155.

3/ Beginning in January 1984, aluminum contracts were traded on the COMEX. The effect of open-market trading on aluminum producers' prices is not yet discernible.

FIGURE 7.--ALUMINUM AND COPPER PRICES, 1964-83.



Source: Compiled from official statistics of the International Monetary Fund.

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Figure 8 shows that U.S. consumption of refined copper in the last 20 years has been characterized by sharp cyclical fluctuations and a very slight downward trend in the long run. From 1964 to 1983, annual copper consumption fell by an average of 0.5 percent. 1/

Cyclical.--Because refined copper is an intermediate good that is used in the production of a host of manufactured goods, the demand for refined copper is derived from the demand for those goods that use refined copper as an input. Purchasers 2/ use refined copper in the production of semifabricated products (e.g., copper wire and brass products) that are, in turn, used as inputs in the production of many durable manufactured goods. 3/ Because these goods are durable, buyers can exercise a large degree of discretion in the timing of their purchases. When general economic conditions are poor and money is tight, buyers can generally delay the purchase of products made from copper, whether purchases of consumer durables such as car radiators, or investments in capital equipment. As a result, changes in copper consumption are closely related to changes in production of durable manufactures. 4/

A number of econometric studies of the copper industry have been made in recent years. In these studies, the demand for copper is generally made a function of the price of copper, the price of substitute materials (generally aluminum), and an economic activity variable, typically the Federal Reserve Board's index of industrial production of durable manufactures. 5/ The studies differ somewhat in methodology, but normally differentiate between short- and long-run elasticities. On average, the results of these studies suggest that a 1-percent increase in the production of durable manufactures will increase the demand for copper by 0.47 percent in the short run and 1.60 percent in the long run. 6/

Secular.--Since 1973, the long-term trend in U.S. consumption of refined copper has been slightly downward. U.S. copper consumption reached a record high level in 1973 and has not approached that level since.

1/ Based on an ordinary least-squares regression of one period's consumption on the previous quarter's consumption.

2/ In 1981, wire rod mills accounted for 72 percent of total U.S. consumption of refined copper, brass mills for 26 percent, and miscellaneous consumers such as foundries, secondary smelters, and chemical plants, for the remaining 2 percent.

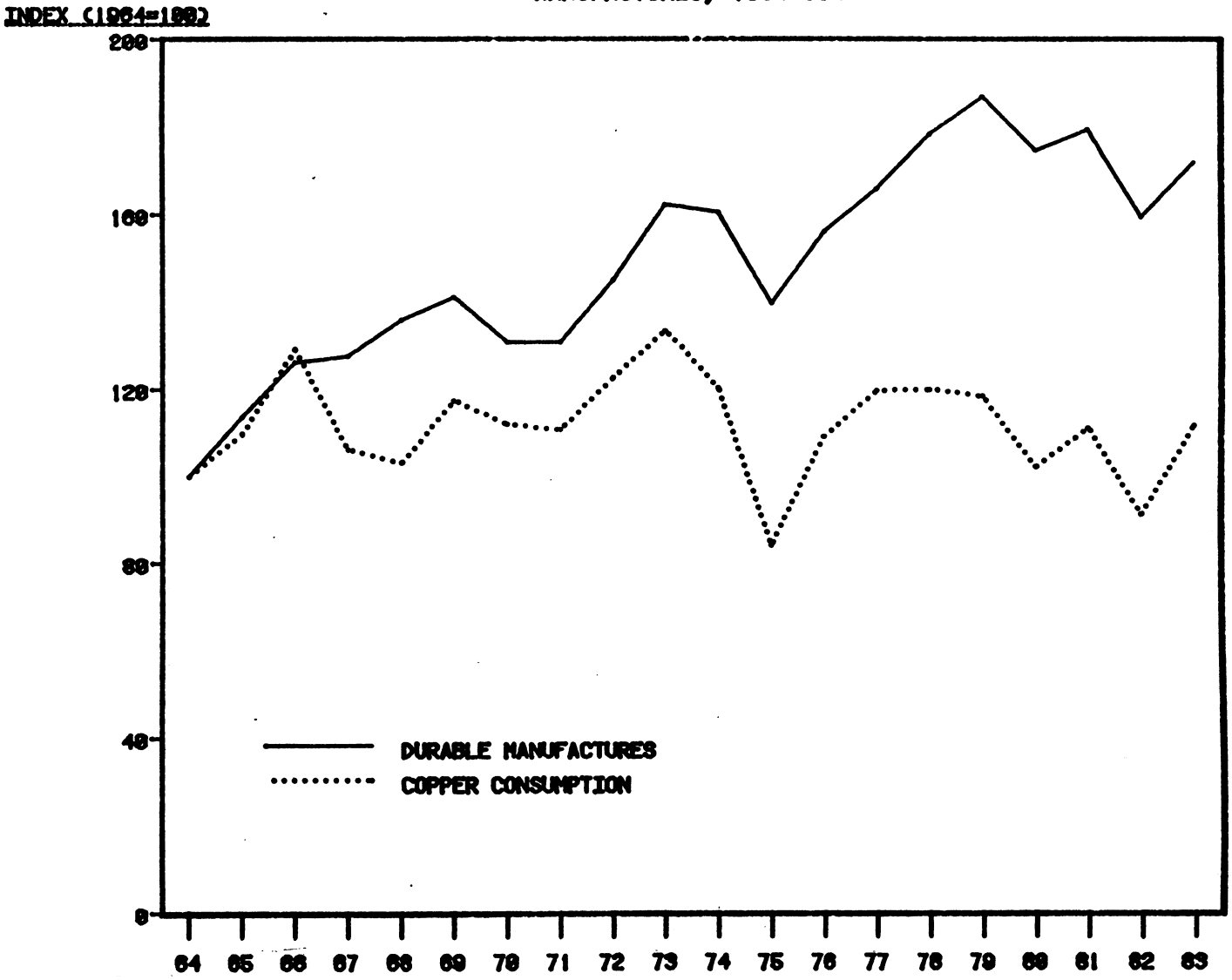
3/ All the principal end-use markets for copper are cyclical industries--electrical and electronic products, building construction, industrial machinery and equipment, and transportation.

4/ The correlation coefficient between consumption of refined copper and industrial production of durable manufactures was 0.21 from 1964 to 1983. However, the correlation coefficient from the first differences of the data was .84, indicating that changes in the level of industrial production of durable manufactures are highly correlated with changes in the consumption of refined copper.

5/ In a normally functioning market, the demand for copper should be negatively related with its own price but positively related with the price of substitutes and the level of economic activity.

6/ Based on elasticity estimates presented in Raymond F. Mikesell, The World Copper Industry, 1978, p. 155.

FIGURE 8.--INDEXES OF U.S. CONSUMPTION OF REFINED COPPER AND U.S. PRODUCTION OF DURABLE MANUFACTURES, 1964-83.



Source: Compiled from official statistics of the U.S. Bureau of Mines and the Federal Reserve Board.

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From 1964 to 1973, U.S. consumption of refined copper increased at an average annual rate of 2.8 percent. 1/ During that 10-year period, U.S. real gross national product (GNP) increased by 43.1 percent, and the U.S. economy suffered only one small recession. From 1964 to 1973, U.S. consumption of refined copper increased by 33.3 percent, from 1.8 million tons in 1964 to 2.4 million tons in 1973.

In 1973, the price of copper hit a record high as prices of many raw materials soared in the wake of a tripling in the price of oil. The huge increase in the price of oil helped push the world economy into a severe recession in 1974 and 1975. U.S. copper consumption fell dramatically during the recession. Even after the U.S. economy recovered, copper consumption remained below its 1973 level. Part of the reason for the reduced consumption was that the huge increase in the price of energy caused manufacturers to search for lightweight alternatives to using heavy metals such as steel and copper in their products.

From 1973 to 1983, U.S. consumption of refined copper decreased at an average annual rate of 3.5 percent, 2/ or overall by 16.5 percent to 2.0 million tons. U.S. real GNP increased by 22.4 percent in this period, and the U.S. economy suffered two major recessions.

Another factor affecting copper consumption is the declining consumption per unit of output by U.S. consumers. Refered to as intensity of use, copper consumption per unit of consuming industry output has declined and is projected to continue to decline in the major U.S. consuming sectors. In industries associated with electronics and communications, the second largest copper consumers, copper's intensity of use has declined because of technological improvements such as satellite and microwave communications equipment and replacement of copper-intensive wires and resistors with semiconductors. In the industrial machinery and equipment sectors, the third largest copper consumer, increased emphasis on energy savings has resulted in improved efficiency for refrigeration and heating equipment and a reduction in the quantity of copper required per unit. In industries producing motor-vehicle parts and electrical equipment for engines, copper use has also declined. The downsizing of vehicles and the smaller radiators required in the growing number of four- and six-cylinder engines resulted in a decline in copper usage per car from 32 pounds in 1976 to 28 pounds in 1980.

In summary, the decline in copper use per unit of industrial output is attributable to new design and fabricating techniques, substitution, and a shift in the general composition of output from basic industrial products to high-technology products.

Product substitution

The principal materials competing with copper are aluminum, carbon steel, stainless steel, plastics (polyvinyl chloride), titanium, zinc, and glass.

1/ Based on an ordinary least-squares regression of 1 year's consumption on the previous year's consumption.

2/ Based on an ordinary least-squares regression of 1 year's consumption on the previous year's consumption.

Aluminum is copper's primary competitor as an electrical conductor. Most overhead high-voltage power cable is now made of aluminum. In underground power cables, copper is rapidly being replaced by aluminum in the lower voltage ranges, but high-tension power cables are still the domain of copper. The substitution of aluminum for housewiring of copper grew rapidly in the 1960's; however, there have been difficulties with installation and with fire risks which have led to bans on aluminum wire in several localities. Aluminum is widely used in place of copper for busbars and switchgear, for transformer windings, for rotors in small electric motors, and for some automobile battery cables.

Copper faces considerable competition in the telecommunications field from several new systems of transmission. The technology which is most advanced is the wave guide system developed in the United Kingdom. Voice, images, and computer messages are transmitted simultaneously by electronic impulses through a tube about the size of an automobile exhaust pipe. Glass-fiber communications transmission cables have begun to compete with copper cables in intercity trunk lines. Optic fibers (spun glass) use electronic impulses to transmit a much greater volume of messages per crosssection of wire than is possible with copper. A third system involves laser beams, the principle of which is also based on controlled electronic impulses.

In heat exchangers, the primary substitutes for copper are aluminum and titanium. In general, aluminum can be used instead of copper in heat exchangers utilizing noncorrosive coolant fluids or containing corrosion inhibitors. Aluminum has replaced copper in domestic refrigerators and freezers, in automobile air conditioners, and, to a lesser extent, in building air conditioners and commercial refrigeration. In large refrigeration units manufacturers are trying to reduce the amount of copper per unit rather than substitute other materials for it. Aluminum has largely replaced copper in automobile engine radiators in Europe but not in the United States or Japan. Aluminum windings in dynamos and starter motors will increasingly be used in the future, and this, together with the use of steel fins, is likely to reduce the amount of copper consumption per automobile. Aluminum is the predominant metal in aircraft heat exchangers.

In plumbing systems, plastic, galvanized steel, and cast iron compete with copper. In machine parts, copper's principal competitors are carbon steel, stainless steel, zinc diecastings, and plastics. Valves and especially bearings face substitution by steel, which is gaining ground in this area, and by aluminum. Although copper (particularly brass) is unlikely to be supplanted by steel in the short term, owing to difficulties of machining steel, the longer term trend may well be adverse. Aluminum alloys are good substitutes for copper alloys in many bearing and bushing applications.

In coinage, silver, nickel, aluminum, and zinc serve as alternates to copper. In April 1980, the Bureau of the Mint decided to manufacture a new penny containing 99 percent zinc, 0.8 percent copper, and 0.2 percent other metals. Traditionally the Mint had manufactured a penny containing 95 percent copper and 5 percent zinc. Although the market loss from this change would not appear to be substantial (consumption of copper in coinage represented a market share of 3 percent of total U.S. copper production), when evaluated for its effect on those copper establishments producing materials for coinage, the impact is more apparent. Consumption of copper for coinage by the Mint

accounted for 40 percent of the production of five major brass/copper-rolling mills and accounted for 10 percent of the base orders of all brass strip mills. In ordnance, copper alloys have marked advantages over the possible substitutes, but in an emergency, aluminum and steel can be used as substitutes in small arms cartridge cases, and aluminum and sintered irons can be used in rotating bands.

In their public hearing testimony, petitioners addressed the impact of product substitution on copper consumption. Petitioners 1/ estimated that between 1983 and 1990 over 1.0 million metric tons of copper would be lost to substitution in the wire and cable industries of the United States, Japan, and Western Europe. In other industries, substitution would account for a loss of over 700,000 metric tons, mainly in the transportation industries (automotive radiators and heaters).

Decreasing U.S. copper ore grades

Among the major factors affecting supply in the U.S. market is the decreasing ore grade of domestic mine facilities. Ore grades have followed a declining trend for years and will continue to decline as mines get older. It is hypothesized that the richest near-surface copper deposits in the United States, except for Alaska, have already been found and that the domestic industry will be producing copper in the future, as at present, from lower grades of ore. The decline of ore grades experienced over the past decades, from more than 2 percent in the early 1920's to 0.65 percent recently, when projected to the year 2000, suggests an average ore grade as low as 0.45 percent. This implies an increase of nearly one-half in the amount of ore that will have to be mined and milled to produce a pound of refined copper. Relative costs of mining and milling will, therefore, tend to increase. However, increased productivity in domestic mining could offset high labor wages and lower ore grades enough to keep increases in domestic mining costs in line with average mining costs increases in foreign countries.

Since the average grade of U.S. copper ore is 35 percent below the average grade in foreign countries, domestic mines at present must mill and concentrate more than one-half as much ore as their foreign competitors to achieve the same copper yield. U.S. milling costs are 55 percent above the average in foreign countries, and almost all of the difference is attributable to the lower grade of domestic ores. Processing lower grade ore entails some loss of efficiency in the flotation process, increased consumption of process water, and added land that is needed for tailings disposal.

Another factor affecting the ability of U.S. producers to supply the market is the condition of smelting facilities. Although some U.S. producers have invested in the more modern flash furnaces, a number of firms still utilize older, less efficient, reverberatory furnaces. This results not only in efficiency losses, but also in increased costs to bring these furnaces into compliance with environmental regulations.

1/ Testimony of Simon Hunt, managing director of Brook Hunt & Associates, pp. 35-37.

Byproducts/coproducts

In recent years, byproduct/coproduct revenues have been very important to the economic viability of the copper-mining industry. Metals currently recovered as byproducts/coproducts of the copper production process are arsenic, bismuth, cobalt, germanium, gold, iron, lead, molybdenum, nickel, platinum-group metals, chenium, selenium, silver, tellurium, uranium, and zinc. With the exception of cobalt, most of these byproducts are recovered in various amounts from domestic copper ores.

Byproducts/coproducts have strongly influenced the economics of the copper market, because their recovery and sales are treated as credits which in effect reduce the cost of producing copper by offsetting the effects of inflation. Table 28 shows the estimated production costs for the producing copper mines of the United States and its major foreign competitors.

Byproduct/coproduct credits have increased in the past decade, moreso because of increased byproduct/coproduct prices rather than improved recoveries. According to the U.S. Bureau of Mines, for producing mines, a 50-percent increase in byproduct/coproduct prices would lower the average total cost by 8 cents per pound, whereas a 50-percent decrease would raise the cost by 10 cents per pound. In 1981, the total operating cost of producing copper mines exceeded the copper-selling prices, and byproduct/coproduct revenues were essential for continued mine production.

In terms of a factor affecting supply, according to the U.S. Bureau of Mines, at a copper price of 85 cents per pound, a 50-percent increase in byproduct/coproduct prices would make available an additional 19 million tons of copper, and a 50-percent decrease in byproduct/coproduct prices would reduce copper availability by 10 million tons. Likewise, at a copper price of $1.25 per pound, the impact of byproduct/coproduct price changes would be greater; a 50-percent increase would make available an additional 12 million tons of copper, whereas a 50-percent decrease would reduce copper availability by 21 million tons. For example, in early 1980, gold and silver prices increased sharply for a short term, causing a renewed interest in, and profitability of, the copper industry. Many companies planned to increase the capacities of existing mines and develop new deposits.

In terms of revenue, the most important byproducts/coproducts in the domestic copper industry are molybdenum, silver, and gold. On an average basis, 0.012 pound of molybdenum, 0.0053 troy ounce of silver, and 0.0022 troy ounce of gold are recovered as byproducts for each pound of copper produced. Table 29 shows the projected U.S. copper and byproduct/coproduct recoveries for 1980-2000.

Table 28.—Estimated production costs for producing copper mines 1/

Item	Number of mines	Mine cost	Mill cost 2/	Smelter-refinery cost 3/	Total operating cost	Taxes 4/	Byproduct credits	Net cost 5/	Total cost, 6/ F.O.B. refinery
		Per pound of refined copper							
Surface:									
Canada	10	$0.42	$0.44	$0.27	$1.13	$0.03	$0.29	$0.87	$1.04
Chile	3	.28	.15	.26	.69	.10	.19	.60	.76
Peru	4	.23	.28	.31	.82	.12	.06	.88	1.12
Philippines	6	.33	.36	.27	.96	.09	.14	.91	1.04
Zaire	3	.19	.11	.30	.60	.22	.12	.70	.79
Other countries	12	.24	.30	.27	.81	.14	.34	.61	.81
Total or average, foreign countries 7/	38	.26	.24	.28	.77	.13	.21	.69	.86
United States	19	.30	.28	.38	.96	.05	.16	.86	1.02
Total or average, all countries 5/	57	.27	.25	.31	.83	.11	.20	.74	.91
Underground:									
Australia	4	.22	.12	.39	.73	.08	.09	.73	.89
Canada	10	.32	.14	.83	1.29	.07	.92	.44	.61
Chile	4	.36	.19	.20	.75	.04	.06	.72	.79
Philippines	5	.41	.33	.28	1.02	.10	.40	.72	.85
Zaire	3	.42	.16	.38	.97	.24	.15	1.05	1.14
Zambia	6	.41	.20	.27	.87	.17	.03	1.01	1.09
Other countries	20	.57	.24	.58	1.38	.12	.88	.63	.92
Total or average, foreign countries 5/	52	.38	.19	.32	.88	.09	.21	.77	.88
United States	5	.54	.31	.35	1.20	.07	.10	1.18	1.26
Total or average, all countries 5/	57	.40	.20	.32	.92	.09	.19	.82	.93
Grand total or average 5/									
Foreign countries	90	.31	.22	.30	.82	.11	.21	.73	.87
United States	24	.35	.29	.37	1.01	.05	.15	.92	1.07
All countries	114	.32	.23	.32	.87	.10	.20	.77	.92

1/ Does not include mines having combined surface and underground operations.
2/ Does not include mines having leach facilities only. Mines having combined float and leach operations are included.
3/ Includes smelting and refining charges, transportation costs to the smelter and refinery (but not to market), and postmill processing charges for other (noncopper) commodities.
4/ Summation of mine, mill, and smelter-refinery costs.
5/ Data may not add to totals shown because of independent rounding.
6/ Includes property, severance, State, and Federal taxes, and royalties.
7/ Total operating cost plus taxes less byproduct credits.
8/ Net cost plus recovery of capital and profit at a 15-pct ROR.
9/ Transportation charges from the refinery to the market are not included.

Source: Bureau of Mine Information Circular/1983, Copper Availability-Market Economy Countries, U.S.

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Table 29.--Projected copper and byproduct recoveries, specified years, 1980-2000

	1980	1985	1990	1995	2000
Ore concentrated:					
Million short tons	305.5	377.1	465.6	574.9	709.5
Recoverable grade:					
Percent copper	0.47	0.42	0.38	0.34	0.31
Copper recovery:					
Million short tons	1.44	1.58	1.77	1.95	2.20
Molybdenum recovery:					
Million pounds	43.60	51.57	63.46	75.84	94.86
Pound per pound of copper	0.015	0.016	0.018	0.019	0.022
Silver recovery:					
Million troy ounces	15.41	16.91	18.94	20.86	23.54
Troy ounce per pound of copper	0.0054	0.0054	0.0054	0.0053	0.0054
Gold recovery:					
Thousand troy ounces	374.4	347.6	318.6	312.0	264.0
Troy ounce per pound of copper	0.00013	0.00011	0.00009	0.00008	0.00006

Source: Bureau of Mines, U.s. Department of the Interior, "The U.S. Copper Industry Problems, Issues, and Outlook," Mineral Issues, October 1981.

Production costs

The current economic conditions facing world copper producers have varying impacts on producers according to their costs of production. According to a recent Bureau of Mines publication, 1/ the estimated average cost of production per pound (including profit at a 15-percent rate of return) for U.S. copper mines in 1981 was 15 cents per pound higher than the average cost in other market economy countries. Because of this difference, depressed copper prices of recent years have had a severe impact on U.S. producers.

Operating costs vary depending on such factors as the size of the operation, mining method, deposit location, stripping ratio, grade of copper, byproducts, energy, and labor. The Bureau of Mines report estimated mine and mill operating costs based on the basis of producing ore over the life of an operation. As shown in the following tabulation, U.S. mine costs in 1981 were the same as those for foreign countries, however, mill costs, and therefore total operating, costs were higher.

Cost per metric ton of ore

Item	Mine	Mill	Total
U.S. mines	$4.90	$4.00	$8.90
Foreign mines	4.90	3.40	8.30
All mines	4.90	3.60	8.50

1/ Copper Availability - Market Economy Countries, Bureau of Mines Information Circular 8930, 1983.

A principal reason for this disparity is the difference in ore grades. Average ore grades for principal world producers, as reported in the Bureau of Mines study, are shown in the following tabulation:

Item	Average ore grade, percent copper
Open-pit mines:	
Canada	0.38
Chile	1.02
Peru	.79
Philippines	.49
Zaire	4.05
All other	.61
Average	.79
Underground:	
Australia	3.01
Canada	2.10
Chile	1.00
Philippines	.47
Zaire	3.90
Zambia	3.20
All other	1.43
Average	1.34

Average ore grades for U.S. open-pit and underground mines were 0.67 percent and 0.88 percent, respectively. Therefore, when total operating costs per pound of refined copper f.o.b. refinery are calculated, the difference in cost between U.S. and foreign producers is about 23 percent. Estimated production costs for U.S. and foreign producers in 1981 are shown in the following tabulation (per pound of copper):

Item	Mine	Mill	Smelter-refinery	Total
U.S. producers	$0.35	$0.29	$0.37	$1.01
Foreign producers	.31	.22	.30	.82
All producers	.32	.23	.32	.87

Two components of these cost figures warrant closer inspection--energy and labor. As noted in an earlier section, energy costs increased in both absolute terms and as a share of total copper production costs from 1979 to 1983. Since more energy is consumed as the grade of copper being mined declines, U.S. producers consume an estimated 50 percent more energy to extract 1 pound of copper from ore than do their foreign competitors with higher ore grades. Prior to the escalation in energy prices due to changes in the international energy markets, the abundance of domestic energy sources and

Government energy policies kept U.S. energy costs below those of more import dependent competitors. In the late 1970's, the situation changed as world energy prices increased. Electrical costs for large, industrial consumers in the southwestern United States increased, in real terms, over 15 percent between 1977 and 1981. Industrial users of natural gas have experienced a doubling in their gas costs since 1978.

Foreign producers have, where possible, switched to cheaper, locally available sources of supply. Chile has increased the production of coal-fired electricity to replace petroleum imports. Hydroelectric capacity has also been increased, with the result that Chilean electricity costs average an estimated 20 to 30 percent below average U.S. costs.

U.S. labor costs (total compensation per worker) increased at an average annual rate of 10.1 percent during 1979-83. Average hourly earnings for all production and related workers producing copper increased from $10.33 in 1973 to $14.92 in 1983, an annual increase of 9.5 percent. Average hourly earnings for all U.S. construction workers increased at an annual rate of 6.4 percent from $9.27 to $11.92. Hourly earnings in the U.S. manufacturing sector increased from $6.70 to $8.83, an annual increase of 7.2 percent.

Transportation costs

In submissions to the Commission and in public hearing testimony, parties in opposition to the imposition of import quotas argued that a substantial portion of the increase in copper imports was due to the actions of U.S. copper producers. 1/ Respondents argue that a change in wire rod production technology resulted in new continuous cast rod capacity being built on the east coast of the United States, while the bulk of copper refining capacity is located in the southwest. The cost of rail transportation between customers (rod mills) and suppliers (refineries) is estimated at 4 cents per pound or more. The cost of transportation from Peru or Chile to the same east coast customers is approximately 2 cents per pound. This difference in cost encourages the importation of copper to feed the east coast markets. Two of the petitioners, Kennecott and Phelps Dodge, are cited as supplying their rod mills in Baltimore, Md. and Norwich, Conn. with foreign material.

U.S. producers sell refined copper on a delivered basis throughout the continental United States. The delivered price includes an average charge for transportation that all purchasers must pay. For purchasers that are near a refinery, the average transportation price they are charged is higher than the actual transportation cost, whereas for purchasers that are far from a refinery, the average transportation price they are charged is less than the actual transportation cost. To avoid shipping copper great distances when another producer's refinery is nearby, a U.S. producer will sometimes provide copper to a nearby customer of another producer in exchange for the other producer providing copper to a more distant customer of the first producer. Imported copper is sold on a c.i.f. basis at the port of debarkation. Transportation costs in the United States are the responsibility of the domestic purchaser. Inland transportation costs run between 1.5 and 3.5 cents a pound.

1/ Prehearing brief on behalf of the National Electrical Manufacturers Association, Wire and Cable Division, pp. 31-34.

Although there is no difference in price due to the location of a customer, the net return to the producer would vary considerably. In a period of low prices, sales to customers located close to a refinery would be more beneficial to the producer. Data on imports of refined and blister copper, by ports, indicate that in 1983 almost 75 percent of blister copper imports entered through two east coast ports (Baltimore and Savannah) in close proximity to rod mills owned by Kennecott and Southwire. Almost 70 percent of refined copper imports entered through east coast or Gulf ports (New Orleans). The largest single volume was entered through Bridgeport, Conn., which is close to Phelps-Dodge's Norwich rod mill. ***. However, the commodity nature of the copper market makes it possible to have foreign material shipped to a customer even if the sale was made by a U.S. producer. Although the exact nature of the transaction may differ in each sale, the bulk of copper imports in 1983 was intended for east coast customers.

Exchange rates

Tables 30 and 31 show nominal and real exchange-rate indexes for the U.S. dollar and the currencies of Belgium, Canada, Chile, Mexico, Peru, the Republic of South Africa, Zaire, and Zambia--countries that were major exporters of copper to the United States during January 1979-December 1983.

The nominal value of all the foreign currencies fell against the dollar during January 1979-December 1983. The Mexican peso, the Peruvian sol, and the Zairean zaire fell particularly sharply against the dollar. The Canadian dollar dropped by a modest 4 percent against the U.S. dollar.

The real exchange-rate indexes, which take into account differences in inflation rates 1/ in the United States and the foreign countries, show that the purchasing power of the Canadian dollar and the Peruvian sol increased against the dollar over the January 1979-December 1983 period. This suggests that, in general, products from Canada and Peru were less competitive in the United States in October-December 1983 than they were in January-March 1979.

Sharply lower real exchange-rate indexes for the Belgian franc, the Mexican peso, and the Zambian kwacha suggest that products from Belgium, Mexico, and Zambia were more competitive in the United States in the last period for which data are available than they were in January-March 1979.

The real value of the Chilean peso increased dramatically in 1979 and 1980, but then fell sharply in 1981 and 1982. Therefore, products from Chile, in general, were much more competitive in the United States in October-December 1983 than they were in October-December 1980. However, compared with the situation in January-March 1979, Chilean products in October-December 1983 were only slightly more competitive.

1/ Producer prices were used to measure inflation for most countries. Consumer prices were used when producer prices were not available.

Table 30.--Nominal exchange rate-indexes, 1979-83

(January-March 1979=100)

Period	Belgium	Canada	Chile	Mexico	Peru	South Africa	Zaire	Zambia
1979:								
Jan.-Mar--	100	100	100	100	100	100	100	100
Apr.-June-	97	102	96	100	93	101	99	99
July-Sept-	101	102	89	100	88	102	89	101
Oct.-Dec--	102	101	89	100	83	103	76	101
1980:								
Jan.-Mar--	102	102	89	100	79	105	64	100
Apr.-June-	101	101	89	100	74	108	53	102
July-Sept-	103	102	89	99	69	113	54	102
Oct.-Dec--	95	100	89	98	62	114	52	100
1981:								
Jan.-Mar--	87	99	89	97	56	111	51	96
Apr.-June-	79	99	89	94	50	102	46	91
July-Sept-	74	98	89	92	47	91	28	88
Oct.-Dec--	78	100	89	89	42	89	28	90
1982:								
Jan.-Mar--	71	98	89	66	38	86	28	88
Apr.-June-	65	95	86	49	32	80	27	86
July-Sept-	62	95	63	35	28	74	27	84
Oct.-Dec--	60	96	50	31	23	76	26	84
1983:								
Jan.-Mar--	62	97	46	22	18	79	27	67
Apr.-June-	59	96	46	20	14	79	26	67
July-Sept-	55	96	44	18	11	77	12	60
Oct.-Dec--	54	96	41	16	10	73	5	57

Source: Compiled from official statistics of the International Monetary Fund.

Note.--The indexes are in terms of dollars per unit of foreign currency.

Table 31.--Real exchange rate-indexes, 1979-83

(January-March 1979=100)

Period	Belgium	Canada	Chile	Mexico	Peru	South Africa	Zaire	Zambia
1979:								
Jan.-Mar--	100	100	100	100	100	100	100	100
Apr.-June-	95	102	105	100	103	101	111	96
July-Sept-	96	101	115	101	107	105	89	101
Oct.-Dec--	96	100	119	102	110	105	96	101
1980:								
Jan.-Mar--	94	102	118	106	113	104	85	102
Apr.-June-	93	100	127	108	112	109	75	101
July-Sept-	92	101	134	112	115	116	78	99
Oct.-Dec--	85	100	139	112	117	120	76	97
1981:								
Jan.-Mar--	77	99	135	114	123	116	76	87
Apr.-June-	69	98	131	116	123	106	75	83
July-Sept-	66	98	130	117	127	98	51	82
Oct.-Dec--	70	101	127	120	129	99	58	83
1982:								
Jan.-Mar--	65	100	122	100	129	98	58	83
Apr.-June-	61	99	117	84	126	93	60	82
July-Sept-	59	99	97	71	122	89	64	81
Oct.-Dec--	57	101	93	75	118	94	72	82
1983:								
Jan.-Mar--	59	102	88	70	116	100	83	72
Apr.-June-	57	103	94	75	111	102	89	1/
July-Sept-	54	102	99	76	107	101	1/	1/
Oct.-Dec--	52	102	96	1/	109	97	1/	1/

1/ Not available.

Source: Compiled from official statistics of the International Monetary Fund.

Note.--The indexes are in terms of dollars per unit of foreign currency.

Producers' Efforts to Compete with Imports

Organizational/operational changes

The domestic copper producers' efforts to compete with imports in recent years have included the acquisition of capital from parent companies, the use of joint ventures to spread the risks of new projects, and limiting expenditures in the United States to the improvement of operating properties while preparing for expansion of capacity by investment in low-cost foreign properties. Oil firms have acquired a number of copper companies in recent years, and their profits have served to improve the availability of capital to their subsidiaries. Most of the remaining independent copper producers have either merged with or sold significant equity shares to other corporations or diversified their product bases in order to improve their ability to obtain loan financing or issue new equity.

Though the above mergers and acquisitions have reduced the likelihood of capital shortages, there have been no guarantees that these funds be reinvested into domestic mines and processing plants. As a result, domestic copper producers have utilized a variety of innovative methods to finance new capacity and attempt to preserve their market shares. One of the more prevalent types of project financing is when debt funding is made available to a joint venture or mining company subsidiary for the purpose of mine development without the parent firm's being directly liable for repayment.

A major operational change in May 1978 reflected the growing importance of foreign competition in the United States. At this time a reconsideration of the pricing mechanism under which the U.S. industry had long operated was made. In an effort to improve the competitive position of the domestic copper industry, the major copper producers dropped the producer price tradition and switched to exchange-based pricing. Since the change, U.S. producer prices have been fluctuating more or less in response to price changes on the London Metal Exchange (LME) and Commodity Exchange, Inc. (COMEX), so that a single world price for copper has been established.

Technological changes

There have been no technological changes resulting from producers' efforts to compete with imports which have substantially altered the cost structure of the domestic copper industry. The major thrust of technological development in the domestic copper industry has been to exploit the economies of scale created by continuously adopting larger mining equipment and methods. In addition, improvements in extraction techniques have reduced costs.

There are many barriers to technological innovation in the copper industry. The special nature of the metals commodity market, the large capital investments in existing productive capacity, the high cost and risk of proving new technology on a large scale, the impact of some restrictive Government regulatory policies, and the questionable investment future of the industry resulting from current economic conditions have contributed to a conservative industry reliance in its operations on proven, uniform technology developed outside the industry. Despite these drawbacks, some technological progress has been made.

The technologies of open-pit mining and froth flotation made possible the development of low-grade copper deposits in the United States, and successive technological improvements in mining operations have permitted continued copper production despite declining ore grades. Blasthole drilling has become more efficient over the last two decades as rotary drills have supplanted percussion drills. The efficiency of materials handling in surface mines has increased as the sizes of electric shovels and ore haul trucks have increased. Productivity in the extraction, crushing, and grinding of copper has increased over the past two decades as the size of crushers grew and the size of ball mills nearly tripled. The use of autogenous and semiautogenous grinding, the displacement of steel mill liners by rubber liners, and the use of computerized control of grinding circuits have all increased. In ore concentration, the size of flotation cells has increased over the years, offering lower unit energy costs, lower unit capital costs, and conservation of floorspace. Integrated computer control of mine and mill processes is gradually being adopted.

Conventional reverberatory smelting furnaces unable to meet emission limits for sulfur dioxide are being phased out domestically in favor of flash smelting reactors or being modified to use oxygen injection. The impetus for this changeover is the need to comply with the January 1, 1988, emission standards for sulfur dioxide. In this regard, development of hydrometallurgical processes that bypass the smelting step is continuing. Although hydrometallurgical processes are not cost efficient in large-scale operations compared with pyrometallurgical processes, they are characterized by lower capital cost and flexibility of scale, an asset for small- to medium-size mines. In addition, in-place leaching, which is limited in use to deposits which cannot be mined economically in any other way, has the potential for additions to domestic copper production.

Adjustments to be Made During Import Relief

In an attempt to judge whether a period of temporary import relief would enable U.S. producers to compete more effectively with imports, the Commission requested the following information in its questionnaires:

1) What specific adjustments in your copper operations would be made by your firm and/or its workers during the period of import relief.

2) The anticipated expenditure of funds.

3) The specific competitive advantage to be gained by the adjustment.

A summary of each primary producer's response follows:

Amax Copper, Inc.--Although not a member of the petitioning group, AMAX gave a general response to the Commission's questions. ***.

Anaconda Minerals Co.--***.

Asarco Inc.--One of the largest U.S. copper producers, Asarco's response to the question of long-term adjustment efforts was extensive. The firm noted that its ability to undertake adjustment efforts would be enhanced if the quota level was somewhat lower than 415,000 short tons. Assuming relief is granted, Asarco plans capital expenditures in its mining and milling operations of about ***, of which *** would represent technological improvements. Capital expenditures in smelting and refining operations would total about *** with the largest expenditures going to ***. All of these expenditures would be made to improve efficiency and lower costs in these operations.

Asarco's Amarillo, Tex, refinery was constructed in the mid-1970's with the objective of supplying high-quality refined copper products and with a major investment in state-of-the-art continuous cast rod technology. The firm has made a major commitment to supply its customers with high-quality refined copper. Capitalizing on this technological strength, the firm feels import relief will result in a period of improved prices and sales volume. The increased revenues would make it possible for Asarco to make the research and development expenditures necessary to increase productivity and retain its leading technological position and thereby to improve its competitive position in the worldwide marketplace.

Cyprus Mines Corp.--If relief were granted to the domestic industry, Cyprus would be in a position to reevaluate many capital investment projects that have been deferred or canceled. If, as anticipated, the imposition of import quotas resulted in a permanent improvement in the copper market, Cyprus anticipates expenditures of *** to maintain and improve the competitive position of its copper properties. Examples of these expenditures are ***.

Duval Corp.--The level of the import quota imposed would render different adjustment strategies for Duval. A quota set at 415,000 tons would result in approximately *** worth of expenditures for technological improvements including ***. Savings from these improvements would be approximately *** per year. A quota of 350,000 tons would allow expenditures for the same type of improvements to increase to *** with an annual savings of ***.

***. However, Duval feels that lower quotas are necessary to permit expenditures for the exploration and research and development necessary to remain competitive in the long term.

Inspiration Consolidated Copper Co.--The firm indicated that import relief would allow it to seek additional methods of producing on a lower unit cost basis. Inspiration listed *** investment projects, totaling ***, all aimed at lowering unit production costs by *** percent. The firm indicated that over the past 2 years, its unit costs had been lowered by *** cents per pound. Although a quota of 415,000 tons would allow some of the investment projects to proceed, a restriction of 325,000 to 350,000 short tons would be required before the full investment program could be implemented.

Kennecott.--Although the firm reported a number of projects that were either completed or begun during 1979-83 to enable Kennecott to compete with imports, data on adjustment efforts if relief were granted were ***. Kennecott plans ***. However, the expenditure of an estimated ***. Kennecott feels the import relief will be successful if it results in financial returns

sufficient to permit modernization and cost reduction programs as well as research and development and technological improvements sufficient to sustain the competitiveness of the firm's copper facilities.

Magma Copper Co.--The firm contemplates major capital expenditures during the period of import relief at its ***. Although these improvements are required to comply with air pollution control standards, the efficiency of the smelter would be raised, but unit production costs would be lowered. ***.

Pinto Valley Copper Corp.--A wholly owned subsidiary of Newmont Mining Corp., Pinto Valley is also an affiliate of Magma Copper Co. Pinto Valley would ***.

Phelps Dodge Corp.--The firm has a current *** program to improve its ability to compete against foreign competition--***. Temporary quota relief would restore balance to the U.S. copper market, allowing an improvement in price levels. This would allow the firm to increase its cash flow and enable it to implement its program. ***. This would result in an expansion of low-cost production and a reduction in unit costs. Over *** would be spent on ***.

Ranchers Exploration & Development Corp.--***, Ranchers owns a mine and copper precipitate plant in Miami, Ariz. ***.

Appendix A

COMMISSION'S FEDERAL REGISTER NOTICE

[Investigation No. TA-201-52]

Unwrought Copper; Investigation

AGENCY: International Trade Commission.

ACTION: Institution of an investigation under section 201 of the Trade Act of 1974 (19 U.S.C. 2251) and scheduling of a hearing to be held in connection with the investigation.

EFFECTIVE DATE: January 26, 1984.

SUMMARY: Following receipt of a petition filed on January 26, 1984, on behalf of Anaconda Minerals Co., Asarco Inc., Copper Range Co., Cyprus Mines Corp., Duval Corp., Inspiration Consolidated Copper Co., Kennecott Corp. Magma Copper Co., Phelps Dodge Corp., Pinto Valley Copper Corp., and Ranchers Exploration and Development Corp., the Commission instituted investigation No. TA-201-52 under section 201 of the Trade Act of 1974 to determine whether black copper, blister copper, and anode copper, provided for in item 612.03 of the Tariff Schedules of the United States (TSUS), or unwrought copper, other than alloyed, provided for in TSUS item 612.06, are being imported into the United States in such increased quantities as to be a substantial cause of serious injury, or the threat thereof, to the domestic industry producing articles like or directly competitive with the imported articles. The Commission must report its determination to the President by July 26, 1984.

FOR FURTHER INFORMATION CONTACT: Daniel Leahy, Investigator (202/523-1369), or Vera A. Libeau, Supervisory Investigator (202/523-0368), U.S. International Trade Commission, Washington, D.C. 20436.

SUPPLEMENTARY INFORMATION:

Participation in the Investigation

Persons wishing to participate in this investigation as parties must file an entry of appearance with the Secretary to the Commission, as provided in § 201.11 of the Commission's Rules of Practice and Procedure (19 CFR 201.11), not later than 21 days after the publication of this notice in the Federal Register. Any entry of appearance filed after that date will be referred to the Chairman, who shall determine whether to accept the late entry for good cause shown by the person desiring to file the entry.

Upon the expiration of the period for filing entries of appearance, the Secretary shall prepare a service list containing the names and addresses of all persons, or their representatives, who are parties to the investigation (19 CFR 201.11(d)). Each document filed by a party to this investigation must be served on all other parties to the investigation (as identified by the service list), and a certificate of service must accompany the document. The Secretary will not accept a document for filing without a certificate of service (19 CFR 201.16(c)).

Public Hearing

The Commission will hold a public hearing in connection with this investigation beginning at 10:00 a.m., on May 15, 1984, in the Hearing Room, U.S. International Trade Commission Building, 701 E Street, NW, in Washington, D.C. Requests to appear at the hearing should be filed in writing with the Secretary to the Commission no later than the close of business (5:15 p.m.) on April 30, 1984.

Prehearing Procedures

To facilitate the hearing process, it is requested that persons wishing to appear at the hearing submit prehearing briefs enumerating and discussing the issues which they wish to raise at the hearing. An original and 22 copies of such prehearing briefs should be submitted to the Secretary no later than the close of business on May 8, 1984. Confidential submissions should be in accordance with the requirements of § 201.6 of the Commission's rules (19 CFR 201.6). Copies of any prehering briefs submitted will be made available for public inspection in the Office of the Secretary. Any prepared statements submitted will be made a part of the transcript. Oral presentations at the hearing should, to the extent possible, be limited to issues raised in the prehearing briefs.

A prehearing conference will be held on May 4, 1984, at 10:00 a.m., in Room 117 of the U.S. International Trade Commission Building.

Persons not represented by counsel or public officials who have relevant matters to present may give testimony without regard to the suggested prehearing procedures outlined above.

Written Submissions

As mentioned, parties to this investigation may file prehearing briefs by the date shown above. Posthearing briefs must be submitted no later than the close of business on May 23, 1984. In addition, any person who has not entered an appearance as a party to the investigation may submit a written statement of information pertinent to the subject of the investigation on or before May 23, 1984. A signed original and 22 copies of each submission must be filed with the Secretary to the Commission. All written submissions, except for confidential business information, will be available for public inspection during regular business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary to the Commission.

Commercial or financial data and any information for which confidential treatment is desired should be submitted separately. The envelope and all pages of such submissions must be clearly marked "Confidential Business Information". Confidential submissions and requests for confidential treatment must conform with the requirements of § 201.6 of the Commission's Rules (19 CFR 201.6).

Remedy

In the event that the Commission makes an affirmative injury determination in this investigation, remedy briefs will be due to the Secretary no later than the close of business on June 28, 1984, and must conform with the requirements of § 201.6 of the Commission's rules.

Inspection of Petition

The petition filed in this case is available for public inspection at the Office of the Secretary, U.S. International Trade Commission.

For further information concerning the conduct of the investigation, hearing process, and rules of general application, consult the Commission's Rules of Practice and Procedure, part 201 and part 207 Subparts A and B (19 CFR Part 201 and 207, Subparts A and B).

Issued: February 8, 1984.

By order of the Commission.

Kenneth R. Mason,

Secretary.

[FR Doc. 84-4145 Filed 2-14-84; 8:45 am]

BILLING CODE 7020-02-M

APPENDIX B

LIST OF WITNESSES APPEARING AT THE PUBLIC HEARING

TENTATIVE CALENDAR OF PUBLIC HEARING

Those listed below appeared as witnesses at the United States International Trade Commission's hearing:

Subject : Unwrought Copper

Inv. No. : TA-201-52

Date and time: May 15, 1984 - 10:00 a.m.

Sessions were held in connection with the investigation in the Hearing Room of the United States International Trade Commission, 701 E Street, N.W., in Washington:

Congressional and state appearances:

Honorable Pete V. Domenici, United States Senator, State of New Mexico

Honorable Dennis DeConcini, United States Senator, State of Arizona

Honorable John Melcher, United States Senator, State of Montana

Honorable Max Baucus, United States Senator, State of Montana

Honorable Eldon D. Rudd, United States Congressman, State of Arizona

Honorable Robert W. Davis, United States Congressman, State of Michigan

Honorable Sherwood L. Boehlert, United States Congressman, State of New York

Honorable James F. McNulty, Jr., United States Congressman, State of Arizona

Honorable Hank Williams, Mayor, City of Globe, Arizona

Honorable Carl J. Eilenberg, Mayor, City of Rome, New York

Government appearance:

Federal Trade Commission, Washington, D.C.

Joseph M. Mattingly, Attorney, Division of International Antitrust, Bureau of Competition

Daniel S. Koch, Attorney

Dr. John Nash, Economist, Bureau of Economics

Benjamin Cohen, Attorney

In support of the petition:

Steptoe & Johnson--Counsel
Washington, D.C.
on behalf of

Anaconda Minerals Company, ASARCO Incorporated, Copper Range Co., Cyprus Mines Corp., Duval Corp., Inspiration Consolidated Copper Company, Kennecott Corp., MAGMA Copper Co., Phelps Dodge Corp., Pinto Valley Copper Corp., and Ranchers Exploration and Development Corp.

Simon Strauss, Consultant on Minerals Policy

Stanley Nehmer, President, Economic Consulting Services, Incorporated

Douglas J. Bourne, Chairman of the Board and Chief Executive Officer, Duval Corporation

Alan S. Kafka, Manager of Copper Sales, ASARCO Incorporated

Larry Dugan, Jr., Vice President Operating Engineers

Edgar Ball, Director, District 37, United Steelworkers of America, AFL-CIO

Simon Hunt, Brook, Hunt & Associates

Richard O. Cunningham)
Robert W. Fleishman)
Ms. Susan Esserman)--OF COUNSEL
Ms. Nina H. Questal)
Robert T. Novick)

- more -

In opposition to the petition:

Williams & Thorman--Counsel
Washington, D.C.
on behalf of

BP Resources Canada Limited, Brunswick Mining and Smelting Corporation Limited, Camchib Mines Inc., Falconbridge Limited, Hudbay Mining (Quebec) Ltd., Inco Limited, Kidd Creek Mines Ltd., Mattabi Mines Limited, Noranda Sales Corporation Ltd., Northgate Patino Mines, Inc., and Pamour Porcupine Mines Ltd.

William G. Deeks, Executive Vice President, Noranda Sales Corporation Ltd., Toronto, Ontario, Canada

David L. Bumstead, Senior Vice President, Copper Division, Noranda Sales Corporation Ltd., Toronto, Ontario, Canada

John R. Hampton, Vice President, Primary and Secondary Metals, Noranda Sales Corporation Ltd., Toronto, Ontario, Canada

Kim G. Ross, Manager, Primary Copper, Noranda Sales Corporation Ltd., Toronto, Ontario, Canada

Neil M. Kemp, Assistant Vice-President Primary Metals Marketing, INCO Limited, Toronto, Ontario, Canada

Bruce W. Gilbert, Senior Vice-President, Marketing, Kidd Creek Mines Limited, Toronto, Ontario, Canada

Reginald A. Willoughby, Vice President and General Counsel, Kidd Creek Mines Limited, Toronto, Ontario, Canada

Phillip C. F. Crowson, Economic Advisor, The Rio Tinto-Zinc Corporation PLC, London, England

James D. Williams, Jr.)
Burton R. Thorman)--OF COUNSEL
Ms. Ann Ottoson King)

- more -

Arnold & Porter--Counsel
Washington, D.C.
on behalf of

Corporacion Nacional del Cobre de Chile ("Codelco")

Patrick Cussen, Vice President-Sales
Operations of Codelco

Leons Kovisars, President, MET Research
Corporation, Chicago, Illinois

Robin G. Adams, Resource Strategies, Inc.,
Exton, Pennsylvania

Dr. Robert S. Pindyck, Professor, Sloan School
of Management, Massachusetts Institute of
Technology, Cambridge, Massachusetts

Dr. Julio Rotemberg, Professor, Sloan School
of Management, Massachusetts Institute of
Technology, Cambridge, Massachusetts

Leonard H. Becker)
Patrick F. J. Macrory)--OF COUNSEL
Hadrian Katz)

Harold Sacks & Company, Inc., New York, N.Y.

Harold Sacks, President

Chapman, Duff and Paul--Counsel
Washington, D.C.
on behalf of

The Mining Chamber of Mexico

Senor Luis Alejandro Figueroa, Managing Director
of El Cobre de Mexico

W. N. Harrell Smith--OF COUNSEL

- more -

Cole & Corette--Counsel
Washington, D.C.
on behalf of

Minpeco, S.A., Lima, Peru

Martin Belaunde Moreyra, General Manager and Chief Executive Officer

Donald MacRae MacKay, Director, Minpeco, S.A.

Oscar Chavez, Technical Assistant

Dan Webster)
J. E. Corette)
John R. Coogan)--OF COUNSEL
Ms. Susan Bierman)

Graubard, Moskovitz, McGoldrick, Dannett & Horowitz--Counsel
New York, N.Y.
on behalf of

Afrimet-Indussa, Inc., and SOZACOM, Minerals and Metals Marketing Organization, The Republic of Zaire

John LeRoy, Executive Vice President of Afrimet-Indussa, Inc.

Michael H. Greenberg--OF COUNSEL

Roseman, Colin, Freund, Lewis & Cohen--Counsel
Washington, D.C.
on behalf of

Zambia Consolidated Copper Mines LImited ("ZCCM")

Francis Kuanda, ZCCM's Chairman & Chief Executive Officer

L. C. Mutakasha, Managing Director of Metal Marketing Corp.

Edwin Kulako

Arnold I. Roth)
Stephen L. Ratner)--OF COUNSEL
Alan L. Doochin)

Verner, Liipfert, Bernhard and McPherson--Counsel
Washington, D.C.
on behalf of

Wire and Cable Division, National Electrical Manufacturers Association (NEMA)

Peter Weisse, Chairman and Chief Executive Officer, Rome Cable Corporation

William F. Morrison, Executive Vice President

Benjamin J. Bowdon, Vice President - Metal Management

National Electrical Manufacturers Association

Bernard Falk, President

Dr. William A. Noellert, Economist - Verner, Liipfert, Bernhard and McPherson

Alan Wm. Wolff)
Ms. Elaine Frangedakis) --OF COUNSEL

Collier, Shannon, Rill & Scott--Counsel
Washington, D.C.
on behalf of

The Copper and Brass Fabricators Council

Patrick J. Davey, Vice President, Marketing, Olin Corp.

David A. Hartquist--OF COUNSEL

_ more -

CERRO Copper Products Company
East St. Louis, Illinois

Henry L. Schweich, President

Southwire Company
Carrollton, Georgia

Harlan L. Carroll, Vice President--Metals Management

APPENDIX C

PRESIDENTIAL MEMORANDUM OF OCTOBER 20, 1978

[3195-01-M]

Memorandum of October 20, 1978

Determination Under Section 202(b) of the Trade Act, Unwrought, Unalloyed Copper

Memorandum for the Special Representative for Trade Negotiations

THE WHITE HOUSE,
October 20, 1978

Pursuant to section 202(b)(1) of the Trade Act of 1974 (P.L. 93-618, 88 Stat. 1978), I have determined the action I will take with respect to the report of the United States International Trade Commission (USITC), transmitted to me on August 23, 1978, concerning the results of its investigation of a petition for import relief. This petition was filed by the Anaconda Co., Asarco, Inc., Cities Service Co. (Minerals Group), Copper Range Co., Cyprus Mines Corp., Duval Corp., Hecla Mining Co., Inspiration Consolidated Copper Co., Kennecott Copper Corp., Magma Copper Co., Phelps Dodge Corp., and Ranchers Exploration and Development Corp., on behalf of the domestic industry producing unwrought, unalloyed copper, provided for in item 612.06 of the Tariff Schedules of the United States.

After considering all relevant aspects of the case, including those considerations set forth in section 202(c) of the Trade Act of 1974, I have determined that import relief is not in the national economic interest for the following reasons:

1. Import relief would impose significant costs on U.S. consumers of unwrought, unalloyed copper (refined copper). The increases in refined copper prices resulting from provision of relief could create incentives for circumvention of relief through increased imports of other copper products such as scrap, blister, and fabricated items. This would effectively reduce the level of protection provided to the domestic copper industry. Moreover, domestic copper fabricators would be faced with higher refined copper input costs and, at the same time, possible increased import competition in fabricated products.

2. Domestic copper market conditions have improved during 1978 and there is an improving outlook over the next several years for both the U.S. and world copper markets. U.S. and world copper prices have risen markedly during 1978 and the world inventory overhang has declined. Domestic refined copper production was up slightly during the first part of 1978; and imports have begun to decline from the high levels prevailing during the first part of the year.

3. Provision of import relief would subject U.S. jobs in other industries to possible foreign retaliation against U.S. exports or compensation by the United States in the form of reducing import restrictions on other products.

4. Import relief would adversely affect U.S. international economic interests. It would be contrary to our efforts to reduce trade barriers in the MTN and to develop cooperative international solutions to the world copper industry's problems in the context of discussions in the UNCTAD Integrated Program for Commodities. Import relief would also affect our bilateral relations with Canada and with LDC copper producers, such as Chile, Zambia, and

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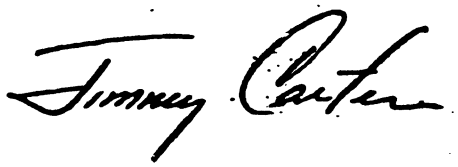
Peru, who are heavily dependent on copper exports as a source of foreign exchange earnings.

5. Trade adjustment assistance benefits have been and will continue to be available to copper mine, smelter, and refinery workers.

This determination is to be published in the FEDERAL REGISTER.



[FR Doc. 78-30-63 Filed 10-20-78; 4:46 pm]

APPENDIX D

STATISTICAL TABLES

Table D-1.—Specified items of copper: U.S. imports for consumption and exports, 1979-83

(In short tons)

Item	1979	1980	1981	1982	1983
	Imports				
Copper ore 1/	33,529	57,717	43,136	130,131	99,870
Copper-bearing materials 1/	1,057	432	2,996	4,463	3,623
Copper waste and scrap 1/	32,666	32,800	38,775	38,919	60,541
Cement copper and copper precipitates 1/2/	116	1	242	62	20
Black copper, blister copper, and anode copper 1/2/	27,112	47,865	32,961	107,339	51,094
Copper, unwrought, unalloyed	224,712	470,627	364,451	284,882	506,588
Master alloys of copper	436	279	249	429	274
Copper, unwrought, alloyed 1/	3,335	1,905	4,794	1,608	4,425
Copper, wrought	169,976	110,934	184,919	160,915	204,497
Total	492,939	722,560	672,523	728,748	930,932
	Exports				
Copper ore 1/	49,122	177,733	166,193	215,239	47,102
Copper-bearing materials 1/	5,743	7,558	6,904	3,143	7,611
Copper waste and scrap 1/	188,545	210,326	161,024	160,784	150,549
Cement copper and copper precipitates 1/2/	813	398	991	202	795
Black copper, blister copper, and anode copper 1/2/	7,378	3,737	9,117	1,963	7,354
Copper, unwrought, unalloyed	81,198	15,915	26,835	33,623	89,674
Master alloys of copper	837	784	757	794	1,052
Copper, unwrought, alloyed 1/	7,464	2,917	4,008	4,824	6,710
Copper, wrought	84,710	118,553	89,120	84,168	61,805
Total	425,810	477,921	464,949	504,740	372,652

1/ Copper content.

2/ These items are reported in combined form in Schedule B. Apportionments, which were based on Commission staff estimates, equal 10 percent to cement and precipitate copper and 90 percent to black, blister, and anode copper.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table D-2.—Refined copper: End-of-period stocks, by selected countries and by metal exchanges, 1979-83

(In thousands of metric tons)

Item	1979	1980	1981	1982	1983
United States	149.3	148.7	281.1	348.6	207.3
Japan	253.7	160.9	162.6	250.5	133.8
West Germany	112.0	107.3	77.9	92.9	92.6
France 1/	69.0	92.0	69.0	70.0	70.0
Canada 2/	30.0	23.8	26.1	38.0	42.0
United Kingdom 1/	37.0	31.6	17.8	19.0	25.6
Zambia 2/	9.1	7.5	12.2	7.2	11.7
Republic of Korea 2/	7.3	7.2	6.9	6.9	6.9
South Africa 2/	3.4	5.8	10.8	4.2	6.3
Zaire 2/	4.3	.8	2.3	9.2	6.0
Australia 2/	4.7	10.5	4.8	8.1	5.5
Brazil 2/	0	0	0	0	1.2
Other	185.4	147.8	118.5	141.3	150.0
Total	865.2	743.9	790.0	996.7	758.8
Of which:					
Producers	506.6	376.4	402.7	572.3	394.9
Merchants	35.0	27.6	46.6	51.0	17.6
Consumers	323.6	339.9	340.7	373.4	346.3
Metal exchange stocks:					
London Metal Exchange 3/	126.5	122.6	126.7	253.2	435.7
Comex	97.9	162.9	170.2	249.0	371.2
Total	224.4	285.5	296.9	502.2	806.9
Grand total, commercial	1,089.6	1,029.4	1,086.9	1,498.9	1,565.7

1/ Held by consumers.

2/ Held by producers.

3/ LME stocks are held in Belgium, France, West Germany, Italy, Netherlands, Sweden, and the United Kingdom.

Source: World Bureau of Metal Statistics, World Metals Statistics, April 1984.

Table D-3.—Copper: U.S. production, imports for consumption, consumption, and stocks, January-March 1983 and January-March 1984

Item	January-March	
	1983 1/	1984
Production:		
Mine—1,000 short tons	288	300
Smelter—do	273	283
Refinery—do	479	406
Imports:		
Blister—do	17	11
Refined—do	101	139
Ratio of imports to production:		
Blister—percent	6.2	3.9
Refined—do	21.1	34.2
Consumption of refined copper—1,000 short tons	520	528
Ratio of imports to refined copper to consumption of refined copper—percent	19.4	23.7
Stocks (refined copper):		
Primary producers 1,000 short tons	170	114
COMEX—do	409	403
Wire rod mills—do	125	109
Brass mills—do	29	33
Other—do	32	32
Total—do	764	691

1/ Data for stocks are as of December 31.

Source: Compiled from official statistics of the U.S. Bureau of Mines and the U.S. Department of Commerce.