COPPER INDUSTRY

STATISTICS FOR 1969 COMPARED WITH OTHER YEARS

ARIZONA, THE UNITED STATES, AND THE WORLD

COMPILED BY ARIZONA DEPARTMENT OF MINERAL RESOURCES

Fairgrounds, Phoenix, Arizona

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COPPER

PHYSICAL PROPERTIES*

Symbol - Cu. Atomic Weight - 63.54. Specific Gravity - 8.96 Melting Point - 1981.4°F. Boiling Point - 4700°F Electrical Resistivity - Microhm-cm. - 1.673 Tensile Strength (H.D. - 60,000 #/sq. in.) (annealed - 30,000) Crystal Structure - Face-centered cubic. Valence - 1 & 2

Copper ranks next to iron as a metal of commercial importance. It has the best conductivity of any base metal; for example, measured on the ordinary basis of conductivity per unit of cross sectional area, aluminum's conductivity is only 61 per cent of that of copper, but 3.5 times that of iron. Copper is therefore the most important metal in the electrical field. Copper has enough strength for minor structural purposes (such as sheet-metal work, electrical manufactures, etc.), is easily rolled and drawn into wire, has great resistance to weathering, and is of moderate cost compared to competitive materials. In addition to these properties, copper is widely used alloyed with zinc to form brass, which is easily worked, offers good resistance to weathering and most solutions (principal exceptions are certain acids and alkalies), and is fairly strong and elastic; and alloyed with tin to form bronze, of note for its resilience. It has good thermal conductivity, so finds many uses in heat-transfer units, such as cooling fins and water heaters. In addition, a large percentage of copper may be recovered as scrap after it has outlived the usefulness for which it was originally intended. Of the total copper consumed in the United States it has been estimated that about 60 per cent eventually returns to use as copper or copper alloys.

* U.S.B.M.'s "MATERIALS SURVEY"

-1-.

The United States produced 1,544,579 short tons of new mined copper in 1969, an all time record. It was more than 28 percent ahead of 1968 and over 8 percent ahead of the previous record set in 1966. Arizona produced more than one-half of it (51.9%), followed by Utah (19.2%), New Mexico (7.8%), Nevada (6.8%), and Montana, (6.7%). Record production was made by Arizona, New Mexico, and Nevada, while Utah's output had been only exceeded by the wartime record year of 1943.

World mine production outside of the United States also increased and at 5.11 million tons was more than 6 percent ahead of 1968 and more than 43 percent greater than in 1960. The major copper producing countries, the U.S.S.R., Zambia, Chile, Republic of the Congo (Kinshasa), Peru, and the Philippines all exceeded their past records. Canada suffered a 10 percent decrease due to lengthy strikes. Free World production, outside of the U.S., totaled 3.84 million tons, over 5 percent more than in 1968 and more than 33 percent ahead of 1960.

United States mine production includes copper recovered from (1) precipitates from leaching; (2) ores in which other metals predominate and (3) copper ores which are shipped directly to smelters or are first concentrated before shipping. The tonnage of the ores in (3) in 1969 was 223,751,510 and it contained 1,345,688 tons of recoverable copper. Arizona, Utah, Montana, Nevada, New Mexico, and Michigan occupied the top 6 positions in ore tonnages and their contents of recoverable copper were as follows: Arizona 11.6 lbs. per ton; Utah and Nevada 11.8 lbs. (given as a combined figure because their tonnages of leached ore are joined to avoid disclosing company confidential data); Montana, 11.4; New Mexico, 13.8 and Michigan 18.4 lbs per ton, respectively.

Domestic production of secondary scrap copper amounted to 1,375,493 tons in 1969, likewise an all-time record. This equaled 89 percent of the year's domestic mine output, down percentage-wise from 1968 and 1967 when comparable figures were 101 and 122 percent respectively. The 1960-1969 decade's low point domestically was 1961 when 849,000 tons of secondary copper production only amounted to 73 percent of the mine production. Fifty-eight percent of the 1969 secondary copper was credited to "New" scrap and 42 percent to "Old". "New" scrap consists of cuttings from new material which are re-melted and re-used. The total scrap production discussed here is not to be confused with the "Secondary Copper Recovered from Scrap as Unalloyed Copper" given in Tables I, IV, and XII and discussed on page 2.

World consumption of refined copper continued to climb, and totalled 7.704 million tons in 1969. This was over 8 percent ahead of 1968 and a striking 53 percent ahead of 1960.

> Refined Copper Consumption A Decade Comparison a/

> > Short Tons

| Designated Area | 1960 | 1969 | Percent Increase |
|------------------------|----------------|---------------|------------------|
| World, Total | 5,029,594 | 7,704,300 | 53.2 |
| Free World | 4,189,930 | 6,249,200 | 49.1 |
| Europe | 2,093,721 | 2,569,700 | 22.7 |
| U.S. b/ | 1,349,896 | 2,142,200 | 58.7 |
| Fed. Rep. Germany | 568,682 | 730,700 | 28.5 |
| U. K. | 617,617 | 602,700 | (2.4) |
| Asia, Total c/ | 422,640 | 960,500 | 127.3 |
| Japan | 335,115 | 891,000 | 165.9 |
| Soviet Sphere, Total | 839,664 | 1,455,100 | 73.3 |
| U.S.S.R. | 679,728 | 992,100 | 46.0 |
| a/ American Bureau of | Metal Statist | tics. b/ U.S. | Bureau of Mines. |
| c/ Excludes Soviet Sph | nere Countries | s. () Decre | ease |

At 2,142,000 tons the United States' consumption of refined copper in 1969 was almost 14 percent greater than in 1968 but 9 percent less than the record 2,360,000 tons for 1966. Within the major classes of domestic consumers as the demand for communication and power transmission cable expanded, the wire mills increased their consumption of refined copper from 828,800 tons in 1960 to 1,296,000 tons in 1969, a 56 percent gain. Likewise, the brass mills in taking 797,000 tons in 1969, registered a 64 percent increase over 1960.

In 1969, mine production plus secondary copper recovered from scrap as unalloyed metal, a total of 2,059,172 tons, was 96.1 percent of the actual United States consumption of refined copper, compared to 89.2 percent for the decade ending with 1969. Graph following Table XII, on page 20, show the courses of mine and secondary copper production and of net imports of copper in the period 1950-1969. This graph shows that, especially since the low point in 1959, the U. S. copper available for consumption has increased markedly. They also show that the portion supplied by newly mined copper drifted lower from 1960 to 1968 and then reversed the trend. The p ortion supplied by secondary production has slowly, but steadily increased, and that supplied by net imports declined from a high of 32.3 percent to a low of 1.2 percent in 1961, 23.1 percent in 1967 and 8.9 percent in 1969.

The United States imports of primary copper amounted to 408,000 tons in 1969 and came principally from South America (Chile and Peru) and Canada with minor amounts from Africa and the Philippines. This was the lowest amount of primary copper imported in any year of the last two decades. 1969 exports were at a low point for the 1960's, and went principally to Italy, West Germany, and the United Kingdom. The U. S. still continued to be a net importer of copper, but the 1969 amount was the lowest in the last four years.

From 1960 to 1969 domestic consumption of copper increased 59 percent.

United States producer's stocks of refined copper, blister, and materials in process of refining (Table X) totalled 330,000 tons at the end of 1969 according to U. S. Bureau of Mines. The increase of 3 percent over 1968 was in the materials in process of refining, however, rather than in the refined stocks, which at year's end totalled 39,000 tons, down 19 percent from 1968, and well below the average of 49,000 tons for the decade. Refined copper stocks outside the United States totalled 234,739 tons at the end of 1969 according to the Copper Institute. This 1969 figure, down over 25 percent from 1968, was a decade "low" and in a manner similar to U.S. refined stocks, was well below the 1960's yearly average of 309,500 tons.

1969 was an exceptional year for copper. The strong demand continued; refined supplies were drawn down, primary production increased and the producer's price rose intermittently as the year progressed. The U.S. producer's price on January 1, 1969, was 42¢ a pound and after raises in January, May, August, and September, three major U.S. producers, Phelps Dodge, Anaconda, and Kennecott, were quoting 52 cents while Copper Range asked 56 cents. The 52 cent price then held until Jan. 1, 1970 when 4 cents were added. U. S. dealer and foreign prices were much higher during the year and were firm around 74½ cents at year end.

Effective January 1, 1969, the U.S. duty of 1.1 cents per pound on imports was suspended retroactively to June 30, 1969 and through June 30, 1970. However, it was stipulated that the suspension would not apply when the price of copper was under 36 cents per pound, and that if the price delivered Connecticut Valley dropped below 24 cents per pound for one calendar month, a duty of 1.8 cents per pound would be reimposed.

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The average number employed in the U.S. copper industry in 1969 was 37,625, an all-time high. (Table XIII) This was an increase of over 27 percent from 1960. The average number of man-hours worked increased 36 percent to 90,570,000 in the same period. Average tons of ore and the average pounds of copper produced per man-hour in 1969, 2.47 and 29.72 respectively, compared with the respective 1960 figures of 2.29 and 33.96.

Average yearly earnings of employees of the copper industry in the United States were 134 percent higher in the period 1965-1969 than they were in the 1947-1949 base period. (Table XII) In the same periods the tons of copper ore produced per man-hour increased 86 percent and the pounds of copper produced, per man-hour increased 31 percent. Productivity continued to fall behind the pace of wage increases even although productivity had a great deal of help from improved technology and equipment. It should be noted, however, that the 1965-1969 ores yielded only an average of 12 pounds of copper per ton whereas the 1947-1949 ores averaged 18.2; and productivity should be weighed on an ore basis with due credit to improved technology and equipment.

In "The Copper Mining Industry, 1966-1970", a paper published by this department in October 1969, B. H. Gerwin wrote, "There is almost unanimity of opinion to the effect that the actual physical shortage of copper (if one really did exist) has already ended or will soon end". In 1969, mine production of recoverable copper in the Free World, (Table IV) was 5,388,600 tons. Adding assumed production of secondary copper of 1,100,000 tons (514,593 tons for the U.S.) gives a total of 6,488,600 tons. Table IV gives Free World consumption of 6,249,200 tons. Surplus production of approximately 240,000 tons is indicated.

Early in 1970, CIPEC, (American Metal Market Feb. 9), estimated a free world surplus of 310,000 metric tons for 1970; British Metals Corp., Ltd. (American Metal Mkt. Feb. 16) predicted Free World production in 1970 of 6,100,000 metric tons (up 400,000 or 7 percent from 1969) and consumption of 6,070,000 (up 320,000 or 5.6 percent from 1969) to give a surplus of only 30,000 metric tons; and in a later article, John J. Lemon, president of Ametalco, Inc. (American Metal Mkt. 5/19) argued that copper may be coming to the end of its bull market, with 420,000 tons of new mine capacity scheduled for completion in the year, an increase of 7.5 percent, European fabricator's orders off; Chinese buying off; and Japanese stocks showing a small surplus.

Copper exploration is active throughout the world and new important deposits are being found in and outside of the great producing areas of the Free World, the Western United States, Zambia and Kinshasha in Africa, and Chile and Peru in South America. Huge developments requiring hundreds of millions of dollars are underway or planned; expansions of existing mines are continuing; mining technology grows to permit mining of lower grade ores; and copper could be in surplus for several years.

On the other hand, consumption of copper is far from static. The U.S. Bureau of Mines in 1969 predicted that nearly 6.3 million tons of newly mined copper will be needed by the United States by the year 2000, as against 1.7 million in 1969 Recent figures of growth of copper consumption outside of the United States are:

| | Pounds | of | Copper | Consumed | Per | Capita |
|---------------|--------|----|--------|----------|------|--------|
| | | | 1949 | 9 | 1969 | |
| Japan | | | 2 | | 15 | |
| Europe | | | 7 | | 15 | |
| Asia & Africa | | | | | 3/4- | ŀ |

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The "traditional" 4¹/₂ percent increase in annual Free World consumption appears slated to be far exceeded by growth in production to 1972 and probably for a few years thereafter. The U.S. growth in consumption was at the rate of 5.3 percent in 1967-68 and the Free World rate in 1969 was 5.6 percent, but, even if consumption should continue at these rates, the presently contemplated capacity increases, averaging over 6 percent per year for 1970 through 1975, would create large surpluses.

The recent increases in nationalization of copper properties in Chile, Zambia, Peru, and the Republic of the Congo, and drives by these countries to increase their producing capacities, plus drives by domestic copper producers to increase capacities to replace those lost to the CIPEC nations, are factors added to that of population explosion, which first prompted the expansion earlier in the past decade, all of which spur exploration and mine development. Whether or not they and other economic factors will result in copper surplus in the next several years is a matter of conjecture, but predominent opinion appears to be that scarcity will be more prevalent thereafter.

contact.

TABLE I

SALIENT U. S. COPPER STATISTICS $\frac{1}{}$

YEARS 1967, 1968, and 1969

| Unit: Sho | rt Tons | | |
|---|---|---|---|
| | 1967 | 1968 | 1969 |
| Arizona Mine Production - Tons Copper U. S. Mine Production - Tons Copper World Mine Production - Tons Copper | 501,741 954,064 r5,564,361 | 627,961 1,204,621 r5,998,674 | 801,363 1,544,579 6,655,477 |
| Refined Stocks - Beginning of Period Refined Stocks - End of Period | 43,000 27,000 | 27,000 48,000 | 48,000 39,000 |
| Refinery Production (From Domestic Ores) Refinery Production (From Foreign Ores) | 846,551 286,431 | 1,160,925 276,461 | 1,468,889 273,926 |
| Secondary Copper Recovered from Scrap as Unalloyed Copper | 423,054 | 433,041 | 514,593 |
| IMPORTS: Copper from Ore, Matte, Regulus Blister Copper Refined Copper | 32,971 269,322 330,571 | 27,559 270,718 400,278 | 39,048 237,949 131,171 |
| Total Imports - Crude and Refined | 632,864 | 698,555 | 408,168 |
| EXPORTS: Copper in Ores, etc. Refined Copper | 59,692 159,353 | 80,739 240,745 | 5,517 200,269 |
| Total Exports - Crude and Refined | 219,045 | 321,484 | 205,786 |
| EXCESS IMPORTS OVER EXPORTS | 413,819 | 377,071 | 202,382 |
| CONSUMPTION: New Refined (Apparent Consumption) Total Refined (Actual) U.S. Mine Prod.% of Appar't Consumption Average E/MJ Price of Copper | r1,320,200 1,935,592 72.3 38.226¢ <u>a</u> / | r1,575,919 1,880,300 76.4 41.847¢ <u>Þ</u> / | 1,682,717 2,142,218 91.8 47.534¢ |

r - Revised

1/ U.S. Bureau of Mines.

a/ Based on first 8 mos. of 1967. Calculated average suspended Sept. thru Dec.

 \overline{b} / Based on last 9 mos. of 1968. Calculated average suspended Jan. thru Mar.

MINE PRODUCTION OF RECOVERABLE COPPER IN THE UNITED STATES

1967 - 1969, BY STATES, IN SHORT TONS $\frac{1}{2}$

| STATE | 1967 | 1968 | 1969 | Rank 1n 1969 |
|----------------------|---------|-----------|-----------|--------------------|
| Alaska | 2/ | 2/ | | |
| Arizona | 501,741 | 627,961 | 801,363 | (1) |
| California | 788 | 1,182 | 1,129 | |
| Colorado | 3,993 | 3,451 | 3,598 | (9) |
| Idaho | 4,210 | 3,525 | 3,332 | (11) |
| Michigan | 58,458 | 74,805 | 75,226 | (6) |
| Missouri | 3,215 | 5,494 | 12,664 | (8) |
| Montana | 65,483 | 69,480 | 103,314 | (5) |
| Nevada | 50,771 | 77,213 | 104,924 | (4) |
| New Mexico | 75,008 | 90,769 | 119,956 | (3) |
| Oregon | | 2/ | | |
| Pennsylvania | 4,401 | 4,850 | 3,382 | (10) |
| Tennessee | 14,600 | 14,196 | 15,353 | (7) |
| Utah | 168,609 | 228,245 | 296,699 | (2) |
| Washington | 21 | 22 | 18 | |
| Wyoming | | | 2/ | |
| Other States $3/.$. | 2,766 | 3,428 | 3,621 | |
| TOTAL | 954,064 | 1,204,621 | 1,544,579 | |

1/ U.S. Bureau of Mines

2/ Included under "Other States". Combined to avoid disclosing individual company confidential data.

3/ Includes: Alaska, Maine in '68 and '69, Oklahoma, Oregon, and Wyoming.

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TABLE III

ARIZONA, UNITED STATES, AND WORLD MINE PRODUCTION OF COPPER, In Short Tons

E/MJ DOMESTIC PRICE OF COPPER

By Years 1912 - 1969 Incl.

| | | ARIZONA | | UNITEI |) STATES | WORLD | E/MJ |
|-------------------------|-----------|---------|-----------|---|-----------|--|--|
| | | % of | % of | | % of | and the state of a 2014 of a state of the sector of the state of the s | Price |
| Year | Tons | U. S. | World | Tons | World | Tons | Per |
| | | Prod. | Prod. | | Prod. | | Pound |
| Beginning of Records | | | | | | | |
| 1874 thru | | | | | | | |
| 1911 | 1,757,554 | @14.40 | 03¢ per 1 | 1b. = \$506 | .283.002* | | |
| 1912 | 182,519 | 29.2 | 16.2 | 624.547 | 55.5 | 1,125,656 | 16.431c |
| 1913 | 203,962 | 33.0 | 18.6 | 617,755 | 56.2 | 1,099,366 | 15.269 |
| 1914 <u>1</u> / | 196,509 | 34.2 | 19.0 | 574.216 | 55.5 | 1.034.487 | 13,602 |
| 1915 <u>1</u> / | 229.986 | 30.9 | 19.6 | 744,036 | 63.4 | 1,173,150 | 17,275 |
| 1916 <u>1</u> / | 360,917 | 36.0 | 23.2 | 1,002,938 | 64.6 | 1,553,498 | 27.202 |
| 1917 <u>1</u> / | 356,083 | 37.6 | 22.2 | 947.717 | 59.1 | 1,602,914 | 27,180 |
| 1918 1/ | 382,428 | 40.0 | 24.2 | 955.011 | 60.5 | 1,579,246 | 24,628 |
| 1919 | 269,050 | 44.4 | 24.6 | 606,167 | 55.3 | 1.095.697 | 18,691 |
| 1920 | 279,128 | 45.6 | 26.4 | 612.275 | 58.0 | 1.056.014 | 17,456 |
| 1921 <u>2/</u> | 92,517 | 39.7 | 15.1 | 233,095 | 38.0 | 613,987 | 12.502 |
| 1912 | | | | 1,1 ^{1,1} 1,11,11,11,11,11,11,11,11,11,11,11,1 | | | an a |
| to | 2,553,099 | 36.9 | 21.4 | 6,917,757 | 58.0 | 11,934,015 | r20.649¢ |
| 1921 | | | | | | | |
| 1922 | 200,022 | 41.5 | 21.4 | 482,292 | 48.2 | 935,374 | 13.382¢ |
| 1923 | 309,464 | 41.9 | 22.8 | 738,870 | 54.5 | 1,355,327 | 14.421 |
| 1924 | 338,876 | 42.2 | 23.0 | 803,083 | 54.5 | 1,472,712 | 13.024 |
| 1 92 5 | 356,678 | 42.5 | 22.6 | 839,059 | 53.2 | 1,576,998 | 14.042 |
| 1926 | 361,648 | 41.9 | 22.7 | 862,638 | 54.0 | 1,596,147 | 13.795 |
| 1927 | 341,095 | 41.3 | 20.5 | 824.980 | 49,5 | 1,666,694 | 12.920 |
| 1928 | 366,138 | 40.5 | 19.2 | 904,898 | 47.5 | 1,903,672 | 14.570 |
| 1929 | 415,314 | 41.6 | 19.3 | 997,555 | 46.4 | 2,150,587 | 18,107 |
| 19 30 <u>3</u> / | 288,095 | 40.9 | 16.2 | 705,074 | 39.7 | 1,775,805 | 12,982 |
| 1931 <u>3</u> / | 200,672 | 37.9 | 13.0 | 528,875 | 34.2 | 1,545,425 | 8.116 |
| 1922 | | | | 2 | | **** | |
| to 1931 | 3,178,002 | 41.3 | 19.8 | 7,687,324 | 48.1 | 15,978,741 | 13.902¢ |

Source: U.S. Geological Survey: Mineral Resources; U.S.B.M. Minerals Yearbooks. * Arizona Metal Production 1936, Elsing and Heineman, Arizona Bureau of Mines.

(continued)

| TART | E | III | (C) | ont | inue | d) |
|-------|---|------------|-----|-----|------|----|
| 1.1.2 | | in the sta | 10 | | | , |

| | | ARIZONA | alaantan amargare (jina taruman arapa | UNITED | STATES | WORLD | E.& M. J. |
|---|---|--|---|--|--|--|--|
| Year | Tons | % of U.S. Prod. | % of World Prod. | Tons | % of World Prod. | Tons | Price Per Pound |
| $\begin{array}{c} 1932 \ 3/\\ 1933 \ 3/\\ 1934 \ 3/\\ 1935 \ 3/\\ 1936 \ 3/\\ 1936 \ 3/\\ 1937 \ 1938 \ 4/\\ 1939 \ 5/\\ 1940 \ 5/\\ 1941 \ 5/\\ 1941 \ 5/\\ \end{array}$ | 91,246 57,021 89,041 139,015 211,275 288,475 210,797 262,117 281,169 326,317 | 38.3 29.9 37.5 36.0 34.4 34.3 37.8 36.0 32.0 34.1 | 8.0 4.9 6.3 8.4 11.1 11.2 9.3 10.6 10.5 11.2 | 238,111 190,643 237,401 386,491 614,516 841,998 557,763 728,320 878,086 958,149 | 20.9 16.4 16.8 23.5 32.4 32.8 24.5 29.4 32.7 33.0 | 1,138,676 1,159,000 1,415,353 1,647,939 1,899,263 2,567,916 2,274,045 2,481,277 2,688,510 2,903,458 | 5.555¢ 7.025 8.428 8.649 9.474 13.167 10.000 10.965 11.296 11.797 |
| 1932 to | 1,956,473 | 34.7 | 9.7 | 5,631,478 | 27.9 | 20,175,437 | 10,564 |
| 1941 1942 5/ 1943 5/ 1944 5/ 1945 1946 | 3 93 ,387 403 ,181 3 58 ,303 287 ,203 289 ,223 | 36.4 37.0 36.8 37.2 47.5 | 12.9 13.2 12.5 12.0 14.1 | 1,080,061 1,090,818 972,549 772,894 608,737 | 35.5 35.6 33.9 32.2 29.6 | 3,039,041 3,064,394 2,866,000 2,400,000 2,056,000 | 11.775¢ 11.775 11.775 11.775 13.820 |
| 1947 1948 <u>6/</u> 1949 <u>6</u> / 1950 1951 | 366,218 375,121 359,010 403,301 415,870 | 43.2 44.9 47.7 44.4 44.8 | 14.6 14.4 14.4 14.4 14.3 | 847,563 834,813 752,750 909,343 928,330 | 33.9 32.1 30.1 32.5 32.0 | 2,500,000 2,600,000 2,500,000 2,760,000 2,900,000 | 20.958 22.038 19.202 21.235 24.200 |
| 1942 to 1951 | 3,650,817 | 41.5 | 13.7 | 8,797,858 | 33.0 | 26,685,435 | r17,103 |

(Continued)

| | A | RIZONA | | UNITED | STATES | WORLD | E/MJ |
|------------------------------|---|---|---|---|--|--|---|
| | | % of | % of | na finis da la caspana magina dispona si da na sebana seb | % of | an a | Price |
| | Tons | U. S. | World | Tons | World | Tons | per |
| Year | | Prod. | Prod. | and a subscription of the | Prod. | والمعالي فالبوا بالمائل فالقار والمتعالية والمتعالية والمتعالية والمعالية والمعالية | Pound |
| 1952 | 395 719 | 42 8 | 13 1 | 025 350 | 30.6 | 3 020 000 | 24 2004 |
| 1053 | 303 525 | 12.0 | 12 0 | 006 100 | 30.0 | 3,020,000 | 24.200¢ |
| 105/7/ | 377 007 | 42.0 | 12.9 | 926,448 | 30.4 | 3,050,000 | 28,798 |
| 1954_/ | 577,927 | 43.2 | 12.2 | 835,472 | 27.0 | 3,100,000 | 29.694 |
| 1955 | 454,105 | 45.5 | 13.3 | 998.570 | 29.2 | 3,420,000 | 37.491 |
| 1956 | 505,908 | 45.7 | 13.4 | 1,104,156 | 29.1 | 3,790,000 | 41.818 |
| 1957 | 515,854 | 47.5 | 13.3 | 1.086.859 | 27.9 | 3 890 000 | 29 576 |
| 1958 | 485,839 | 49.6 | 12.9 | 979 329 | 25 9 | 3 780 000 | 25 764 |
| 1959 | 430,297 | 52 2 | 10.7 | 824 846 | 20 / | 1,010,000 | 21 182 |
| 1960 | 538 605 | 49 9 | 11 6 | 1 080 160 | 20.4 | 4,040,000 | 22 052 |
| 1961 | 587 053 | 50 / | 12 1 | 1,000,109 | 23.2 | 4,050,000 | 32,000 |
| 1901 | 507,055 | 50,4 | 12.1 | 1,100,100 | 24.0 | 4,850,000 | 29,921 |
| 1952 | a Ta da Artical Table de aglimata vela ĝo patricis muna franco en | وسيعتب والبرايين ويداريه | ويستريده ومعارية والمؤمد والمواول | | anyy amin' any front in an industry and | A film for the second | |
| to | 4,684,832 | r47.2 | 12.5 | 9,926,363 | 26.4 | 37,590,000 | 31,236c |
| 1961 | | a Bandhan and an | united descentrate to the terms in much and adding to | | | | , |
| 1062 | 6111 2/12 | 50 h | 10 7 | 1 000 401 | 01- 0 | E 005 000 | |
| 1063 | 660 077 | 54 | 12./ | 1,228,421 | 24.2 | 5,085,000 | 30.600¢ |
| 1905 | 600,977 | 54.5 | 13.0 | 1,213,166 | 23.8 | 5,088,000 | 30,600 |
| 1904 | 702,277 | 55.4 | r13.0 | 1,246,780 | r23.5 | r5,297,000 | 31,960 |
| 1905 | 703,377 | 52.0 | 12./ | 1,351,734 | r24.4 | r5,549,000 | 35.017 |
| 1900 | 739,569 | 51./ | r12.8 | 1,429,152 | r24.6 | r5,800,000 | 36.170 |
| 1967 | 8/501,741 | 52.6 | r 9.0 | 8/954,064 | r17.1 | r5 564 000 | 38 226* |
| 1968 | 8/627.961 | 52.1 | 10.5 | 8/1 204 621 | 20 1 | ~5,909,000 | 11 917** |
| 1969 | 9/801,363 | 51.9 | 12.0 | 9/1.544.579 | 23.2 | 6 655 000 | 41,047 AA |
| Rest State State State State | | in the second | | | | 0,000,000 | 17 * 20 T |
| 1962 | | | | | itali. Adalah di kangkan itan kang kangkan | ni an fan de fan Andrikk Maagin dan af na fan stron men men man final mag | high a find an ball and a find and a second |
| to | 5,370,218 | 52.8 | 11.9 | 10,172,517 | 22.6 | 45,037,000 | 36.675¢ |
| 1969 | And the University of the State of States and | | anital de la constant | , Martin and a state of the | | | |

TABLE III (continued)

| 1874 | . and a share and a she for the standard set of t | na i son den en de se antenna de se de | ik Man di bagi ini dari ng hang bagi kan ding Kari Kang Kang Kang Kang Kang Kang Kang Kang | anderen anderen einer |
|------|---|--|--|---|
| to | ARIZONA ONLY | 23,152,662 Tons | at 23.825¢ per pound = | \$11,032,412,000 |
| 1909 | | | | |

r Revised

* Based on first 8 months of 1967

** Based on the last 9 months of 1968

TABLE III Continued

NOTES: 1/ World War I 1914 - 1918.

2/ Post World War I Recession. Lasted about one year.

- 3/ Depression began in 1930; was at its worst in 1933; gradually improved till 1937.
- 4/ Recession in 1938. Recovery in 1939 caused by War demand.
- 5/ World War II began in 1939; copper consumption reached its height in 1944.
- 6/ In the year 1948 and the early months of 1949, copper was being produced in the United States at the rate of 68,000 short tons per month, imports were at the rate of 18,000 tons of blister copper and 22,000 tons of refined copper, and exports were at the rate of 12,000 tons per month. The price of copper averaged 22.5 cts. during this period, varying from 21-3/8 to 23-3/8 cts.

In March 1949 the copper import tax was suspended, and during the months following the suspension, domestic demand fell drastically, and for four months net domestic consumption of copper was at or below the level of domestic production, even though the latter was severely curtailed. During this period, imports continued at practically the same rate. The price of copper dropped from 23-3/8 cts. to 16-1/2 cts. per pound. Many mines were forced to close down, and the large low-cost producers curtailed production. The average monthly production dropped from a high of 78,000 to a low of 56,000 tons.

- 7/ Curtailment early in the year, and a series of strikes in August and September caused a loss in production of over 100,000 tons. Reduced consumption in the U.S. was offset by an appreciable rise in the use of copper outside of this country, chiefly Europe. Result: a short supply of copper at the end of the year.
- 8/ The 1967 Copper Strike started July 16, 1967, ending in March 1968.

-1--

9/ 1969, Highest annual production in history.

TABLE IV

MINE PRODUCTION OF COPPER - WORLD

UNITED STATES PRODUCTION OF SECONDARY UNALLOYED COPPER

WORLD CONSUMPTION OF REFINED COPPER

(Primary and Secondary)

| | | SHOP | RT TONS | | |
|--------------------------------------|---|--|--|--|---|
| | | MINE P | RODUCTION 1/ | UNA | SICONDARY ALLOYND COPPER |
| Year | United States | Remainder of Free World &yDifference) | Soviet Sphere | <u>2</u> / Total World | PRODUCTION United States 1/ |
| 1960 1961 1962 1963 1964 | 1,080,169 1,165,155 1,228,421 1,213,166 1,246,780 | 2,883,731 2,911,145 2,961,479 3,037,175 r3,153,145 | 686,100 773,700 895,100 837,659 r897,075 | 4,650,000 4,850,000 5,085,000 5,088,000 r5,297,000 | 300,259 290,805 301,374 314,643 366,197 |
| 1965 1966 1967 1968 1969 | 1,351,734 1,429,152 954,064 1,204,621 1,544,579 | r3,233,897 r3,350,221 r3,539,004 r3,641,219 3,844,021p | r963,369 r1,020,627 r1,070,932 r1,153,160 1,266,400p | 5,549,000 5,800,000 r5,564,000 5,999,000 6,655,000 p | 462,811 509,084 423,054 433,041 514,593 |

WORLD CONSUMPTION OF REFINED COPPER

| | United | Remainder | Soviet | TOTAL |
|------|-----------|-----------------|-----------|-------------|
| | States | of Free World | Sphere | WORLD |
| Year | <u></u> / | (By Difference) | 3/ | 3/ |
| 1960 | 1,349,896 | 2,840,034 | 839,664 | 5,029,594 |
| 1961 | 1,462,830 | 3,033,270 | 1,038,300 | 5,534,400 |
| 1962 | 1,599,676 | 2,922,024 | 1,091,200 | 5,612,900 |
| 1963 | 1,744,273 | 3,061,327 | 1,147,500 | 5,953,100 |
| 1964 | 1,825,281 | 3,525,119 | 1,174,000 | 6,524,400 |
| 1965 | 2,004,623 | r3,504,677 | 1 231 300 | 6 740 600 |
| 1966 | 2,359,954 | r3,402,846 | 1 300 700 | 7 063 500 |
| 1967 | 1,935,592 | r3,434,008 | 1 344 800 | 6 71/1 /100 |
| 1968 | 1,880,300 | r3.808.900 | 1,405,500 | 7 00/1 700 |
| 1969 | 2,142,218 | 4,106,982 | 1,455,100 | 7,704,300 |
| | | | | |

r Revised

1/ U. S. Bureau of Mines

 $\overline{2}$ / Includes total and recoverable ore-content. See Table V.

3/ American Bureau of Metal Statistics.

WORLD MINE PRODUCTION OF COPPER (TOTAL OR RECOVERABLE CONTENT OF ORE AS INDICATED),

BY CONTINENTS AND PRINCIPAL COUNTRIES IN THOUSAND SHORT TONS 1/2/

Years 1966, 1967, 1968 and 1969

| | 1966 | 1967 | 1968 | 1969p |
|---|--|---|---|--|
| NORTH AMERICA: | ال میں ایس ایس ایک میں ایک میں ایک | na fan diwar fan din af Annals a graf genag waar fan Gind Annapan a | nan ferna feine gegen anner französische konst Annalisen, Hitpe mahalistig konst führe fräh | in and a subscription of the distance of the subscription of the |
| U.S.A. 3/ | 1,429 | 954 | 1,205 | 1,545 |
| Canada 3/ | 508 | r613 | 608 | 551 |
| Mexico | 62 | 62 | 67 | 73 |
| Others | r14 | r13 | r15 | 8 |
| | r ² ,013 | r1,642 | r1,895 | 2,177 |
| SOUTH AMERICA: | alainin taan taan taa | ny janya mangkana dina dina kana dina kana dina dina dina dina dina dina dina d | | |
| Chile | 731 | 732 | r735 | 769 |
| Peru 3/ | 194 | r212 | r234 | 237 |
| Others | r 8 | r10 | r12 | 9 |
| | r 933 | r954 | r981 | 1,015 |
| EUROPE : | | | | |
| U.S.S.R. 4/ | 825 | 880 | r937 | 992 |
| Yugoslavia | 69 | 70 | r 78 | 98 |
| Others | 159 | r177 | r201 | 270 |
| ₩ <u>₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩</u> | 1,053 | r1,127 | r1,216 | 1,360 |
| ASIA: | aga na tanàna dia mandra amin'ny tanàna amin'ny taona dia mandritra dia mandritra dia mandritra dia mandritra d I | tel (| | |
| China, mainland e | 99 | 88 | 99 | 110 |
| Cyprus e | 20 | 17 | 19 | 22 |
| Japan | 123 | 131 | 132 | 133 |
| Philippines | 81 | 94 | r122 | 145 |
| Turkey | 40 | 35 | 32 | 30 |
| Others | 49 | 48 | r49 | 50 |
| | 412 | 413 | r453 | 490 |
| AFRICA: | | | | |
| Zambia | 687 | 730 | 733 | 825 |
| Congo (Kinshasa) | 348 | 352 | r358 | 399 |
| South Africa, Republic | of 137 | r165 | r161 | 163 |
| Others | r85 | r 79 | r 80 | 82 |
| .» | r1,257 | r1,326 | r1,332 | 1,469 |
| OCEANIA: | and the second | | | |
| Australia | 123 | r103 | r120 | 143 |
| Fiji (exports) | | | el | 5/ |
| | 123 | r103 | r121 | 143 |
| TOTAL WORLD 6/ | r5,800 | r5,564 | r5,999 | 6,655 |

e Estimate p Preliminary r Revised

1/ U. S. Bureau of Mines

Z/ Cuba, Hungary, Kenya, and Malasia also produce copper but production data are not available.

3/ Recoverable in Europe. 5/ Less than 500 tons.
3/ Recoverable
4/ Output from U.S.S.R, in Asia included with U.S.S.R.

6/ Totals may not add, due to rounding.

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TABLE VI

REFINED COPPER PRODUCED, NEW (PRIMARY), IMPORTED, EXPORTED, AND WITHDRAWN FROM SUPPLY ON DOMESTIC ACCOUNT

YEARS 1964 - 1969

| Unit: | Short | Tons |
|-------|-------|------|

| | 1964 | 1965 | 1966 |
|---|---------------------------------|--|-----------------------------------|
| Ref. Prod. of New Cu from U.S. Ores Ref. Prod. of New Cu from Foreign Ores Total Ref. Prod. of New Copper | 1,259,852 396,543 | 1,335,660 <u>376,133</u> 1,711,703 | 1,353,637 357,897 |
| Imports of Refined Copper Stocks at beginning of period | 137,707 52,000 | 137,443 37,000 | r 164,328 35,000 |
| Toral Available Supply | 1,846,102 | 1,886,236 | r1,910,312 |
| Exports of Refined Copper Stocks at end of period | 316,230 37,000 | 324,965 35,000 | 273,071 43,000 |
| Total | 353,230 | 359,965 | 316,071 |
| Withdrawn on Domestic Acc.(Apparent Cons.) | 1,493,000 | r1,526,271 | r1,594,241 |
| Reported Actual Consumption | 1,825,281 | 2,004,623 | 2,359,954 |
| | | . * | |
| | 1967 | 1968 | 1969 |
| Ref. Prod. of New Cu from U.S. Ores Ref. Prod. of New Cu from Foreign Ores Total Ref. Prod. of New Copper | 846,551 286,431 1,132,982 | 1,160,925 276,461 1,437,386 | 1,468,889 273,926 1,742.815 |
| Imports of Ref. Copper Stocks at beginning of period | 330,571 43,000 | 400,278 | 131,171 48,000 |
| Total Available Supply | 1,506,553 | 1,864,664 | 1,921,986 |
| Exports of Refined Copper Stocks at end of period | 159,353 27,000 | 240,745 48,000 | 200,269 39,000 |
| Total | 186,353 | 288,745 | 239,269 |
| Withdrawn on Domestic Acc.(Apparent Cons.) | 1,320,200 | 1,575,919 | 1,682,717 |
| Reported Actual Consumption | 1,935,592 | 1,880,300 | 2,142,218 |

r Revised

Source: U.S. Bureau of Mines

TABLE VII

IMPORTS OF PRIMARY COPPER INTO UNITED STATES

1967, 1968, 1969

1964, 1965, 1966

| S | hc | \mathbf{r} | t | т | on | S |
|---|----|--------------|---|---|----|---|
| | | | | | | |

| | 1967 | 1968 | 1969 |
|---------------------------------------|---|----------|-----------|
| Ore, Matte - Regulus (Copper Content) | 32,971 | 27,559 | 39,048 |
| Canada | 7,229 | 7,214 | 9,181 |
| Chile | 691 | | |
| Mexico | 145 | 219 | 89 |
| Peru | 6,615 | 4,637 | 9,664 |
| Phillippines | 16,058 | 14,543 | 18,269 |
| Australia | 708 | 942 | 1,662 |
| Other Countries | 1,525 | 4 | 183 |
| Blister Copper | ang pangang sangang pang pang pang pang pang pang pan | | |
| (Copper Content) | 269,322 | 270,718 | 237,949 |
| Mexico | 2,937 | 5,067 | 2,816 |
| Chile | 141,629 | 136,320 | 100,768 |
| Peru | 84,329 | 89,033 | 107,385 |
| South Africa Republic of | 38,866 | 38,243 | 25,160 |
| Other Countries | 1,561 | 2,055 | 1,820 |
| Refined Cathodes and Shapes | 330,571 | 400,278 | 131,171 |
| Canada | 140,602 | 135,115 | 84,941 |
| Chile | 30,791 | 42,860 | 21,470 |
| Germany, West | 33,269 | 55,263 | 2,574 |
| Peru | 27,694 | 18,525 | 4,372 |
| United Kingdom | 20,468 | 22,572 | 3,950 |
| Zambia | 9,577 | 22,898 | 999 |
| Other Countries | r68,170 | r103,045 | 12,865 |
| TOTAL PRIMARY IMPORTS | 632,864 | 698,555 | 408,168 |
| TOTAL PRIMARY EXPORTS | | | un entras |
| (refined & ore Concts & matte) | 219,045 | 321,484 | 205,786 |
| EXCESS IMPORTS | 413,819 | 377,071 | 202,382 |
| | | | |
| | 1964 | 1965 | 1966 |
| TOTAL PRIMARY IMPORTS | 581,591 | 506,936 | r565,118 |
| TOTAL PRIMARY EXPORTS | 321,625 | 340,475 | 275,220 |
| EXCESS IMPORTS | 259,966 | 166,461 | r289,898 |

r Revised

Source: U. S. Bureau of Mines

TABLE VIII

EXPORTS OF PRIMARY COPPER FROM THE UNITED STATES

a and specials in each

1967, 1968, 1969

| Sho | rt Tons | | |
|--|---------|---------|---------|
| | 1967 | 1968 | 1969 |
| Ore, Concts. & Matte | 59,692 | 80,739 | 5,517 |
| Refined Ingcts, Bars, Etc. | 159,353 | 240,745 | 200,269 |
| Argentina | 241 | r273 | 191 |
| Belgium - Luxembourg | r 2,794 | r7,336 | 2,206 |
| Brazil | r 6,918 | 31,335 | 17,065 |
| Canada | r 4,785 | 5,739 | 20,428 |
| France | 18,821 | r30,403 | 17,055 |
| Germany, West | r19,497 | r29,501 | 26,282 |
| India | r 6,415 | r15,216 | 12,955 |
| Italy | r27,200 | r38,992 | |
| Japan | 29,214 | r18,823 | 14,942 |
| Mexico | 975 | 19 | 18 |
| Netherlands | r 3,290 | 9,294 | 8,295 |
| Spain | 336 | 794 | 2,705 |
| Sweden | 1,126 | r 3,831 | 4,605 |
| Switzerland | 1,341 | 2,313 | 2,350 |
| United Kingdom | 26,588 | 37,773 | 24,436 |
| Yugoslavia | | r 1,302 | 2,713 |
| Other Countries | r 9,812 | r 7,801 | 6,070 |
| Total Exports of Primary Copper (Crude and Refined) | 219,045 | 321,484 | 205,786 |

r Revised

Source: U. S. Bureau of Mines.

· · ·

TABLE IX

STOCKS OF REFINED COPPER REPORTED BY

U.S.B.M. AND COPPER INSTITUTE*

| | | | Short Tons | |
|-------|------|----------|------------------|------------------|
| END O | F | IN | U.S.A. | OUTSIDE U.S.A. |
| PERIO | D | U.S.B.M. | COPPER INSTITUTE | COPPER INSTITUTE |
| Year | 1960 | 98,000 | 139,272 | 288,510 |
| | 1961 | 49,000 | 79,755 | 332,479 |
| | 1962 | 71,000 | 117,441 | 358,856 |
| | 1963 | 52,000 | 76,934 | 394,143 |
| | 1964 | 37,000 | 45,594 | 277,303 |
| | | | | |
| | 1965 | 35,000 | 60,811 | 327,723 |
| | 1966 | 43,000 | 65,707 | 293,167 |
| | 1967 | 27,000 | 55,350 | 272,202 |
| | 1968 | 48,000 | 56,609 | 316,090 |
| | 1969 | 39,000 | 45,943 | 234,739 |

* Inventory data of the Bureau of Mines and Copper Institute always differ owing to somewhat different bases. After Jan. 1, 1947 the differences were due chiefly to the method of handling metal in process of refining (included as "refined" by Copper Institute and as "unrefined" by the U.S.B.M.), and to other minor variations in interpretation until May, 1951. Then the Institute's inventory data began to include tonnages delivered to U.S. consumers at foreign ports. Bureau of Mines figures are on the basis of metal physically held at primary smelting and refining plants in the U.S. In the Bureau's classification cathodes to be used chiefly for casting into shapes are considered stocks in process and not refined stocks.

TABLE X

STOCKS OF REFINED COPPER, BLISTER, AND MATERIALS IN PROCESS REPORTED BY UNITED STATES BUREAU OF MINES

| | | | Short Tons | | |
|----------------------------|------|---------|--------------------------------------|---------|--|
| END OF BLISTER & MATERIALS | | | | | |
| PERIC | D | REFINED | IN PROCESS OF REFINING $\frac{1}{2}$ | TOTAL | |
| Year | 1960 | 98;000 | 261,000 | 359,000 | |
| | 1961 | 49,000 | 236,000 | 285,000 | |
| | 1962 | 71,000 | 246,000 | 317,000 | |
| | 1963 | 52,000 | 252,000 | 304,000 | |
| | 1964 | 37,000 | 246,000 | 283,000 | |
| | 1965 | 35,000 | 246,000 | 281,000 | |
| | 1966 | 43,000 | 270,000 | 313,000 | |
| | 1967 | 27,000 | 220,000 | 247,000 | |
| | 1968 | 48,000 | 272,000 | 320,000 | |
| | 1969 | 39,000 | 291,000 | 330,000 | |

1/ Includes copper in transit from smelter in the U.S. to refineries therein.

TABLE XI

REFINED COPPER CONSUMED IN U. S. 1966-1969

BY CLASSES OF CONSUMERS 1/

| | Unit: Short Tons | | | | | | |
|---|---|---|---|---|---|---|---|
| Class of Consumer C | athodes | Wire Bars | Ingots and Ingot Bars | Cakes and Slabs | Billete | Other | Total |
| 1966: | a national restances and the second secon | | | 01404 | DITIOUD | O DILOL | |
| Wire Mills Brass Mills Chemical Plants Secondary Smelt. Foundries Miscellaneous 2/ | 2,698 180,350 9,408 2,101 1,407 | 1,356,428 39,503 57 52 | 10,811 211,500 1,586 9,968 15,678 9,489 | 234,156 111 <u>3/</u> <u>3</u> / | 22 262,834 395 774 | 883 147 732 204 1,261 7,399 | 1,370,842 928,490 2,318 19,691 19,492 19,121 |
| Total | 195,964 | 1,396,040 | 259,032 | 234,267 | 264,025 | 10,626 | 2,359,954 |
| 1967: Wire Mills Brass Mills Chemical Plants Secondary Smelt. Foundries & Misc ^{2/} Total 1968: Wire Mills Brass Mills Chemical Plants Secondary Smelt. Foundries & Misc. ² | 6,058 152,310 4,908 3,557 166,833 16,632 141,836 3,583 2,460 | 1,226,370 $28,090$ $$ 173 $1,254,633$ $1,164,933$ $26,610$ $$ 134 | 6,964 115,640 1,386 3,816 21,331 149,137 6,716 140,658 520 2,583 19,150 | 153,146 <u>3</u> / 153,146 122,367 <u>3</u> / | 200,906 1,119 202,025 220,504 1,083 | 844 282 1,014 254 7,424 9,818 993 475 1,123 188 7,752 | 1,240,236 650,374 2,400 8,978 33,604 1,935,592 1,189,274 652,450 1,643 6,354 30,579 |
| Total | 164,511 | 1,191,677 | 169,627 | 122,367 | 221,587 | 10,531 | 1,880,300 |
| <u>1969:</u> Wire Mills Brass Mills Chemical Plants Sacondary Smalt. Foundries & Misc.2 | 50,631 183,644 3,856 3,008 | 1,237,939 31,847 1,014 | 4/ 152,529 471 3,025 23,777 | 4/ 172,264 238 | 256,714 1,659 | 7,746 128 2,624 67 9,027 | 1,296,316 797,126 3,095 6,958 38,723 |
| Total | 241,149 | 1,270,800 | 179,802 | 172,502 | 258,373 | 19,592 | 2,142,218 |

1/ U.S. Bureau of Mines

Includes iron and steel plants, primary smelters producing alloys other than copper, consumers of copper powder and copper shot, and misc. manufacturers.
 Included with "Billets" to avoid disclosing individual company confidential data.

4/ Included with "Other" to avoid disclosing individual company confidential data.

TABLE XII

U. S. PRODUCTION AND CONSUMPTION OF COPPER

| Short Tons | | | | | | | |
|------------|--|---|---|--|---|--|--|
| | inner Allen Fridan inner in sich finne Angelfingsfrören, beite für verstenen B | nn fessyllin a teang haya dan ata Anna indan ya ma'na fan a taan filla a teang taan filla a taan filla a taan t | innen fremsfelin Gronen fra Allen og a frem grandlanser forstag bland hvert Rei og Statig Bank Blank Bank vinnt | n yan da salah dan yang kasar kasar da kasar da kasar da salah salah salah salah salah salah salah salah salah | Total | | |
| | | | | Total | Production | | |
| | Mine | Secondary | Total | Actual | As % of | | |
| Year | Production | Production* | Production | Consumption | Consumption | | |
| 1950 | 909,343 | 260,704 | 1,170,047 | 1,424,434 | 82.2 | | |
| 1951 | 928,330 | 186,462 | 1,114,792 | 1,416,865 | 78.7 | | |
| 1952 | 925,359 | 173,904 | 1,099,263 | 1,479,732 | 74.3 | | |
| 1953 | 926,448 | 242,855 | 1,169,303 | 1,494,215 | 78.3 | | |
| 1954 | 835,472 | 212,241 | 1,047,713 | 1,254,729 | 83.5 | | |
| 1955 | 998,570 | 246,928 | 1,245,498 | 1,502,004 | 82.9 | | |
| 1956 | 1,104,156 | 273,060 | 1,377,216 | 1,521,389 | 90.5 | | |
| 1957 | 1,086,141 | 248,015 | 1,334,156 | 1,347,815 | 99.0 | | |
| 1958 | 979,329 | 255,121 | 1,234,450 | 1,250,677 | 98.7 | | |
| 1959 | 824,846 | 261,588 | 1,086,434 | 1,463,031 | 74.3 | | |
| Totals | | n ya na ya na ya na | | | | | |
| 1950-59 | 9,517,994 | 2,360,878 | 11,878,872 | 14,154,891 | | | |
| 10 Yr. | | | | м. | | | |
| Avg. | 951,799 | 236,088 | 1,187,887 | 1,415,489 | 83,9 | | |
| 1960 | 1,080,169 | 300,259 | 1,380,428 | 1,349,896 | 102.3 | | |
| 1961 | 1,165,155 | 290,805 | 1,455,960 | 1,462,830 | 99.5 | | |
| 1962 | 1,228,421 | 301,374 | 1,529,795 | 1,599,676 | 95.6 | | |
| 1963 | 1,213,166 | 314,643 | 1,527,809 | 1,744,273 | 87.6 | | |
| 1964 | 1,246,780 | 366,197 | 1,612,977 | 1,825,281 | 88.4 | | |
| 1965 | 1.351.734 | 462,811 | 1,814,545 | 2,004,623 | 90.5 | | |
| 1966 | 1,429,152 | 509,084 | 1,938,236 | 2,359,954 | 82.1 | | |
| 1967 | 954,064 | 423,054 | 1,377,118 | 1,935,592 | 71.1 | | |
| 1968 | 1,204,621 | 433.041 | 1,637,662 | 1,880,300 | 87.1 | | |
| 1969 | 1,544,579 | 514,593 | 2,059,172 | 2,142,218 | 96.1 | | |
| Total | <u>an an an ann an an an an an an an an an </u> | والمواقع ومستركب فيستركب والمعرفي والمعارية والمعارية والمعرفين والمعرفين والمعرفين والمعروفي والمعرو | | n en | | | |
| 1960-69 | 12,417,841 | 3,915,861 | 16,333,702 | 18,304,643 | and the second secon | | |
| 10 Yr. | ar fan yn hendraeth feneden. 200 Maka fen diwn fan Armen graeg frigerifen | | | | | | |
| Avg. | 1,241,784 | 391,586 | 1,633,370 | 1,830,464 | 89.2 | | |

* Unalloyed copper. Source: U. S. Bureau of Mines



Million Short Tons

-20-

£ .

TAB'E FIII

COPPER MINING EMPLOYMENT, WAGES, AND HOURS IN THE U. S. AND ARIZONA

FOR THE YEARS 1965 THROUGH 1969

Averages for Base Period 1947-1949 are given as well as for the years 1965-1969

| | | A'' | ''B'' | | "C | • 15 al 242 | ''D' | 380 |
|---|---------|----------|------------------------|----------------------------------|-----------------------------|-------------|-------------------|---------------------------|
| 1. 1. 1 201. 1 | Averag | e Number | Average V | Veekly | Average | Weekly | Average Earnin | Hourly |
| | Linpio | | | Sol and the second second second | c. un chat addressed of the | | | Contraction of the second |
| Period | Arizona | U.S.2/ | Arizona ³ / | U.S.4/ | Arizona3/ | U.S.4/ | Arizona3/ | U.S.4/ |
| 1965 | 14,200 | 29.900 | r\$146.10 | \$136.71 | 45.01 | 43.40 | \$3.246 | \$3.150 |
| 1966 | 15,200 | 32,350 | 150,06 | r139.87 | 45.20 | 43.45 | 3.320 | 3.219 |
| 1967 | r12,158 | 24,050 | r141.35 | r136.51 | 42.60 | 42.25 | 3.318 | 3.231 |
| Jan-July | 15,657 | 32,729 | r149.30 | r142.77 | 44.54 | 43.54 | 3.352 | 3.279 |
| Aug-Dec | 7,260 | 11,900 | r130.41 | 127.95 | 39.88 | 40.44 | 3.270 | 3.164 |
| 1968 | r14,125 | 30,258 | r149.19 | r156.06 | 43.02 | 45,90 | 3.468 | 3.400 |
| Jan-Mar | 7,533 | 12.267 | r118.38 | r129.04 | 36.73 | 40.20 | 3.223 | 3.210 |
| Apr-Dec | 16.322 | 36,256 | r160.10 | r165,53 | 45.11 | 47.80 | 3.549 | 3.463 |
| 1969 | 16,842 | 37,625 | 166.65 | 168.91 | 44.38 | 46.29 | 3.755 | 3.649 |
| Base | | | | | | | | |
| 1947-49 | 10,700 | 27,100 | 64.20 | 63.11 | 44.83 | 44.10 | 1.432 | 1.431 |
| 1965-69 | 14,505 | 30,837 | 150.66 | 147.39 | 44.04 | 44.26 | 3.421 | 3.330 |
| and the second se | | | | | | | | |

r Revised

- 1/ Arizona estimates of copper mining employees include all full and part-time wage and salary workers who worked or received pay during the pay period which includes the 12th of the month. Proprietors, self-employed, unpaid family workers, domestics, and members of the armed forces are excluded.
- 2/ The U.S. figures are those reported for "All Employees".
- 3/ Estimates of hours and earnings of the Arizona Copper Mining Industry are based upon a sample of full and part-time production and related employees whose payroll and hours are reported for the pay period which includes the 12th of the month.
- 4/ The U.S. figures relate to Production workers in mining.
- Sources: "Employment and Earnings and Monthly Report on the Labor Force," U.S. Department of Labor, Bureau of Labor Statistics; "Arizona Current Employment Development," & "Arizona Average: Earnings and Hours in Selected Industries," both published by the Employment Security Commission of Arizona

(continued)

TABLE XIII (continued)

| | **E | 5 * * | יי ו | Average Earnings | |
|-------------------|---------------|---|------------------|-------------------|---|
| | Man | Hours | Total | Earnings | Per Man |
| | "A" x "C" | x No.Weeks | E., | x ''D'' | ''F'' ÷ ''A'' |
| Period | Arizona | U. S. | Arizona | U. S. | Arizona U.S. |
| 1965 | 33,235,384 | 67,478,320 | \$107,882,056 | \$212.556.708 | \$7,597 \$7,109 |
| 1966 | 35,726,080 | 73,091,590 | 118,610,586 | 235,281,828 | 7,803 7,273 |
| 1967 | r26,932,402 | 52,837,850 | r 89,361,710 | 170,719,093 | 7,350 7,099 |
| Jan-July | 21,153,217 | 43,225,381 | 70,905,583 | 141,736,024 | 7,764 7,424 |
| Aug-Dec | 6.273.174 | 10,426,863 | 20,513,279 | 32,990,595 | 6,781 6,654 |
| 1968 | r31.598.190 | 72,219,794 | r109,582,523 | 245,547,300 | 7,758 8,115 |
| Jan-Mar | 3,596,932 | 6,410,729 | 11,592,912 | 20,578,440 | 6,157 6,710 |
| Apr-Dec | 28,715,132 | 67.588.436 | 101,910,003 | 234.058.754 | 8,325 8,608 |
| 1969 | 38,867,294 | 90.566.385 | 145,946,689 | 330,476,739 | 8,666 8,783 |
| | ,, | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | 2.0,5.0,000 | ,, | - , |
| Base | | | | | |
| 1947-49 | 24,943,412 | 62,145,720 | 35,718,966 | 88,930,525 | 3,338 3,282 |
| 1005 00 | 22 017 610 | 70 071 070 | 110 607 1111 | 006 006 667 | 7 004 7 664 |
| 1965-69 | 33,217,610 | 70,971,972 | 113,637,444 | 230,330,00/ | 7,834 7,004 |
| Increase | | | | | 135% 134% |
| | | "G" | 0 | H. David | at in a f |
| | | Tons of Co | pper ores | Mine Produ | ction of |
| | | Sold or | ireated, | Recoverabl | e copper^ |
| | | Mine Pro | | T- D | aun da |
| | | in Short | Tons | In P | ounds |
| Period | | Arizona | U.S. | Arizona | 0.5. |
| 1965 | | 92,859,535 | 1/3,286,198 | 1,308,809,700 | 2,430,879,000 |
| 1966 | | 101,558,298 | 186,966,042 | 1,359,481,200 | 2,499,863,100 |
| 1967 | | 74,289,203 | 127,066,097 | 901,853,500 | 1,608,078,200 |
| 1053 | | 101,293,963 | 170,054,065 | 1,146,313,600 | 2,055,156,700 |
| 1969 | | 127,848,828 | 223,751,510 | 1,477,520,000 | 2,691,376,400 |
| 1965-69 Av | verage | 99,569,965 | 176,224,782 | 1,238,795,600 | 2,257,070,680 |
| Bose | | | | | |
| 1947-49 A | verage | 38,082,754 | 82,875,490 | 641,029,770 | 1,511,500,639 |
| | | | | | |
| | | Tons of Con | oper Ore* | Pounds o | of Copper* |
| | | Produced Per | Man Hour | Produced P | er Man Hour |
| | | Arizoni | U.S. | Arizona | U. S. |
| 1965-19 69 | Average | 2.9975 | 2.4830 | 37.2933 | 31.8022 |
| Base | | | | | |
| 1947-1949 | Average | 1 5268 | 1 3336 | 25 6004 | 2/1 2210 |
| | TACT ARE | 1.5200 | 1,0000 | 23.0394 | 24.3219 |
| Increase | | 96% | 86% | 45% | 31% |
| * Does no | ot include co | opper precipita | ate source mate: | rial or cement co | pper produced. |

TABLE XIV

SUMMARY OF ESTIMATED COPPER MINING EMPLOYMENT, WEEKLY EARNINGS, WEEKLY HOURS, HOURLY EARNINGS, IN ARIZONA AND UNITED STATES, BY YEARS 1947 TO 1969 INCLUSIVE

| | NO. OF E | MPLOYEES | WEEKLY | EARNINGS | WEEKLY | HOURS | / 4 | HOURLY E | ARNINGS |
|---------|----------|----------|----------|----------|--------|--------------------|------|----------|---------|
| 1947 | 10 700 | 25 700 | \$ 59 40 | \$59 27 | 45.0 | 44.8 | | \$1.32 | \$1.32 |
| 1048 | 10,900 | 27,800 | 65 99 | 65 81 | 45 2 | 45 2 | | 1 46 | 1.46 |
| 1949 | 10,500 | 27,300 | 66.98 | 63.96 | 44.3 | 42.3 | | 1.512 | 1.512 |
| 1947-49 | 10 700 | 07 100 | | | | <u>i s ter tri</u> | | | |
| Average | 10,700 | 27,100 | \$ 64.20 | \$63.11 | 44.83 | 44.1 | - | \$1.432 | \$1.431 |
| 1950 | 9,500 | 25,800 | \$ 75.80 | \$72.05 | 46.5 | 45.0 | | \$1.63 | \$1.601 |
| 1951 | 10,100 | 25,900 | 83.01 | 78.37 | 47.7 | 46.1 | | 1.74 | 1.70 |
| 1952 | 10,700 | 26,500 | 90.31 | 85.73 | 47.06 | 45.6 | | 1.92 | 1.88 |
| 1953 | 11,400 | 28,600 | 96.03 | 91.60 | 46.73 | 45.8 | 11.1 | 2.055 | 2.00 |
| 1954 | 11,900 | 27,400 | 96.60 | 87.33 | 45.31 | 42.6 | | 2.132 | 2.05 |
| 1955 | 11.800 | 27,200 | 104,90 | 95.70 | 47.0 | 44.1 | | 2.232 | 2.17 |
| 1956 | 13.300 | 34,400 | 112.07 | 100.95 | 47.1 | 43.7 | | 2.377 | 2.31 |
| 1957 | 14,000 | 32,500 | 106.22 | 98.23 | 43.8 | 41.1 | | 2.425 | 2.39 |
| 1958 | 13,500 | 28,400 | 95.40 | 94.62 | 39.8 | 39.1 | | 2.399 | 2.42 |
| 1959 | 11,100 | 22,400 | 108,15 | 106.25 | 42.8 | 42.5 | | 2.526 | 2.50 |
| 1960 | 12 733 | 29,600 | 116.83 | 114.75 | 43.69 | 43.3 | | 2.674 | 2.65 |
| 1961 | 13 117 | 27 000 | 126.29 | 119.03 | 44.8 | 43.6 | | 2,817 | 2.73 |
| 1962 | 13 350 | 28,500 | 129.29 | 120.98 | 44.3 | 42.9 | | 2.920 | 2.82 |
| 1963 | 13 393 | 27,800 | 133.81 | 124.48 | 44.6 | 43.1 | | 3.003 | 2.89 |
| 1964 | 13 275 | 27 000 | 140.97 | 130,42 | 45.0 | 42.9 | | 3.113 | 3.04 |
| 1965 | 14 200 | 29,900 | r146.10 | 136.71 | 45.0 | 43.4 | | r3.246 | 3.15 |
| 1966 | r15 200 | r32.350 | 150.06 | r142.26 | 45.2 | 43.5 | | 3.32 | 3.22 |
| 1967 | r12 158 | 24,050 | r141.35 | r136.51 | 42.6 | 42.3 | | 3.32 | 3.23 |
| 1968 | r14 125 | 30,258 | r149.19 | r156.06 | 43.0 | 45.9 | | 3.47 | 3.40 |
| 1969 | 16,842 | 37,625 | 166.65 | 168.91 | 44.4 | 46.3 | | 3.76 | 3.65 |
| | | | | | | | | | |

r Revised 1/ See Footnote 1/ Table XIII 2/ See Footnote 2/ Table XIII 3/ See Footnote 3/ Table XIII 4/ See Footnote 4/ Table XIII

Sources: "Employment and Earnings and Monthly Report on the Labor Force", U.S. Department of Labor, Bureau of Labor Statistics; "Arizona Current Employment Development" and "Arizona Average; Earnings and Hours in Selected Industries," both published by the Employment Security Commission of Arizona.

TABLE XV

UNITED STATES COPPER MINING - OUTPUT OF COPPER ORE; AMOUNT AND VALUE OF

COPPER, GOLD, AND SILVER RECOVERED THEREFROM. 2^{12}

| ************************************** | Tons Copper | Gold | Silver | Copper 2/ | Pounds Copper | Value of |
|--|-------------|---|--|---|--|--|
| | Ore | Ounces | Ounces & | Pounds & | Per Ton of Ore | Copper, Gold |
| Year | Annual Rate | & Value | Value | Value | & Price 3/ | & Silver |
| 1947) | 82,875,491 | 479,589 | 7,785,382 | 1,511,500,640 | 18.2 | |
| to) | | | | | | · |
| 1949) | | \$16,785,615 | \$7,045,770 | \$ 314,664,195 | 20.818¢ | \$338,495,580 |
| 1960 | 134,994,082 | 539,249 | 9,469,133 | 1,970,387,781 | 14.6 | |
| | | \$18,873,715 | \$8,569,565 | \$ 631,568,395 | 32.053¢ | \$659,011,675 |
| 1961 | 142,721,798 | 532,215 | 10,385,661 | 2,145,224,433 | 15.0 | |
| | | \$18,627,525 | \$9,601,544 | \$ 641,872,603 | 29.921¢ | \$670,101,672 |
| 1962 | 150,216,710 | 483,243 | 10,944,522 | 2,239,326,000 | 14.9 | |
| | × | \$16,913,505 | \$11,874,806 | \$ 685,233,756 | 30.500¢ | \$714,022,067 |
| 1963 | 146,449,540 | 438,537 | 10,309,897 | 2,178,498,800 | 14.9 | angangangalan na Manangalan dina dina dina dina dina dina dina di |
| | | \$15,348,795 | \$13.187,595 | \$ 666,620,633 | 30.600¢ | \$695,157,023 |
| 1964 | 155,200,464 | 430,630 | 11,470,890 | 2,280,880,781 | 14.7 | |
| - | • | \$15,072,050 | \$14,831,861 | \$ 688,734,761 | 31.960¢ | \$718,638,672 |
| 1965 | 173,286,198 | 567,531 | 12,801,638 | 2,430,879,000 | 14.0 | |
| | | \$19,863,585 | \$16,552,518 | \$ 851,220,899 | 35.017¢ | \$887,637,002 |
| 1966 | 186,966,042 | 547,327 | 13,230,411 | 2,499,863,100 | 13.37 | ĸĸ੶ੑਗ਼ਗ਼੶ੑੑਗ਼ੑੑੑਫ਼ਫ਼੶ੑੑੑ੶ੑੑਖ਼ੑਖ਼ਖ਼ੑੑਫ਼ਗ਼੶ਫ਼ਫ਼ੑਖ਼ਫ਼ਗ਼ੑਖ਼ਗ਼ਫ਼ੑਖ਼ਗ਼ਗ਼ਗ਼ਖ਼ਖ਼ਖ਼ਖ਼ਖ਼ਖ਼੶੶੶੶੶੶ਖ਼ਖ਼ੑਖ਼ਖ਼ਖ਼੶੶੶੶ਫ਼ਖ਼੶੶੶ਖ਼ਖ਼੶੶ਖ਼ਖ਼੶੶੶ਖ਼ਖ਼੶ |
| | | \$19,156,445 | \$17,106,921 | \$ 904,200,483 | 36.170¢ | \$940,463,849 |
| 1967 | 127,066,097 | 321,398 | 8,351,423 | 1,608,078,200 | 12.66 | |
| | | \$11,248,930 | \$12,942,033 | \$ 614,703,973 | 38.226¢ | \$638,894,935 |
| 1968 | 170,054,065 | 405,863 | 9,532,341 | 2,055,156,700 | 12.09 | finderlagehousteplane ander absorption over alle de la regeleration de la regeleration de la regeleration de la |
| | | \$15,934,506 4/ | \$20,443,059 | \$ 860,021,424 | 41.847¢ | \$896,398,989 |
| 1969 | 223,751,510 | 579,297 | 13,581,516 | 2,691,376,400 | 12.03 | n de meer van waar te alleer en an weer kante gevoer werne de teel maar de me |
| The second s | | \$24,048,994 5/ | \$24,320,013 | \$1,279,318,855 | 47.534¢ | \$1,327,687,865 |
| - 1 | | an and many weighting and the same date and shared and a stranged and the same stranged and | And the second | and the subscript of the second se | A second state of the second state of the second | |

1/ U. S. Bureau of Mines 2/ Does not include precipitate copper.

3/ E/MJ Annual Average Metal Prices, Domestic Refinery, E/MJ, Mar. 1970 p70
 4/ Calculated average annual price, \$39.2608/Troy Ounce.
 5/ Calculated average annual price, \$41.5141/Troy Ounce.

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ARIZONA SECTION

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| | | | |

ARIZONA'S COPPER INDUSTRY

Arizona's mines produced 801,363 tons of recoverable copper in 1969, more than ever before, and more than all of the other states combined. Furthermore, even the increase over 1968 of 173,402 tons was more copper than was produced by any other state in the nation except Utah. 1969 production was 8.4 percent ahead of the record set in 1966 and 27.6 percent ahead of 1968. The 1969 production value of \$761.8 million, was likewise ahead of 1968, reflecting the price increases referred to previously in this report.

Over two-thirds (67.7 percent) of the total production came from mines operated by four companies, namely Phelps Dodge Corp., (33%); Magma Copper Co., (14%) Kennecott Copper Corp., (11%) and the American Smelting and Refining Co., (9%). (See Table XIX) In 1960, four-fifths (80%) of the total production came from the mines of the Phelps Dodge Corp., Magma Copper Co., Kennecott Copper Corp., and the Inspiration Consolidated Copper Company.

The recoverable content of Arizona's copper ores was 0.58 percent in 1969 (not including precipitate copper) as compared to 0.75 percent in 1960. This drop from 15.0 to 11.6 pounds of copper per ton of ore is a decrease of 23 percent in grade of ore.

The value of Arizona's copper production in 1969, \$761.8 million amounted to 88.6 percent of the total value of all minerals produced. In addition, the copper ores were the source of all of the State's molybdenum output plus most of the gold and silver, valued at \$20.9 million, \$4.6 million, and \$11.0 million respectively. The total value of the four metals was \$798.3 million or 92.9 percent of the value of the total mineral output. In 1960, the value of the copper output was 83.2 percent of the total mineral value and that of the four metals was 86.7 percent of the total.

Arizona's unequaled mine production in 1969 resulted from both long established properties that had a year of steady, uninterrupted operation and new mines that came on stream after years of planning and preparation.

After more than four years of planning, overburden removal, and construction, The Anaconda Company's new Twin Buttes mine south of Tucson started operations on schedule in September with expectation of reaching an annual production rate of 60,000 tons of copper early in 1970. The company has reported that Twin Buttes reserves would permit increasing production at an appropriate time. The mine is an open pit from which ore and waste are removed by an extensive conveyor belt system. Molybdenum is an important by-product of the operation.

After more than 2 years of mine development and plant construction, Duval Sierrita Corp.'s big, new, copper-molybdenum mine south of Tucson at the end of 1969 was about ready to start production. Initially designed to process 66,000 tons of ore per day, it was soon announced that capacity would be increased to 72,000 tons per day. The Sierrita ore body is estimated to contain <u>hll</u> million tons of ore with an average content of 0.35 percent copper and 0.036 percent molybdenum.

1969 saw the start of projects of the Magma Copper Co. to expand its San Manuel and Superior divisions in Pinal County. An over-all investment of more than \$135 million is estimated for the projects. Production at the underground San Manuel mine will be increased from about 40,000 to over 60,000 ore tons per day by 1972. In addition, an electrolytic refinery will be built with a capacity to extract 200,000 tons of refined copper per year beginning in 1972. At the Superior division, production is to be increased from 1,500 tons of ore per day to 2,500 tons by 1974 by means of an additional shaft and expansion of mine and mill facilities. It is projected that Superior ore production will reach 3,000 tons per day by 1975. Plans call for the ultimate closing of the Superior smelter and shipment of concentrates to the San Manuel smelter.

Kennecott Copper Corporations' Ray Mines Division in 1969, completed an electrowinning plant to produce refined cathode copper from solutions from its silicate ore, vat leaching plant at Ray, also completed in the year. The \$35 million project, designed to treat 10,000 tons of ore daily, also involved completion of a \$13 million contact acid plant with a designed capacity of 750 tons per day.

Inspiration Consolidated Copper Co. in February 1969 started production of copper rod in its new mill at Miami. The 5/16 inch rod is supplied to Arizona wire and cable manufacturers. The company is the first to become an integrated, mine to manufactured product, copper producer in the State.

In December 1969, Hecla Mining Co., equal owner with El Paso Natural Gas Co. and to be operator of the Lakeshore copper property in Pinal County, started twin 7500 ft. inclined shafts as initial development work towards mining of the 470 million ton orebody averaging 0.75 percent copper discovered by El Paso Natural Gas in 1967-1969.

Phelps Dodge Corp. in June 1969 announced plans to develop its Metcalf mine near Morenci in Greenlee County. The \$100 million project including facilities for handling 30,000 tons of ore per day, was started late in the year and is scheduled for completion by early 1973. The production rate of 50,000 tons per year of copper is to replace the expected decline of production from its Bisbee . : mines.

Exploration for copper properties in Arizona continues to be very active, and several recent discoveries are being studied as to their economic feasibility.

1969 was a good year for copper in Arizona.

TABLE XVI

ARIZONA COPPER MINING - OUTPUT OF COPPER ORE; AMOUNT AND VALUE OF

COPPER, GOLD, SILVER, AND MOLYBDENUM RECOVERED THEREFROM 1/

| | ani ang inang nang nang nang nang nang n | and a second | анарыя паріалі (бразні аласти таласти различни) | (Thousands) | | | |
|------------|---|--|---|-----------------------------------|---------------------------------|---------------------------------|------------------------------------|
| e(**.) | Tons of Copper | Gold Ounces & | Silver Ounces & | Molybdenum <u>2</u> / Pounds & | Copper <u>3</u> / Pounds & | Pounds Copper Per Ton of Ore | Value of Copper, Gold. Silver & |
| Year | Annual Rate | Value | Value | Value | Value | & Price 4/ | Molybdenum |
| 1947 to | 38,082,754 | 79,612 | 2,603,485 | 474 | 723,353,767 | 19.0 | |
| 1949 | | \$2,786,420 | \$2,356,154 | \$ 349 <u>5</u> / | \$150,588,843 | 20.318¢ | \$156,080,417 |
| 1960 | 66,032,439 | 115,602 \$4,046,070 | 3,689,622 \$3,339,108 | 4,359 \$5,211 | 993,370,700 \$318,405,110 | 15.0 32.053¢ | \$331,001,288 |
| 1961 | 71,918,991 | 129,184 \$4,521,440 | 4,380,458 | 4,878 \$6,232 | 1,092,360,900 \$ 326,845,305 | 14.6 29.921c | \$341,648,435 |
| 1962 | 78,868,147 | 117,362 \$4,107,670 | 4,571,370 | 4,412 | 1,200,945,700 \$ 367,489,384 | 15.2 30.600c | \$382,420,990 |
| 1963 | 80,615,132 | 121,177 \$4,241,195 | 4,494,239 | 5,553 | 1,217,337,700 \$ 372,505,336 | 15.1 30.600c | \$390,073,663 |
| 1964 | 86,132,039 | 133,983 \$4,689,405 | 4,915,362 \$6,355,563 | 6,296 \$9,532 | 1,279,898,700 \$ 409,055,625 | 14.9 31.960c | \$429,632,593 |
| 1965 | 92,859,535 | 133,830 \$4,684,050 | 5,352,850 \$6,921,235 | 9,399 \$15,880 | 1,308,809,700 \$ 458,305,893 | 14.1 35.017c | \$485,791,178 |
| 1966 | 101,558,298 | 127,431 \$4,460,085 | 5,595,644 \$7,235,168 | 10,161 \$17,812 | 1,359,481,200 \$ 491,724,350 | 13.39 36.170c | \$521,231,603 |
| 1967 | 74,289,203 | 66,933 \$2,342,655 | 3,996,587 \$6,193,431 | 9,261 \$15,385 | 901,853,500 \$ 344,742,519 | 12.14 38.226c | \$368,663,605 |
| 1968 | 101,293,963 | 89,419 \$3,510,661 6/ | 4,697,394 \$10,074,031 | 12.127 | 1,146,313,600 \$ 479,697,852 | 11.32 41.847c | \$512,489,544 |
| 1969 | 127,848,828 | 108,718 \$4,513,330 7/ | 5,899,843 \$10,564,672 | 12,699 \$20,947 | 1,477,520,000 \$ 702,324,357 | 11.56 47.534c | \$738,349,359 |

1/ U.S. Bureau of Mines

2/ Molybdenum content of recovered concentrate.

3/ Does not include precipitate copper.

4/ E/MJ Annual Average Metal Prices, Domestic Refinery, E/MJ, Mar. 1970 p70

5/ Calculated from values of molybdenum concentrates shipped from U.S. Mines,

U. S. Bureau of Mines, Minerals Yearbook, 1949.

6/ Calculated average annual price, \$39.2608/Troy Ounce.

7/ Calculated average annual price, \$41.5141/Troy Ounce.

-2.8-

TABLE XVII

ARIZONA MINE PRODUCTION OF COPPER, LEAD, ZINC, GOLD AND SILVER

1858 - 1969 Incl. - In Terms of Recoverable Metals

| | COPPI | ER | LEA | D | ZINC |
|--|---|--|-------------------|------------------------------|---------------------------------|
| | Short Tons | Value (thousands) | Short Tons | Value (thousands) | Value Short Tons (thousands) |
| 1874 - 1968 | 22,351,299 | \$ 10,270,572 | 651,305 | \$129,028 | 1,020,795 \$ 249,154 |
| 1969 | 801,363 | 761,840 | 217 | 65 | 9,039 2,639 |
| Total 1874-1969 | 23,152,662 | \$ 11,032,412 | 651,522 | \$129,093 | 1,029,834 \$ 251,793 |
| | No. P | | | | |
| | Ounces | Value (thousands) | Ounces | Value (thousands) | |
| 1858 - 1968 | 13,640,412 | \$ 365,319 | 403,050,809 | \$ 336,423 | \$11,350,496,000 |
| 1969 | 110,878 | 4,603 | 6,141,000 | 10,997 | 780,144,000 |
| Total 1858 - 1969 | 13,751,290 | \$ 369,922 | 409,191,809 | \$ 347,420 | \$12,130,640,000 |
| Est. Value of Other M Est. Value of Other M Est. Value of Metals | Metals & Non-Metal Metals & Non-Metal & Non-Metals prod | llics Produced the llics Produced in luced thru 1969 | ru 1968. 1969. | \$ 888,701,000 79,331,000 | \$ 968,032,000 |
| Grand Total Estimated | Value of Arizona | Mineral Product | ion thru 1969 | | \$13,098,672,000 |

Source: U. S. Bureau of Mines.

TABLE XVIII

MINE PRODUCTION OF GOLD, SILVER, COPPER, LEAD AND ZINC IN ARIZONA, 1969, BY CLASSES OF ORE OR OTHER SOURCE MATERIALS, IN TERMS OF RECOVERABLE METALS

| Source | Number of mines <u>1</u> / | Material sold or treated (short tons) | Gold (troy ounces) | Silver (troy ounces) | Copper (thousand pounds) | Lead (thousand pounds) | Zinc (thousand pounds) |
|---|----------------------------------|--|--------------------------|----------------------------|--------------------------------|------------------------------|------------------------------|
| Lode ore: | | | 1 | | | | |
| Dry gold | 7 | 512 | 500 | 25 | 5 | | |
| Dry gold-silver | 8 | 63,565 | 139 | 4,245 | 1,057 | | |
| Dry silver | 18 | 104,272 | 153 | 83,110 | .677 | 13 | |
| Total 3/ | 33 | 168,349 | 792 | 87,380 | 1,738 | 13 | 2/ |
| Copper Copper-lead and | 45 | 127,848,828 | 108,718 | 5,899,843 | 1,477,520 | 1 | 478 |
| lead-zinc 4/ | 2 | 2,945 | 4 | 3,674 | 28 | 241 | 208 |
| Copper-zine | 1 | 103,838 | 26 | 36,460 | 6,404 | 34 | 17,307 |
| Lead | 8 | 571 | 106 | 5,224 | 1 | 126 | . 8 |
| Total 3/ | 56 | 127,956,182 | 108,854 | 5,945,201 | 1,483,953 | 403 | 18,001 |
| Other "lode" material: Gold-silver tailings | 1 | 59,199 | 533 | 21,211 | 176 | | |
| Cold_silver alegnup | 5/ | 20 | 2 | 25 | 1 | | |
| Silver tailings | -1 | 32,142 | 341 | 85.723 | | | |
| Copper cleanup | 5/ | 178 | 6 | 213 | 37 | | |
| Copper precipitates | 15 | 83,418 | | | 116,023 | | |
| Copper tailings | 1 | 133.617 | | | 749 | | |
| Lead cleanup, zinc cleanu and uranium ore 4/ | 1p 5/ | <u>6</u> / 217 | 345 | 1,269 | 48 | 18 | 76 |
| Total 3/ | 18 | 308,791 | 1,227 | 108,441 | 117,034 | 18 | 76 |
| Total "lode" material Placer | 90 1 | 128,433,322 | 110,873 5 | 6,141,022 | 1,602,726 | 434 | 18,078 |
| Total all sources | 91 | 128,433,322 | 110,878 | 6,141,022 | 1,602,726 | 434 | 18,078 |

1/ Detail will not necessarily add to totals because some mines produce more than one class of material.

 $\frac{2}{4}$ Less than 1/2 unit. $\frac{3}{2}$ Data may not add to totals because of independent rounding. $\frac{4}{4}$ Combined to avoid disclosing individual company confidential data.

5/ From properties not classed as mines. 6/Excludes uranium ore tonnage.

Source: U. S. Bureau of Mines

TABLE XIX

COPPER PRODUCTION RECORD OF LARGE ARIZONA COPPER MINES

YEARS 1968 and 1969

| | 5. S | | | × |
|------------------------|------------|---|------------|--------------|
| | | 1968 | 19 | 969 |
| | Tons | Pounds | Tons | Pounds |
| | Copper Ore | Copper | Copper Ore | Copper |
| - | Mined | Recovered | Mined | Recovered |
| PHELPS DODGE : | | | X | |
| Morenci | 15,474,029 | 190,550,991 | 19,270,608 | 250,900,610 |
| Precipitate Copper | | 23,162,309 | | 22,753,650 |
| New Cornelia | 9,018,377 | 117,087,616 | 10,736,239 | 135,584,362 |
| Lavender Pit | 4,715,382 | 42,519,649 | 5,550,147 | 58,535,646 |
| Precipitate Copper | , , | 6,882,147 | | 6,520,000 |
| Copper Queen | 622 597 | 44,808,595 | 781,959 | 58,628,154 |
| Precipitate Copper | 022,000 | 402 401 | ,, | 481.502 |
| | 1 | 102,401 | | , |
| Sub-Total | 20 830 385 | 125 113 708 | 36 338 053 | 533 /103 02/ |
| Sub-Iocal | 29,000,000 | 425,415,700 | 30.330.933 | 333,403,924 |
| KENNECOIT - Ray | 6,746,163 | 89,071,942 | 11,653,549 | 151,638,42 |
| Precipitate Copper | | 21,741,698 | | 29,967,59 |
| Sub-Total | 6,746,163 | 110,813,640 | 11,653,549 | 181,606,013 |
| TTTTES SEDVICE _ MIAMI | | | | |
| Miami | | 11.076.950 | | 13 755 800 |
| Copper Cities | 3.359.097 | 29,218,381 | 4 644 525 | 39 785 236 |
| " " Dump Leach | - , , | 4,355,962 | .,, | 3 799 103 |
| Castle Dome | | 2,430,667 | | 1.831.29 |
| | | | | |
| Sub-Total | 3,359,097 | 47,081,960 | 4,644,525 | 59,171,430 |
| INSPIRATION : | 6,167,134 | 63 282 621 | 8 514 309 | 03 762 105 |
| Precipitate Copper | 0,107,104 | 6 441 542 | 0,014,009 | 95,702,19 |
| Christmas Division | 1 173 407 | 15 282 665 | 1 012 913 | 21 201 26 |
| Precipitate Copper | 1,1/3,40/ | 19,202,000 | 1,913,013 | 21,501,20 |
| Ox Hide Mine | 1,070,230 | 743,763 | 3,908,540 | 7,242,99 |
| Sub-Total | 8,410,771 | 85,750,591 | 14,336,662 | 132.053.65 |
| | | والمؤام معادية والمنافقة والمتحرين مستواني منها والمواجع والمحاوي والمحاوي والمحاوي والمحاوي والمحاوي | | |
| MAGMA : | | | | |
| San Manuel | 11,367,640 | 144,148,653 | 15,280,816 | 191,443,36 |
| Precipitate Copper | | | | |
| Superior | 333,607 | 29,412,021 | 422,629 | 35,236,39 |
| Sub-Total | 11,701,247 | 173,560,674 | 15,703,445 | 226,679,76 |
| | | | | |

Continued

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TABLE XIX (continued)

COPPER PRODUCTION RECORD OF LARGE ARIZONA COPPER MINES (Continued)

YEARS 1968 and 1969

| | | 1968 | 1 | .969 |
|---|-----------------------------------|--|-------------------------------------|--|
| 0/19/1M - A19900 | Tons Copper Ore Mined | Pounds Copper Recovered | Tons Copper Ore Mined | Pounds Copper Recovered |
| A.S.& R. CO: Silver Bell Precipitate Copper Mission Unit Precipitate Copper | 3,907,900 6,009,700 | 43,665,411 4,908,962 76,118,920 | 3,874,100 7,939,500 | 40,076,810 5,226,103 97,322,040 |
| San Xavier Unit Siliceous flux ore | 41,873 | 397,197 | 69,684 | 1,050,694 |
| Sub-Total | 9,959,473 | 125,090,490 | 11,883,284 | 143,675,647 |
| PIMA MINING CO: Pima | 13,060,328 | 128,973,406 | 14,104,752 | 131,222,891 |
| Sub-Total | 13,060,328 | 128,973,406 | 14,104,752 | 131,222,891 |
| BAGDAD COPPER CORP: Precipitate Copper | 2,099,223 | 22,218,258 14,258,460 | 2,030,112 | 20,467,794 14,780,613 |
| Sub-Total | 2,099,223 | 36,476,718 | 2,030,112 | 35,248,407 |
| DUVAL: Esperanza Precipitate Copper Mineral Park Precipitate Copper Sierrita Precipitate Copper | 5,473,156 6,226,284 490,958 | 44,301,678 4,477,979 50,357,689 7,051,189 | 5,487,589 6,030,700 1,034,473 | 41,273,230 3,618,615 51,219,897 6,221,380 |
| Sub-Total | 12,190,398 | 106 188,535 | 12,552,762 | 102,333,122 |
| ANACONDA CO: Twin Buttes | 2 | ₹ru, 671,111 | 3,014,557 | 22,280,200 |
| Sub-Total | V aiz Sic i i | ⊰'umo) yttmmaù Jaèn | 3,014,557 | 22,280,200 |
| TOTALS | 97,357,085 | 1,239,349,722 | 126,262,601 | 1,567,675,046 |
| Other Copper Producers | 4,529,873 | 16,572,278 | 1,775,506 | r 35,050,954 |
| GRAND TOTAL | 101,886,958 | 1,255,922,000 | 128,039,207 | r 1,602,726,000 |

Source: Company Reports. U.S. Bureau of Mines figures used to compute amounts for "Other Copper Producers."

TABLE XX

SUMMARY OF TOTAL COVERED EMPLOYMENT & WAGES IN ARIZONA COPPER MINING

1948 -1969 INCLUSIVE

| nitiig alagidataana ingaata oo aasar dada aan | Average No. | ann aith ann ann ann ann ann ann ann ann ann an | Average | Average | Tons |
|---|-------------|---|----------|----------|-------------|
| COPPER | Covered | Covered | Annual | Weekly | Copper |
| MINING | Employees | Wages | Wage | Wage | Ores |
| 1948 | 11,493 | \$ 41,318,524 | \$ 3,595 | \$ 69.13 | 39,072,204 |
| 1949 | 11,001 | 40,612,224 | 3,692 | 71.00 | 37,365,611 |
| 1950 | 10,181 | 41,994,321 | 4,125 | 79.33 | 41.757.273 |
| 1951 | 10,754 | 47,825,698 | 4,447 | 85.52 | 42,784,388 |
| 1952 | 11,365 | 54,950,235 | 4,835 | 93.14 | 44,472,522 |
| 1953 | 12,068 | 62,742,982 | 5.199 | 99,98 | 45,187,838 |
| 1954 | 12,502 | 65,518,853 | 5,241 | 100.79 | 43,072,894 |
| 1955 | 12,399 | 71,293,263 | 5,750 | 110.58 | 52,189,728 |
| 1956 | 14,008 | 83,568,996 | 5,966 | 114.73 | 60,468,580 |
| 1957 | 14,652 | 85,125,320 | 5,809 | 111.71 | 59,571,834 |
| 1958 | 14,100 | 74,726,972 | 5,300 | 101.93 | 56,255,809 |
| 1959 | 11,568 | 72,095,130 | 6,232 | 119.85 | 53,121,545 |
| 1960 | 13,764 | 90,312,848 | 6,562 | 126.19 | 66,032,439 |
| 1961 | 14,275 | 97,271,286 | 6,814 | 131.04 | 71,918,991 |
| 1962 | 14,408 | 101,920,108 | 7,074 | 136.04 | 78,868,147 |
| 1963 | 14,303 | 104,291,588 | 7,292 | 140.23 | 80,615,132 |
| 1964 | 14,720 | 113,792,031 | 7,730 | 148.65 | 86,132,039 |
| 1965, | 15,239 | 122,163,124 | 8,016 | 154.16 | 92,859,535 |
| 19661 | 17,018r | 137,187,611 | 8,061r | 155.02r | 101,558,298 |
| 1967 | 13,426 | 108,427,206 | 8,076 | 155.31 | 74,289,203 |
| 1968 | 15,734 | 136,089,579 | 8.649 | 166.33 | 101.293.963 |
| 1969 | 19,459 | 173,183,018 | 8,900 | 171.15 | 127,848,828 |
| | | | | | |

r - Revised

1.1

Sources: Arizona Employment Security Commission and the U.S. Bureau of Mines

1/ Beginning with 1966, the number of covered employees includes the portion of copper smelter employees carried in Manufacturing.

TABLE XXI

Charles and such assert

4• ())))

AVERAGE NUMBER OF COVERED EMPLOYEES, TOTAL WAGES, AVERAGE ANNUAL WAGE AND AVERAGE WEEKLY WAGE

Base Period 1947-1949 and Years 1967, 1968 and 1969

ARIZONA INDUSTRIES COVERED BY SOCIAL SECURITY

| 1.497 | 0-4139-144 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)-194 (0)- | Average | | Average | Average |
|---|---|--|--|---|--|
| | 1999 - NA | No. of 1/ | Total | Annual | Weekly |
| | | Employees | Wages | Wage | Wage |
| | 122.07 | | | MARIT MADE | 9 Claesfor |
| A 1933 | and the second | | Base Period 194 | 7-1949 | |
| g Only 2/ | ((,))) | 11.278 | \$ 39,432,008 | \$3,496 | \$67.23 |
| ing 3/ | and a statistic provide the factor | 1,500 | 5,175,000 | 3,450 | 66.35 |
| Smelting | | 12,778 | \$ 44,607,008 | \$3,491 | \$67.13 |
| & Smelting | Ţ | 1,592 | 4,913,010 | 3,085 | 59.33 |
| uarrving & S | Smelting | 14.370 | \$ 49,520,018 | \$3,446 | \$66.27 |
| g (Excl. Sme | lting) | 12,639 | 36,910,624 | 2,920 | 56,15 |
| 9 | | 10.844 | 35,424,826 | 3,267 | 62.83 |
| lities (Exc) | L. R.R.s) | 10,530 | 29,948,944 | 2,844 | 54.69 |
| Retail Trade | a | 36.213 | 91,916,860 | 2.538 | 48.81 |
| sc. Incl. Ag | gri.) | 18,643 | 43,103,526 | 2,312 | 44.46 |
| AVERAGES | | 103,239 | \$286,824,798 | \$2,778 | \$53.42 |
| | | | ni, i fem | an i actual de maria de la seconda de la Esta de la seconda de la se | uni actur (n: |
| | | | | | |
| | | | | ties (FrailR | |
| S. S. A. | 6 - C. | | YEAR 1 | 967 | |
| No. C | | | | . (Teol, Astro | |
| « Onla 2/ | | | | + | A155 71 |
| g Univ Z/ | | 12,761 | \$103,324,280 | \$8,097 | \$100.11 |
| $\frac{1}{1}$ ing $\frac{4}{2}$ | | 12,761 665 | \$103,324,280 5,102,926 | \$8,097 7,674 | \$155.71 |
| ing 4/ | lting | 12,761 <u>665</u> 13,426 | \$103,324,280 5,102,926 \$108,427,206 | \$8,097 7,674 \$8,076 | \$155.71 147.58 \$155.31 |
| ing 4/ lining & Smel & Quarrying | lting | 12,761 665 13,426 1,363 | \$103,324,280 5,102,926 \$108,427,206 9,646,675 | \$8,097 7,674 \$8,076 7,078 | \$155.71 147.58 \$155.31 136.12 |
| ing 4/ ining & Sme & Quarrying Ouarrying & | lting g Smelting | 12,761 665 13,426 1,363 14,789 | \$103,324,280 5,102,926 \$108,427,206 9,646,675 \$118,073,881 | \$8,097 7,674 \$8,076 7,078 \$7,984 | \$155.71 147.58 \$155.31 136.12 \$153.54 |
| ing 4/ lining & Smel & Quarrying Quarrying & g (Excl. Sme | lting g Smelting elting) | 12,761 665 13,426 1,363 14,789 78,011 | \$103,324,280 5,102,926 \$108,427,206 9,646,675 \$118,073,881 554,221,621 | \$8,097 7,674 \$8,076 7,078 \$7,984 7,104 | \$155.71 147.58 \$155.31 136.12 \$153.54 136.62 |
| ing 4/ lining & Smel & Quarrying Quarrying & g (Excl. Sme | lting g Smelting elting) | 12,761 665 13,426 1,363 14,789 78,011 23,535 | \$103,324,280 5,102,926 \$108,427,206 9,646,675 \$118,073,881 554,221,621 190,096,812 | \$8,097 7,674 \$8,076 7,078 \$7,984 7,104 8,077 | \$155.71 147.58 \$155.31 136.12 \$153.54 136.62 155.33 |
| ing 4/ lining & Sme & Quarrying & g (Excl. Smu lities (Exc | lting Smelting elting) 1.R.R.s) | 12,761 665 13,426 1,363 14,789 78,011 23,535 22,990 | \$103,324,280 5,102,926 \$108,427,206 9,646,675 \$118,073,881 554,221,621 190,096,812 162,796,174 | \$8,097 7,674 \$8,076 7,078 \$7,984 7,104 8,077 7,081 | \$155.71 147.58 \$155.31 136.12 \$153.54 136.62 155.33 136.17 |
| ing 4/ lining & Sme & Quarrying & g (Excl. Smu lities (Exc Retail Tradu | lting g Smelting elting) l.R.R.s) e | 12,761 665 13,426 1,363 14,789 78,011 23,535 22,990 98,117 | \$103,324,280 5,102,926 \$108,427,206 9,646,675 \$118,073,881 554,221,621 190,096,812 162,796,174 463,417,889 | \$8,097 7,674 \$8,076 7,078 \$7,984 7,104 8,077 7,081 4,723 | \$155.71 147.58 \$155.31 136.12 \$153.54 136.62 155.33 136.17 90.83 |
| ing 4/ lining & Smel & Quarrying & g (Excl. Smel lities (Exc Retail Trade c. (Incl. A | lting Smelting elting) 1.R.R.s) e gri.) | 12,761 665 13,426 1,363 14,789 78,011 23,535 22,990 98,117 71,117 | \$103,324,280 5,102,926 \$108,427,206 9,646,675 \$118,073,881 554,221,621 190,096,812 162,796,174 463,417,889 349,470,467 | \$8,097 7,674 \$8,076 7,078 \$7,984 7,104 8,077 7,081 4,723 4,914 | \$155.71 147.58 \$155.31 136.12 \$153.54 136.62 155.33 136.17 90.83 94.50 |
| | g Only 2/ ing 3/ Smelting & Smelting warrying & S g (Excl. Sme lities (Excl Retail Trade sc. Incl. Ag AVERAGES | g Only 2/ ing 3/ Smelting & Smelting uarrying & Smelting g (Excl. Smelting) lities (Excl. R.R.s) Retail Trade sc. Incl. Agri.) AVERAGES | Average No. of <u>1</u> / <u>Employees</u> g Only <u>2</u> / ing <u>3</u> / Smelting & Smelting uarrying & Smelting g (Excl. Smelting) 12,778 <u>1,500</u> 12,778 <u>1,592</u> <u>14,370</u> 14,370 <u>12,639</u> 10,844 lities (Excl. R.R.s) 10,530 Retail Trade <u>36,213</u> <u>18,643</u> AVERAGES <u>103,239</u> | Average No. of 1/ Employees Total Wages Base Period 194 g Only 2/ 11,278 \$ 39,432,008 ing 3/ 1,590 5,175,000 Smelting 12,778 \$ 44,607,008 & Smelting 1,592 4,913,010 uarrying & Smelting 14,370 \$ 49,520,018 g (Excl. Smelting) 12,639 36,910,624 10,844 35,424,826 lities (Excl. R.R.s) 10,530 29,948,944 Retail Trade 36,213 91,916,860 sc. Incl. Agri.) 18,643 43,103,526 AVERAGES 103,239 \$286,824,798 | Average No. of 1/ Employees Total Wages Annual Mage Base Period 1947-1949 g Only 2/ ing 3/ Smelting 11,278 1,590 12,778 \$ 39,432,008 5,175,000 3,450 \$3,496 Smelting 1,590 12,778 \$ 44,607,008 44,607,008 \$3,491 & Smelting 12,778 \$ 44,607,008 49,520,018 \$3,446 g (Excl. Smelting) 12,639 14,370 \$ 49,520,018 49,520,018 \$3,446 g (Excl. Smelting) 12,639 12,639 36,910,624 2,920 \$3,446 \$3,446 g (Excl. Smelting) 12,639 10,844 35,424,826 3,267 \$3,267 \$3,267 lities (Excl. R.R.s) 10,530 29,948,944 2,844 \$444 2,844 \$424,826 3,267 \$2,678 Netrail Trade 36,213 91,916,860 2,538 \$2,312 \$3,239 \$286,824,798 \$2,778 AVERAGES 103,239 \$286,824,798 \$2,778 \$2,778 |

Source: Arizona Employment Security Commission

(Continued)

10-43 M 210.

| the state of the second se | Average No. of 1/ Employees | Total Wages | Average Annual Wage | Average Weekly Wage |
|--|-----------------------------------|-----------------|---------------------------|---------------------------|
| Copper Mining Only 2/ | 14,906 | \$129,262,538 | \$8,672 | \$166.77 |
| Copper Smelting 5/ | 828 | 6,827,041 | 8,245 | 158,56 |
| All Copper Mining & Smelting | 15,734 | \$136,089,579 | \$8,649 | \$166.33 |
| Other Mining & Quarrying | 1,179 | 8,693,338 | 7,373 | 141.79 |
| All Mining, Quarrying & Smelting | 16,913 | \$144,782,917 | \$8,560 | \$164.62 |
| Manufacturing (Excl. Smelting) | 83,555 | 625,968,789 | 7,492 | 144.08 |
| Construction | 26,680 | 224,007,626 | 8,396 | 161.46 |
| Trans. & Utilities (Excl.R.R.s) | 23,851 | 178,990,171 | 7,505 | 144.33 |
| Wholesale - Retail Trade | 102,655 | 510,816,657 | 4,976 | 95.69 |
| Services Misc. (Incl. Agri.) | 76,600 | 400,111,753 | 5,223 | 100.44 |
| TOTALS AND AVERAGES | 330,254 | \$2,084,677,913 | \$6,312 | \$121.38 |

YEAR 1968

YEAR 1969

| Copper Mining Only 2/ | 18,372 | \$163,930,795 | \$8,923 | \$171.60 |
|----------------------------------|---------|---|---|----------|
| Copper Smelting 6/ | 1,087 | 9,252,223 | 8,512 | 163.69 |
| All Copper Mining & Smelting | 19,459 | \$173,183,018 | \$8,900 | \$171.15 |
| Other Mining & Quarrying | 1,524 | 12,095,708 | 7,937 | 152.63 |
| All Mining, Quarrying & Smelting | 20,983 | \$185,278,726 | \$8,830 | \$169.81 |
| Manufacturing (Excl. Smelting) | 92,370 | 723,505,497 | 7,833 | 150.63 |
| Construction | 33,303 | 307,238,608 | 9,226 | 177.42 |
| Trans & Utilities (Excl.R.R.s) | 25,544 | 203,764,145 | 7,977 | 153.40 |
| Wholesale - Retail Trade | 112,774 | 592,249,783 | 5,252 | 101.00 |
| Services Misc. (Incl. Agri.) | 85,118 | 477,274,188 | 5,607 | 107.83 |
| TOTALS AND AVERAGES | 370,092 | \$2,489,310,947 | \$6,726 | \$129.35 |
| | | and the second | and a second where a descent to a second provided and the second s | |

1/ This number includes all covered employees on payroll, and is not restricted to production workers only, on which the average hourly and weekly earnings report. 2/ This number includes all copper mining and milling employees and some copper smelting employees not reported under Manufacturing by the Employment Security Commission.

3/ Smelting Employment has been segregated from Manufacturing as reported by the Employment Security Commission.

4/ Total covered Smelting Employees - 1,265 in 1967.

5/ Total covered Smelting Employees - 1,558 in 1968.

6/ Total covered Smelting Employees - 1,986 in 1969.

TABLE XXII

MINERAL PRODUCTION IN ARIZONA IN 1969 1/

| | | Value |
|--|--|-------------|
| | Quantity | (Thousands) |
| | | |
| Clays thousand short tons | 120 | \$394 |
| Copper (recoverable content of ores, etc.) short tons | 801,363 | 761,840 |
| Diatomite short tons | 725 | W |
| Gem stones | NA | 153 |
| Gold (recoverable content of ores, etc.) troy ounces | 110,878 | 4,603 |
| Gypsum thousand short tons | 83 | 424 |
| Helium, grade a 2/ thousand cubic feet | 56,300 | 1,126 |
| Iron ore (usable) thousand long tons, gross weight | 18 | 136 |
| Lead (recoverable content of ores, etc.) short tons | 217 | 65 |
| Lime thousand short tons | 283 | 5,074 |
| Mercury 76-pound flasks | W | W |
| Molybdenum (content of concentrate) thousand pounds | 12,699 | 20,947 |
| Natural gas (marketed) million cubic feet | 1,136 | 199 |
| Petroleum (crude)thousand 42-gallon barrels | 2,433 | 7,056 |
| Pumice thousand short tons | 910 | 814 |
| Sand and gravel thousand short tons | 16,744 | 18,224 |
| Silver (recoverable content of ores, etc.) | | |
| thousand troy ounces | 6,141 | 10.997 |
| Stone thousand short tons | 2,827 | 5,812 |
| Tungsten concentrate (60-percent WO3basis) short tons | 1 | 2 |
| Uranium (recoverable content U ₃ O 8) thousand pounds | W | W |
| Zinc (recoverable content of ores.etc.) short tons | 9.039 | 2,639 |
| Value of items that cannot be disclosed: Asbestos, | | |
| cement, feldspar, mica (scrap), perlite. | | |
| pyrites, vanadium, vermiculite, zeolite, | | |
| and values indicated by symbol W | XX | 18,970 |
| coal (bituminous 1968) | | |
| cour (breaminous, 1900) | for a second | |
| Total | XX | 859,475 |
| Total 1967 constant dollars | vv | - /725 125 |
| iotal 190/ Constant dollars | AA | P/123,125 |

p/ Preliminary. NA Not available. W Withheld to avoid disclosing individual company confidential data; included with "Value of items that cannot be disclosed." XX Not applicable.

1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers.)

2/ Bureau of Mines estimate from non-company sources.

3/ Estimate based on \$8.00 per pound for sales to the Atomic Energy Commission and an assumed price of \$6.50 per pound for commercial sales.