

LEAD AND ZINC INDUSTRY

ARIZONA, THE UNITED STATES AND THE WORLD
Statistics for 1970, 1971 and Other Years

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LEAD AND ZINC INDUSTRY
STATISTICS FOR 1970, 1971 (PRELIMINARY) AND OTHER YEARS
ARIZONA, THE UNITED STATES AND THE WORLD

REVIEW

Arizona

In 1949, the combined value of the output of Arizona's 181 lead, lead-zinc and zinc mines, was \$28,130,000. In 1970, Arizona's 8 very small producers of lead, zinc or both, and one fair-sized copper-zinc mine, produced lead or zinc ores or concentrates with combined value of \$2,947,000.

In 1949, Arizona was 4th among the states in lead and 2nd in zinc with 8 percent of the nation's lead and 12 percent of its zinc production. In 1971, it was 13th in lead and 12th in zinc with 0.2 percent of the lead and 1.6 percent of the zinc production. In 1949, of the 25 leading lead producers in the United States, Arizona's Copper Queen mine at Bisbee ranked 5th; the Tiger mine near Mammoth, 11th; the San Xavier near Sahuarita, 19th; and the Iron King at Humboldt, 22nd. Of the 25 leading zinc producers, the Copper Queen was 3rd, Iron King 14th and San Xavier 17th. In 1970, Arizona's Bruce mine near Bagdad, its only producer of a substantial quantity of zinc, was not among the leaders.

The preliminary figures for 1971 show continued decline in Arizona's lead-zinc production. The lead tonnage dropped from 285 to 115 and zinc from 9,618 to 7,942. Present indications are that production may drop still further, but who knows? More favorable conditions may spur discoveries capable of restoring the State's lead-zinc status; or someone might buy another idle mine for taxes, as was done in 1934 with the Iron King, which thereafter became Arizona's largest lead-zinc mine and one of the nation's 25 leading producers, until 1968 when it was closed.

The United States

Although preliminary figures of the Bureau of Mines, prepared March 29, 1972, show that United States lead production in 1971 increased for the 9th consecutive year, the increase is a mere 0.3 percent, compared to a 12 percent gain in 1970. The Bureau figures also show a 2.3 percent rise in consumption in 1971, due to increased storage battery requirements of the automobile industry. The preliminary figure for 1971 is 0.2 percent above the record consumption in 1969. The 1970 and 1971 figures for U.S. mine production are respectively 571,767 and 573,377 tons; and for U.S. consumption of primary and secondary lead, are 1,360,552 and 1,392,400 tons. Imports exceeded exports by 352,221 tons in 1970 and 250,000 in 1971.

Domestic lead production far exceeded demand in 1970 and primary smelter and refinery stocks nearly doubled. Production was practically the same in 1971 in spite of continued low prices, increases in operating costs, and capital requirements for pollution control, which resulted in the shut-down of some mines and smelters. Missouri continued its high 1970 rate of production, 75 percent of the 1970 and 74 percent of the 1971 U.S. total. Most of it came from its new field, the largest in the world, in the southeastern part of the state.

The U.S. zinc industry had a bad year in 1970 and a worse one in 1971 when four smelters closed and another announced its planned closure. Domestic mine production dropped 3.4 percent to 534,136 tons in 1970; and another 8.0 percent in 1971 to 491,636 tons, according to U.S. Bureau of Mines preliminary figures. Consumption of slab zinc dropped 14 percent in 1970 to 1,186,951 tons; then rose 11 percent to 1,259,043 tons according to the preliminary 1971 figures. Zinc stocks at producer and consumer plants combined rose 12 percent in 1970; but dropped 21 percent in 1971 according to the preliminary figures. Net imports increased 10 percent in 1970 to 814,913 tons and then 13 percent in 1971 to 917,598 tons. In 1971, 52 percent of the domestic zinc production came from the following eastern states, listed with their ranking among the producing states in parentheses: Tennessee (1), New York (2), New Jersey (6), Pennsylvania (7), Virginia (10) and Maine (16). Tennessee alone accounted for 23 percent of the total. In 1949, their total was only 22 percent of the nation's output.

The monthly average of New York lead prices held at 16.50 cents per pound from January through June then fell to 14.19 for December in 1970. London prices rose a little to 15.24¢/lb. in March then declined to 12.49 in December. In 1971, the New York price held at 13.50 through May and averaged 14.02 for December. On March 1, 1972, it had moved up to 15.50. The monthly average of quoted prices for common zinc at East St. Louis held at 15.50 cents per pound through July 1970 and at 15.00 cents for September 1970 through February 1971. It then rose gradually to 17.00 for August through December and on until mid-March, 1972, when the Federal Price Commission allowed a large company to raise, thus creating a 17-18 cent, probably temporary, quotation.

The Free World

Free world mine production of lead was up about 5 percent in 1970 while consumption stayed about the same as in 1969, but in 1971 production is reported to have fallen off for the first time since 1964 while consumption increased a little and stocks declined. The U.S. lead price picked up a little after the President's imposition of a 10 percent surcharge on imports in August 1971, but the London price plunged about 22 percent then recovered 40 percent of the plunge after the surcharge was lifted in December. Low prices and increasing

costs made 1971 a difficult year; some Free World mines and smelters closed. Pressure to eliminate use of anti-knock lead compounds in gasoline has been lessened by recent contention that its use offers better air than is to be had without it. This, forecasts of rapid expansion of Free World demand, and improved economic conditions so far in 1972, give promise of a better year.

L E A D

PHYSICAL PROPERTIES

Lead is one of the most important of the nonferrous metals used in industry. Its chief uses are in storage batteries and anti-knock gasoline for automobiles. Its alloys and chemical compounds have wide usage, especially in construction.

Lead is the softest and heaviest of the common metals. It is very malleable and can be rolled into foil less than 0.0005 inches thick, but it is inelastic and cannot be drawn into fine wire. Alloying is the only method of hardening it.

Some of the physical properties of lead (Plumbum. Symbol Pb) are:

Atomic weight - 207.19. Specific gravity - 11.344.

Melting point - 327.4°C. Boiling point 1,620°C.

Specific resistance 20.65 microhms (20°-40°C).

Hardness (Mohs' scale) - 1.5. Tensile strength - 3,000 lbs./sq. in.

Crystal structure - Isometric. Bivalent or tetravalent.

METAL DUTIES ON LEAD

In effect in 1971

| | |
|--|--------------|
| Lead in ores and concentrates. | 0.75¢/lb. |
| Lead-bullion, pigs, bars, Babbitt metal, solder, type metal, scrap and antimonial lead dross | .1.0625¢/lb. |
| Lead pipe, sheets, rods, angles, bars, wire. | 11%* |

* If valued at 13 1/3¢/lb. or less, duty would have been 1.3125¢/lb.

Z I N C

PHYSICAL PROPERTIES

Zinc is a hard metal, ductile if pure, but in its commercial forms, brittle. Its importance is due largely to its corrosion resistance and use as a protective coating or galvanizing on iron and steel, and to its use in alloys, particularly for die-castings. Alone, zinc has few uses except in sheets for weather-proofing. Zinc compounds are important as pigments, fillers and chemicals. Domestic zinc oxide is produced directly from ores by fuming, and is used extensively, especially in rubber, paint and ceramic industries. The symbol for zinc is Zn. Physical properties other than those above are:

Atomic weight - 65.37. Specific gravity - 7.14.

Melting point - 419.5°C. Boiling point - 907°C.

Electrical resistivity - 5.916 microhms per c.c.

Tensile strength, cast - 9,000 lbs. per sq. in. Rolled - 21,000.

Crystal structure - hexagonal. Bivalent.

METAL DUTIES ON ZINC

In effect in 1971

| | |
|--|------------|
| In ores and concentrates. | .0.67¢/lb. |
| In unwrought slabs, pigs, dust. | .0.70¢/lb. |
| In scrap, dross and skimmings | .0.75¢/lb. |
| In plate, sheets, angles, pipe, powder, die-cast alloy. | 11% |
| In uncoated wire. | 7% |

TABLE I
MINE PRODUCTION OF RECOVERABLE LEAD AND ZINC IN ARIZONA ^{1/}

| Year | Number of Mines | Tons Material Treated | Tons Lead | Tons Zinc | Value of Lead | Value of Zinc | E/MJ Annual | |
|-------|-----------------------|-----------------------------|--------------|--------------|---------------------|---------------------|--|-----------------------|
| | | | | | | | Avg. Price ¢/lb. Lead ^{2/} | Zinc ^{3/} |
| 1949 | 174 | 968,301 | 33,568 | 70,658 | \$10,607,000 | \$17,523,000 | 15.4¢ | 12.1¢ |
| 1950 | 139 | 888,099 | 26,383 | 60,480 | \$ 7,123,000 | \$17,176,000 | 13.3¢ | 13.9¢ |
| 1951 | 136 | 954,985 | 17,394 | 52,999 | \$ 6,018,000 | \$19,292,000 | 17.5¢ | 18.0¢ |
| 1952 | 112 | 819,752 | 16,520 | 47,143 | \$ 5,319,000 | \$15,651,000 | 16.5¢ | 16.2¢ |
| 1953 | 68 | 452,660 | 9,428 | 27,530 | \$ 2,470,000 | \$ 6,332,000 | 13.5¢ | 10.9¢ |
| 1954 | 45 | 346,313 | 8,385 | 21,461 | \$ 2,297,000 | \$ 4,636,000 | 14.0¢ | 10.7¢ |
| 1955 | 46 | 408,486 | 9,817 | 22,684 | \$ 2,925,000 | \$ 5,580,000 | 15.1¢ | 12.3¢ |
| 1956 | 46 | 452,191 | 11,999 | 25,580 | \$ 3,768,000 | \$ 7,007,000 | 16.0¢ | 13.5¢ |
| 1957 | 45 | 481,327 | 12,441 | 33,905 | \$ 3,558,000 | \$ 7,866,000 | 14.7¢ | 11.4¢ |
| 1958 | 31 | 388,987 | 11,890 | 28,532 | \$ 2,782,000 | \$ 5,821,000 | 12.1¢ | 10.3¢ |
| 1959 | 22 | 449,166 | 9,999 | 37,325 | \$ 2,300,000 | \$ 8,585,000 | 12.2¢ | 11.4¢ |
| 1960 | 22 | 515,075 | 8,495 | 35,811 | \$ 1,988,000 | \$ 9,239,000 | 11.9¢ | 12.9¢ |
| 1961 | 22 | 433,680 | 5,937 | 29,585 | \$ 1,223,000 | \$ 6,804,000 | 10.9¢ | 11.5¢ |
| 1962 | 16 | 487,115 | 6,966 | 32,888 | \$ 1,282,000 | \$ 7,564,000 | 9.6¢ | 11.6¢ |
| 1963 | 17 | 419,853 | 5,815 | 25,419 | \$ 1,256,000 | \$ 5,846,000 | 11.1¢ | 12.0¢ |
| 1964 | 17 | 447,372 | 6,147 | 24,690 | \$ 1,611,000 | \$ 6,716,000 | 13.6¢ | 13.6¢ |
| 1965 | 16 | 425,895 | 5,913 | 21,757 | \$ 1,845,000 | \$ 6,353,000 | 16.0¢ | 14.5¢ |
| 1966 | 17 | 342,279 | 5,211 | 15,985 | \$ 1,575,000 | \$ 4,636,000 | 15.115¢ | 14.5¢ |
| 1967 | 12 | 362,776 | 4,771 | 14,330 | \$ 1,336,000 | \$ 3,967,000 | 14.000¢ | 13.8¢ |
| 1968 | 12 | 121,348 | 1,704 | 5,441 | \$ 450,000 | \$ 1,469,000 | 13.212¢ | 13.5¢ |
| 1969 | 11 | 107,354 | 217 | 9,039 | \$ 65,000 | \$ 2,639,000 | 14.895¢ | 14.6¢ |
| 1970 | 11 | 133,773 | 285 | 9,618 | \$ 89,000 | \$ 2,947,000 | 15.619¢ | 15.319¢ |
| 1971p | | | 115 | 7,942 | \$ 32,000 | \$ 2,562,000 | 13.800¢ | 16.128¢ ^{4/} |

^{1/} U.S. Bureau of Mines. p preliminary. ^{2/} Common lead, N.Y. ^{3/} Prime Western, E. St. Louis

^{4/} Delivered price, effective January 1971; E. St. Louis quotation dropped.

TABLE II

MINE PRODUCTION OF GOLD, SILVER, COPPER, LEAD AND ZINC IN ARIZONA, 1970, BY CLASSES
OF ORE OR OTHER SOURCE MATERIALS, IN TERMS OF RECOVERABLE METALS ^{1/}

| Source | Number of mines ^{2/} | Material sold or treated (short tons) | Gold (troy ounces) | Silver (troy ounces) | Copper (short tons) | Lead (short tons) | Zinc (short tons) |
|--------------------------------------|----------------------------------|---|--------------------------|----------------------------|---------------------------|-------------------------|-------------------------|
| Lode ore: | | | | | | | |
| Dry gold | 1 | 144 | 65 | 85 | ^{3/} | - | - |
| Dry gold-silver | 6 | 60,682 | 451 | 12,753 | 479 | 1 | - |
| Dry silver | 8 | 28,917 | 55 | 82,109 | 1 | 1 | - |
| Total | 15 | 89,743 | 571 | 94,947 | 480 | 2 | - |
| Copper | 51 | 150,240,842 | 107,292 | 7,130,261 | 847,147 | 2 | 50 |
| Copper-zinc | 3 | 130,953 | 249 | 58,408 | 3,760 | 210 | 9,402 |
| Lead | 5 | 360 | 1 | 2,277 | ^{3/} | 31 | 2 |
| Lead-zinc and zinc ^{4/} | 3 | 2,460 | 2 | 1,025 | 9 | 37 | 163 |
| Total | 64 | 150,374,615 | 107,544 | 7,191,971 | 850,916 | 280 | 9,618 |
| Other lode material: | | | | | | | |
| Gold-silver and silver tailings | 2 | 62,646 | 839 | 31,503 | 104 | - | - |
| Copper cleanup | ^{5/} | 701 | - | 1,964 | 164 | - | - |
| Copper precipitates | 14 | 87,856 | - | - | 66,220 | - | - |
| Copper tailings and lead tailings | 2 | 20,700 | 899 | 10,032 | 32 | 3 | ^{3/} |
| Total | 18 | 171,903 | 1,738 | 43,499 | 66,521 | 3 | ^{3/} |
| Grand Total | 82 | 150,636,261 | 109,853 | 7,330,417 | 917,918 | 285 | 9,618 |

^{1/} U.S. Bureau of Mines.

^{2/} Detail will not necessarily add to totals because some mines produce more than one class of material.

^{3/} Less than $\frac{1}{2}$ unit.

^{4/} Combined to avoid disclosing individual company data.

^{5/} From properties not classed as mines.

TABLE III
SALIENT LEAD STATISTICS FOR 1968-1970
ARIZONA, THE UNITED STATES AND THE WORLD
(In short tons, except as indicated)

| <u>UNITED STATES</u> | <u>1968</u> | <u>1969</u> | <u>1970</u> |
|---|-------------|-------------|-------------|
| Mine Production Recoverable Lead | 359,156 | 509,013 | 571,767 |
| Value | \$94,903 | 151,635 | 178,609 |
| Secondary Lead from scrap <u>2/</u> | 550,879 | 603,905 | 597,390 |
| Imported in Ore, Matte, Bullion <u>3/</u> | 87,844 | 111,245 | 112,702 |
| Imported in Pigs, Bars <u>3/</u> | 338,120 | 278,380 | 244,623 |
| Imported in Scrap, etc. <u>3/</u> | 6,481 | 6,962 | 6,857 |
| Production of Refined Primary | | | |
| From U.S. ores & Base Bullion | 349,039 | 513,931 | 528,086 |
| From Foreign ores & Base Bullion | 118,271 | 124,724 | 133,644 |
| Exported Lead in Pigs & Bars <u>4/</u> | 8,281 | 4,968 | 7,747 |
| Exported in Scrap | 937 | 2,340 | 4,214 |
| Stocks (lead content) Dec. 31 at: | | | |
| Primary Smelters & Refineries | 90,427 | 101,860 | 192,985 |
| Consumer Plants | 78,900 | 126,404 | 133,502 |
| Reported Consumption | 1,328,790 | 1,389,358 | 1,360,552 |
| Percent of Reported Consumption: | | | |
| Mine Production | 27.03% | 36.64% | 42.02% |
| Mine and Secondary Production | 68.49% | 80.10% | 85.93% |
| <u>ARIZONA</u> Mine Production | 1,704 | 217 | 285 |
| <u>WORLD</u> Mine Production | 3,314,992 | 3,568,602 | 3,740,171 |
| <u>PRICE</u> of Common Lead per lb. | | | |
| New York, E/MJ | 13.21¢ | 14.90¢ | 15.62¢ |
| London | 10.88¢ | 13.09¢ | 13.76¢ |

1/ U.S. Bureau of Mines. 2/ Old and new scrap.

3/ General imports include material for immediate use as well as under bond. Bullion, is base bullion. Scrap is reclaimed.

4/ 1969 and 1970 exports are unwrought and wrought lead and lead alloys (new classification).

5/ Recoverable lead.

TABLE IV

U.S. AND ARIZONA MINE PRODUCTION OF RECOVERABLE LEAD

Tons, Value and Price by Years, 1947-1950, 1957-1971, Inclusive 1/

| Year | Avg. Price <u>2/</u> ¢ per lb. | U.S. Mine Production | | Arizona Mine Production | |
|--------------|-----------------------------------|----------------------|----------------|-------------------------|--------------|
| | | Short Tons | Value | Short Tons | Value |
| 1947 | 14.673 | 384,221 | \$ 112,750,000 | 28,566 | \$ 8,227,000 |
| 1948 | 18.043 | 390,476 | 140,907,000 | 29,899 | 10,704,000 |
| 1949 | 15.364 | 409,908 | 125,957,000 | 33,568 | 10,607,000 |
| 1950 | 13.296 | 430,827 | 114,566,000 | 26,383 | 7,123,000 |
| 1947-50 Avg. | 15.344 | 403,858 | 123,545,000 | 29,604 | 9,165,000 |
| 1956 | 16.013 | 352,826 | 112,996,000 | 11,999 | 3,768,000 |
| 1957 | 14.658 | 338,216 | 99,151,000 | 12,441 | 3,558,000 |
| 1958 | 12.109 | 267,377 | 64,753,000 | 11,890 | 2,782,000 |
| 1959 | 12.211 | 255,586 | 62,419,000 | 9,999 | 2,300,000 |
| 1960 | 11.948 | 246,669 | 58,944,000 | 8,495 | 1,988,000 |
| 1961 | 10.871 | 261,921 | 56,947,000 | 5,937 | 1,223,000 |
| 1962 | 9.631 | 236,956 | 45,642,000 | 6,966 | 1,282,000 |
| 1963 | 11.137 | 253,369 | 56,435,000 | 5,815 | 1,256,000 |
| 1964 | 13.596 | 286,010 | 77,772,000 | 6,147 | 1,611,000 |
| 1965 | 16.000 | 301,147 | 96,367,000 | 5,913 | 1,845,000 |
| 1966 | 15.115 | 327,368 | 98,964,000 | 5,211 | 1,575,000 |
| 1967 | 14.000 | 316,931 | 88,741,000 | 4,771 | 1,336,000 |
| 1968 | 13.212 | 359,156 | 94,903,000 | 1,704 | 450,000 |
| 1969 | 14.895 | 509,013 | 151,635,000 | 217 | 65,000 |
| 1970 | 15.619 | 571,767 | 178,609,000 | 285 | 89,000 |
| 1971p | 13.800 | 573,377 | 158,252,000 | 115 | 32,000 |

1/ U.S. Bureau of Mines p Preliminary2/ E/MJ, Annual Average Metal Price, N.Y. Common Lead.

TABLE V

MINE PRODUCTION OF RECOVERABLE LEAD IN THE UNITED STATES, BY STATES ^{1/}

(In Short Tons)

| <u>State</u> | <u>1967</u> | <u>1968</u> | <u>1969</u> | <u>1970</u> | <u>1971^p</u> |
|----------------------------|-------------|-------------|-------------|-------------|-------------------------|
| Arizona | 4,771 | 1,704 | 217 | 285 | 115 |
| California | 1,735 | 4,001 | 2,518 | 1,772 | 2,216 |
| Colorado | 21,923 | 19,778 | 21,767 | 21,855 | 24,386 |
| Idaho | 61,387 | 54,790 | 65,597 | 61,211 | 65,084 |
| Illinois | 2,384 | 1,467 | 791 | 1,532 | 1,489 |
| Kansas | 1,031 | 1,227 | 395 | 80 | - |
| Kentucky | 845 | 2/ | - | - | - |
| Missouri | 152,649 | 212,611 | 355,452 | 421,764 | 427,737 |
| Montana | 898 | 1,870 | 1,753 | 996 | 494 |
| Nevada | 1,500 | 863 | 1,420 | 364 | 76 |
| New Mexico | 1,827 | 1,363 | 2,368 | 3,550 | 2,895 |
| New York | 1,653 | 1,396 | 1,686 | 1,280 | 879 |
| Oklahoma | 2,727 | 2,387 | 605 | 797 | - |
| Utah | 53,813 | 45,205 | 41,332 | 45,377 | 38,726 |
| Virginia | 3,430 | 3,573 | 3,358 | 3,356 | 3,384 |
| Washington | 2,762 | 5,655 | 8,649 | 6,784 | 5,185 |
| Wisconsin | 1,596 | 1,126 | 1,102 | 761 | 711 |
| Other States ^{3/} | - | 140 | 3 | 3 | - |
| Total | 316,931 | 359,156 | 509,013 | 571,767 | 573,377 |

^p Preliminary estimates

^{1/} U.S. Bureau of Mines

^{2/} Included with "Other States"

^{3/} Includes Alaska, Oregon, South Dakota, Tennessee and, for 1968, Kentucky, to avoid disclosing individual company confidential data.

TABLE VI

UNITED STATES IMPORTS AND EXPORTS OF LEAD ^{1/}
(Lead Content in Short Tons)

IMPORTS, by country of origin

| <u>Ore, Matte, etc.</u> | <u>1968</u> | <u>1969</u> | <u>1970</u> |
|------------------------------|----------------|----------------|----------------|
| Canada | 36,815 | 48,606 | 41,337 |
| Mexico | 303 | 301 | 440 |
| Honduras | 9,272 | 12,988 | 15,054 |
| Colombia | 1 | 345 | 464 |
| Peru | 13,976 | 22,582 | 21,337 |
| Bolivia | 5,718 | 3,605 | 3,041 |
| Republic of South Africa | 608 | 365 | |
| Australia | 20,592 | 20,335 | 29,360 |
| Other Countries | 551 | 125 | 1,373 |
| Total | 87,836 | 109,252 | 112,406 |
| <u>Base Bullion</u> | | | |
| Australia | - | 1,979 | - |
| Canada | 8 | 1 | - |
| Mexico | - | 13 | 170 |
| United Kingdom | - | - | 126 |
| Total | 8 | 1,993 | 296 |
| <u>Pigs and Bars</u> | | | |
| Canada | 60,161 | 44,457 | 63,753 |
| Mexico | 56,516 | 57,451 | 38,368 |
| Peru | 75,105 | 57,249 | 52,473 |
| Belgium-Luxembourg | 18,649 | 1,315 | 680 |
| France | 4,604 | 5,627 | 1,255 |
| West Germany | 20,711 | 1,289 | 703 |
| United Kingdom | 22,919 | 8,664 | 2,928 |
| Yugoslavia | 19,775 | 27,862 | 18,765 |
| Australia | 46,919 | 60,791 | 51,705 |
| Republic of South Africa | 8,298 | 12,558 | 12,984 |
| Other Countries | 4,463 | | 1,009 |
| Total | 338,120 | 278,380 | 244,623 |
| <u>Reclaimed Scrap, etc.</u> | <u>Total</u> | | |
| | 6,481 | 6,962 | 6,857 |
| GRAND TOTAL, IMPORTS | 432,445 | 396,587 | 364,182 |
| GRAND TOTAL, EXPORTS | 9,218 | 7,308 | 11,961 |
| EXCESS IMPORTS | 423,227 | 389,279 | 352,221 |

^{1/} U. S. Bureau of Mines

TABLE VII

LEAD IMPORTED AND EXPORTED BY THE UNITED STATES 1/
(In Short Tons)

| <u>Year</u> | <u>Imports</u> | <u>Exports</u> | <u>Net Imports</u> |
|----------------|----------------|----------------|--------------------|
| 1948-1952 Avg. | 434,909 | 3,500 | 431,409 |
| 1958 | 601,044 | 3,386 | 597,658 |
| 1959 | 410,697 | 4,121 | 406,576 |
| 1960 | 359,656 | 5,843 | 353,813 |
| 1961 | 409,402 | 11,733 | 397,669 |
| 1962 | 402,752 | 7,467 | 395,285 |
| 1963 | 389,081 | 3,513 | 385,568 |
| 1964 | 340,993 | 23,342 | 317,651 |
| 1965 | 350,110 | 11,604 | 338,506 |
| 1966 | 439,088 | 5,933 | 433,155 |
| 1967 | 498,523 | 6,930 | 491,593 |
| 1968 | 432,445 | 9,218 | 423,227 |
| 1969 | 396,587 | 7,308 | 389,279 |
| 1970 | 364,182 | 11,961 | 352,221 |
| 1971p | 265,375 | 15,498 | 249,877 |

TABLE VIII

CONSUMPTION OF LEAD IN THE UNITED STATES 1/

Unit: Short Tons

| <u>Year</u> | <u>Metal Products</u> | <u>Storage Batteries</u> | <u>Pigments</u> | <u>Gasoline Additives</u> | <u>Other Uses</u> | <u>TOTAL</u> |
|-------------|-----------------------|--------------------------|-----------------|---------------------------|-------------------|--------------|
| 1958 | 382,822 | 312,725 | 95,901 | 159,412 | 35,527 | 986,387 |
| 1959 | 407,520 | 380,732 | 103,671 | 160,020 | 39,206 | 1,091,149 |
| 1960 | 369,731 | 353,196 | 98,541 | 163,826 | 35,878 | 1,021,172 |
| 1961 | 359,302 | 367,998 | 94,824 | 169,802 | 35,290 | 1,027,216 |
| 1962 | 380,623 | 419,906 | 102,968 | 168,926 | 37,212 | 1,109,635 |
| 1963 | 396,797 | 439,081 | 99,075 | 192,811 | 35,594 | 1,163,358 |
| 1964 | 406,523 | 429,348 | 103,636 | 223,466 | 39,165 | 1,202,138 |
| 1965 | 410,344 | 455,347 | 108,883 | 225,203 | 41,705 | 1,241,482 |
| 1966 | 440,117 | 472,492 | 119,888 | 246,879 | 44,501 | 1,323,877 |
| 1967 | 404,104 | 466,665 | 103,190 | 247,170 | 39,387 | 1,260,516 |
| 1968 | 401,797 | 513,703 | 109,734 | 261,897 | 41,659 | 1,328,790 |
| 1969 | 390,588 | 582,546 | 102,386 | 271,128 | 42,710 | 1,389,358 |
| 1970 | 351,452 | 593,453 | 98,736 | 278,505 | 38,406 | 1,360,552 |
| 1971p | 340,948 | 625,259 | 87,397 | 264,240 | 74,547 2/ | 1,392,400 |

1/ U.S. Bureau of Mines. Primary and secondary metal. p Preliminary.

2/ Includes 46,000 tons of estimated undistributed consumption.

TABLE IX

WORLD MINE PRODUCTION OF LEAD, (CONTENT OF ORE), BY COUNTRIES 1/

(Thousands of Short Tons)

| Year | U. S. A. <u>2/</u> | MEXICO | CANADA | PERU <u>2/</u> | AUSTRALIA | REST OF FREE WORLD | TOTAL FREE WORLD | SOVIET <u>e</u> <u>3/</u> SPHERE | TOTAL WORLD (ESTIMATED) |
|-------|-----------------------|--------|--------|-------------------|-----------|-----------------------|---------------------|-------------------------------------|----------------------------|
| 1961 | 262 | 200 | 183 | 150 | 302 | 840 | 1,937 | 703 | 2,640 |
| 1962 | 237 | 213 | 211 | 141 | 415 | 820 | 2,037 | 728 | 2,765 |
| 1963 | 253 | 209 | 199 | 164 | 460 | 796 | 2,081 | 694 | 2,775 |
| 1964 | 286 | 187 | 206 | 166 | 420 | 794 | 2,059 | 718 | 2,777 |
| 1965 | 301 | 184 | 303 | 170 | 406 | 841 | 2,205 | 762 | 2,967 |
| 1966 | 327 | 192 | 323 | 160 | 409 | 904 | 2,315 | 823 | 3,138 |
| 1967 | 317 | 189 | 340 | 176 | 421 | 895 | 2,338 | 821 | 3,159 |
| 1968 | 359 | 192 | 360 | 170 | 429 | 949 | 2,459 | 856 | 3,315 |
| 1969 | 509 | 188 | 331 | 170 | 497 | 974 | 2,669 | 900 | 3,569 |
| 1970p | 572 | 195 | 395 | 171 | 496 | 977 | 2,806 | 934 | 3,740 |

e Estimate. p Preliminary.

1/ U.S. Bureau of Mines. 2/ Recoverable. 3/ Some Smelter Production Included in Data.SOVIET SPHERE, MINE PRODUCTION OF LEAD, (CONTENT OF ORE), BY COUNTRIES 1/

(Thousands of Short Tons)

| COUNTRIES | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970p |
|-----------------------------|---------------|---------------|------|------|------|------|------|------|------|-------|
| Bulgaria | 88 | 104 | 98 | 101 | e110 | e110 | 95 | 104 | 101 | 130 |
| China, Mainland <u>e/</u> | 99 | 99 | 110 | 110 | 110 | 110 | 100 | 110 | 110 | 110 |
| Korea, North <u>e/</u> | 55 | 55 | 55 | 60 | 66 | 66 | 72 | 77 | 77 | 77 |
| Poland | 42 | 42 | 43 | 42 | 45 | 50 | 49 | 53 | 60 | 67 |
| Rumania <u>e/</u> <u>2/</u> | 13 | 14 | 14 | 14 | 17 | 44 | 44 | 36 | 48 | 46 |
| U. S. S. R. | <u>2/</u> 390 | <u>2/</u> 390 | 347 | 364 | 386 | 413 | 440 | 460 | 485 | 485 |
| Other <u>3/</u> | 16 | 24 | 27 | 27 | 28 | 30 | 21 | 20 | 19 | 19 |
| Total <u>e/</u> | 703 | 728 | 694 | 718 | 762 | 823 | 821 | 860 | 900 | 934 |

e Estimate. p Preliminary.

1/ U.S. Bureau of Mines. 2/ Smelter Production 3/ Includes Czechoslovakia, E. Germany and Hungary

TABLE X

U.S. AND ARIZONA MINE PRODUCTION OF RECOVERABLE ZINC

TONS, VALUE AND PRICES BY YEARS FROM 1947 to 1969 INCLUSIVE 1/

| Year | Average Price <u>2/</u> cts./lb. | U.S. Mine Production | | Arizona Mine Production | |
|-------|--|----------------------|---------------|-------------------------|--------------|
| | | Short Tons | Value | Short Tons | Value |
| 1947 | 10.500 | 637,608 | \$133,898,000 | 54,644 | \$13,224,000 |
| 1948 | 13.589 | 629,977 | 171,215,000 | 54,478 | 14,491,000 |
| 1949 | 12.144 | 593,203 | 144,077,000 | 70,658 | 17,523,000 |
| 1950 | 13.866 | 623,375 | 172,874,000 | 60,480 | 17,176,000 |
| 1951 | 18.000 | 681,189 | 245,228,000 | 52,999 | 19,292,000 |
| 1952 | 16.215 | 666,001 | 215,984,000 | 47,143 | 15,651,000 |
| 1953 | 10.855 | 547,430 | 118,847,000 | 27,530 | 6,332,000 |
| 1954 | 10.681 | 473,471 | 101,143,000 | 21,461 | 4,636,000 |
| 1955 | 12.299 | 514,671 | 126,599,000 | 22,684 | 5,580,000 |
| 1956 | 13.494 | 542,340 | 146,367,000 | 25,580 | 7,009,000 |
| 1957 | 11.399 | 531,735 | 121,225,000 | 33,905 | 7,866,000 |
| 1958 | 10.309 | 412,005 | 84,947,000 | 28,532 | 5,821,000 |
| 1959 | 11.448 | 425,303 | 97,377,000 | 37,325 | 8,585,000 |
| 1960 | 12.946 | 435,427 | 112,741,000 | 35,811 | 9,239,000 |
| 1961 | 11.542 | 464,390 | 107,200,000 | 29,585 | 6,804,000 |
| 1962 | 11.625 | 505,491 | 117,527,000 | 32,888 | 7,564,000 |
| 1963 | 11.997 | 529,254 | 126,989,000 | 25,419 | 5,846,000 |
| 1964 | 13.568 | 574,858 | 155,993,000 | 24,690 | 6,716,000 |
| 1965 | 14.500 | 611,153 | 177,234,000 | 21,757 | 6,353,000 |
| 1966 | 14.500 | 572,558 | 166,044,000 | 15,985 | 4,636,000 |
| 1967 | 13.843 | 549,413 | 151,562,000 | 14,330 | 3,967,000 |
| 1968 | 13.500 | 529,446 | 142,950,000 | 5,441 | 1,469,000 |
| 1969 | 14.600 | 553,124 | 161,512,000 | 9,039 | 2,639,000 |
| 1970 | 15.319 | 534,136 | 163,650,000 | 9,618 | 2,947,000 |
| 1971p | 16.128 <u>3/</u> | 491,636 | 158,582,000 | 7,942 | 2,562,000 |

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1/ U.S. Bureau of Mines.2/ E/MJ, Annual Average Metal Price, E. St. Louis, Prime Western Zinc.3/ Delivered price, effective January 1971; E. St. Louis quotation dropped.

TABLE XI
STATISTICS OF THE UNITED STATES ZINC INDUSTRY 1/

| | Short Tons | | | |
|-------------------------------|------------------|------------------|------------------|------------------|
| | <u>1968</u> | <u>1969</u> | <u>1970</u> | <u>1971p</u> |
| Stocks Jan. 1 | | | | |
| Producers | 81,916 | 65,379 | 65,788 | 98,314 |
| Consumers | <u>102,535</u> | <u>101,818</u> | <u>102,007</u> | <u>89,551</u> |
| Total | <u>184,451</u> | <u>167,197</u> | <u>167,795</u> | <u>187,865</u> |
| Production of Slab Zinc from: | | | | |
| Domestic Ores | 499,491 | 458,754 | 403,953 | |
| Foreign Ores | 521,400 | 581,843 | 473,858 | |
| Scrap | <u>79,865</u> | <u>70,553</u> | <u>77,156</u> | |
| Total | <u>1,100,756</u> | <u>1,111,150</u> | <u>954,967</u> | <u>840,178</u> |
| Imports (general): Slab Zinc | <u>304,576</u> | <u>324,776</u> | <u>270,413</u> | <u>319,072</u> |
| GRAND TOTAL | <u>1,589,783</u> | <u>1,607,355</u> | <u>1,393,175</u> | <u>1,347,115</u> |
| Exports - Slab, Pigs, Blocks | <u>33,011</u> | <u>9,298</u> | <u>288</u> | <u>13,347</u> |
| Stocks Dec. 31 | | | | |
| Producers | 65,379 | 65,788 | 98,314 | 50,589 |
| Consumers | <u>101,818</u> | <u>102,007</u> | <u>89,551</u> | <u>98,355</u> |
| Total | <u>167,197</u> | <u>167,795</u> | <u>187,865</u> | <u>148,944</u> |
| Apparent Consumption | <u>1,389,575</u> | <u>1,426,030</u> | <u>1,205,052</u> | <u>1,184,824</u> |
| Reported Consumption | | | | |
| Slab Zinc | 1,350,656 | 1,385,350 | 1,186,951 | 1,259,043 |
| Zinc in ores <u>2/</u> | | | | 123,400 |

p Preliminary.

1/ U.S. Bureau of Mines.

2/ Excluding that used for slab zinc.

TABLE XII

MINE PRODUCTION OF RECOVERABLE ZINC, BY STATES 1/
(Short Tons)

| <u>STATE</u> | <u>1967</u> | <u>1968</u> | <u>1969</u> | <u>1970</u> | <u>1971p</u> |
|-----------------|-------------|-------------|-------------|-------------|--------------|
| Arizona | 14,330 | 5,441 | 9,039 | 9,618 | 7,942 |
| California | 441 | 3,525 | 3,327 | 3,514 | 2,720 |
| Colorado | 52,442 | 50,258 | 53,715 | 56,694 | 59,519 |
| Idaho | 56,528 | 57,248 | 55,900 | 41,052 | 43,140 |
| Illinois | 20,416 | 18,182 | 13,765 | 16,797 | 12,248 |
| Kansas | 4,765 | 3,012 | 1,900 | 1,186 | --- |
| Kentucky | 6,317 | 4,603 | 4,988 | 4,189 | 4,334 |
| Maine | --- | 5,099 | 7,639 | 9,114 | 5,751 |
| Missouri | 7,430 | 12,301 | 41,099 | 50,721 | 51,029 |
| Montana | 3,341 | 3,778 | 6,143 | 1,457 | 81 |
| Nevada | 3,035 | 2,104 | 941 | 127 | 39 |
| New Jersey | 26,041 | 25,668 | 25,076 | 28,683 | 28,580 |
| New Mexico | 21,380 | 18,686 | 24,308 | 16,601 | 14,189 |
| New York | 70,555 | 66,194 | 58,728 | 58,577 | 62,781 |
| Oklahoma | 10,670 | 6,921 | 2,744 | 2,650 | --- |
| Pennsylvania | 35,067 | 30,382 | 33,035 | 29,554 | 27,458 |
| Tennessee | 113,065 | 124,039 | 124,532 | 118,260 | 111,396 |
| Utah | 34,251 | 33,153 | 34,902 | 34,688 | 26,624 |
| Virginia | 18,846 | 19,257 | 18,704 | 18,063 | 17,317 |
| Washington | 21,540 | 13,884 | 9,738 | 11,956 | 5,874 |
| Wisconsin | 28,953 | 25,711 | 22,901 | 20,634 | 10,614 |
| TOTAL <u>2/</u> | 549,413 | 529,446 | 553,124 | 534,135 | 491,636 |

1/ U.S. Bureau of Mines. p Preliminary.2/ Listed figures only.

TABLE XIII

ZINC IMPORTED AND EXPORTED BY THE UNITED STATES 1/
(In Short Tons)

| Year | IMPORTS (General) | | | EXPORTS Blocks, Pigs or Slabs | NET IMPORTS |
|-------|-------------------|--------------------------|---------|-------------------------------------|----------------|
| | Zinc In Ores | Blocks, Pigs or Slabs | TOTAL | | |
| 1959 | 500,115 | 156,963 | 657,078 | 11,629 | 645,449 |
| 1960 | 457,155 | 120,767 | 577,922 | 75,144 | 502,778 |
| 1961 | 415,700 | 127,562 | 543,262 | 50,055 | 493,207 |
| 1962 | 467,398 | 141,957 | 609,355 | 36,102 | 573,253 |
| 1963 | 372,769 | 144,757 | 517,526 | 33,853 | 483,673 |
| 1964 | 357,145 | 118,340 | 475,485 | 26,515 | 448,970 |
| 1965 | 428,040 | 152,990 | 581,030 | 5,939 | 575,091 |
| 1966 | 521,320 | 278,175 | 799,495 | 1,406 | 798,089 |
| 1967 | 534,092 | 222,112 | 756,204 | 16,809 | 739,395 |
| 1968 | 543,366 | 304,576 | 847,942 | 33,011 | 814,931 |
| 1969 | 602,120 | 324,776 | 926,896 | 9,298 | 917,598 |
| 1970 | 525,759 | 270,413 | 796,172 | 288 | 795,884 |
| 1971p | 342,600 | 319,072 | 661,672 | 13,347 | 648,325 |

TABLE XIV

IMPORTS AND EXPORTS OF ZINC BY THE UNITED STATES 1/
(In Short Tons)

| Country of Origin | IMPORTS (General) | | | |
|--------------------------------------|-------------------|---------|---------|---------|
| | 1968 | 1969 | 1970 | 1971p |
| Zinc Content of Ores: | | | | |
| Canada | 310,586 | 367,529 | 317,992 | 209,165 |
| Honduras | 12,959 | 15,272 | 19,267 | 21,511 |
| Mexico | 142,313 | 143,747 | 128,949 | 89,844 |
| Peru | 39,899 | 57,087 | 48,037 | 15,026 |
| Other Countries | 37,609 | 18,485 | 11,514 | 7,054 |
| Total in Ores | 543,366 | 602,120 | 525,759 | 342,600 |
| Blocks, Pigs or Slabs | | | | |
| Australia | 19,915 | 34,237 | 30,335 | 38,554 |
| Belgium-Luxembourg | 16,500 | 13,296 | 14,371 | 9,367 |
| Canada | 116,874 | 148,851 | 120,611 | 150,868 |
| Japan | 45,735 | 52,502 | 32,525 | 8,705 |
| Mexico | 19,034 | 12,092 | 7,358 | 10,130 |
| Peru | 53,729 | 30,204 | 31,923 | 23,873 |
| Other Countries | 32,789 | 33,594 | 33,290 | 77,575 |
| Total Blocks, Pigs or Slabs | 304,576 | 324,776 | 270,413 | 319,072 |
| TOTAL IMPORTS | 847,942 | 926,896 | 796,172 | 661,672 |
| TOTAL EXPORTS (Blks., Pigs or Slabs) | 33,011 | 9,298 | 288 | 13,347 |
| NET IMPORTS | 814,931 | 917,598 | 795,884 | 648,325 |

1/ U.S. Bureau of Mines. p Preliminary.

TABLE XV

CONSUMPTION OF SLAB ZINC IN THE UNITED STATES 1/
(In Short Tons)

| <u>Year</u> | <u>Galvanizing</u> | <u>Brass & Bronze</u> | <u>Zinc-Base Alloys</u> | <u>Rolled Zinc</u> | <u>Zinc Oxide</u> | <u>Other Uses <u>2/</u></u> | <u>Total</u> |
|-------------|--------------------|---------------------------|-------------------------|--------------------|-------------------|-----------------------------|---------------------|
| 1955 | 451,141 | 146,243 | 430,807 | 51,589 | 22,433 | 17,599 | 1,119,812 |
| 1956 | 439,146 | 124,004 | 360,507 | 47,359 | 19,160 | 18,614 | 1,008,790 |
| 1957 | 367,757 | 112,390 | 376,039 | 41,269 | 20,428 | 17,737 | 935,620 |
| 1958 | 381,229 | 101,375 | 316,830 | 40,616 | 13,331 | 14,946 | 868,327 |
| 1959 | 361,027 | 129,278 | 389,331 | 42,949 | 18,248 | 15,364 | 956,197 |
| 1960 | 371,589 | 99,023 | 338,373 | 38,696 | 15,593 | 14,610 | 877,884 |
| 1961 | 382,077 | 128,523 | 341,766 | 41,204 | 18,137 | 19,506 | 931,213 |
| 1962 | 388,570 | 129,805 | 423,608 | 42,233 | 18,517 | 29,088 | 1,031,821 |
| 1963 | 420,287 | 128,237 | 468,619 | 42,166 | 16,037 | 29,767 | 1,105,113 |
| 1964 | 456,336 | 135,095 | 524,582 | 44,181 | 19,991 | 27,083 | 1,207,268 |
| 1965 | 482,421 | 126,848 | 637,970 | 45,882 | 25,781 | 35,190 | 1,354,092 |
| 1966 | 509,436 | 185,552 | 606,036 | 52,612 | 28,438 | 41,592 | 1,423,666 |
| 1967 | 472,470 | 131,537 | 535,118 | 45,443 | 29,774 | 36,331 | 1,250,673 |
| 1968 | 498,774 | 161,906 | 562,946 | 48,943 | 34,937 | 43,150 | 1,350,656 |
| 1969 | 493,381 | 179,469 | 576,391 | 48,650 | 41,447 | 46,042 | 1,385,380 |
| 1970 | 474,249 | 127,747 | 463,636 | 41,065 | 43,829 | 36,425 | 1,186,951 |
| 1971p | 449,150 | 146,641 | 498,926 | 34,966 | 40,037 | 29,323 | 1,199,043 <u>3/</u> |

1/ U.S. Bureau of Mines. p Preliminary.

2/ Includes Zinc used in making Zinc Dust, Bronze Powder, Alloys, Chemicals, Castings and Miscellaneous items not elsewhere mentioned.

3/ Does not include estimated consumption of 60,000 tons by plants which report annually only.

TABLE XVI

UNITED STATES CONSUMPTION OF ZINC BY SOURCE CLASS 1/
(Short Tons)

| <u>Class</u> | <u>1968</u> | <u>1969</u> | <u>1970</u> | <u>1971p</u> |
|-----------------------------------|-------------|-------------|-------------|--------------|
| Slab Zinc | 1,350,656 | 1,385,380 | 1,186,951 | 1,259,043 |
| Recoverable Zinc from: | | | | |
| Ores used for non-slab zinc items | 124,109 | 126,712 | 124,781 | 123,400 |
| Zinc-base scrap <u>2/</u> | 101,316 | 100,636 | 93,451 | 87,600 |
| Copper-base scrap | 162,853 | 194,356 | 160,027 | 135,200 |
| Aluminum & magnesium-base scrap | 6,423 | 7,083 | 6,386 | 6,000 |
| Total | 1,745,357 | 1,814,167 | 1,571,596 | 1,611,243 |

p Preliminary. 1/ U.S. Bureau of Mines. 2/ Excludes scrap used for redistilled slab zinc and remelt spelter.

TABLE XVII

WORLD MINE PRODUCTION OF ZINC, (CONTENT OF ORE) BY COUNTRIES ^{1/}

(Thousand Short Tons)

| Year | U. S. A. ^{3/} | Canada | Mexico | Peru ^{3/} | Italy | Australia | Japan | West Germany | Other ^{3/} | Total |
|-------|---------------------------|--------|--------|-----------------------|-------|-----------|-------|-----------------|---------------------|-------|
| 1961 | 464 | 443 | 296 | 192 | 150 | 349 | 185 | 134 | 736 | 2,949 |
| 1962 | 505 | 502 | 277 | 179 | 144 | 378 | 212 | 124 | 709 | 3,030 |
| 1963 | 529 | 497 | 264 | 215 | 118 | 394 | 218 | 119 | 782 | 3,136 |
| 1964 | 575 | 730 | 260 | 261 | 130 | 386 | 239 | 123 | 795 | 3,499 |
| 1965 | 611 | 911 | 248 | 281 | 127 | 391 | 244 | 120 | 808 | 3,741 |
| 1966 | 573 | 1,047 | 242 | 284 | 128 | 414 | 280 | 118 | 823 | 3,909 |
| 1967 | 549 | 1,249 | 266 | 336 | 137 | 449 | 290 | 117 | 848 | 4,241 |
| 1968 | 529 | 1,273 | 265 | 321 | 154 | 466 | 291 | 122 | 909 | 4,330 |
| 1969 | 553 | 1,316 | 279 | 331 | 146 | 559 | 297 | 122 | 1,035 | 4,638 |
| 1970p | 534 | 1,366 | 291 | 349 | 120 | 534 | 308 | 135 | 1,119 | 4,756 |

SOVIET SPHERE

WORLD

| Year | Bulgaria | China Mainland ^{e/} | North Korea ^{e/} | Poland | Other ^{4/} | U. S. S. R. ^{e/} | Total | Total |
|-------|------------------|---------------------------------|------------------------------|--------|---------------------|---------------------------|-------|-------|
| 1961 | 82 | 110 | 100 | 154 | 10 | 440 | 896 | 3,845 |
| 1962 | 69 | 110 | 100 | 160 | 11 | 450 | 900 | 3,930 |
| 1963 | 64 | 110 | 110 | 162 | 14 | 440 | 900 | 4,036 |
| 1964 | 71 | 110 | 110 | 166 | 14 | 470 | 941 | 4,440 |
| 1965 | 73 | 110 | 115 | 168 | 15 | 520 | 1,001 | 4,742 |
| 1966 | 75 | 110 | 115 | 166 | 17 | 550 | 1,033 | 4,942 |
| 1967 | 75 | 100 | 125 | 173 | 21 | 595 | 1,089 | 5,330 |
| 1968 | 82 | 110 | 132 | 181 | 54 | 595 | 1,154 | 5,484 |
| 1969 | 85 | 110 | 138 | 188 | 61 | 672 | 1,254 | 5,892 |
| 1970p | 99 ^{e/} | 110 | 143 | 209 | 72 | 672 | 1,305 | 6,061 |

^{e/} Estimate. p Preliminary. ^{1/} U.S. Bureau of Mines. ^{2/} Recoverable zinc. ^{3/} Includes 33 countries.

^{4/} East Germany and Hungary, 1961-70. Czechoslovakia added, 1967-70, and Rumania, 1968-70, prior figures not being available.