GOLD, SILVER, AND MOLYBDENUM

Statistics for 1968, 1969 (Preliminary) and Other Years

ARIZONA, THE UNITED STATES, AND THE WORLD

Section I. Gold

Section 2. Silver

Section 3. Molybdenum

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C O N T E N T S

Continued

C O N T E N T S

G O L D

PHYSICAL PROPERTIES 1/

Gold is a heavy, soft, yellow, ductile, malleable metallic element in group 1 of the periodic system. Symbol, Au; valences, 1 and 3; isometric; atomic number, 79; atomic weight, 196.967; specific gravity, 19.32 (at 20°C); melting point, 1063°C; boiling point, 2,966°C; specific electrical resistivity, 2.42 microhms per cubic centimeter; insoluble in water and in acids; and soluble in aqua regia, in potassium cyanide solutions, and in hot sulfuric acid. Most of the metal is retained in gold reserves but some is used in jewelry. Gold is commonly alloyed with varying percentages of copper and silver. White gold is usually an alloy with nickel, but in dentistry this alloy contains platinum or palladium. (Chambers Technical Dictionary, MacMillan Co., New York 3rd ed., 1958, 1028pp.; supplement, pp952-1028.; Handbook of Chemistry and Physics, 45th ed., 1964, pp B-112, B-177.)

Gold 2/ was one of the first metals used by man.

Its workability, beauty, resistance to tarnish and corrosion, and scarcity, accounted for its early use in jewelry, ornaments, and money. It has been sought throughout most of man's existence over most of the world, and has influenced the course of history.

While much of today's gold production is absorbed by governments and central banks, substantial amounts are going into the aircraft and aerospace industries in brazing alloys and on thermal control surfaces. Parts for the communications industry are made of alloys containing gold or of metals clad with it, and such use is growing. Its functional reliability more than offsets its relative high price.

1/ Bureau of Mines - A Dictionary of Mining, Mineral and Related Terms, 1968, p498.
2/ Mineral Facts and Problems, Bulletin 630, U.S. Bureau of Mines, U. S. Department of the Interior, pp387-397.

G O L D - 1968-1969

A R I Z O N A

Arizona's gold production in both 1968 and 1969 ranked fourth in value, after copper, molybdenum, and silver, among the State's metallic commodities. The gold was mainly a by-product of the copper industry and production increased along with that of copper in 1968 and 1969. The value of gold output was increased also by higher prices following the establishment of the "two-tier" price system in March, 1968.

Arizona's production of recoverable gold for the years 1955-1969 is to be found in Table I of the Appendix.

Seven of the first 25 leading gold producing mines in the United States in 1968 were in Arizona. Each of the seven raised its rank from that of 1967 except the Iron King and the Christmas mine, which was a newcomer to the group and moved into the 20th spot as shown below.

Mine	Operator	Source of Gold	Rank 1967	Rank 1968
New Cornelia	Phelps Dodge Corp.	Copper, gold silver ores	(8)	(6)
Copper Queen - Lavender Pit	" " "	Copper Ore	(9)	(7)
San Manuel	Magma Copper Co.	Copper Ore	(13)	(10)
Morenci	Phelps Dodge Corp.	Copper, Gold silver ores	(17)	(13)
Magma	Magma Copper Co.	Copper Ore	(20)	(16)
Iron King	Shattuck Denn Mining Corp.	Lead-Zinc Ore	(11)	(18)
Christmas	Inspiration Consolidated Copper Co.	Copper Ore	(-)	(20)

Source: U. S. Bureau of Mines.

In 1968, 93 percent of Arizona's gold production was a by-product of the copper industry; 6 percent came from lead-zinc ores; and 1 percent came from other ores. Comparative figures were 83, 16, and 1 percent respectively in 1967.

Table II, Arizona Production of Gold and Silver in 1968, shows the ore sources of both metals.

UNITED STATES PRODUCTION

United States production of recoverable gold in 1968 was 1,478,292 Troy ounces; down almost 7 percent from 1967. Table IV of the Appendix shows that the drop was due mainly to decreased production from gold ores in Nevada and South Dakota combined with reduced placer output in California, which more than

offset gains in other states. By-product gold from the copper industry, however, gained in 1968 over 1967 as smelters were down only 3 months due to the copper strike, instead of 5 in 1967.

The U. S. Bureau of Mines has reported a preliminary figure for 1969 production of 1.7 million ounces; up 15 percent over 1968 as a new gold mine began operations in Nevada and by-product gold came from the copper industry without interruption.

United States monetary stocks declined early in 1968 then reversed their trend and continued their comeback through 1969.

Prompted by the heavy outflow of gold from the United States, central banks of the United States and 6 other nations formed an agreement in early 1968 designed to maintain their remaining gold reserves by restricting sales from monetary stocks to official use only and no longer supplying gold to the London or any other market, thus establishing a "two-tier" price system. Gold outside these central banks was left to seek its own level, thus establishing a free market for gold, subject to the laws of the United States and other countries. The U. S. Treasury then terminated both its purchases of gold from domestic producers and sales to domestic consumers. "Domestic producers could sell and export freely to foreign buyers as well as to authorized domestic users." The latter could "Continue to import gold or to purchase gold from domestic producers within the limits of their licenses or authorizations under the Gold Regulations." There was no change of the prohibition of unauthorized private holdings of gold by U. S. Citizens either in the United States or abroad.

The establishment of a gold market essentially free of government influence resulted in domestic prices above the official $35. The average weekly free-market gold price in 1968 fluctuated between $37.55 and $42.81 an ounce and at year-end was $42.30. The average price for the year was $39.26.

1968 was a year with a series of crises. Massive amounts of money were shifted out of one currency into another or into gold. In 1969, the price of gold rose to a high of $44 in the spring then declined to $35 at the end of the year. Confidence in the dollar, although somewhat uneasy, had returned. On New Year's Day, 1970, the International Monetary Fund distributed the first Special Drawing Rights (S.D.R's) to its members, thereby introducing man made international monetary reserves into a system long dominated by gold. Agreement as to form and use of the S.D.R's was reached in late 1969 after more than $1\frac{1}{2}$ years of negotiations and compromise. At year end there was at least temporary calm in the international money markets.

Salient Gold Statistics for the years 1963-1968, are given in Table III of the Appendix.

UNITED STATES CONSUMPTION

Domestic gold consumption in 1968 was 6,604,000 Troy ounces, almost 5 percent above 1967 and a record high.

According to the U. S. Bureau of Mines, apparent annual consumption of gold in domestic industry and the arts increased about 80 percent from 1963 to 1968. This represents a growth rate of nearly 13 percent per year over the 5-year period. Total consumption was about 3.5 times domestic mine production over this period.

About 70 percent of the gold purchased by industrial consumers was used in fabricating jewelry, decorative products, and dental materials. The remainder was used chiefly in electrical and electronic components and other industrial products including space and defense equipment.

Substantial quantities of gold brazing alloys are used in the aircraft industry and lesser amounts in the aerospace industry. Gold is finding new uses in the electrical industry in printed circuitry, connectors semi-conductor parts, low current contacts, vacuum tubes, sub-miniature and micro-miniature circuits for computers. In most of its industrial applications, especially where functional reliability is paramount, there is no satisfactory substitute for gold.

UNITED STATES GOLD CONSUMPTION IN INDUSTRY AND IN THE ARTS[e] 1/

Year	Net Consumption (thousand troy ounces)
1960	3,000
1961	2,775
1962	3,576
1963	2,920
1964	4,203r
1965	5,276
1966	6,062
1967	6,294
1968	6,604

e Estimate r Revised 1/ U.S. Bureau of Mines

UNITED STATES GOLD STOCKS

Total United States gold stocks, including gold in the Exchange Stabilization Fund, declined $1,173 million in 1968, almost the same as in 1967, and stood at $10,892 million at year end. The difference in these two years, however, was in the timing of the losses. They were incurred principally in December of 1967 and on into the first five months of 1968, including a record drop of $1,197 million in March. The principal causes were the devaluation of the pound Sterling followed by speculative purchasing and settlement of unfavorable trade balances. After the first period of losses in 1968, the U.S. balance-of-payments showed a surplus and the nation's gold stocks generally increased through the remainder of 1968.

During the first eleven months of 1969, United States gold stocks made a net increase of $279 million to a total of $11,171 million at the end of November. Increases totaling $398 million were made in March, April, May, August, September, and October. Losses were recorded in January, February, July and November of 1969, while in June stocks remained unchanged.

A tabulation of U.S. Monetary Stocks and Official Free World Reserves is supplied in Table V of the Appendix.

UNITED STATES FOREIGN TRADE

In 1968, as in the seven previous years, the United States was a net exporter of gold. Net exports for the year amounted to 18 million ounces. About 96 percent of the total went to the United Kingdom with minor amounts going to Singapore, the Syrian Arab Republic, and Belgium-Luxembourg.

This pattern changed in 1969, however, as the United States became a net importer of gold for the first 10 month period of the year. According to Table VI of the Appendix, the United States imported 4,337,000 more ounces of gold than it exported.

WORLD PRODUCTION

At 46,168,000 Troy ounces, World gold production in 1968 was about 460,000 ounces above 1967 output. 340,000 of the increase were from the Soviet Sphere and 120,000 from the Free World. The Republic of South Africa, the Philippines, and the Democratic Republic of the Congo (Kinshasa), were the principal Free World gainers. Canada, the United States, and Ghana were the principal losers.

Early production returns of the major Free World leaders indicate that 1969 output may closely approximate 1968's results. The United States, with the first strike free year of the last three at its base metal mines, is reported to have increased production to 1.7 million ounces. Both the Republic of South Africa and Canada in late 1969 were reported as behind the previous year's figures.

World production for the years 1966-1968 is given in Table VII of the Appendix.

TABLE I - ARIZONA'S PRODUCTION OF RECOVERABLE GOLD 1/

Year	Troy Ounces	Value
1955	127,616	$4,467,000
56	146,110	5,114,000
57	152,449	5,336,000
58	142,979	5,004,000
59	124,627	4,362,000
60	143,064	5,007,000
61	145,959	5,109,000
62	137,207	4,802,000
63	140,030	4,901,000
64	153,676	5,379,000
65	150,431	5,265,000
66	142,528	4,988,000
67	80,844	2,830,000
68	95,999	3,769,000
69p	110,300	4,654,000

p Preliminary 1/ U.S. Bureau of Mines

TABLE II - ARIZONA PRODUCTION OF GOLD AND SILVER IN 1968 1/

By Class of Ore In Terms of Recoverable Metal

Source	Number of Mines 2/	Material Sold or Treated Short Tons	Gold Troy Ounces	Silver Troy Ounces
LODE ORE:				
Dry Gold	1	72	68	65
Dry Gold-Silver	6	59,762	109	3,441
Dry Silver	21	43,982	6	35,800
Total	28	103,816	183	39,306
Copper	44	101,293,963	89,419	4,697,394
Copper-Zinc	2	22,090	4	6,175
Lead	6	498	- -	2,999
Lead-Zinc	2	98,566	5,274	186,506
Zinc	2	194	- -	89
Total	56	101,415,311	94,697	4,893,163
Other "lode" Material:				
Gold-silver tailings	1	22,762	854	11,920
Silver tailings	1	22,071	135	7,909
Copper cleanup	3/	1,162	54	1,633
Copper precipitates	15	78,570	- -	- -
Lead cleanup, lead tailings, and uranium ore 4/	1 5/	178 6/	72	4,231
Total	18	124,743	1,115	25,693
Total "lode" material	87	101,643,870	95,995	4,958,162
Placer	1	- -	4	- -
TOTAL ALL SOURCES	88	101,643,870	95,999	4,958,162

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/ From properties not classed as mines.
4/ Combined to avoid disclosing individual company confidential data.
5/ Excludes properties not classed as mines and the count of uranium mines from which copper and silver were recovered as by-products.
6/ Excludes uranium ore tonnage.

TABLE III - SALIENT GOLD STATISTICS 1/

		1963	1964	1965	1966	1967	1968
UNITED STATES:							
Mine Production	thousand troy ozs.	1,454	1,456	1,705	1,803	1,584	1,478
Value	thousands	$50,889	$50,971	$59,682	$63,119	$55,447	$58,038 2/
Ore (dry and siliceous) produced:							
Gold ore	thousand short tons	2,459	2,631	3,113	3,447	3,076	2,780
Gold-silver ore	thousand short tons	223	224	206	248	157	199
Silver ore	thousand short tons	556	542	752	669	617	655
Percentage derived from:							
Dry and siliceous ores		51	54	54	58	69	63
Base-metal ores		36	37	40	37	27	34
Placers		13	9	6	5	4	3
Refinery production 3/	thousand troy ozs.	1,469	1,469	1,675	1,802	1,526	1,539
Imports, general	thousand troy ozs.	1,281	1,169	2,905	1,200	930	5,944
Exports	thousand troy ozs.	5,820	12,078	36,717	13,067	28,720	23,962
Stocks Dec 31: Monetary 4/	millions	$15,596	$15,471	$13,806	$13,235	$12,065	$10,892
Industrial	thousand troy ozs.	NA	2,329	2,656	2,734	3,086	3,617
Consumption in industry and the arts	thousand troy ozs.	2,920	4,203	5,276	6,062	6,294	6,604
Price: Average 5/	per troy oz.	$35.00	$35.00	$35.00	$35.00	$35.00	$39.26 2/
WORLD:							
Production	thousand troy ozs.	43,147	44,841r	46,225r	46,580r	45,708r	46,168
Official Reserves 6/	millions	$42,310	$43,015r	$43,230r	$43,185	$41,600	$40,905

r Revised NA Not Available

1/ U. S. Bureau of Mines
2/ Average U. S. Treasury price Jan. 2 - March 15, 1968, and Englehard selling quotations Mar.20-Dec.31, 1968
3/ From domestic ores.
4/ Includes gold in Exchange Stabilization Fund
5/ Price under authority of Gold Reserve Act of Jan. 31, 1934
6/ Held by Free World central banks and governments

TABLE IV - MINE PRODUCTION OF RECOVERABLE GOLD IN THE UNITED STATES BY STATES 1/

	MINE PRODUCTION (Troy Ounces)			REFINERY PRODUCTION
	1966	1967	1968	1968
Alaska	27,325	22,948r	21,262	12,500
Arizona	142,528	80,844r	95,999	99,190
California	67,764	40,570r	15,682	15,280
Colorado	31,915	21,181r	22,638	20,750
Idaho	5,056	4,838r	3,227	3,200
Montana	25,009	9,786r	13,385	16,450
Nevada	366,903	434,993r	317,382	323,460
New Mexico	9,295	5,188r	6,630	7,680
Oregon	281	186	23	20
South Dakota	606,467	601,785r	593,052	621,960
Tennessee	141	181r	140	130
Utah	438,736	288,350r	334,419	333,740
Washington 2/	85,000r	73,337r	54,453	84,890
TOTAL	1,803,420	1,584,187r	1,478,292	1,539,250
Percent by type of mine production:				
Placers	5.1	4.1	2.5	
Dry ore	57.6	68.4	63.1	
Copper ore	30.3	20.3	27.5	
Lead & Zinc ore	0.3	0.2	0.2	
Complex Base Metal ores	6.4	6.7	6.5	
Other Sources	0.3	0.3	0.2	

r Revised
1/ U. S. Bureau of Mines
2/ Pennsylvania and Washington production combined to avoid disclosing individual company confidential data.

TABLE V GOLD MONETARY STOCKS 1/

(In Billions of Dollars)

End of Years	U.S. Monetary Stocks	U.S. % of Free World	Free World Official Reserves 2/
1950	$ 22.7	63.4%	$35.8
1951	22.7	63.15%	35.95
1952	23.2	64.1%	36.2
1953	22.0	60.3%	36.2
1954	21.7	58.1%	37.35
1955	21.7	58.4%	37.15
1956	21.9	58.1%	37.7
1957	22.85	58.7%	38.9
1958	20.6	51.6%	39.9
1959	19.5	48.0%	40.6
1960	17.8	44.0%	40.5
1961	16.9	41.1%	41.1
1962	16.1	38.7%	41.4
1963	15.6	36.9%	42.3
1964	15.5	36.0%r	43.Cr
1965	13.806	32.0%r	43.2r
1966	13.235	30.6%	43.2r
1967	12.065	29.0%	41.6
1968	10.892	26.6%	40.9

r Revised 1/ U. S. Bureau of Mines 2/ Held by Free World Banks & governments

TABLE VI - U. S. IMPORTS AND EXPORTS OF GOLD 1/

For 1966-1968, and First Three Quarters of 1969

Years	Imports Troy Ounces	Export Troy Ounces
1966	1,200,000	13,067,000
1967	929,869r	28,719,982
1968	5,944,515	23,962,391
1969:		
1st Quarter	1,262,049	9,435
2nd Quarter	1,570,810	26,800
3rd Quarter	1,339,912	286,353
October	491,084	3,838
10-Month Total	4,663,855	326,426

1/ U. S. Bureau of Mines.

TABLE VII WORLD PRODUCTION OF GOLD 1/

Country 2/	Troy Ounces 1966	1967	1968p
Republic of South Africa	30,879,700	30,532,880	31,094,466
Canada	3,319,474r	2,961,999	2,668,018
United States 3/	1,803,420	1,584,187	1,478,292
Australia	916,985r	801,009r	796,635
Ghana	684,395	762,609	727,122
Philippines	453,546	490,557r	527,355
Southern Rhodesia	550,000e	500,000	500,000
Japan 4/	256,394r	252,993r	238,301
Colombia	280,823	257,668r	237,480
Nicaragua	199,108	177,702	193,008
Mexico	213,609	165,287r	176,952
Brazil	167,955	171,700	170,070
Republic of the Congo (Kinshasa)	159,821r	153,520	169,975
India	120,244	101,628	115,357
Rest of Free Countries	984,147r	884,653r	825,288
TOTAL FREE WORLD	40,989,621r	39,798,392r	39,918,319
U.S.S.R.e	5,370,000	5,700,000	6,040,000
North Korea e	160,000	160,000	160,000
China Mainland e	60,000	50,000	50,000
Total Soviet Sphere	5,590,000	5,910,000	6,250,000
TOTAL	46,579,621r	45,708,392r	46,168,319

e Estimate p Preliminary r Revised

1/ U. S. Bureau of Mines.
2/ Gold was also reported as being produced in Bulgaria, Czechoslovakia, Rumania and probably in East Germany, Hungary and Thailand.
3/ Mine Production
4/ Refinery production for Japan was as follows; 1966, 555,476 ounces; 1967, 678,133 ounces, and 1968, 614,336 ounces.

S I L V E R

Some of the physical properties of silver are as follows: 1/

Symbol - Ag Atomic Weight 107.88 Atomic Number - 47

Specific Gravity - 10.5 (at 20°C) Melting Point - 960.5°C

Valence - 1 Resistivity - Ohm-cm 1.62×10^{-6} (20°C)

Hardness (Mohs' Scale) 2.5-3

Crystal Structure - Isometric, Cubic

Silver 2/, a white, metallic element in Group I of the periodic system, has been mined through the centuries in many parts of the world because of its beauty and usefulness.

Its properties of high maleability, ductility, and resistance to corrosion make it a much sought after industrial commodity. The light sensitivity of certain silver salts, and the metal's high thermal and electrical conductivity add to its desirability. Demands for silver exceed its production.

Silver was used in jewelry, ornaments, utensils and some coins in ancient times. Industrial uses have increased while coinage demands have decreased.

Principal industrial uses include: manufacture of photographic materials, sterling silverware, and electroplate; use in solders, and in brazing alloys used in high temperature applications. Substantial amounts are used in electrical contacts in light duty relays in telephone and aviation equipment, fluorescent-lamp contacts, and protection devices for motors and thermostats.

1/ Handbook of Chemistry, by N. A. Lange, Handbook Publishers, Sandusky, Ohio. 1934. p37, pp54-55, pp192-193.

2/ Mineral Facts and Problems, Bulletin 630, U.S. Bureau of Mines, U. S. Department of the Interior, pp809-821

S I L V E R - 1968-1969

A R I Z O N A

The value of Arizona's silver production continued its yearly increase through 1969, the 11th consecutive year excepting 1967. However, while the ounces of silver produced in 1968 increased 8 percent over 1967, and the average price increased 38 percent, the ounces recovered in 1969 increased 22 percent, and the average N.Y. price decreased 16. The silver amounted to 1.3 percent of the State's total mineral production in 1969, as shown in Table I.

Seven of the nation's 25 leading silver-producing mines were in Arizona in 1968, just as in 1967, but they held considerably different ranks. The Iron King mine of Shattuck Denn Mining Corp. did not make the 1968 list while the Magma Mine of Magma Copper Co. returned to the group of 25 after a one year's absence and occupied the number 23 spot as shown in the following table of ranks of Arizona mine among the first 25.

Mine	Operator	Source of Silver	Rank 1967	Rank 1968
Pima	Pima Mining Co.	Copper Ore	14th	10th
Mineral Park	Duval Corp.	" "	17th	12th
Copper Queen - Lavender Pit	Phelps Dodge Corp.	" "	19th	13th
Morenci	Phelps Dodge Corp.	" "	20th	15th
Mission	American Smelting & Refining Co.	" "	12th	16th
New Cornelia	Phelps Dodge Corp.	" "	21st	22nd
Magma	Magma Copper Co.	" "	-	23rd
Iron King	Shattuck Denn Mining Corp.	Lead-Zinc Ores	18th	-

Source: U. S. Bureau of Mines.

The following table shows Pima County to be well in the lead as a producer of silver, gold and copper; and Pinal second in silver and copper but slightly below Cochise in gold. Pima's production of over 2½ times second place Pinal is outstanding.

ARIZONA PRODUCTION OF SILVER, GOLD AND COPPER, IN 1968

BY COUNTIES AND PERCENTAGES OF TOTAL 1/

SILVER			GOLD			COPPER		
COUNTY	Ounces in thousands	%	COUNTY	Ounces in thousands	%	COUNTY	Tons in thousands	%
Pima	2,008	40.5	Pima	29	30.5	Pima	207	33.0
Pinal	785	15.8	Cochise	24	25.1	Pinal	143	22.8
Mohave	595	12.0	Pinal	23	24.5	Greenlee	107	17.0
Cochise	548	11.1	Greenlee	9	9.8	Gila	70	11.1
Greenlee	519	10.5	Yavapai	6	5.8	Cochise	48	7.6
Yavapai	259	5.2	Gila	4	4.1	Mohave	29	4.6
Others 2/	244	4.9	Others 2/	1	0.2	Others 2/	24	3.9
TOTAL	4,958	100.0		96	100.0		628	100.0

1/ U. S. Bureau of Mines
2/ Includes all three commodities in Maricopa County; Silver in Gila; Silver and Copper in Coconino and Graham; Copper in Yavapai; and minor amounts of Silver and/or Gold in Mohave, Yuma, and Santa Cruz Counties.

Arizona silver activities in 1968, except for the copper by-product production, generally conformed to the national trend of reduced exploration and development as prices worked lower during the year.

The pace slowed in the Tombstone area when Austral Oil of Houston stopped exploration and development at the Santa Ana mine and gave up its lease and option agreement. The owners, Ernest B. Escapule and son, later resumed their operation of the mine and their small cyanide mill.

Consolidated Minerals, Inc. recovered silver at the White Hills mine north of Kingman by cyaniding dump materials.

In early 1969, a rich silver strike was reported by Continental Dynamics, Inc. at their Black Diamond property in the Kofa Mountains in Yuma County. Early reports by Continental, a subsidiary of Dyn-O-Tex of Amarillo, Texas, put the mine's value in the billions of dollars. By October, the earlier excitement had subsided and four men were reported working some small silver veins.

UNITED STATES PRODUCTION

United States production of newly mined silver in 1968 amounted to 32,728,979 Troy ounces, 1.2 percent more than in 1967. 1969 output is estimated to have been over 39 million ounces, reflecting the year's increased domestic production of base metal ores.

Five States, Idaho, Utah, Arizona, Montana, and Colorado consistently produce over 90 percent of the nations new silver, with Idaho alone accounting for almost 48 percent.

A work stoppage at the Lucky Friday mine during the first 5½ months of 1968 compared to a 2½ month stoppage in 1967 was responsible for much of Idaho's reduced output in 1968. At copper mines of Utah, Arizona, and Montana, the strike continued into 1968 about 3 months compared with 5½ months in 1967, and their output of by-product silver increased in 1968, but not very much.

The sharp increase in value of domestic silver production in 1968 was due primarily to price increases. The average N.Y. price went from $1.550 per troy ounce for 1967 to $2.144 in 1968. A high of $2.565 was reached in mid-1968.

Salient Silver Statistics are given in Table II of the Appendix.

In 1968 gains in domestic silver production were registered by Arizona, California, Michigan, Missouri and Utah, and decreases were recorded by Idaho, Colorado, and Tennessee. State-by-State silver production for 1966-1968 is given in Table III.

UNITED STATES CONSUMPTION

A complete tabulation of United States Silver consumption for 1966-1968 is given in Table IV.

Industrial, coinage, and total consumption, were down 15, 16, and 15 percent respectively in 1968.

The largest uses in photographic materials and electrical and electronic products were down over 17 percent in 1968. Increased silver recovery from process and product wastes was given as a major factor in reducing silver consumption in photographic materials while the reduction in silver used in batteries was credited to curtailed purchases of new silver and increased recovery and reuse of silver from batteries and other scrap by the Navy Department.

The outflow of U. S. Treasury bullion stock in 1968 totaled 381.4 million ounces, broken down as follows: 165.0 million ounces were transferred to the Strategic Stockpile; 105.2 million went by G.S.A. sales; 74.2 million ounces were used for the redemption of silver certificates; 36.8 million went for the minting of the 40-percent-silver half dollars; and 0.2 million ounces went for miscellaneous uses.

At the end of 1968, Treasury silver stocks stood at 240 million ounces, composed of 70.88 million ounces of bullion and 169.1 million of unmelted coins.

By November, 1969, the stocks were down by about one half, to 120.5 million ounces made up of 74.8 million ounces in bullion and 45.7 million in coins. In the first 10 months of 1969, the Treasury used 15.2 million ounces in the manufacture of U. S. silver-clad coins and sold or exchanged 81.1 million ounces. Commercial stocks totaled 166.4 million ounces at the close of 1968 with 89.2 million ounces held in Commodity Exchange Warehouses. At the end of October 1969, commercial stocks aggregated about 187 million ounces.

The New York price of silver fluctuated widely in 1968 reflecting monetary uncertainties; market speculation and change in the Treasury's policy with respect to disposal of its silver stocks. Prices ranged from a low of 181.00 cents per Troy ounce in mid-February to a record high of 256.50 cents in mid-June and then declined to 190.00 at year end as earlier held apprehensions about silver's supply failed to materialize.

Silver prices eased further in 1969 as domestic silver production increased, reflecting a record year of copper and lead production and declines in photographic and coinage requirements. Prices are given in Table V of the Appendix.

UNITED STATES FOREIGN TRADE

Table VI of the Appendix gives imports and exports of silver for the years 1961-1968.

The United States exports of silver in ore, base, and refined bullion, increased 78 percent in 1968 over the previous year to a record of 125.761 million Troy ounces. Of this total, 68 percent was destined for three countries, the United Kingdom (56.404 million ounces); Switzerland (16.462 million ounces); and Belgium-Luxembourg (12.789 million ounces). Silver imported into the United States in 1968 increased 27 percent to a total of 70.709 million ounces, but exports exceeded imports by 55 million ounces.

In 1969 exports exceeded imports, though not as much as in 1968. Exports totalled 74.179 million ounces and imports 52.486 million for the first three Quarters of the year.

WORLD PRODUCTION

The Free World continued to produce over 80 percent of the world's newly mined silver in 1968. Western hemisphere countries supplied 62 percent of the world total, with Canada moving into the number one position with a 25 percent increase over 1967. The U.S.S.R., principal Soviet Sphere producer, barely held its own. Other major increases were made by Mexico and Peru in 1968. World production figures for 1966-1968 are given in Table VII of the Appendix.

TABLE I - COMPARISON OF ARIZONA'S RECOVERABLE SILVER

AND TOTAL MINERAL PRODUCTION 1/

Year	Recoverable Silver		Value of Total Mineral Production (in 000's)	Silver % of Total
	Troy Ounces (in 000's)	Value (in 000's)		
1955	4,634	$4,194	$378,277	1.1
56	5,179	4,687	485,751	1.0
57	5,279	4,778	372,641	1.3
58	4,685	4,240	314,520	1.3
59	3,898	3,528	326,862	1.1
1960	4,775	4,322	415,512	1.0
61	5,120	4,733	432,614	1.1
62	5,464	5,917	474,131	1.2
63	5,373	6,873	481,392	1.4
64	5,811	7,513	534,353	1.4
1965	6,095	7,881	580,092	1.4
66	6,339	8,196	622,079	1.3
67	4,588	7,112	465,255	1.5
68	4,958r	10,633r	617,543r	1.7
69p	6,071	10,865	850,527	1.3

p Preliminary

1/ U. S. Bureau of Mines

TABLE II - SALIENT SILVER STATISTICS 1/

		1963	1964	1965	1966	1967	1968
UNITED STATES:							
Mine Production	thousand troy ozs.	35,243	36,334	39,806	43,669	32,345r	32,729
Value	thousands	$45,076	$46,980	$51,469	$56,464	$50,135r	$70,191
Ore (dry & siliceous)produced:							
Gold Ore	thousand short tons	2,460	2,631	3,113	2,580	2,315	2,003
Gold-Silver ore	thousand short tons	223	224	205	248	157	199
Silver ore	thousand short tons	587	644	902	1,069	904	701
Percentage derived from -							
Dry & Siliceous ores		33	32	35	33	39	39
Base Metal ores		67	68	65	67	61	61
Imports, General 2/	thousand troy ozs.	59,062	51,674	54,709	63,032	55,520	70,709
Refinery Productions 3/	thousand troy ozs.	35,000 4/	37,000 4/	39,000 4/	48,358	30,268	42,052
Exports 2/	thousand troy ozs.	31,485	109,395	39,665	85,538	70,769	125,761
Stocks Dec 31:Treasury 5/	million troy ozs.	1,583	1,218	804	594	351	240e
Industry 6/	million troy ozs.	- - -	- - -	- - -	57,244	83,353	166,356
Consumption							
Industry and Arts	thousand troy ozs.	110,000	123,000	137,000	183,696	171,031	145,293
Coinage	thousand troy ozs.	111,493	203,000	320,321	53,582	43,851	36,833
Price 7/	per troy ounce	$1.279	$1.293+	$1.293+	$1.293+	$1.550+	$2.144+
WORLD:							
Production	thousand troy ozs.	249,982	248,545r	257,415r	266,731r	259,081r	272,507
Consumption 8/							
Industry & the Arts	thousand troy ozs.	260,700r	299,200r	336,600r	355,100r	348,600r	347,300
Coinage 9/	thousand troy ozs.	167,000	267,100	381,100r	130,700r	89,200r	59,500

e Estimate r Revised

1/ U. S. Bureau of Mines
2/ Excludes coinage
3/ From domestic ores
4/ U. S. Bureau of the Mint.
5/ Excludes silver in silver dollars
6/ Includes silver in Comex warehouses
7/ Average New York price
8/ Free World only: Sources Handy and Harman 1963-1965
U. S. Bureau of Mines 1966-1968
9/ Free World only: Source Handy and Harman

TABLE III - MINE PRODUCTION OF RECOVERABLE SILVER IN THE UNITED STATES, BY STATES 1/

	MINE PRODUCTION			REFINERY PRODUCTION
	Troy Ounces			Troy Ounces
State	1966	1967	1968	1968
Alaska	7,193	5,787	3,900	3,450
Arizona	6,338,696	4,588,081	4,958,162	5,149,040
California	189,989	144,515	597,961	292,700
Colorado	2,085,534	1,817,699	1,646,283	1,454,600
Idaho	19,776,785	17,033,330	15,958,715	15,466,400
Kentucky	1,086	586	- - -	- - -
Michigan	483,000	301,992	472,813	332,100
Missouri	- - -	226,168r	340,856	395,900
Montana	5,319,785	2,066,464	2,132,571	2,802,000
Nevada	867,567	565,755	645,192	561,900
New Mexico	242,620	157,495	224,866	271,900
New York	21,590	31,103	27,615	27,600
Oregon	343	31	335	170
South Dakota	109,885	121,258	137,668	137,100
Tennessee	100,716	130,078	89,525	82,500
Utah	7,755,411	4,874,640	5,120,772	4,300,000
Other States	368,788 2/	279,898 2/	371,745 3/	422,640 4/
TOTAL	43,668,988	32,344,862r	32,728,979	31,700,000

r Revised
1/ U. S. Bureau of Mines
2/ Includes Oklahoma, Pennsylvania and Washington.
3/ Includes Maine, Oklahoma, Pennsylvania and Washington.
4/ Includes Kentucky, Texas, Washington and Wisconsin.

TABLE IV - U. S. CONSUMPTION OF SILVER, BY END USE 1/

Thousand Troy Ounces

	1966	1967	1968
Electroplated ware	21,486	17,897	15,279
Sterling ware	30,894	30,269	28,349
Jewelry	6,349	5,751	4,538
Photographic Materials	48,435	50,306	41,607
Dental and Medical Supplies	2,457	2,690	3,094
Mirrors	2,946	2,174	1,745
Brazing, Alloys and Solders	18,419	15,390	15,124
Electrical and Electronic Products:			
Batteries	12,517	11,405	5,764
Contacts and Conductors	33,676	26,777	25,805
Rocket Nozzels	699	- - -	- - -
Catalysts	2,683	5,847	2,310
Bearings	569	600	451
Miscellaneous 2/	2,564	1,925	1,228
Total Net Industrial Consumption	183,696	171,032	145,293
Coinage	53,852	43,851	36,833
TOTAL CONSUMPTION	237,548	214,883	182,126

1/ U. S. Bureau of Mines.
2/ Includes silver-bearing copper, silver-bearing lead anodes, ceramic paints, etc

TABLE V AVERAGE PRICES OF SILVER - NEW YORK

In cents per Troy ounce 0.999 Fine

Yearly Basis 1/	
Year	Price
1955	89.099
56	90.826
57	90.820
58	89.044
59	91.202
1960	91.375
61	92.449
62	108.521
63	127.912
64	129.300
1965	129.300
66	129.300
67	154.968
68	214.460
69 2/	179.966

Monthly Basis		
Month	1968 1/	1969 2/
January	198.955	197.886
February	185.474	183.972
March	218.048	182.571
April	220.275	177.810
May	237.682	176.095
June	246.405	164.548
July	231.381	161.833
August	219.455	165.262
September	220.850	178.548
October	197.283	187.250
November	201.778	192.313
December	195.929	191.50 3/
Average	214.460	179.966

1/ Year Book of the American Bureau of Metal Statistics, years 1955-1968.
2/ E/MJ.
3/ American Metal Market.

TABLE VI UNITED STATES IMPORTS AND EXPORTS OF SILVER 1/

In Thousands of Troy Ounces

Year	U. S. Imports	Exports
1961	50,256	39,828
62	76,359	13,057
63	59,062	31,485
64	51,674	109,395
65	54,709	39,665
66	63,032	85,538
67	55,520	70,769
68	70,709	125,761
1969 - 1st Qtr.	14,099	19,376
69 - 2nd Qtr.	16,633	27,712
69 - 3rd Qtr.	21,754	27,091
1969 - 9 Mo. Total	52,486	74,179

1/ U. S. Bureau of Mines.

TABLE VII - WORLD PRODUCTION OF SILVER 1/ 2/

Country 3/	Thousand troy ounces 1966	1967	1968p
Canada	32,825r	36,315r	45,621
Mexico	41,983	37,939	40,031
Peru	32,841	35,870	36,020
United States	43,669	32,119	32,729
Australia	18,888r	19,783r	21,618
Japan	10,319	10,800r	10,713
Rest of Free Countries	43,646r	41,795r	43,615
Total Free World	224,171r	214,621r	230,347
U.S.S.R.	33,000r	35,000	35,000
East Germany	4,800	4,800	4,800
Czechoslovakia	2,400	2,400	NA
North Korea	650	700	700
Rest of Soviet Sphere	1,710r	1,560r	1,660
Total Soviet Sphere[e]	42,560r	44,460r	42,160
TOTAL WORLD	266,731r	259,081r	272,507

e Estimate p Preliminary r Revised NA Not Available.

1/ U. S. Bureau of Mines
2/ Recoverable content of ores and concentrates produced unless otherwise noted.
3/ Silver was also produced in Bulgaria, Guatemala, Hungary, Thailand, Turkey, and several African countries in insignificant amounts.

M O L Y B D E N U M

PHYSICAL PROPERTIES 1/

Molybdenum is a silvery-white, very hard, metallic element in the Chromium group or group VI of the periodic system. Its physical properties are similar to those of iron and its chemical properties are similar to those of a nonmetal. It is used for electrodes of mercury-vapor lamps. as wire for winding electric-resistance furnaces, and in steel alloys. Symbol, Mo; isometric; valences, 2, 3, 4,?, 5,?, and 6: atomic number, 42; atomic weight 95.94; specific gravity, 10.22 (at 20°C); melting point, 2,620° ± 10°C; boiling point, 5,560°C or sublimes at 4,507°C (at 760mm); insoluble in water, in hydrofluoric acid, and in ammonia: soluble in hot concentrated nitric acid, in hot concentrated sulfuric acid, and in aqua regia; and slightly soluble in hydrochloric acid. As an alloying agent, it increases the hardenability and toughness of quenched and tempered steels and it raises the strength of steel at high temperatures. Used in nickel-based alloys that are heat-resistant and corrosion-resistant; in electrodes in electrically heated glass furnaces and forehearths; in nuclear-energy applications; for missile and aircraft parts; and as a wire for filaments for metal-evaporation processes and for filaments, grids, and screens in electronic tubes.

(C.T.D.; Handbook of Chemistry and Physics, 45th ed., 1964, pp.B2, B-121, B-195).

1/ U. S. Bureau of Mines; A Dictionary of Mining, Mineral, and Related Terms, p 723, (1968).

M O L Y B D E N U M - 1968-1969

A R I Z O N A

Molybdenum, the principal by-product of Arizona's copper industry, continued to increase in importance in the States mineral economy in 1968. Its 1968 value, $19.207 million, represented more than a 3-fold gain over the 1960 value and almost a 7-fold gain over the 1955, and the preliminary figure for 1969 is almost 8 percent above the 1968, as shown in Table I in the Appendix. Produced as molybdenite (MoS_2) concentrate in Arizona, molybdenum accounted for over 3-percent of the State's mineral value in 1968; but the percentage decreased in 1969 due to a large increase in the value of copper production. Table II shows molybdenum's increasing importance to the State's economy as well as its relation to the values of other minerals produced in the State.

Table III shows that Arizona since 1955 has accounted for an increasing proportion of the United States molybdenum supply.

Molybdenum, in molybdenite concentrate, is recovered in Arizona at the copper mines of American Smelting and Refining Co., Bagdad Copper Corp., Duval Corp., Inspiration Consolidated Copper Co., Kennecott Copper Corp., Magma Copper Co. San Manuel Division, Miami Copper Co., Phelps Dodge Corp., and Pima Mining Co.

Table V gives production figures for some of these companies. However, only those for Magma and Miami Copper are for Arizona production alone.

Two new, large copper mines are to add materially to Arizona's molybdenum output in 1970 and beyond. The Duval Sierrita Corp.'s $163 million copper-molybdenum project is expected to reach the production stage in the first half of 1970. Its designed ore capacity is 72,000 t.p.d.

The Anaconda Company's new Twin Buttes project south of Tucson in 1969 completed the largest pre-production stripping program in mining history and started production in September. Capacity production rate of 30,000 ore tons per day is expected early in 1970.

UNITED STATES PRODUCTION

The United States molybdenum production of 93.477 million pounds was a record high in 1968 and 3.8 percent above the 1967 figure. Primary molybdenum mines accounted for almost three-fourths of the total while the remainder came as a by-product from copper, tungsten, and uranium operations. Preliminary data indicates that 1969 output increased almost 5 percent over 1968 as an estimated 98 million pounds of production was recorded.

American Metal Climax, Inc. the largest molybdenum producer in the United States reported a record production of 60 million pounds in 1968. This marked the first full year of production from its new Urad mine. Its new Henderson molybdenum project at Empire, Colorado was on schedule,and a production rate of fifty million pounds of molybdenum per year is planned for mid-1970. Proven and probably ore reserves are reported to be 303 million tons of 0.49 percent MoS_2.

The Molybdenum Corp. of America reported 9.1 million pounds of molybdenum produced in 1968 at its Questa, New Mexico operation; down from the 9.4 million pounds reported for 1967 due to production problems which were corrected at midyear.

The company announced plans to increase production to 14 million pounds annually by late 1969, in view of the development of increased ore reserves reported to total 157 million tons of 0.186 percent MoS_2.

UNITED STATES CONSUMPTION

Alloy steels continued to be molybdenum's largest consumer. Use in stainless steel increased over 60 percent in the 1960-1968 period.

Table VI shows that the major end uses of molybdenum in 1968 were: Alloy steels (excluding Stainless and High speed and Tool) 46.7 percent; Stainless steels, 12.3 percent; Cast irons, 8.5 percent; and High speed and Tools steels, 6.4 percent.

UNITED STATES, FOREIGN TRADE

Exports of molybdenum ore and concentrates were about the same in 1968 as in the two previous years except for changes in export pattern. The greatest change in the three years was in increase in exports to the Netherlands due to its initiation of molybdic oxide production. See Table VII.

Imports of molybdenum in various forms continued to be small in 1968, as it had been in previous years. Some 1200 pounds of contained molybdenum came from Chile, and some 208,000 pounds came mainly from Canada.

FREE WORLD PRODUCTION

In spite of the 3.38 million pound increase recorded for United States molybdenum production in 1968, the Free World total did not quite equal that of the previous year or match expectations, as Canada, Chile, and Peru all reported decreases. The Canadian reduction was due to a work stoppage at their largest producing mine while Chilean output was lower as a result of the severe drouth that adversely affected production at the El Teniente mine. The Peruvian decrease was credited to grade variations at Southern Peru Copper's Toquepala property, the country's major molybdenum producer.

TABLE I - VALUES OF ARIZONA'S MOLYBDENUM, SILVER AND GOLD PRODUCTION 1/

Year	Molybdenum Thousand $	Silver Thousand $	Gold Thousand $
1955	1,511	4,194	4,467
56	2,670	4,687	5,114
57	3,071	4,778	5,336
58	2,827	4,240	5,004
59	4,019	3,528	4,362
1960	5,211	4,322	5,007
61	6,232	4,733	5,109
62	5,864	5,917	4,802
63	7,584	6,873	4,901
64	9,532	7,513	5,379
1965	15,880	7,881	5,265
66	17,812	8,196	4,988
67	15,385	7,112	2,830
68	19,207	10,633	3,769
69p	20,727	10,865	4,654

p Preliminary

1/ U. S. Bureau of Mines

TABLE II - VALUES AND PERCENTAGES OF ARIZONA'S PRINCIPAL MINERAL PRODUCTS

FOR 1955, 1960, 1966, 1967, 1968, and 1969 1/

(Dollar Values in Millions)

Commodity	1955		1960		1966		1967		1968		1969p	
COPPER	$339	89.6%	$346	83.2 %	$535	86.0%	$384	82.5%	$526	85.1%	$757	89.0%
MOLYBDENUM	2	0.4	5	1.3	18	2.9	15	3.3	19	3.1	21	2.4
SAND & GRAVEL	7	1.7	14	3.4	20	3.3	18	4.0	14	2.3	15	1.7
SILVER	4	1.1	4	1.0	8	1.3	7	1.5	11	1.7	11	1.3
PETROLEUM	-	-	W	-	2/	0.1	8	1.8	10	1.6	8	0.9
STONE	2	0.6	5	1.2	4	0.7	3	0.8	6	1.0	5	0.6
LIME	1	0.4	2	0.6	4	0.6	3	0.7	5	0.7	5	0.6
GOLD	4	1.2	5	1.2	5	0.8	3	0.6	4	0.6	5	0.6
URANIUM	W	-	6	1.5	3 3/	0.6	1 4/	0.1	2 5/	0.3	W	-
ZINC	6	1.5	9	2.2	5	0.8	4	0.9	1	0.2	3	0.3
LEAD	3	0.8	2	0.5	2	0.3	1	0.3	2/	0.1	2/	0.0
Arizona Total Value	$378		$416		$622		$465		$618		$851	

W Withheld to avoid disclosing individual company confidential data.

1/ Source: U. S. Bureau of Mines 2/ Less than ½ million. 3/ Method of reporting changed.

4/ Estimated based on $8.00 per pound F.O.B. Mill.

5/ Estimated based on $8.00 per pound for A.E.C. sales and assumed price of $6.50 per pound, commercial sales.

TABLE III MOLYBDENUM PRODUCTION COMPARISON

Molybdenum (content of concentrate) in thousand pounds

Year	U. S. 1/ Production	Arizona 1/ Production	Arizona's Share of Total (Percent)
1955	61,781	1,497	2.4
56	57,462	2,392	4.2
57	60,753	2,385	3.9
58	41,069	2,320	5.6
59	50,956	3,181	6.2
1960	68,237	4,359	6.4
61	66,563	4,878	7.3
62	51,244	4,412	8.6
63	65,011	5,553	8.5
64	65,605	6,296	9.6
1965	77,372	9,399	12.1
66	90,532	10,161	11.2
67	90,097r	9,261	10.3r
68	93,477r	12,127	13.0
69p	98,000e	12,698	13.0

e Estimate p Preliminary r Revised
1/ U. S. Bureau of Mines.

TABLE IV - SALIENT MOLYBDENUM STATISTICS 1/

(Thousand pounds of contained molybdenum and thousands of dollars)

	1963	1964	1965	1966	1967	1968	1969
UNITED STATES:							
Concentrate:							
Production	65,011	65,605	77,372	90,532	90,097r	93,477	98,000e
Shipments	65,839	65,097	77,310	91,670	81,596	93,245	87,421 2/
Value	$91,096	$97,121	$120,801	$144,327	$133,604	$151,000	NA
Consumption	49,241	56,409	68,112	75,476	58,967	75,647	61,210 2/
Imports for Consumption	- - -	- - -	142	5	1,179	1	NA
Stocks, Dec.31:							
Mine and Plant	2,436	4,303	4,208	3,433	9,919	12,208	6,668 2/
Primary Products:							
Production	48,756	55,946	66,616	74,392	54,922	69,675	55,354 2/
Shipments	49,599	60,403	71,718	78,811	57,231	63,761	65,039 2/
Consumption	37,478	43,119	48,621	52,324	49,506	49,271	37,485 3/
Stocks, Dec.31:Producers	4,504	4,398	3,839	5,945	7,156	18,170	14,735 2/
FREE WORLD: Production	75,055r	77,908r	98,531r	124,988r	126,416r	125,673	NA

e Estimate r Revised NA Not Available.

1/ U. S. Bureau of Mines
2/ Covers first 10 months only.
3/ Covers first 9 months only.

TABLE V. - MAJOR U. S. MOLYBDENUM PRODUCERS 1/

(Content) In thousand of pounds

Companies	1966	1967	1968
American Metal Climax, Inc.	55,779	55,622	57,834
ASARCO	950	830	848
Duval Corp.	3,902	4,285	5,728
Kennecott Copper Corp.	15,557	9,853	11,933 2/
Magma Copper Company	2,554	2,402	2,758
Molybdenum Corp. of America	7,743	9,362	9,101
Tennessee Corp. Miami Copper Div.	35	56	51
	86,520	82,408	88,253
TOTAL U. S. PRODUCTION 3/	90,532	90,097	93,477

1/ Yearbook of the American Bureau of Metal Statistics, 50 Broadway, New York. p123.

2/ 1968 Figure from Kennecott Copper Annual Report p12.

3/ Source: U. S. Bureau of Mines.

TABLE VI - UNITED STATES CONSUMPTION OF MOLYBDENUM PRODUCTS BY END USES, 1968 AND FIRST THREE QUARTERS, PRODUCT CONSUMPTION, 1969 1/

(Thousand Pounds, Contained Molybdenum)

End Use	Molybdic Oxides	2/ Ferro Molybdenum	Ammonium & Sodium Molybdate	3/ Other Molybdenum Materials	4/ Total
Steel: (Ingots and castings)					
High Speed and Tool	1,993	1,023	- -	157	3,173
Stainless	4,191	1,826	- -	42	6,059
Other Alloys (Excl. Stainless)	20,997	2,008	- -	10	23,017
Cast Irons	1,324	2,804	W	82	4,210
Cutting and Wear Resistant Materials	62	250	- -	6	317
Welding Rods	- -	406	- -	12	418
Nonferrous Alloys	750	641	- -	1,151	2,543
Electrical Materials 5/	5/	- -	- -	23	23
Chemicals: Catalysts	1,289	- -	503	- -	1,792
Pigments	770	- -	389	12	1,170
Lubricants	2	- -	- -	749	751
Other	80	- -	69	86	235
Miscellaneous	2,334	768	- -	2,462	5,564
TOTAL 4/	33,792	9,727	961	4,791	49,271
1969:					
1st Quarter	8,829	2,678	155	1,095	12,758
2nd Quarter	8,658	2,766	168	1,216	12,807
3rd Quarter	8,043	2,408	165	1,212	11,830

W Withheld to avoid disclosing individual company confidential data, included in Miscellaneous.

1/ U. S. Bureau of Mines
2/ Includes Calcium Molybdate.
3/ Includes purified molybdenum disulphide.
4/ Data may not add to totals shown due to independent rounding.
5/ Less than $\frac{1}{2}$ reporting unit.

TABLE VII - U. S. EXPORTS OF MOLYBDENUM ORE AND CONCENTRATES (including roasted concentrates), BY PRINCIPAL COUNTRIES 1/

(Thousand pounds of contained molybdenum)

Country	1966	1967	1968
Netherlands	11,551	16,287	14,652
Canada	1,014	3,415	1,394
Japan	3,405	2,690	5,088
West Germany	4,779	1,971	1,989
Belgium-Luxembourg	2,726	1,878	2,330
France	1,978	1,526	1,117
Others	4,315	2,233	2,436
Total	29,768	30,000	29,006

1/ U. S. Bureau of Mines

TABLE VIII - FREE WORLD PRODUCTION OF MOLYBDENUM IN ORES AND CONCENTRATES 1/

Thousand Pounds of Molybdenum

Country 2/	1963	1964	1965	1966	1967	1968p
United States	65,011	65,605r	77,372r	90,532	90,097r	93,477
(Arizona 3/)	(5,553)	(6,296)	(9,399)	(10,161)	(9,261)	(12,127)
Canada 4/	834	1,225	9,557	20,596r	21,377r	20,007
Chile	6,400	8,393	8,142r	10,232r	10,752	8,521
Peru	1,122r	871	1,499r	1,484r	2,037	1,750
Other 5/	1,688	1,814	1,961r	2,144r	2,153r	1,918
Free World Total	75,055r	77,908r	98,531r	124,988r	126,416r	125,673e

e Estimate p Preliminary r Revised.

1/ U. S. Bureau of Mines

2/ Molybdenum is also produced in negligible amounts in Argentina, Bolivia, Nigeria South-West Africa, and Spain.

3/ Included in U. S. Total.

4/ Shipments.

5/ Other includes small production in South Korea, Norway, Japan, Mexico, Philippines and Australia.