

# COPPER

By Daniel L. Edelstein

The United States maintained its position as the world's second largest mine producer of copper, accounting for about 19% of world production. Chile, the largest mine producer, accounted for about 24%. Domestic mine production, which had trended upward for most of the previous decade, remained level in 1994 at about 1.8 million tons. However, because of a rise in average copper prices, the value of production rose by more than 20%, to \$4.4 billion. About 40 mines operating in 12 States produced reportable quantities of copper; the top 18 mines accounted for more than 98% of production. The five principal mining States, in descending order, Arizona, Utah, New Mexico, Montana, and Michigan, accounted for 98% of production. There were no significant changes in the operating status of domestic copper mines in 1994, though capital expenditures at several mines during the year led to increased production capacity. Capacity was expected to increase slightly in 1995 as several expansions come on stream. U.S. copper companies continued to invest heavily in South America, influenced by favorable geologic settings and a positive international investment climate there. By the third quarter of the year, Phelps Dodge Corp., had commissioned its 115,000-ton-per-year La Candelaria Mine in Chile.

The United States was the largest producer and consumer of refined copper, accounting for 20% and 23%, respectively, of world totals. Domestic consumption of refined copper rose by more than 13.3% during 1994 to record-high levels. This was the third consecutive year of large demand increases, consumption having risen by 6.3% and 8.5%, respectively, in 1992 and 1993.

During the year, 8 primary and 5 secondary smelters, 9 electrolytic and 6 fire refineries, and 15 electrowinning plants operated in the United States. However, at yearend, Southwire Co. announced the immediate closing of its Gaston Recycling Industries secondary smelter and associated electrolytic refinery. Electrowon production of about 490,000 tons, essentially the same as in the previous year, accounted for 27% of domestic mine production. Conversion of old scrap to alloys and refined copper declined by 43,000 tons, but contributed 500,000 tons of copper to the market, a quantity equivalent to about 19% of industrial copper

consumption.

Copper was consumed, both as refined copper and as direct melt scrap, at about 35 brass mills, 15 wire rod mills, and 750 foundries, chemical plants, and miscellaneous consumers. Copper and copper alloys found both structural and electrical use in building construction, 42%; electrical products, 22%; industrial machinery and equipment, 13%; transportation equipment, 13%; and consumer and general products, 10 %.

Copper was mined in 55 countries in 1993, of which the top 2, Chile and the United States, accounted for more than 43%, and the top 10 for about 78% of the world total. Land-based world copper resources at yearend 1993 were estimated at 1.6 billion tons. The world reserve base was estimated at 600 million tons, and world reserves at 300 million tons. The United States has about 15% each of reserves and the reserve base.

The world supply/demand balance for refined copper shifted in 1994. Following 6 years of surplus production and a near tripling of world refined inventories to 1.4 million tons, copper demand exceeded production and global copper inventories declined by 360,000 tons. The shortfall was the result of a slight drop-off in world refined production at a time when estimated world consumption grew by 400,000 tons, or 3.6%. Copper prices, which in November 1993 had fallen to their lowest level in 7 years, rose during 1994 in response to increasing supply tightness. The U.S. producer price averaged \$1.41 per pound in December, up from \$0.92 in December 1993.

## Production

For the second consecutive year, there were relatively few changes in the operating status of domestic mines, smelters, and refineries. Capital investments at a number of facilities led to increased productivity, and set the stage for expanded capacity in 1995. Solvent extraction-electrowon production continued to feel the dilution effects of heavy rains and flooding during 1993 and remained below 1992 levels. Overall mine production capacity rose by about 40,000 tons to 2.08 million tons, principally owing to capacity increases at several of Cyprus Amax Minerals Co.'s mines, and Cobre Mining Co.'s Continental Mine,

which was reopened in 1993. Several copper mines were under development and slated for startup in 1995, including Great Lakes Minerals 543-s deposit in Michigan and Arimetco International Inc.'s Zonia and Van Dyke Mines. Phelps Dodge was planning the startup of the Southside Extension at its Morenci Mine for the second half of 1995. Several other mines, including Magma Copper Co.'s Robinson project, were under development and were scheduled for startup in 1996.

While smelter capacity remained unchanged at 1.9 million tons, investments made in 1993 and 1994 led to higher capacity usage and increased primary smelter production. Secondary smelter production declined slightly, and at yearend, Southwire Co. announced the immediate closure of its secondary smelter and the phase-out of the associated electrolytic refinery at its Gaston Copper Recycling Corp., Gaston, SC. High operating costs and the large additional capital investment needed to comply with environmental regulations were cited by the company as the reason for closure. Though refinery capacity declined to 2.5 million tons owing to the closure of the under-utilized Cox Creek Refinery in 1993, production of primary refined copper increased, owing to the pass through of higher smelter output.

**Foreign Investments.**—Domestic copper companies continued to look toward South American investments to increase capacity and lower average costs. With an improved investment climate, and a far-reaching privatization program begun in 1992, foreign investment in Peruvian mining projects surged. ASARCO Incorporated continued to invest in its majority owned (52.3%) Southern Peru Copper Corp. (SPCC). In May, SPCC, which operated the Toquepala and Cuajone open pits and the Ilo smelter, purchased the government-owned Ilo refinery for \$65 million and a commitment to invest an additional \$20 million in capital improvements. SPCC was reportedly midway through a \$445 million modernization and expansion program, begun in 1992. In November, Magma Copper Co., through its wholly owned subsidiary, Global Magma Ltd., purchased for \$245 million a 98.43% interest in Empresa Minera Especial Tintaya S.A., operator of the 50,000-ton-per-year Tintaya Mine in Peru. As part of the purchase, Magma agreed to invest \$85 million

over 5 years. Plans called for increasing production over 2 years by 27%, and reducing operating costs to \$0.55 per pound from the current \$0.60. Cyprus Amax acquired approximately 91.5% of the shares of Sociedad Minera Cerro Verde, S.A. in March at a cost of about \$31 million and initiated an expansion program to increase annual electrowon production from 18,000 tons to 45,000 metric tons over an 18-month period. Cyprus anticipated expending \$375 million over a 5-year period. Cyprus estimated reserves to contain more than 7 billion pounds of copper.

In Chile, Cyprus won the competition for the rights to 51% of El Abra, a world class copper deposit with identified leach reserves of more than 400 million tons of ore, for \$330 million. Total development costs of the 115 thousand-ton-per-year oxide leach project, scheduled onstream by mid-1997, were expected to be about \$1 billion. Cyprus projected cash operating costs over the first 10 years of operation to average \$0.42 per pound of copper. In October, 3 months ahead of schedule, Phelps Dodge Corp. began commercial production at its Candelaria Mine. Phelps Dodge expected to produce about 118,000 tons per year of copper over a 34-year life from identified reserves of more than 350 million tons of ore grading 1.1% copper. In other foreign investments, Freeport-McMoran Copper and Gold Inc. reported being ahead of schedule in expanding milling capacity at its Indonesian operations from the 1994 rate of 72,500 tons of ore per day to 115,000 tons per day by late 1995. Production in 1994 rose to 322,000 tons of recoverable copper, up from 299,000 in 1993, and only 164,000 tons in 1990. Proved and probable reserves were expanded to 1.13 billion tons of ore grading 1.3% copper. Freeport was also expanding its Huelva, Spain, smelter and refinery to 270,000 tons and 215,000 tons, respectively. The expansions were scheduled for completion in early 1996. Freeport also entered into a joint venture with Mitsubishi Materials Corp. (70%) and Fluor Daniel Inc. (10%) to construct a new 200,000-ton smelter/refinery in Indonesia.

**Mine and Plant Labor.**—Domestic mines employed an average of 13,150 mine, mill and office workers, a decline of about 150 from the previous year. Productivity at domestic copper mines rose to a record high 66 kilograms of copper per worker-hour in 1994, an increase from 64 pounds of copper per worker-hour in 1993. With the exception of 1991, productivity has increased steadily from the 1989 level of 50 kilograms per worker hour. Productivity, which had increased dramatically during the early 1980's, stabilized and even decreased slightly in the late 1980's in the face of higher copper

prices. In the 1990's, a renewed round of capital investments and expansions of electrowinning capacity resulted in a renewed improvement in worker productivity.

**Costs and Earnings.**—While some effects were still being felt from the heavy rains that led to higher costs and lower profits in 1993, higher copper prices and lower operating costs resulted in most domestic mining companies reporting improved profits from copper operations in 1994. Phelps Dodge Mining Co. reported net profits of \$326.4 million, an increase of almost \$100 million from 1993, but slightly below 1992 profits. Lower operating costs were in part attributed to new production from its Candelaria Mine in Chile. Cyprus Climax Metals Co. reported a near quadrupling of profits from its copper/molybdenum operations to \$206 million. The company attributed increased profits to higher metal prices, the company's realized price for copper and molybdenum having risen by \$0.15 and \$1.15 per pound, respectively, and a 17% improvement in worker productivity. Net operating costs were reportedly reduced from \$0.72 to \$0.69 per pound of copper. Magma Copper Co. realized a record net income in 1994 of \$87.4 million, up from \$21.9 million in 1993. Magma attributed the improved financial results to increased sales, an \$0.08-per-pound cost reduction in its mined copper, and a rise in the realized price for copper from \$0.94 to \$0.98 per pound. A price protection program in 1993 and 1994, aimed at assuring a sustained cash flow, resulted in Magma's 1993 realized copper price outperforming Comex by \$0.09 per pound, but the 1994 realized price lagging Comex by the same amount. ASARCO Incorporated, reported a rise in net earnings from \$15.6 million in 1993 to \$64.0 million in 1994, mostly as a result of a \$44.9 million contribution from its 52.3% stake in Southern Peru Copper Corp. Production problems at its Ray Mine and El Paso smelter led to a fall-off in production and higher operating costs.

**Mines, Smelters, and Refineries.**—According to the company's annual report, copper mine production by Asarco fell by about 20,000 tons in 1994, to 260,000 tons, owing to difficult mining conditions at its Ray Mine, in part due to water accumulation from the previous year's heavy rains. In July, production was curtailed at the older, higher-cost sections of the Hayden mill, and a 15-month development plan initiated to restore capacity and increase operating flexibility. Production at the El Paso smelter continued to lag behind 1992 levels as startup troubles with the new CONTOP smelter were resolved. In May, Asarco's redesigned stainless steel reactors were installed and full capacity established. The

company began development of a new 4.6 million ton, high-grade (2.07% copper) ore body at the Mission Mine. The ore will be accessed from an incline within the existing pit and was expected to yield 12,700 tons of copper per year over a 5-year period beginning mid-1996.

According to the company annual report, mine production at Phelps Dodge's U.S. operations, including minority owner share, remained unchanged in 1994 at about 584,000 tons. At its Morenci Mine, construction began on the Southside extension project, designed to add 68,000 tons of electrowon production per year, beginning in mid-1995. District-wide exploration in the Morenci area identified almost 700 million tons of leachable material grading 0.28% copper. Additional reserves were also identified at the Chino and Tyrone Mines.

According to the RTZ Corp. PLC annual report, mine production at Kennecott's Bingham Canyon Mine rose slightly from the record 307,000 tons produced in 1993: higher equipment availability offset a lower average ore grade. Refinery production declined, however, owing to startup problems associated with its refinery modernization. In the first full year of operation, production at the Flambeau Mine exceeded its projected lifetime average of 27,000 tons per year by more than 50% owing to processing of a high-grade material. RTZ reported that its replacement smelter at Magna, UT, was 88% complete at yearend, and was on track for startup in early 1995, 3 months ahead of schedule. At a budgeted cost of \$880 million, the new smelter was expected to nearly double output while reducing smelter emissions by 96%. In January, the Environmental Protection Agency (EPA) proposed including large portions of the Bingham Canyon property on the Superfund list. At yearend, final action was still pending on the proposal. To date, Kennecott had spent \$115 million on site remediation.

Cyprus Climax Metals Co. reported mine production of 294,000 tons of copper, a nominal increase from the previous year. Capacity increases from fleet modernizations and mill expansion helped to maintain production in light of lower ore grades at its Bagdad and Sierrita Mines and to improve overall employee productivity by 17%. At yearend, the Sierrita mill was operating at a sustained rate of 105,000 tons per day, about 5,000 tons above designed capacity. The Bagdad mill was expanded during 1994 to 77,000 tons per day. In October, Cyprus commissioned a new 120,000-ton-per-year refinery at Miami that would make the company self-sufficient in refining. A study, expected to

be completed in mid-1995, was underway to determine the feasibility of a large open-pit and solvent extraction-electrowinning (SX-EW) operation near Casa Grande, AZ.

Arimetco International Inc. reported a record production of 9,000 tons of copper and net profits of \$2.7 million in its 1994 annual report. At its Yerington-MacArthur Mine, production rose by 14% to 6,500 tons, owing to expansion of leach pads. At the Johnson Camp Mine, production fell by one-third, to 2,500 metric tons. A shortage of pad space led to curtailment of open pit mining during the first quarter. With completion of additional pad space, mining was resumed. Cash operating costs at Yerington and Johnson were reported to have dropped to \$0.50 per pound and \$0.65 per pound, respectively, by yearend. Plans called for startup of 60,000-pound-per-day SX-EW operations at both the Van Dyke and Zonia Mines by yearend 1995. Longer term plans called for development of the Yerington sulfides and the Mesaba and Copper Chief ore bodies.

Metall Mining Corp. reported disappointing results from its Copper Range operations. Owing to mining problems, reported production declined by about 4,000 tons to 43,200 tons, and cash operating costs rose from \$0.80 to \$0.94 per pound of copper. To reduce costs, Metall was investigating the feasibility of leaching copper from pillars in abandoned sections of the mine. As part of a consent decree to settle outstanding litigation regarding smelter noncompliance with emissions standards, Metall agreed to close its smelter, beginning in February 1995. Concentrates were to be processed in Canada, with anode returned to Copper Range for refining. A decision to build a new compliant smelter was pending the outcome of its leach tests. However, at mid-1995, Metall announced the immediate suspension of mining and milling at Copper Range, though work on the leaching feasibility continued.

## Trade

In response to growing demand coincident with stagnant production, U.S. import dependence for refined copper rose to the highest level in 7 years. Imports of refined copper rose to near record levels, while exports, principally to Asian countries, declined. Imports of copper and brass semifabricates rose by almost 17,000 tons, to 82,000 tons, while exports declined by about 4,000 tons, to 455,000 tons. Trade in copper concentrates increased, though net imports remained essentially unchanged at 180,000 tons. Concentrate exports were increased by one major producer as environmental constraints

curtailed its smelter output. Other smelters increased purchases to maintain smelter efficiency in light of mine production shortfalls.

In April, as an amendment to the Uruguay Round of the General Agreement on Tariffs and Trade (GATT), completed in December 1993, Japan announced that it would phase down its copper duty over a 5-year period from a flat 15,000 yen per ton, about 8% ad valorem at prevailing prices, to 3% ad valorem.

## Prices and Stocks

The global supply/demand balance for refined copper shifted dramatically in 1994 from surplus to deficit. World inventories declined precipitously throughout 1994, extending a trend begun in November 1993. Before that, inventories had been growing since early 1990, except for a brief dip in 1992. In the United States, however, strong demand in 1993 had precipitated a decline in stocks a few months earlier; domestic inventories had peaked in May 1993 and fallen by 25% by yearend.

Global copper prices, which in November 1993 were at the lowest level in over 6 years, rose slightly during the first quarter of 1994. The U.S. producer price averaged \$0.91 per pound during the first 4 months of 1994, up from the low in November 1993 of \$0.86. In May, in response to a continued drawdown of domestic and world inventories, prices began to move sharply upward: the U.S. producer price averaged \$1.41 per pound in December, the highest level in 5 years. Domestic inventories fell to a minimum in October of only 95,000 tons, or, at the prevailing rate of consumption, less than 2 weeks of supply. Tightness in copper supply was further evidenced by the backwardation, forward contracts selling at a discount to spot purchases, that developed in Comex prices. While forward contracts traded at a slight premium early in the year, by May, forward contracts were consistently trading at a discount. The backwardation widened with rising prices, and in December, the discount for 3-month forward contracts averaged \$0.24 per pound.

In September, the U.S. Defense National Stockpile Center completed the sell-off of more than 8,000 tons of brass slabs being stored in depots in Nevada and Indiana. Inventories of refined copper had been liquidated during 1993.

## Consumption

Domestic consumption of refined copper rose 13% during 1994 to a record-high level. This followed on the heels of above average

growth in 1992 and 1993, demand having risen by 6.3% and 8.5%, respectively, during these years. Demand showed signs of slowing at yearend, with consumption for December falling below that for the comparable month in 1993. The growth in demand was fueled by strong economic activity in the major end use markets: housing starts and building permits rose by 12.9% and 13.7%, respectively, and automobile sales and production rose by 8.6% and 11.8%, respectively. According to data compiled by the Copper Development Association Inc. (CDA) on copper and copper alloy shipments to the U.S. market, building construction demand rose 8% and accounted for 42% of shipments; electric and electrical products demand rose about 2% and accounted for 22% of shipments; industrial machinery demand rose 6% and accounted for 13% of shipments; transportation equipment demand rose 15% and accounted for 13% of shipments; and consumer and general product demand rose 24% and accounted for 10% of shipments. Total shipments rose about 9%, to 3.36 million tons. According to estimates by the U.S. Bureau of Mines, electrical applications in all industry segments accounted for 78% of refined copper consumption.

The domestic scrap market was relatively weak in 1994, and did not reflect the strong growth in copper demand. The quantity of copper recovered from old scrap was lower in 1994 owing to a fall-off in secondary refined production. Low copper prices during the first half of the year and the small difference between the price of refined copper and scrap copper served to discourage the conversion to refined copper. At brass mills, where industry accounts indicated that mills were running at capacity throughout much of the year, consumption of scrap rose by 16%. However, brass mills typically consume large quantities of new scrap returned from customers. With industry consuming increased amounts of both domestic and foreign brass mill products, new scrap availability increased. While domestic consumption of scrap at refineries was weak, scrap dealers reported a strong market, owing to a vigorous demand for copper scrap in Asian markets. U.S. exports of copper and copper-alloy scrap through November rose to about 360,000 tons, up from 262,000 in 1993. The strong export market served to bolster scrap prices and led to the narrower processing margins that discouraged domestic scrap consumption.

## World Review

The global supply/demand balance shifted from one of surplus in 1993 to a significant

deficit in 1994. According to data compiled by the International Copper Study Group, world demand for refined copper increased by 400,000 tons and world inventories declined by more than 350,000 tons. The United States, where consumption grew by more than 13%, accounted for about 75% of the net growth in global demand. Demand in Europe, which declined in 1993, grew by about 2%, while demand in Asia and the Middle East was stagnant. Production of refined copper, on the other hand, declined by more than 300,000 tons, principally owing to lower production in China, Japan, Kazakhstan, Russia, and Zambia. Increased competition for concentrates and appreciation of the yen led to a 10% reduction in Japanese production.

World mine production fell slightly during 1994 despite a net gain in world capacity of about 100,000 tons. In Canada, production fell by more than 100,000 tons owing to mine closures in British Columbia in late 1993 that were attributed to high costs and low copper prices. However, by yearend 1994, mining had been resumed at Princeton Mining's Similco Mine and at Gibraltar Mines Ltd.'s Mcleese Lake Mine. A labor dispute that curtailed production at Westmin Resources Ltd.'s Myra Falls copper-zinc mine was settled in August. In the Philippines, high costs and typhoon damage reduced production at Atlas Consolidated Mining and Development Corp.'s operations. Erosion of infrastructure led to a continued decline in Russian production, and in Zambia technical difficulties led to a decline in production. Zambia Consolidated Copper Mines Ltd. announced a company-wide cost-cutting program, and at yearend the government was considering reducing its 60% ownership of the company. Political turmoil continued to plague Zairian production.

Notable production increases occurred in Chile and Indonesia. In Chile, Phelps Dodge's Candelaria Mine began production during the third quarter, and at midyear production began from the Quebrada Teniente deposit at Codelco's El Teniente Division. Other new capacity included the commissioning of an 80,000-ton-per year Ammonia leach plant at Escondida, and startup of the Quebrada Blanca, Cerro Colorado and Ivan SX-EW operations. In Indonesia, mill expansion led to increased production from the Grasberg Mine.

With an increased share of mine production coming from SX-EW, and a growth in world smelter capacity of more than 400,000 tons over a 2-year period, a shortage of copper concentrates developed in 1994. Smelter capacity utilization was low, and spot treatment and refining charges were at very low levels during the year. According to CRU

International Ltd., spot treatment and refining charges averaged only about \$0.13 per pound of copper, down from about \$0.22 in 1993. Treatment and refining charges negotiated under long-term contracts, however, were reported to be substantially higher, at about \$0.25 per pound.

### **Outlook**

U.S. mine production, which has been relatively stable over the past 2 years, is expected to increase, beginning in the second half of 1995, with start-up of Morenci's Southside extension and Great Lakes Minerals' 543-s deposit. Small increases are expected from Asarco's Ray Mine and the new underground mine at Mission, and Arimetco's Yerington and Van Dyke Mines. In early 1995, Arimetco announced plans to begin dewatering of the Yerington pit. Start-up of Magma's Robinson project in 1996 is expected to further add to capacity and overshadow reductions in SX-EW production at its San Manuel open pit. Total domestic mine production is projected to reach 1.9 million tons in 1996.

Domestic refinery production, which declined slightly in 1994, is expected to increase in the second half of 1995 with commissioning of the new Kennecott smelter, which will feed the refurbished refinery, and increased SX-EW production from Phelps Dodge. Production will increase significantly in 1996 as these facilities come up to capacity. There will be an off-setting loss from reduced SX-EW production at San Manuel, and secondary production will decline with the closing of Southwire's Gaston smelter/refinery. In mid-1995, Metall Mining announced plans to stop mining/refining at Copper Range by yearend. By 1996, overall refinery production is expected to increase by more than 150,000 tons from the 1994 level.

Domestic copper consumption was at a record level in 1994, having risen by more than 30% from the depressed 1991 level. While consumption in early 1995 remained strong, it showed signs of weakening in later months, and leading economic indicators showed a market softening. Although the dramatic growth in copper consumption experienced over the past 3 years is not expected to continue, consumption is projected to remain near 1994 levels through 1995, and to rise at a slower rate in 1996.

World mine capacity is expected to grow rapidly in the next several years. According to data compiled by the International Copper Study Group (ICSG), announced expansions could increase mine capacity by more than 1.8 million tons by 1998, and 3 million tons by the

year 2000. Much of the slated increases are in Chile, where capacity could rise from the current 2.4 million tons per year to 3.4 million tons in 1997, and 4.2 million tons in 2000. Major increases are also anticipated from mines in Australia, Indonesia, Peru, and the Philippines. Zaire is seeking funds to help restore an estimated 100,000 tons of capacity. With new smelter projects under consideration in more than 12 countries, smelter capacity could rise by the year 2000 by more than 2 million tons. Major new or expanded smelter production planned for 1995 includes the Chagres smelter in Chile, the Garfield smelter in the United States, and several smaller smelters in China, India, the Philippines, and Mexico.

Increases in refinery capacity will mostly be from electrowinning.

### **OTHER SOURCES OF INFORMATION**

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TABLE 1  
SALIENT COPPER STATISTICS 1/

(Metric tons unless otherwise specified)

	1990	1991	1992	1993	1994	
United States:						
Mine production:						
Ore concentrated 2/	thousand metric tons	241,000 r/	261,000 r/	263,000 r/	262,000 r/	271,000
Average yield of copper 2/	percent	0.49 r/	0.45 r/	0.48 r/	0.49 r/	0.47
Recoverable copper:						
Arizona		979,000	1,020,000	1,150,000	1,160,000	1,120,000
Michigan, Montana, Utah		322,000	337,000	385,000	387,000	397,000
New Mexico		263,000	253,000	211,000	224,000	234,000
Other States		23,900	17,000	16,000	31,100	55,700
Total recoverable		1,590,000	1,630,000	1,760,000	1,800,000	1,810,000
Total value	millions	\$4,310	\$3,930	\$4,180	\$3,640	\$4,430
Smelter production: 3/						
From domestic and foreign ores		1,160,000	1,120,000	1,180,000	1,270,000	1,310,000
From scrap (new and old)		305,000	364,000	394,000	415,000	397,000
Total smelter		1,460,000	1,490,000	1,570,000	1,680,000	1,710,000
Byproduct sulfuric acid	thousand metric tons	1,110 r/	1,100 r/	1,090 r/	1,190 r/	1,180
Refinery production:						
Primary materials:						
Electrolytic from domestic ores		1,110,000	1,060,000	1,110,000	1,210,000	1,280,000
Electrolytic from foreign materials		74,600	76,900	96,100	88,600	63,500
Electrowon		393,000	441,000	502,000	491,000	493,000
Total primary		1,580,000	1,580,000	1,710,000	1,790,000	1,840,000
Secondary materials (scrap):						
Electrolytic		328,000	318,000	331,000	337,000	269,000
Fire refined		113,000	99,600	102,000	123,000	122,000
Total secondary		441,000	418,000	433,000 r/	460,000	392,000
Total refined		2,020,000	2,000,000	2,140,000	2,250,000	2,230,000
Secondary copper produced:						
Recovered from new scrap		774,000	682,000	723,000	748,000	827,000
Recovered from old scrap		537,000	518,000	555,000	543,000	500,000
Total copper from scrap		1,310,000	1,200,000	1,280,000	1,290,000	1,330,000
Copper sulfate:						
Production		34,300	40,200	46,800	46,400	48,400
Stocks, Dec. 31		1,410	2,380	2,860	2,990	2,510
Exports:						
Refined		211,000	263,000	177,000	217,000	157,000
Unmanufactured 4/		780,000	806,000	676,000	685,000	752,000
Imports:						
Refined		262,000	289,000	289,000	343,000	470,000
Unmanufactured 4/		512,000	512,000	593,000	637,000	763,000
Copper stocks, Dec. 31:						
Blister and in-process material		119,000	135,000	166,000	146,000	171,000
Refined copper:						
Refineries		26,000	38,300	35,500	33,400	42,500
Wire rod mills		24,300	29,600	37,000	34,700	39,800
Brass mills		9,780	10,700	12,500	14,100 r/	8,530
Other industry		23,200	22,800	23,800	3,650 r/	4,100
New York Commodity Exchange (COMEX)		18,000	30,600	96,000	67,200	24,200
Total refined		101,000	132,000	205,000	153,000	119,000
Consumption:						
Refined copper, reported		2,150,000	2,050,000	2,180,000	2,360,000	2,680,000
Apparent consumption, primary refined and old scrap		2,170,000	2,090,000	2,300,000	2,510,000 r/	2,680,000
Price:						
Producer, weighted average	cents per pound	123.16	109.33	107.42	91.56	111.05
COMEX, first position	do.	119.09	104.88	102.72	85.28	107.05
London Metal Exchange (LME), Grade A cash	do.	121.02	106.21	103.72	86.76	104.64
World production:						
Mine	thousand metric tons	8,950 r/	9,140 r/	9,500 r/	9,480 r/	9,430
Smelter	do.	9,680 r/	9,610 r/	9,660 r/	9,560 r/	9,750
Refinery	do.	10,800	10,600	11,100 r/	11,400	11,100

r/ Revised. NA Not available.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits, except prices; may not add to totals shown.

2/ Data series revised to reflect only ore concentrated. Yield calculations include precipitates.

3/ Includes primary copper produced from foreign ores, matte, etc., to avoid disclosing company proprietary data.

4/ Includes copper content of alloy scrap. Copper content of alloy scrap imported and exported in 1990 was estimated from gross weight.

TABLE 2  
LEADING COPPER PRODUCING MINES IN THE UNITED STATES IN 1994, IN ORDER OF OUTPUT 1/

Rank	Mine	County and State	Operator	Source of copper	Capacity (thousand metric tons)
1	Morenci	Greenlee, AZ	Phelps Dodge Corp.	Copper-molybdenum ore, concentrated and leached.	400
2	Bingham Canyon	Salt Lake, UT	Kennecott, Utah Copper Corp.	do.	310
3	San Manuel	Pinal, AZ	Magma Copper Co.	do.	170
4	Chino	Grant, NM	Phelps Dodge Corp.	Copper-molybdenum ore, concentrated and leached.	160
5	Bagdad	Yavapai, AZ	Cyprus Minerals Co.	do.	130
6	Sierrita	Pima, AZ	do.	do.	135
7	Ray	Pinal, AZ	ASARCO Incorporated	Copper ore, concentrated and leached.	150
8	Pinto Valley	Gila, AZ	Magma Copper Co.	Copper-molybdenum ore, concentrated and leached.	90
9	Mission Complex	Pima, AZ	ASARCO Incorporated	Copper ore, concentrated.	90
10	Tyrone	Grant, NM	Phelps Dodge Corp. and Burro Chief Copper Co.	Copper ore, concentrated and leached.	70
11	Inspiration	Gila, AZ	Cyprus Minerals Co.	Copper ore, leached.	60
12	Continental	Silver Bow, MT	Montana Resources Inc.	Copper-molybdenum ore, concentrated.	50
13	White Pine	Ontonagon, MI	Copper Range Co.	Copper ore, concentrated.	60
14	Flambeau	Rusk, WI	Kennecott Corp.	do.	40
15	San Xavier	Pima, AZ	ASARCO Incorporated	do.	35
16	Continental	Grant, NM	Cobre Mining Co.	do.	20
17	Superior (Magma)	Pinal, AZ	Magma Copper Co.	do.	20
18	Miami	Gila, AZ	do.	Copper ore, leached.	12

1/ The mines in this list accounted for 98% of the U.S. mine production in 1994.

TABLE 3  
MINE PRODUCTION OF COPPER-BEARING ORES AND RECOVERABLE COPPER CONTENT OF ORES PRODUCED  
IN THE UNITED STATES, BY SOURCE AND TREATMENT PROCESS 1/

(Metric tons)

Source and treatment process	1993		1994	
	Gross weight	Recoverable copper	Gross weight	Recoverable copper
Mined copper ore:				
Concentrated	262,000,000	1,270,000	271,000,000 2/	1,240,000
Leached 3/	NA	491,000	NA	493,000
Total	NA	1,760,000	NA	1,740,000
Copper precipitates shipped; leached from tailings, dump, and in-place material	25,900	19,000	30,200	26,400
Other copper-bearing ores 4/	5,870,000	25,900	6,000,000	49,300
Grand total	XX	1,800,000	XX	1,810,000

NA Not available. XX Not applicable.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ In 1994, 584,189 ounces of gold, and 12,366,989 ounces of silver, were recovered from concentrated ore. The average value of gold and silver per metric ton of ore concentrated was \$1.08.

3/ Includes electrowon from concentrates roast-leached in 1993. Not all producers are able to distinguish leach ore from waste rock. Values previously published for the gross weight of leach ore were significantly under valued because they excluded undifferentiated leach/waste material.

4/ Includes gold ore, gold-silver ore, lead ore, lead-copper ore, lead-zinc ore, molybdenum ore, silver ore, tungsten ore, zinc ore, fluorspar, flux ores, clean up, ore shipped directly to smelters, and tailings.

TABLE 4  
CONSUMPTION OF COPPER AND BRASS MATERIALS IN THE UNITED STATES, BY ITEM 1/

(Metric tons)

Item	Brass mills	Wire rod mills	Foundries, chemical plants, miscellaneous users	Secondary smelters- refiners 2/	Total
1993:					
Copper scrap	744,000 r/ 3/	W	60,700	892,000 r/	1,700,000
Refined copper 4/	503,000 r/	1,820,000	40,800 5/	(6/)	2,360,000
Hardeners and master alloys	875	--	3,010	--	3,880 r/
Brass ingots	--	--	113,000	--	113,000
Slab zinc	85,800	--	19,000	3,390	108,000
Miscellaneous	--	--	--	41	41
1994:					
Copper scrap	862,000 3/	W	67,100	779,000	1,710,000
Refined copper 4/	568,000	2,060,000	47,100 5/	(6/)	2,680,000
Hardeners and master alloys	841	--	2,650	--	3,490
Brass ingots	--	--	120,000	--	120,000
Slab zinc	89,200	--	12,900	4,200	106,000
Miscellaneous	--	--	--	15	15

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Brass mills."

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Includes ingot makers.

3/ Includes consumption of copper scrap at wire rod mills to avoid disclosing company proprietary data.

4/ Detailed information on consumption of refined copper can be found in table 5.

5/ Includes consumption of refined copper at secondary smelters-refiners to avoid disclosing company proprietary data.

6/ Withheld to avoid disclosing company proprietary data; included in "Foundries, chemicals plants, miscellaneous users."

TABLE 5  
CONSUMPTION OF REFINED COPPER SHAPES IN THE UNITED STATES, BY CLASS OF CONSUMER 1/

(Metric tons)

Class of consumer	Cathodes	Ingots and ingot bars	Cakes and slabs	Wirebar, billets and other	Total
1993:					
Wire rod mills	1,820,000	--	--	--	1,820,000
Brass mills	313,000 r/	32,600	55,500 r/	102,000	503,000 r/
Chemical plants	--	--	--	865 r/	865 r/
Ingotmakers	W	W	W	2,170	2,170
Foundries	1,580	5,090	W	3,530	10,200
Miscellaneous 2/	W	W	W	27,600	27,600
Total	2,130,000	37,700	55,500 r/	136,000	2,360,000
1994:					
Wire rod mills	2,060,000	--	--	--	2,060,000
Brass mills	339,000	32,700	73,200	124,000	568,000
Chemical plants	--	--	--	1,130	1,130
Ingotmakers	W	W	W	4,490	4,490
Foundries	2,060	4,570	W	4,430	11,100
Miscellaneous 2/	W	W	W	30,400	30,400
Total	2,410,000	37,300	73,200	164,000	2,680,000

r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Wirebar, billets and other."

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Includes iron and steel plants, primary smelters producing alloys other than copper, consumers of copper powder and copper shot, and other manufacturers.

TABLE 6  
U.S. EXPORTS OF UNMANUFACTURED COPPER (COPPER CONTENT), BY COUNTRY 1/

Country	Ore and concentrate		Matte, ash and precipitates		Refined		Unalloyed copper scrap		Blister and anodes		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
1993	227,000	\$264,000	13,100	\$22,400	217,000	\$416,000	110,000	\$126,000	11,400	\$25,700	578,000	\$854,000
1994:												
Argentina	--	--	56	596	--	--	--	--	--	--	56	596
Australia	1	3	129	775	17	69	29	66	(2/)	4	177	917
Belgium	36	36	2,140	8,280	8	12	1,130	1,330	--	--	3,310	9,660
Canada	142,000	188,000	20,400	16,000	18,900	44,600	73,700	98,700	10,800	27,500	266,000	374,000
China	--	--	17	40	3,790	7,570	19,100	21,900	13	20	22,900	29,500
El Salvador	--	--	--	--	1,270	2,870	3	24	2	16	1,280	2,910
Germany	9	44	18	159	413	1,130	157	167	2	18	599	1,520
Honduras	2	4	2	12	662	1,640	--	--	--	--	665	1,660
Hong Kong	4	5	80	123	110	206	13,700	12,900	3	14	13,900	13,200
India	--	--	482	319	61	33	1,830	1,700	33	52	2,400	2,100
Italy	--	--	--	--	2,570	5,270	445	818	159	321	3,180	6,410
Japan	85,900	97,900	1,140	2,510	45,800	103,000	19,700	39,100	449	607	153,000	243,000
Korea, Republic of	11,600	18,100	--	--	2,190	4,160	8,680	16,400	26	51	22,500	38,700
Mexico	87	94	35	52	5,930	12,300	177	194	147	230	6,380	12,800
Netherlands	--	--	--	--	850	1,550	162	280	3	12	1,010	1,840
Philippines	20,200	23,400	--	--	--	--	23	6	8	34	20,300	23,400
Singapore	--	--	--	--	1,030	2,120	451	580	--	--	1,480	2,700
Taiwan	3	3	353	836	56,400	133,000	1,420	2,090	113	208	58,300	136,000
Thailand	--	--	--	--	14,600	35,600	40	50	15	51	14,600	35,700
United Kingdom	267	512	5	14	432	660	41	61	10	14	756	1,260
Other	34	41	228	129	1,530	3,590	946	1,070	25	50	2,770	4,880
Total	261,000	328,000	25,100	29,800	157,000	359,000	142,000	197,000	11,900	29,200	596,000	943,000

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: Bureau of the Census.



TABLE 7  
U.S. EXPORTS OF COPPER SEMIMANUFACTURES, BY COUNTRY 1/

Country	Pipes and tubing		Plates, sheets, foil, and bars		Bare wire, including wire rod 2/		Wire and cable, stranded		Copper sulfate	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
1993	18,800	\$68,800	26,600	\$96,100	42,600	\$159,000	11,800	\$58,900	334	\$771
1994:										
Australia	178	771	76	416	48	246	54	254	9	29
Canada	8,620	28,800	17,100	54,000	14,000	39,600	4,170	14,000	829	1,290
Chile	107	332	2	27	45	164	43	278	--	--
China	193	1,030	693	1,730	183	350	159	258	--	--
Colombia	176	439	14	54	13	70	58	485	--	--
Costa Rica	112	372	1,160	4,300	189	587	49	167	--	--
Dominican Republic	36	120	584	1,540	756	2,780	354	1,130	--	--
El Salvador	11	51	809	2,220	6	13	181	821	--	--
France	68	363	31	116	5	70	66	881	--	--
Germany	8	71	102	778	39	613	154	2,640	--	--
Guatemala	135	229	9	51	3	8	88	363	--	--
Hong Kong	12	71	1,520	9,490	264	1,620	124	635	--	--
Iran	99	539	--	--	--	--	5	418	--	--
Ireland	2	149	(3/)	14	42	242	102	587	--	--
Israel	20	68	1	22	25	264	78	603	13	36
Jamaica	12	48	240	658	33	94	108	483	--	--
Japan	44	339	500	3,850	2,870	6,200	96	842	--	--
Korea, Republic of	463	529	398	3,220	322	615	97	1,260	5	60
Mexico	4,870	15,800	4,090	14,100	24,300	81,900	2,700	16,200	21	67
Netherlands	363	1,390	3	68	9	120	11	255	--	--
New Zealand	165	739	16	135	(3/)	8	7	37	(3/)	4
Norway	--	--	643	1,990	7	33	7	76	--	--
Philippines	19	58	41	171	27	88	155	1,080	(3/)	6
Russia	2	4	--	--	--	--	235	1,250	--	--
Saudi Arabia	387	1,260	1	17	88	636	291	477	--	--
Singapore	23	98	164	1,020	50	558	34	529	6	13
Spain	339	886	1	16	6	40	2	56	--	--
Taiwan	467	2,900	490	3,750	614	1,520	162	1,120	41	85
Thailand	449	1,410	67	232	4	31	35	803	--	--
Trinidad and Tobago	1	6	24	93	771	2,070	42	188	--	--
United Arab Emirates	440	1,450	--	--	7	41	3	68	--	--
United Kingdom	288	1,750	149	1,440	241	1,150	221	2,090	4	11
Venezuela	222	845	97	334	29	149	342	1,940	--	--
Other	960	3,490	254	1,760	579	3,330	776	4,870	69	84
Total	19,300	66,400	29,300	108,000	45,600	145,000	11,000	57,200	997	1,680

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Total exports of wire rod for 1993 were 3,270 tons valued at \$8,450,000 and 1994 were 7,230 tons valued at \$15,400,000.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 8  
U.S. IMPORTS FOR CONSUMPTION OF UNMANUFACTURED COPPER (COPPER CONTENT), BY COUNTRY 1/

Country	Ore and concentrate		Matte, ash and precipitates		Blister and anode		Refined		Unalloyed scrap		Total	
	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)
1993	37,000	\$46,200	2,300	\$2,430	97,600	\$201,000	343,000	\$669,000	45,800	\$74,100	526,009	\$993,215
1994:												
Brazil	--	--	--	--	--	--	22,600	51,800	--	--	22,615	51,848
Bulgaria	--	--	--	--	1,180	2,290	21	39	--	--	1,205	2,329
Canada	19,900	42,500	1,170	802	55	108	270,000	616,000	19,500	39,100	310,640	699,001
Chile	49,700	60,100	--	--	41,600	81,600	82,700	178,000	86	202	174,124	319,423
Costa Rica	--	--	--	--	--	--	--	--	553	407	553	407
Germany	--	--	--	--	(3/)	2	26,700	69,000	239	384	26,914	69,400
Indonesia	7,960	21,300	--	--	--	--	--	--	--	--	7,956	21,323
Japan	--	--	--	--	(3/)	13	6,470	14,800	--	--	6,475	14,859
Mexico	4,290	6,810	6	565	14,800	26,700	24,400	55,600	17,500	28,900	60,984	118,561
Namibia	--	--	--	--	2,150	5,080	--	--	--	--	2,146	5,082
Panama	--	--	--	--	--	--	--	--	661	1,190	661	1,185
Peru	--	--	--	--	13,300	25,100	14,800	31,800	36	26	28,179	56,976
Poland	--	--	--	--	--	--	8,900	19,800	--	--	8,901	19,764
Russia	--	--	--	--	--	--	12,000	32,100	--	--	12,010	32,126
Turkey	--	--	--	--	4,000	10,300	--	--	--	--	4,002	10,302
United Kingdom	--	--	--	--	(3/)	2	(3/)	4	460	354	460	360
Venezuela	--	--	--	--	--	--	--	--	3,160	2,210	3,158	2,209
Other	--	--	4	10	189	357	1,450	3,470	2,500	2,420	4,143	6,253
Total	81,900	131,000	1,180	1,380	77,300	152,000	470,000	1,070,000	44,700	75,100	675,123	1,431,405

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ C.i.f. value at U.S. port.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 9  
U.S. IMPORTS FOR CONSUMPTION OF COPPER SEMIMANUFACTURES, BY COUNTRY 1/

Country	Pipes and tubing		Plates, sheets, foil, and bars		Bare wire, including wire rod		Wire and cable, stranded		Copper sulfate	
	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)
1993	63	\$635	50,000	\$200,000	19,700	\$53,900	604	\$3,760	9,430	\$8,690
1994:										
Belgium	1	9	77	625	14	80	1	8	--	--
Canada	6	47	14,500	47,800	25,200	61,800	206	594	3,610	2,730
Chile	20	74	1,410	3,970	183	466	--	--	423	343
China	--	--	147	796	842	3,150	--	--	245	164
Finland	--	--	3,860	14,300	315	1,390	(3/)	21	--	--
France	20	80	347	1,120	178	1,180	20	268	102	84
Germany	3	46	6,080	21,200	349	2,190	96	608	513	608
Israel	1	2	36	95	678	4,030	313	2,070	804	651
Italy	--	--	26	72	30	206	108	1,060	--	--
Japan	3	266	7,820	41,400	223	2,600	28	1,060	6	58
Luxembourg	--	--	570	5,140	--	--	--	--	--	--
Macedonia	--	--	253	578	--	--	--	--	--	--
Malaysia	--	--	869	5,710	--	--	--	--	--	--
Mexico	4	43	1,340	4,430	657	2,020	261	589	4,550	4,640
Netherlands	--	--	87	361	74	373	--	--	402	321
Peru	--	--	68	134	--	--	--	--	340	253
Poland	--	--	404	1,020	--	--	--	--	20	15
Russia	--	--	2	12	--	--	--	--	162	122
South Africa, Republic of	--	--	--	--	--	--	--	--	940	613
Sweden	--	--	12,100	43,200	4	6	(3/)	2	--	--
Taiwan	(3/)	4	31	300	43	283	20	127	181	118
Turkey	--	--	--	--	481	1,850	64	254	--	--
United Kingdom	5	68	241	1,410	73	725	4	80	--	--
Venezuela	13	36	10	18	--	--	269	865	--	--
Other	17	42	621	2,030	65	558	31	151	96	116
Total	94	718	50,800	196,000	29,400	82,900	1,420	7,750	12,400	10,800

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ C.i.f. value at U.S. port.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 10  
COPPER: WORLD MINE PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country	1990	1991	1992	1993	1994 e/
Albania	11,500	6,100	3,900	3,900 e/	3,900
Argentina	400	400	300	300 r/ e/	300
Armenia	XX	XX	2,000	500 e/	500
Australia	327,000	320,000	378,000	402,000 r/	416,000 3/
Bolivia	200	100 r/	101 r/	94 r/	79 3/
Botswana 4/	20,600	20,600	20,400	20,100 r/	22,800 3/
Brazil	36,400	37,900	39,800 r/	43,400 r/	45,000
Bulgaria	32,900	47,200	47,400 r/	60,400 r/	60,000
Burma	4,630 r/	4,590 r/	3,730 r/	3,580 r/	5,800
Canada:					
By concentration or cementation	790,000	808,000	766,000	731,000	623,000
Leaching (electrowon)	3,700	3,300	3,100	2,700	3,000
Chile 5/	1,590,000	1,810,000	1,930,000	2,060,000 r/	2,220,000 3/
China e/	285,000	304,000	334,000	345,000 r/	350,000
Colombia	300	3,600	3,900	4,000 e/	4,000
Cuba e/	2,000 r/	2,000 r/	1,500 r/	1,500 r/	1,400
Cyprus	-- r/	-- r/	-- r/	-- r/	--
Czechoslovakia 6/ 7/ 8/	3,300	2,600	2,500 e/	XX	XX
Ecuador e/	100	100	100	100	100
Finland	12,600	11,700	9,270 r/	11,100 r/	8,740 3/
France	300 e/	300 e/	100	72 r/	--
Georgia e/	XX	XX	6,000	5,000	3,000
Germany:					
Eastern states	3,600	XX	XX	XX	XX
Western states	-- r/	XX	XX	XX	XX
Total	3,600	--	--	--	--
Honduras	1,400	1,000 e/	1,600	1,000 r/ e/	1,000
India e/	58,200	55,400 3/	55,000	58,200	50,700
Indonesia 6/	164,000	212,000	281,000	299,000	322,000 3/
Iran	65,800 r/	84,300 r/	105,000	86,600	120,000
Japan	12,900	12,400	12,100	10,300 r/	6,040 3/
Kazakhstan e/	XX	XX	250,000 r/	250,000 r/	202,000 3/
Korea, North e/	15,000	15,000	16,000	16,000	16,000
Korea, Republic of	53 r/	5	4	5	5
Macedonia e/	XX	XX	7,200	7,000	7,000
Malaysia	24,300	25,600	28,600	25,200	25,300 3/
Mexico:					
By concentration or cementation	267,000 r/	260,000 r/	263,000 r/	274,000 r/	260,000 3/
Leaching (electrowon)	26,900	32,100	27,900 r/	30,000 r/	35,000 3/
Mongolia	124,000	90,100	105,000	96,900 r/	99,600 3/
Morocco	16,400	15,800	14,300	14,000 e/	13,600
Mozambique e/	28	--	--	--	-- 3/
Namibia	27,800 r/	31,700 r/	31,300 r/	29,500 r/	28,400 3/
Nepal	3	4	2	2	2
Norway	19,700	17,400	12,700	8,700 r/	7,410 3/
Oman	14,000	14,000	13,600	12,000 e/	6,500
Papua New Guinea	170,000	204,000 r/	193,000	204,000 r/	206,000 3/
Peru: 9/					
By concentration or cementation	323,000 r/	382,000	369,000	375,000 r/	380,000
Leaching (electrowon)	16,300	17,900	19,000	18,300 r/	19,000
Philippines	182,000	148,000	124,000	136,000	110,000 3/
Poland	330,000 r/	320,000 r/	332,000 r/	383,000 r/	328,000
Portugal 9/	163,000	165,000	148,000	150,000 r/ e/	139,000
Romania 6/	32,000	27,200	25,000	27,000 e/	27,000
Russia	XX	XX	699,000 r/	584,000 r/	573,000 3/
Saudi Arabia e/	900	900	900	900	900
Serbia and Montenegro	XX	XX	90,000	85,000 e/	85,000
Slovakia 8/	XX	XX	XX	500 e/	500
South Africa, Republic of 6/	179,000	185,000	176,000	166,000 r/	165,000 3/
Spain	10,900	8,320 r/	9,430 r/	3,520 r/	4,890
Sweden	74,300	81,700 r/	89,100 r/	88,900 r/	79,400 3/
Turkey 10/	33,500 r/	33,100 r/ e/	26,500 r/ e/	22,900 r/	31,000

See footnotes at end of table.

TABLE 10--Continued  
COPPER: WORLD MINE PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country	1990	1991	1992	1993	1994 e/
U.S.S.R. e/ 11/	950,000	900,000	XX	XX	XX
United Kingdom	1,000	300	--	--	--
United States: 6/					
By concentration or cementation	1,190,000	1,190,000	1,260,000	1,310,000	1,320,000 3/
Leaching (electrowon) 12/	394,000	441,000	502,000	491,000	488,000 3/
Uzbekistan e/	XX	XX	75,000 r/	70,000 r/	70,000
Yugoslavia 13/ 14/	140,000	138,000 e/	XX	XX	XX
Zaire: 15/					
By concentration or cementation	127,000 r/	57,500 r/	37,000 r/	6,400 r/	7,200
Leaching (electrowon)	229,000	180,000 e/	107,000 r/	40,000 r/ e/	32,800
Zambia: 16/					
By concentration or cementation (smelted)	316,000 r/	281,000 r/	322,000 r/	285,000 r/	273,000 3/
Leaching (electrowon)	105,000	110,000	108,000	111,000 r/	112,000 3/
Zimbabwe e/ 6/	14,700 3/	14,400	10,100	9,000	9,350
Total	8,950,000 r/	9,140,000 r/	9,500,000 r/	9,480,000 r/	9,430,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Data represent copper content by analysis of concentrates produced except where otherwise noted. Table includes data available through July 17, 1995.

3/ Reported figure.

4/ Copper content of pelletized nickel-copper matte produced in smelter.

5/ Reported by Comision Chilena del Cobre (COCHILCO). Includes recoverable copper content of nonduplicative mine and metal products produced from domestic ores and concentrates, and leach production for electrowinning. Mine production data reported by Servicio Nacional de Geologia y Minería (SERNAGEOMIN) were as follows, in thousand metric tons: 1990--1,620; 1991--1,860; 1992--1,970; 1993--2,090 (revised); and 1994--2,250 (estimated).

6/ Recoverable content.

7/ Dissolved Dec. 31, 1992.

8/ Production in Czechoslovakia for 1990 came from the Czech Republic and Slovakia, all production from 1991-94 came from Slovakia.

9/ Recoverable copper content by analysis of concentrates for export plus nonduplicative total of copper content of all metal and metal products produced indigenously from domestic ores and concentrates; includes leach production for electrowinning in Peru and Portugal.

10/ Excludes copper content of pyrite.

11/ Dissolved in Dec. 1991.

12/ Includes electrowon from concentrates roast-leached.

13/ Dissolved in Apr. 1992.

14/ Copper content by analysis of ore mined.

15/ Recoverable content of blister, black copper, and Sodimiza concentrate.

16/ Data are for fiscal years beginning Apr. 1 of year stated. Zambian-mined copper reported recovered during smelting and electrowinning.

TABLE 11  
COPPER: WORLD SMELTER PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country 3/	1990	1991	1992	1993	1994 e/
Albania, primary	11,800 r/	4,800	2,300 r/	2,300 r/	1,500
Australia:					
Primary	192,000	195,000	304,000	323,000 r/	315,000
Secondary e/	10,000	10,000	10,000	10,000 r/	10,000
Total	202,000	205,000 r/	314,000 r/	333,000 r/	325,000
Austria, secondary	41,000	44,800	49,500	47,300 r/	51,600 4/
Belgium: e/					
Primary	1,500	1,000	800	800 r/	1,000
Secondary	103,000	105,000	102,000 r/	102,000 r/	103,000
Total	105,000	106,000	103,000	103,000 r/	104,000
Brazil, primary	152,000	141,000	158,000 r/	161,000 r/	160,000
Bulgaria: e/					
Primary	29,300	26,800	24,000	24,000	24,000
Secondary	1,000	1,000	1,000	1,000	1,000
Total	30,300	27,800	25,000	25,000	25,000
Canada:					
Primary	476,000	505,000	515,000	518,000 r/	515,000 4/
Secondary	47,400	26,800 r/	37,400	44,100 r/	45,000
Total	523,000	532,000 r/	552,000	562,000 r/	560,000
Chile, primary 5/	1,210,000	1,180,000	1,190,000	1,240,000	1,280,000
China, primary e/	359,000 r/	385,000 r/	418,000 r/	443,000 r/	480,000
Czech Republic, primary	XX	XX	XX	500	--
Czechoslovakia: 6/					
Primary e/	5,000	5,000	5,000	XX	XX
Secondary e/	3,200	3,000	3,000	XX	XX
Total	8,200	8,000	8,000	XX	XX
Finland:					
Primary	90,200	90,100	111,000 r/	107,000 r/	98,200 4/
Secondary e/	12,000	12,000	12,000	12,000	12,000
Total e/	102,000	102,000	123,000 r/	119,000 r/	110,000
France, secondary e/	6,600	5,800	6,100	5,900 r/	5,880
Germany:					
Primary:					
Eastern states	20,000 r/	XX	XX	XX	XX
Western states	180,000 r/	XX	XX	XX	XX
Total primary	200,000 r/	186,000 r/	165,000 r/	141,000 r/	237,000 4/
Secondary, western states e/	75,900 r/	70,000	70,000	60,000 r/	54,800 4/
Total e/	XX	256,000 r/	240,000 r/	201,000 r/	292,000 4/
Hungary, secondary e/	100	100	100	100	100
India, primary	40,700	45,500 r/	47,700 r/	37,000 r/	50,300
Iran: 7/					
Primary	54,800 r/	81,900 r/	86,400 r/	85,000 r/	125,000 4/
Secondary e/	4,600	6,300	6,400	7,000	8,000
Total e/	59,400 r/	88,200 r/	92,800 r/	92,000 r/	133,000
Japan:					
Primary	893,000	968,000	1,050,000	1,100,000 r/	1,030,000 4/
Secondary	147,000	118,000	129,000	85,700 r/	96,500 4/
Total	1,040,000	1,090,000	1,180,000	1,190,000 r/	1,130,000 4/
Kazakhstan: e/					
Primary	XX	XX	300,000 r/	300,000 r/	275,000
Secondary	XX	XX	20,000 r/	20,000 r/	20,000
Total	XX	XX	320,000 r/	320,000 r/	295,000
Korea, North: e/					
Primary	25,000	20,000	21,000	23,000	23,000
Secondary	5,000	5,000	5,000	5,000	5,000
Total	30,000	25,000	26,000	28,000	28,000
Korea, Republic of, primary	161,000	149,000	170,000	142,000 e/	160,000
Mexico, primary	175,000	183,000	228,000	282,000 r/	277,000 4/
Namibia, primary 8/	33,200	33,500 r/	37,500	34,800 e/	30,100 4/
Norway, primary	36,500	38,400	39,300	37,200 r/	39,400 4/

See footnotes at end of table.

TABLE 11--Continued  
COPPER: WORLD SMELTER PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country 3/	1990	1991	1992	1993	1994 e/
Oman, primary	12,100	12,200	15,000	27,700	24,200
Peru, primary	196,000	269,000	254,000	238,000 r/	244,000
Philippines, primary	153,000 r/	167,000 r/	169,000 r/	171,000 r/	168,000
Poland:					
Primary e/	331,000	353,000	363,000	360,000	360,000
Secondary e/	20,000	20,000	20,000	20,000	20,000
Total	351,000	373,000	383,000	380,000	380,000
Portugal, secondary e/	2,000	2,000	1,000	1,000	1,200
Romania:					
Primary e/	27,300	27,800	27,400 r/	25,000 r/	23,000
Secondary e/	1,000	1,000	1,000	1,000	5,000
Total	28,300	28,800	28,400 r/	26,000 r/	28,000
Russia: e/					
Primary	XX	XX	706,000 r/	589,000 r/	579,000
Secondary	XX	XX	10,000 r/	10,000 r/	10,000
Total	XX	XX	716,000 r/	599,000 r/	589,000
Serbia and Montenegro:					
Primary	XX	XX	80,000 r/	44,100 r/	60,000
Secondary	XX	XX	48,000 r/	13,300 r/	20,000
Total	XX	XX	128,000 r/	57,400 r/	80,000
Slovakia, primary e/	XX	XX	XX	3,000	3,000
South Africa, Republic of, primary	176,000	165,000	159,000 r/	157,000 r/	166,000 4/
Spain:					
Primary	118,000 r/	111,000	110,000	136,000 r/	142,000 4/
Secondary	32,000 r/	38,000	40,000	37,300 r/	46,800 4/
Total	150,000 r/	149,000	150,000	173,000 r/	189,000 4/
Sweden:					
Primary	76,400	68,100	77,800	76,300 r/	79,100
Secondary	31,600	29,400	20,600	22,100 r/	19,600
Total	108,000	97,500	98,400	98,400	98,700
Taiwan, primary	16,100	--	--	--	--
Turkey, undifferentiated 9/	25,200 r/	32,400 r/	31,600 r/	39,600 r/	36,000
U.S.S.R.: e/ 10/					
Primary	1,370,000 r/	1,360,000 r/	XX	XX	XX
Secondary	110,000 r/	50,000 r/	XX	XX	XX
Total	1,480,000 r/	1,410,000 r/	XX	XX	XX
United States:					
Primary 11/	1,160,000	1,120,000	1,180,000	1,270,000	1,310,000 4/
Secondary	305,000	364,000	394,000	415,000	397,000 4/
Total	1,470,000	1,480,000	1,570,000	1,690,000	1,710,000 4/
Uzbekistan: e/					
Primary	XX	XX	70,000 r/	65,000 r/	50,000
Secondary	XX	XX	5,000 r/	5,000 r/	5,000
Total	XX	XX	75,000 r/	70,000 r/	55,000
Yugoslavia: 12/					
Primary	106,000	95,800 r/	XX	XX	XX
Secondary	68,300	58,700 r/	XX	XX	XX
Total	174,000	155,000	XX	XX	XX
Zaire, primary:					
Electrowon	229,000	180,000	111,000	50,000 e/	50,000
Other	117,000	52,500	19,900	10,000 e/	10,000
Total	346,000	233,000	131,000	60,000 e/	60,000
Zambia, primary: 13/					
Electrowon	51,900	64,500	64,000 r/	62,400 r/	62,400 4/
Other	332,000	300,000	356,000 r/	305,000 r/	318,000 4/
Total	384,000	365,000	420,000 r/	367,000 r/	380,000 4/

See footnotes at end of table.

TABLE 11--Continued  
COPPER: WORLD SMELTER PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country 3/	1990	1991	1992	1993	1994 e/
Zimbabwe, primary 14/	14,100	13,800	9,700	8,200	10,000
Total primary:					
Electrowon	281,000	245,000	175,000 r/	112,000 r/	112,000
Other	8,340,000 r/	8,360,000 r/	8,470,000 r/	8,480,000 r/	8,670,000
Total secondary	1,030,000 r/	971,000 r/	990,000 r/	925,000 r/	937,000
Total undifferentiated	25,200	32,400	31,600	39,600	36,000
Grand total	9,680,000 r/	9,600,000 r/	9,660,000 r/	9,560,000 r/	9,750,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ This table includes total production of copper metal at the unrefined stage, including low-grade cathode produced by electrowinning methods. The smelter feed may be derived from ore, concentrates, copper precipitate or matte (primary), and/or scrap (secondary). To the extent possible, primary and secondary output of each country is shown separately. In some cases, total smelter production is officially reported, but the distribution between primary and secondary has been estimated. Table includes data available through July 17, 1995.

3/ Argentina presumably produces some smelter copper utilizing its own small mine output together with domestically produced cement copper, and possibly using other raw materials including scrap, but the levels of such output cannot secondary has been estimated.

4/ Reported figure.

5/ Data revised to exclude high-grade electrowon production. Data include low-grade electrowon which is re-refined.

6/ Dissolved Dec. 31, 1992.

7/ Data are for year beginning Mar. 21 of year stated. Secondary production is estimated to be about 5% of total.

8/ Includes products of imported concentrate.

9/ Secondary production is estimated to be about 5% to 10% of total.

10/ Dissolved in Dec. 1991.

11/ Figures for U.S. primary smelter production may include a small amount of copper derived from precipitates shipped directly to the smelter for further processing; production derived from electrowinning and fire-refining is not included. Copper content of precipitates shipped directly to smelter are as follows, in metric tons: 1990--22,997; 1991--27,684; 1992--27,196; 1993--19,043; and 1994--26,400.

12/ Dissolved in Apr. 1992.

13/ For fiscal year beginning Apr. 1 of year stated. Electrowon is total electrowon production reported, less the quantity reported as "finished production, leach cathodes." (See table 38).

14/ Includes impure cathodes produced by electrowinning in nickel processing.



TABLE 12  
COPPER: WORLD REFINERY PRODUCTION, 1/ 2/ BY COUNTRY

(Metric tons)

Country	1990	1991	1992	1993	1994 e/
Albania, primary e/	10,900	4,400	90	100	100
Argentina, secondary e/	10,900 r/	12,000 r/	15,000	15,000	15,000
Australia:					
Primary	250,000	244,000	271,000 r/	285,000 r/	312,000 3/
Secondary	24,000	35,000	32,000	24,000 r/	24,000 3/
Total	274,000	279,000	303,000 r/	309,000 r/	336,000 3/
Austria:					
Primary	8,690	8,080	5,710	5,870 r/	3,040 3/
Secondary	41,000	44,800	49,000	46,900 r/	47,400 3/
Total	49,700	52,800	54,700	52,700 r/	50,500 3/
Belgium: 4/					
Primary	230,000	192,000	213,000 r/	276,000 r/	267,000
Secondary	102,000	106,000	103,000 r/	103,000 r/	104,000
Total	332,000	298,000	316,000 r/	379,000 r/	371,000
Brazil:					
Primary	152,000	141,000	158,000 r/	161,000 r/	160,000
Secondary	49,600	37,000	52,200 r/	54,000 r/	55,000
Total	202,000	178,000	210,000 r/	215,000 r/	215,000
Bulgaria:					
Primary	14,300	7,850	13,000 r/	11,800 r/	21,000
Secondary	10,000	5,000	5,000 e/	5,000 e/	5,000
Total	24,300	12,800	18,000 r/ e/	16,800 r/ e/	26,000
Canada:					
Primary	468,000	504,000	508,000	520,000	505,000
Secondary	47,400	34,500	31,100	41,600	45,000
Total	516,000	538,000	539,000	562,000	550,000 3/
Chile, primary	1,190,000	1,230,000	1,240,000	1,270,000 r/	1,280,000
China: e/					
Primary	400,000	400,000	430,000	485,000 r/	440,000
Secondary	160,000	160,000	229,000	245,000 r/	244,000
Total	560,000	560,000	659,000	730,000 r/	684,000
Czech Republic, primary	XX	XX	XX	500	--
Czechoslovakia: 5/					
Primary e/	8,000	10,000	8,000	XX	XX
Secondary e/	17,400	15,900	20,600	XX	XX
Total	25,400	25,900	28,600	XX	XX
Egypt, secondary e/	3,600	3,600	3,600	3,600	3,600
Finland:					
Primary	63,100 r/	61,500 r/	65,900 r/	67,700 r/	58,400 3/
Secondary	2,000 r/	3,000 r/	5,000 r/	6,000 r/	10,800 3/
Total	65,100	64,500	70,900 r/	73,700 r/	69,200 3/
France:					
Primary e/	18,000	19,600	27,700 3/	21,100 r/	20,200
Secondary e/	26,000	30,000	29,000	23,300 r/	21,500
Total e/	44,000	49,600	56,700	44,400 r/	41,700
Germany:					
Primary:					
Eastern states e/	39,900	XX	XX	XX	XX
Western states	204,000	XX	XX	XX	XX
Subtotal	244,000	203,000	236,000	271,000 r/	253,000
Secondary:					
Eastern states e/	16,800	XX	XX	XX	XX
Western states	272,000	XX	XX	XX	XX
Subtotal e/	289,000	318,000	345,000	361,000 r/	339,000
Total:					
Eastern states e/	56,700	XX	XX	XX	XX
Western states	476,000	XX	XX	XX	XX
Grand total	533,000	522,000	582,000	632,000 r/	592,000 3/
Hungary, primary and secondary e/	12,800 3/	12,000	12,000	11,000	11,000
India, primary:					
Electrolytic	40,600	46,200 r/	44,300 r/	36,300 r/	48,300 3/
Fire refined e/	1,000	1,000	1,000	500	500
Total e/	41,600	47,200 r/	45,300 r/	36,800 r/	48,800

See footnotes at end of table.

TABLE 12--Continued  
COPPER: WORLD REFINERY PRODUCTION, 1/ 2/ BY COUNTRY

(Metric tons)

Country	1990	1991	1992	1993	1994 e/
Iran, primary 6/ 7/	47,800 r/	79,700 r/	102,000 r/	84,900 r/	64,000 3/
Italy, primary and secondary	83,000	82,500 e/	76,000 e/	90,300 r/	94,000
Japan:					
Primary	893,000	968,000	1,050,000	1,100,000 r/	1,030,000 3/
Secondary	115,000	109,000	115,000	89,700 r/	93,700 3/
Total	1,010,000	1,080,000	1,160,000	1,190,000	1,120,000 3/
Kazakhstan: e/					
Primary	XX	XX	310,000 r/	310,000 r/	282,000 3/
Secondary	XX	XX	20,000 r/	20,000 r/	20,000 3/
Total	XX	XX	330,000 r/	330,000 r/	302,000 3/
Korea, North: e/					
Primary	25,000	19,000	20,000	22,000	22,000
Secondary	10,000	5,000	5,000	5,000	5,000
Total	35,000	24,000	25,000	27,000	27,000
Korea, Republic of:					
Primary	183,000 e/	202,000	209,000	218,000 e/	222,000
Secondary e/	2,560	1,000	2,000	2,000	2,000
Total	186,000	203,000	211,000	220,000 e/	224,000
Mexico:					
Primary:					
Electrowon	26,900	32,100	27,900	30,000 e/	26,900 3/
Other	94,900 r/	73,900 r/	82,600 r/	73,800 r/	96,500 3/
Secondary	31,200 r/	53,000	80,500 r/	77,200 r/	78,600 3/
Total	153,000 r/	159,000 r/	191,000 r/	181,000 r/	202,000 3/
Norway, primary 7/	36,500	38,400	39,300	37,200 r/	39,400 3/
Oman, primary	12,000	11,400	16,200	20,500	22,000
Peru, primary	228,000 r/	286,000 r/	276,000 r/	278,000 r/	280,000
Philippines, primary	126,000	115,000	146,000	172,000 e/	153,000 3/
Poland, primary 7/	346,000	379,000	387,000	404,000	405,000
Portugal, primary	1,000	300	--	--	--
Romania: e/					
Primary	40,300	29,800	21,000	22,000 r/	22,100
Secondary	4,000	4,000	3,080	3,000	4,600
Total	44,300	33,800	24,100	25,000 r/	26,700
Russia:					
Primary e/	XX	XX	525,000 r/	522,000 r/	500,000
Secondary e/	XX	XX	50,000	40,000 r/	50,000
Total	XX	XX	575,000 r/	562,000 r/	550,000 3/
Serbia and Montenegro:					
Primary	XX	XX	78,600 r/	43,400 r/	61,000
Secondary	XX	XX	36,200 r/	7,890 r/	11,100
Total	XX	XX	115,000	51,300 r/	72,100
Slovakia , primary and secondary	XX	XX	XX	28,000	28,000
South Africa, Republic of, primary 7/	133,000	127,000	120,000 r/	128,000 r/	130,000 3/
Spain:					
Primary	116,000 e/	111,000	134,000	137,000 r/	142,000
Secondary	50,000 e/	38,000	44,800	42,000 r/	46,800
Total	166,000 e/	149,000	179,000	179,000 r/	188,000
Sweden:					
Primary	66,300	67,600	71,600	76,300	77,300
Secondary e/	31,000	29,000	30,000	22,500 3/	25,800 3/
Total	97,300	96,600	102,000	98,800	103,000
Taiwan:					
Primary	16,100	--	--	--	--
Secondary e/	6,000	12,000	12,000	10,000	10,000
Total e/	22,100	12,000	12,000	10,000	10,000
Turkey, primary	84,200	80,800	104,000 r/	92,400	100,000
U.S.S.R.: e/ 8/					
Primary	1,100,000	950,000	XX	XX	XX
Secondary	130,000	120,000	XX	XX	XX
Total	1,230,000	1,070,000	XX	XX	XX

See footnotes at end of table.

TABLE 12--Continued  
COPPER: WORLD REFINERY PRODUCTION, 1/ 2/ BY COUNTRY

(Metric tons)

Country	1990	1991	1992	1993	1994 e/
United Kingdom:					
Primary	47,000	16,600	10,400 e/	10,600 r/	11,100 3/
Secondary	74,600	53,500	31,700 e/	35,900 r/	35,600 3/
Total	122,000	70,100	42,100 e/	46,600 r/	46,700 3/
United States:					
Primary:					
Electrowon	393,000	441,000	502,000	491,000	493,000 3/
Other	1,180,000	1,140,000	1,210,000	1,300,000	1,340,000 3/
Secondary	441,000	418,000	433,000	460,000	392,000 3/
Total	2,020,000	2,000,000	2,140,000	2,250,000	2,230,000 3/
Uzbekistan: e/					
Primary	XX	XX	70,000 r/	65,000 r/	50,000
Secondary	XX	XX	5,000 r/	5,000 r/	5,000
Total	XX	XX	75,000 r/	70,000 r/	55,000
Yugoslavia: 9/					
Primary	102,000	107,000	XX	XX	XX
Secondary	49,200	27,000 e/	XX	XX	XX
Total	151,000	134,000	XX	XX	XX
Zaire, primary 10/	141,000	104,000	47,500	40,000	24,000
Zambia, primary: 11/					
Electrowon	52,700	45,400	43,700	48,800 r/	49,200 3/
Other	385,000	357,000	428,000	363,000 r/	320,000 3/
Total	438,000	402,000	472,000	412,000 r/	370,000 3/
Zimbabwe: 12/					
Primary	14,100	13,800	9,670	8,190	10,000
Secondary e/	8,400	8,200	8,200	8,200	6,000
Total e/	22,500	22,000	17,900	16,400	16,000
Total primary	8,860,000 r/	8,740,000 r/	9,140,000 r/	9,380,000 r/	9,160,000
Total secondary	1,740,000 r/	1,680,000 r/	1,800,000 r/	1,760,000 r/	1,700,000
Total primary and secondary, undifferentiated	229,000 r/	222,000 r/	208,000 r/	257,000 r/	263,000
Grand total	10,800,000	10,600,000	11,100,000 r/	11,400,000	11,100,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ This table includes total production of refined copper, whether produced by pyrometallurgical or electrolytic refining methods and whether derived from primary unrefined copper or from scrap. Copper cathode derived from electrowinning processing is also included. Table includes data available through July 17, 1995.

3/ Reported figure.

4/ Includes leach cathode from Zaire, which is processed.

5/ Dissolved Dec. 31, 1992.

6/ Data are for Iranian years beginning Mar. 21 of that stated.

7/ May include secondary.

8/ Dissolved in Dec. 1991.

9/ Dissolved in Apr. 1992.

10/ Excludes leach cathode exported for reprocessing in Belgium.

11/ Data are for fiscal year beginning Apr. 1 of that stated. Electrowon covers only presumably high-grade electrowon cathodes reported as "finished production leach cathodes." Other, in addition to electrorefined cathodes, includes a smaller amount of "finished product shapes" presumably cast from electrorefined cathodes, high-grade electrowon cathodes, or any blister-anodes and low-anodes and low-grade electrowon cathodes that were furnace- or fire-refined.

12/ May not include copper-nickel matte (copper content more than 6,000 tons per year) imported from Botswana for toll refining.