

# Mineral Industry Surveys

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## PRECIOUS METALS IN MAY 2000

U.S. mines produced 28,700 kilograms (kg) of gold and 185,000 kg of silver in May 2000. Compared with April, production of gold was down by 8% in California and up by 16% in Nevada; silver was up by 34% in Nevada. Table 8 in this report lists the top 30 gold-producing mines in the United States in the first quarter of 2000.

### Gold

**Domestic.**—The U.S. Mint (Mint) removed some of its holdings from Handy & Harman Refining Group Inc. (H&H) one day prior to H&H's Chapter 11 bankruptcy filing. The Mint's holdings, which were listed in court documents as the largest of the 20 unsecured creditors of H&H, were less than half of the \$29 million reported as part of the creditors list filed with the court (American Metal Market, 2000e).

Battle Mountain Gold Co. has settled with the Water Quality Control office of the Colorado Department of Public Health and Environment. The settlement was related to alleged pollutants that were reportedly discharged into the Rico Seco Creek from Battle Mountain's gold mine near San Luis, CO. The discharge was comprised of dissolved solids, manganese, and sulfate. There was no cyanide detected in the ground water flowing from the pit that was developed as part of the reclamation process. Battle Mountain began operating a system to pump and treat groundwater from the pit after the state issued a violation notice and cease-and-desist order August 1999 (American Metal Market, 2000b).

The Rosebud gold mine in Nevada will be placed on care-and-maintenance followed by reclamation activities. Mining was scheduled to cease at the end of July with ore processing continuing into August. Rosebud, which is jointly owned by Hecla Mining Co. and Newmont Mining Corp., began commercial operation in 1997 and will have produced about 12,000 kg (375,000 ounces) of gold (Platt's Metals Week, 2000d).

**International.**—The Indonesian government has received a commitment from PT Freeport Indonesia to reduce its ore output by about 13% from its gold and copper mines following the discovery of toxic waste in a mine-site landslide that killed four people (Mining Journal, 2000). A large accumulation of mining waste collapsed on May 4, after 4 days of heavy rains at the company's Grasberg Mine in Irian Jaya. The collapse sent a 20-foot wave of water and material into the Wanagon Valley. Prior to this incident, PT Freeport was under pressure from environmental groups for failing to minimize the environmental impact of the Grasberg Mine, which is expected to produce about 60,000 kg of gold in 2000 (Platt's Metal Week, 2000a).

The Bank of England (BOE) sold 25,000 kg of gold at \$275.25 per troy ounce (ounce) on May 23. The auction, which was only 2.1 times oversubscribed, drew little enthusiasm. The subscription level was at its highest during BOE's November 1999 auction, when the gold on offer was 8 times oversubscribed. The next auction is July 12 (Platt's Metal Week, 2000e).

**Update.**—A new web site for gold, silver, and platinum-group metals offers consumers 24-hour access to professional analysis, general market news, and prices to trade. The web site is [www.thebulliondesk.com](http://www.thebulliondesk.com) (American Metal Market, 2000d).

The London Bullion Market Association's (LBMA) gold clearing statistic rose slightly during April. The volume of gold transferred rose 4% in comparison with March, reaching 25.2 million ounces (780,000 kg). The number of gold transfers fell from 800 to 791. The volume of gold transferred in April was the same as in April 1999 (American Metal Market, 2000c).

Gold demand during the first quarter of 2000 remained strong. The demand for gold was 795,000 kg, up 1% from the first quarter of 1999, when gold demand went on to set a record for the full year. Demand for jewelry was 7% above the first quarter of 1999 at 701,000 kg of gold, a record for this period. Outstanding gains

in jewelry consumption were seen in Brazil, Mexico, Southeast Asia, Turkey, and the United Kingdom. Investment demand for gold was 94,000 kg, 29% below the first quarter of 1999; a sharp fall in sales of new gold coins in the United States accounted for almost all of the decline. U.S. gold coin demand had been exceptionally strong in 1999 in anticipation of the Y2K disruption. Elsewhere in the world, investment demand for gold was unchanged (World Gold Council, 2000).

A newly patented technology developed at Monash University in Melbourne, Australia, recovers cyanide contained in gold tailings. The technology will be tested in a mobile pilot plant initially located in Kalgoorlie, Australia. The recovery process is capable of removing both free and metal-complexed cyanides directly from mine tailings before they are discharged into tailings dams. The new technology can be added to existing waste treatment plants, can use off-the-shelf chemicals, and may prove to be a simpler and cheaper treatment for gold ores containing copper (American Metal Market, 2000a).

### Silver

Canadian miner Pan American Silver Corp. will move forward with plans to develop the Dukat silver deposit in the Magadan region of Russia, despite the possibility that its mining license could be revoked. Pan American holds the mining license for Dukat through Serebro Dukat, its 70%-owned Russian subsidiary. According to terms of Pan American's Dukat license, the company must start production at the mine by September 2001. In December 1999, Kaskol, a Moscow company involved primarily in heavy machinery building, outbid Pan American for the old ore processing mill at the Dukat mine site. To meet the September 2001 deadline, Pan American must either construct a new mill or negotiate a settlement with Kaskol. The company is considering the construction of a new mill with the aim of building around the old mill and meeting the deadline. Dukat is expected to produce about 500 metric tons (t) of silver-in-concentrate and 1 t of gold-in-concentrate per year for at least 15 years (Platt's Metals Week, 2000c).

Metallurgists at the Federal Government's National Institute of Standards and Technology (NIST) have developed a method for making pure silver powder for use in filling dental cavities. Traditionally, an amalgam of mercury, which has strong corrosion resistance and good mechanical strength, was the material of choice. Now, NIST scientists have found a way to remove naturally occurring silver oxide from the surface of silver metal powder by treating it with a dilute acid solution which removes the oxide layer. The pure silver particles can then be compacted with normal dental tools until they harden. These fillings are 80% as dense and at least as strong as mercury-alloy amalgams. Although the American Dental Association has deemed mercury-containing amalgams safe—as long as the materials remain intact—materials that do not contain mercury are more desirable (Silver News, 2000).

### Platinum-Group Metals

South Africa's Anglo American Platinum Ltd. (Amplats), the world's largest platinum producer, will invest R12.6 billion to increase platinum production from 62,200 kg to about 109,000 kg per year by the end of 2006. A total of R10 billion will be spent on mining, including new mine development and expansion of

existing mines in South Africa located on the eastern and western limbs of the Bushveld Complex. A new mine in Maandagshoek, costing R1.3 billion and producing 5,040 kg of platinum per year, is expected to come into operation by 2004. The reduction in Russian supplies and the depletion of stocks is expected to create a supply-demand deficit which Amplats could fill with the output from its expanded operations (Metal Bulletin, 2000).

Johnson Matthey signed a supply and development agreement with James Cropper Plc. Under terms of the agreement, Technical Fibre Products, the advanced composites subsidiary of James Cropper, will provide key components in Johnson Matthey's new Membrane Electrode Assembly (MEA) products for fuel cells. The agreement centers upon the development of carbon composite substrates to be used to support the catalysts and other MEA components that form the heart of polymer electrolyte membrane (PEM) fuel cells. There now seems little doubt that fuel cells will emerge as a major propulsion system for cars and trucks within the next 5 to 10 years and will generate an additional demand for about 500,000 kg of platinum. Offering an attractive driving range and quick refueling, fuel cells may displace various high-energy battery options that are now being investigated to meet zero emission requirements on vehicles in the United States (Platt's Metals Week, 2000b).

Currently, fuel cell power units cost about 10 times that of conventional gasoline engines and use hydrogen (liquid or gas) as the primary fuel. Most researchers in the field, however, have begun investigating alternatives to pure hydrogen as the primary fuel because of difficulties associated with its storage and distribution and are considering the use of methanol. Methanol is low in carbon and rich in hydrogen. Fuel cell power systems fueled by methanol would require a reformer subsystem to convert methanol to the hydrogen required. One disadvantage of methanol is that, unlike the use of pure hydrogen, water would not be the only exhaust pipe emission; carbon monoxide, carbon dioxide, and nitrogen oxides would also be emitted (Metal Bulletin Monthly, 2000). In a related project, researchers at NASA's Jet Propulsion Laboratory, Pasadena, CA, have developed an improved method of fabricating PEM-electrode structures for methanol fuel cells. The procedure involves the use of improved sprayers to deposit inks containing catalytic metals onto proton exchange membranes of perfluorosulfonic acid polymers. The inks usually contain the catalytic metal (platinum for the cathode or a mixture of platinum and ruthenium for the anode), a proton-conducting ionomer solution, water, and isopropanol, with perhaps a small amount of a polytetrafluoroethylene-based additive. In experiments, the performances of fuel cells containing electrode structures made by the new method were found to be comparable to fuel cells made by older methods. The amount of catalyst used in the new method, however, ranged from 1 to 2 milligrams per square centimeter ( $\text{mg}/\text{cm}^2$ ), whereas the amounts used in the older methods were typically about 4  $\text{mg}/\text{cm}^2$ . The new method is suitable for mass production and may be a significant step toward commercialization and reducing the cost of fuel cells (NASA Tech Briefs, 1999).

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TABLE 1  
MINE PRODUCTION OF RECOVERABLE GOLD AND SILVER IN THE UNITED STATES, BY STATE 1/

(Kilograms)

| Gold                | Alaska  | California | Nevada  | Other States 2/ | Total      |
|---------------------|---------|------------|---------|-----------------|------------|
| 1999: p/            |         |            |         |                 |            |
| May                 | 1,340   | 1,460      | 21,700  | 4,170           | 28,600     |
| June                | 1,310   | 1,520      | 22,600  | 4,280           | 29,700     |
| July                | 1,390   | 1,420      | 20,100  | 4,390           | 27,300     |
| August              | 1,390   | 1,350      | 21,100  | 4,340           | 28,100     |
| September           | 1,360   | 1,370      | 21,200  | 4,310           | 28,300     |
| October             | 1,260   | 1,540      | 21,800  | 4,440           | 29,000     |
| November            | 1,180   | 1,640      | 22,200  | 4,470           | 29,500     |
| December            | 1,260   | 1,810      | 21,900  | 4,620           | 29,600     |
| January-December r/ | 15,700  | 17,500     | 257,000 | 51,300          | 341,000    |
| 2000:               |         |            |         |                 |            |
| January r/          | 1,200   | 1,470      | 21,300  | 4,200           | 28,200     |
| February r/         | 1,140   | 1,390      | 20,000  | 4,030           | 26,500     |
| March r/            | 1,200   | 1,390      | 20,800  | 4,400           | 27,700     |
| April               | 1,190   | 1,280      | 19,500  | 4,240           | 26,200     |
| May                 | 1,190   | 1,180      | 22,700  | 3,640           | 28,700     |
| January-May         | 5,900   | 6,700      | 104,000 | 20,500          | 137,000    |
| Silver              | Arizona | Idaho      | Nevada  | Other States 3/ | Total      |
| 1999: p/            |         |            |         |                 |            |
| April               | 16,500  | 34,400     | 48,300  | 68,500          | 168,000    |
| May                 | 17,200  | 35,100     | 44,700  | 64,600          | 162,000    |
| June                | 16,200  | 34,400     | 50,500  | 66,500          | 168,000    |
| July                | 16,600  | 35,100     | 39,000  | 65,200          | 156,000    |
| August              | 14,600  | 35,100     | 39,300  | 61,400          | 150,000    |
| September           | 13,900  | 34,400     | 47,600  | 59,900          | 156,000    |
| October             | 13,500  | 35,100     | 48,700  | 63,500          | 161,000    |
| November            | 12,100  | 34,400     | 41,500  | 61,500          | 150,000    |
| December            | 14,700  | 34,400     | 75,100  | 61,800          | 187,000    |
| January-December r/ | 183,000 | 417,000    | 577,000 | 769,000         | 1,950,000  |
| 2000:               |         |            |         |                 |            |
| January             | W       | 34,400     | 58,500  | 75,200          | 168,000    |
| February            | W       | 34,300     | 63,300  | 69,900          | 167,000    |
| March               | W       | 34,300     | 71,200  | 75,000          | 181,000    |
| April               | W       | 34,300     | 57,600  | 73,400          | 165,000 r/ |
| May                 | W       | 34,300     | 77,100  | 73,400          | 185,000    |
| January-May         | W       | 172,000    | 328,000 | 366,000         | 866,000    |

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data, included with "Other States".

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Includes Arizona, Colorado, Idaho, Montana, New Mexico, South Carolina, South Dakota, Utah, and Washington.

3/ Includes Alaska, California, Colorado, Missouri, Montana, New Mexico, New York, South Carolina, South Dakota, Tennessee, Utah, Washington, and State indicated by symbol W.

TABLE 2  
SELECTED PRECIOUS METAL PRICES

(Dollars per troy ounce)

|                              | Gold                | Silver  | Platinum             | Palladium            |
|------------------------------|---------------------|---|----------------------|----------------------|
| <u>Engelhard Industries:</u> |                     |   |                      |                      |
| 1999:                        |                     |   |                      |                      |
| Low/date                     | 253.88 (July 20)    | 4.91 (January 4, April 14,<br>May 28, June 4) | 344.00 (January 28)  | 293.00 (May 4)       |
| High/date                    | 326.70 (October 5)  | 5.75 (September 28)                           | 457.00 (November 16) | 456.00 (December 29) |
| Average                      | 279.91              | 5.25  | 378.94               | 363.20               |
| 2000:                        |                     |   |                      |                      |
| April:                       |                     |   |                      |                      |
| Low/date                     | 276.17/28           | 4.96/26 and 27                                | 473.00/26            | 570.00/10, 11, 13    |
| High/date                    | 283.63/11           | 5.18/13 and 18                                | 527.00/5             | 610.00/5 and 28      |
| Average                      | 280.88              | 5.10  | 499.79               | 587.05               |
| May:                         |                     |   |                      |                      |
| Low/date                     | 272.41/26           | 4.95/30                                       | 504.00/8             | 571.00/30            |
| High/date                    | 281.88/5            | 5.16/4  | 567.00/24            | 630.00/1             |
| Average                      | 276.25              | 5.04  | 533.14               | 585.36               |
| June:                        |                     |   |                      |                      |
| Low/date                     | 273.61/1            | 4.95/1  | 550.00/14 and 16     | 584.00/1             |
| High/date                    | 292.65/13           | 5.15/6  | 586.00/26            | 697.00/19            |
| Average                      | 286.87              | 5.05  | 565.23               | 656.41               |
| Year to date                 |                     |   |                      |                      |
| Low/date                     | 272.41 (May 26)     | 4.95 (March 30, May 30,<br>June 1)            | 416.00 (January 6)   | 437.00 (January 6)   |
| High/date                    | 313.88 (February 7) | 5.53 (February 7)                             | 586.00 (June 26)     | 815.00 (February 22) |
| Average                      | 286.29              | 5.14  | 507.52               | 600.545              |
| <u>Handy and Harman:</u>     |                     |   |                      |                      |
| 1999                         |                     |   |                      |                      |
|                              | 278.81              | 5.25  | XX                   | XX                   |
| 2000:                        |                     |   |                      |                      |
| April                        | 279.75              | 5.10  | XX                   | XX                   |
| May                          | 275.10              | 5.05  | XX                   | XX                   |
| June                         | 285.73              | 5.05  | XX                   | XX                   |
| Average year to date         | 285.14              | 5.14  | XX                   | XX                   |
| <u>London Final: 1/</u>      |                     |   |                      |                      |
| 1999                         |                     |   |                      |                      |
|                              | 278.77              | 5.22  | XX                   | XX                   |
| 2000:                        |                     |   |                      |                      |
| April                        | 279.69              | 5.06  | XX                   | XX                   |
| May                          | 275.19              | 4.99  | XX                   | XX                   |
| June                         | 285.73              | 5.00  | XX                   | XX                   |
| Average year to date         | 285.20              | 5.09  | XX                   | XX                   |

XX Not applicable.

1/ Silver price reported as "London Spot/US Equiv."

Source: Platt's Metals Week.

TABLE 3  
U.S. IMPORTS AND EXPORTS OF GOLD 1/

(Kilograms of gold content, unless otherwise specified)

| Period and country              | Ores and concentrates 2/ | Doré and precipitates | Refined bullion 3/ | Ash and residues | Total 4/ | Waste and scrap (gross weight) | Metal powder (gross weight) | Gold compounds (gross weight) |
|---------------------------------|--------------------------|-----------------------|--------------------|------------------|----------|--------------------------------|-----------------------------|-------------------------------|
| <b>Imports for consumption:</b> |                          |                       |                    |                  |          |                                |                             |                               |
| 1999                            | 117                      | 24,700                | 196,000            | 133              | 221,000  | 30,500                         | 5,500                       | 9,400                         |
| <b>2000:</b>                    |                          |                       |                    |                  |          |                                |                             |                               |
| February                        | 5                        | 2,680                 | 12,300             | --               | 15,000   | 1,200                          | 18                          | 1,640                         |
| March                           | 5                        | 10,000                | 23,500             | 2                | 33,500   | 3,210                          | 656                         | 2,240                         |
| <b>April:</b>                   |                          |                       |                    |                  |          |                                |                             |                               |
| Australia                       | --                       | --                    | 120                | --               | 120      | --                             | --                          | --                            |
| Brazil                          | --                       | --                    | 3,940              | --               | 3,940    | 2                              | --                          | 140                           |
| Canada                          | --                       | --                    | 5,670              | --               | 5,670    | 422                            | 10                          | --                            |
| Chile                           | --                       | 18                    | 425                | --               | 443      | --                             | --                          | --                            |
| Colombia                        | --                       | 56                    | 949                | --               | 1,010    | 18                             | --                          | 1,610                         |
| Dominican Republic              | --                       | --                    | 55                 | --               | 55       | 316                            | 2                           | --                            |
| France                          | --                       | --                    | 122                | --               | 122      | 4                              | --                          | --                            |
| Mexico                          | --                       | 468                   | 90                 | --               | 558      | 136                            | --                          | --                            |
| Peru                            | --                       | 1,110                 | --                 | --               | 1,110    | --                             | --                          | --                            |
| Uruguay                         | --                       | --                    | 896                | --               | 896      | --                             | --                          | --                            |
| Other                           | --                       | 91                    | 178                | --               | 269      | 144                            | 1                           | 26                            |
| Total                           | --                       | 1,740                 | 12,400             | --               | 14,200   | 1,040                          | 13                          | 1,780                         |
| Year to date                    | 11                       | 16,200                | 63,400             | 3                | 79,700   | 6,460                          | 816                         | 5,980                         |
| <b>Exports:</b>                 |                          |                       |                    |                  |          |                                |                             |                               |
| 1999                            | 117                      | 87,300                | 435,000            | --               | 523,000  | 40,000                         | 270                         | 561,000                       |
| <b>2000:</b>                    |                          |                       |                    |                  |          |                                |                             |                               |
| February                        | 1                        | 7,270                 | 81,600             | --               | 88,900   | 5,470                          | 14                          | 313,000                       |
| March                           | 2                        | 8,490                 | 49,300             | --               | 57,700   | 3,980                          | 102                         | 56,200                        |
| <b>April:</b>                   |                          |                       |                    |                  |          |                                |                             |                               |
| Australia                       | --                       | --                    | 3,100              | --               | 3,100    | --                             | --                          | 421                           |
| Canada                          | --                       | 200                   | 25                 | --               | 224      | 1,340                          | (5/)                        | 132,000                       |
| Israel                          | --                       | --                    | --                 | --               | --       | --                             | (5/)                        | 18,500                        |
| Italy                           | --                       | --                    | 21                 | --               | 21       | 509                            | --                          | --                            |
| Japan                           | --                       | 5                     | 391                | --               | 396      | --                             | --                          | --                            |
| Korea, Republic of              | 1                        | --                    | 28                 | --               | 29       | --                             | --                          | --                            |
| Mexico                          | --                       | --                    | 2,230              | --               | 2,230    | --                             | --                          | 3,040                         |
| Peru                            | --                       | --                    | 399                | --               | 399      | --                             | --                          | --                            |
| Sweden                          | --                       | 2                     | 1                  | --               | 3        | 143                            | 2                           | --                            |
| Switzerland                     | --                       | 11,000                | 3,520              | --               | 14,500   | --                             | --                          | --                            |
| United Kingdom                  | --                       | --                    | 1,890              | --               | 1,890    | 4,510                          | 26                          | 495                           |
| Other                           | --                       | 3                     | 46                 | --               | 49       | 60                             | --                          | 37                            |
| Total                           | 1                        | 11,200                | 11,600             | --               | 22,800   | 6,570                          | 28                          | 154,000                       |
| Year to date                    | 5                        | 35,500                | 203,000            | --               | 239,000  | 22,400                         | 311                         | 540,000                       |

-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Includes gold content of base metal ores, concentrates, and matte imported for refining.

3/ Bullion also moves in both directions between U.S. markets and foreign stocks on deposit in the Federal Reserve Bank. Monetary gold excluded.

4/ "Waste and scrap," "Metal powder," or "Gold compounds" not included in "Total."

5/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS AND EXPORTS OF SILVER, REFINED AND AS NITRATE 1/

(Kilograms)

| Period and country              | Bullion<br>(silver content) | Doré<br>(silver content) | Total<br>(silver content) | Other<br>unwrought<br>silver<br>(gross weight) | Metal<br>powder<br>(gross weight) | Silver<br>nitrate<br>(gross weight) |
|---------------------------------|-----------------------------|--------------------------|---------------------------|--|-----------------------------------|-------------------------------------|
| <b>Imports for consumption:</b> |                             |                          |                           |  |                                   |                                     |
| 1999                            | 2,660,000                   | 404,000                  | 3,060,000                 | 126,000  | 120,000                           | 4,450                               |
| <b>2000:</b>                    |                             |                          |                           |  |                                   |                                     |
| February                        | 1,010,000                   | 15,400                   | 1,020,000                 | 997  | 8,060                             | 2,030                               |
| March                           | 371,000                     | 12,900                   | 384,000                   | 8,780  | 48,000                            | 36                                  |
| <b>April:</b>                   |                             |                          |                           |  |                                   |                                     |
| Belgium                         | --                          | --                       | --                        | --   | --                                | 4,320                               |
| Canada                          | 88,800                      | --                       | 88,800                    | 23,500   | --                                | 17                                  |
| Chile                           | --                          | 10,800                   | 10,800                    | --   | --                                | --                                  |
| France                          | --                          | --                       | --                        | --   | 100                               | --                                  |
| Germany                         | --                          | --                       | --                        | --   | 1,620                             | --                                  |
| Japan                           | --                          | --                       | --                        | --   | 13,900                            | --                                  |
| Mexico                          | 135,000                     | 5,270                    | 140,000                   | 1,570  | --                                | 799                                 |
| Panama                          | 80                          | --                       | 80                        | --   | --                                | --                                  |
| Switzerland                     | --                          | --                       | --                        | --   | 50                                | --                                  |
| Other                           | --                          | --                       | --                        | 1 2/   | --                                | --                                  |
| Total                           | 224,000                     | 16,100                   | 240,000                   | 25,100   | 15,700                            | 5,140                               |
| Year to date                    | 1,870,000                   | 60,000                   | 1,930,000                 | 49,500   | 76,400                            | 7,200                               |
| <b>Exports:</b>                 |                             |                          |                           |  |                                   |                                     |
| 1999                            | 481,000                     | 64,400                   | 545,000                   | 75,100   | 318,000                           | 62,500                              |
| <b>2000:</b>                    |                             |                          |                           |  |                                   |                                     |
| February                        | 1,770                       | 8,340                    | 10,100                    | 2,230  | 37,100                            | 6,580                               |
| March                           | 16,400                      | 4,980                    | 21,400                    | 11,200   | 39,000                            | 23,500                              |
| <b>April:</b>                   |                             |                          |                           |  |                                   |                                     |
| Australia                       | 155                         | --                       | 155                       | --   | --                                | --                                  |
| Austria                         | --                          | --                       | --                        | --   | 307                               | --                                  |
| Canada                          | --                          | --                       | --                        | 454  | 2,110                             | 12,300                              |
| China                           | --                          | --                       | --                        | --   | 492                               | --                                  |
| Dominican Republic              | --                          | --                       | --                        | 642  | --                                | --                                  |
| France                          | --                          | --                       | --                        | --   | 980                               | --                                  |
| Germany                         | --                          | --                       | --                        | 501  | 3,110                             | 6                                   |
| Greece                          | --                          | --                       | --                        | --   | 317                               | --                                  |
| Hong Kong                       | --                          | --                       | --                        | --   | 1,040                             | --                                  |
| Ireland                         | --                          | --                       | --                        | --   | 837                               | --                                  |
| Japan                           | 19,500                      | --                       | 19,500                    | --   | 12,400                            | --                                  |
| Korea, Republic of              | --                          | --                       | --                        | 22   | 1,360                             | --                                  |
| Mexico                          | 4,990                       | 3,980                    | 8,970                     | 45   | 472                               | 165                                 |
| Netherlands                     | --                          | --                       | --                        | --   | 750                               | --                                  |
| Singapore                       | --                          | --                       | --                        | --   | 92                                | --                                  |
| Switzerland                     | --                          | 1,660                    | 1,660                     | --   | --                                | --                                  |
| Taiwan                          | --                          | --                       | --                        | 936  | 1,800                             | --                                  |
| Thailand                        | --                          | --                       | --                        | 400  | --                                | --                                  |
| United Kingdom                  | 211                         | 335                      | 545                       | 855  | 4,870                             | --                                  |
| Other                           | --                          | --                       | --                        | 28 2/  | 22                                | --                                  |
| Total                           | 24,800                      | 5,970                    | 30,800                    | 3,880  | 31,000                            | 12,500                              |
| Year to date                    | 99,900                      | 22,700                   | 123,000                   | 22,000   | 123,000                           | 61,000                              |

-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS AND EXPORTS OF SILVER, RAW, SEMIMANUFACTURED, AND WASTE AND SCRAP 1/

(Kilograms of silver content, unless otherwise specified)

| Period and country              | Silver ores and concentrates | Base metal ores and concentrates | Ash and residues | Total   | Semimanufactured form 2/ 3/ (gross weight) | Waste and scrap (gross weight) |
|---------------------------------|------------------------------|----------------------------------|------------------|---------|--|--------------------------------|
| <b>Imports for consumption:</b> |                              |                                  |                  |         |  |                                |
| 1999                            | 10,800                       | 2,750                            | 101,000          | 115,000 | 139,000                                    | 1,640,000                      |
| 2000:                           |                              |                                  |                  |         |  |                                |
| February                        | 101                          | --                               | 2,730            | 2,830   | 12,800                                     | 96,900                         |
| March                           | --                           | --                               | 2,550            | 2,550   | 13,400                                     | 34,500                         |
| April:                          |                              |                                  |                  |         |  |                                |
| Argentina                       | --                           | --                               | --               | --      | --   | 330                            |
| Australia                       | --                           | --                               | 136              | 136     | --   | --                             |
| Brazil                          | --                           | --                               | --               | --      | 196  | --                             |
| Canada                          | 891                          | --                               | 1,330            | 2,220   | 276  | 7,930                          |
| China                           | --                           | --                               | --               | --      | --   | 617                            |
| Dominican Republic              | --                           | --                               | --               | --      | --   | 493                            |
| France                          | --                           | --                               | --               | --      | 464  | --                             |
| Germany                         | --                           | --                               | --               | --      | 1,350 4/                                   | 968                            |
| Korea, Republic of              | --                           | --                               | --               | --      | 766  | 11,000                         |
| Malaysia                        | --                           | --                               | --               | --      | --   | 7,770                          |
| Mexico                          | --                           | --                               | --               | --      | --   | 4,200                          |
| Poland                          | --                           | --                               | --               | --      | 136  | --                             |
| Russia                          | --                           | --                               | --               | --      | 72   | --                             |
| Spain                           | --                           | --                               | --               | --      | 371  | --                             |
| United Kingdom                  | --                           | --                               | 1,430            | 1,430   | 186  | 441                            |
| Other                           | --                           | --                               | --               | --      | 100 4/                                     | 75                             |
| Total                           | 891                          | --                               | 2,890 4/         | 3,780   | 3,920                                      | 33,800                         |
| Year to date                    | 1,030                        | --                               | 17,300           | 18,300  | 38,200                                     | 433,000                        |
| <b>Exports:</b>                 |                              |                                  |                  |         |  |                                |
| 1999                            | 70,800                       | --                               | --               | 70,800  | 122,000                                    | 1,310,000                      |
| 2000:                           |                              |                                  |                  |         |  |                                |
| February                        | 17,000                       | --                               | --               | 17,000  | 10,000                                     | 181,000                        |
| March                           | 411                          | --                               | --               | 411     | 22,100                                     | 165,000                        |
| April:                          |                              |                                  |                  |         |  |                                |
| Belgium                         | --                           | --                               | --               | --      | 435  | 19,200                         |
| Canada                          | 1,060                        | --                               | --               | 1,060   | 4,700                                      | 55,500                         |
| China                           | --                           | --                               | --               | --      | --   | 19,300                         |
| France                          | --                           | --                               | --               | --      | 550 4/                                     | 61                             |
| Germany                         | 39                           | --                               | --               | 39      | 108 4/                                     | 9,400                          |
| Hong Kong                       | --                           | --                               | --               | --      | 179 4/                                     | 501                            |
| Italy                           | --                           | --                               | --               | --      | 521 4/                                     | 8,100                          |
| Japan                           | --                           | --                               | --               | --      | 1,070 4/                                   | 9,430                          |
| Mexico                          | --                           | --                               | --               | --      | 1,180                                      | 16,800                         |
| Netherlands                     | --                           | --                               | --               | --      | 183  | 121                            |
| New Zealand                     | --                           | --                               | --               | --      | 81 4/                                      | --                             |
| Philippines                     | --                           | --                               | --               | --      | --   | 123                            |
| Singapore                       | --                           | --                               | --               | --      | 135 4/                                     | --                             |
| Spain                           | --                           | --                               | --               | --      | 862  | --                             |
| Sweden                          | --                           | --                               | --               | --      | --   | 2,670                          |
| Switzerland                     | --                           | --                               | --               | --      | 35 4/                                      | 333                            |
| Taiwan                          | --                           | --                               | --               | --      | 323 4/                                     | --                             |
| United Kingdom                  | --                           | --                               | --               | --      | 210 4/                                     | 2,690                          |
| Other                           | --                           | --                               | --               | --      | 96 4/                                      | 50                             |
| Total                           | 1,100                        | --                               | --               | 1,100   | 10,700                                     | 144,000                        |
| Year to date                    | 26,600                       | --                               | --               | 26,500  | 70,200                                     | 858,000                        |

-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Containing 99.5% or more by weight of silver. Imports only.

3/ Semimanufactured (including silver plated with gold or platinum) forms of silver.

4/ All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.



TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM-GROUP METALS 1/

(Kilograms of metal content, unless otherwise specified)

| Period and country | Platinum grain and nuggets | Platinum sponge | Other unwrought platinum | Platinum, other | Platinum waste and scrap | Platinum coins | Unwrought palladium | Palladium, other | Iridium 2/ | Unwrought osmium | Unwrought ruthenium | Rhodium 3/ |
|--------------------|----------------------------|-----------------|--------------------------|-----------------|--------------------------|----------------|---------------------|------------------|------------|------------------|---------------------|------------|
| 1999               | 6,100                      | 78,300          | 7,820                    | 16,500          | 19,700                   | 169            | 165,000             | 24,100           | 2,270      | 23               | 11,400              | 10,500     |
| 2000:              |                            |                 |                          |                 |                          |                |                     |                  |            |                  |                     |            |
| February           | 222                        | 8,900           | 123                      | 474             | 280                      | 9              | 14,100              | 280              | 88         | --               | 2,010               | 529        |
| March              | 87                         | 5,550           | 168                      | 734             | 315                      | (4/)           | 15,900              | 2,520            | 165        | 23               | 1,120               | 716        |
| April:             |                            |                 |                          |                 |                          |                |                     |                  |            |                  |                     |            |
| Australia          | --                         | --              | --                       | 101             | --                       | (5/)           | --                  | --               | --         | --               | --                  | --         |
| Belgium            | --                         | 270             | --                       | --              | --                       | --             | 889                 | 31               | --         | --               | --                  | 174 6/     |
| Brazil             | --                         | --              | --                       | 66              | --                       | --             | 1                   | --               | --         | --               | --                  | --         |
| Canada             | 1                          | --              | --                       | 34              | 50                       | --             | 232                 | 3                | (5/)       | --               | --                  | --         |
| Chile              | --                         | --              | --                       | 20              | --                       | --             | --                  | --               | --         | --               | --                  | --         |
| Colombia           | --                         | --              | --                       | --              | (4/)                     | --             | --                  | --               | --         | --               | --                  | --         |
| Dominican Republic | --                         | --              | --                       | --              | 1                        | --             | --                  | --               | --         | --               | --                  | --         |
| France             | --                         | --              | --                       | --              | --                       | --             | --                  | --               | 24         | --               | --                  | --         |
| Germany            | 36                         | 254             | 31 6/                    | 193             | 3                        | --             | 472 6/              | 111 6/           | (4/)       | --               | 62 6/               | 42         |
| Hong Kong          | --                         | --              | --                       | --              | 24                       | --             | --                  | --               | --         | --               | --                  | --         |
| Israel             | --                         | --              | 9 6/                     | --              | --                       | --             | --                  | --               | --         | --               | --                  | --         |
| Ireland            | --                         | --              | --                       | --              | --                       | --             | --                  | 8                | --         | --               | 12                  | --         |
| Italy              | --                         | 31              | --                       | --              | --                       | --             | 266                 | (5/)             | --         | --               | --                  | --         |
| Japan              | 27                         | 2               | --                       | --              | --                       | --             | 586                 | 17               | --         | --               | --                  | 9          |
| Malaysia           | --                         | --              | --                       | --              | (4/)                     | --             | --                  | --               | --         | --               | --                  | --         |
| Mexico             | --                         | --              | --                       | --              | 24                       | --             | --                  | --               | --         | --               | --                  | --         |
| Netherlands        | --                         | --              | --                       | 2               | --                       | --             | --                  | --               | --         | --               | --                  | --         |
| Norway             | --                         | 16              | --                       | --              | --                       | --             | 446                 | --               | --         | --               | --                  | --         |
| Russia             | --                         | --              | 10                       | --              | --                       | --             | 8,480               | 60               | --         | --               | --                  | --         |
| South Africa       | 31                         | 4,100           | 32                       | --              | --                       | --             | 1,760               | 83               | 30         | --               | 1,410               | 419        |
| Spain              | --                         | --              | --                       | 17              | --                       | --             | --                  | --               | --         | --               | --                  | --         |
| Sweden             | --                         | --              | --                       | --              | --                       | --             | 125                 | --               | --         | --               | --                  | --         |
| Switzerland        | --                         | --              | 1                        | 89              | --                       | --             | --                  | 153              | --         | --               | --                  | --         |
| Taiwan             | --                         | --              | --                       | --              | 32                       | --             | --                  | (5/)             | --         | --               | --                  | --         |
| United Kingdom     | --                         | 1,560           | 44                       | 88 6/           | 6                        | 3              | 850                 | --               | 7 6/       | --               | 53                  | 7 6/       |
| Total              | 95                         | 6,240           | 127                      | 610             | 140                      | 3              | 14,100              | 467              | 61         | --               | 1,540               | 651        |
| Year to date       | 657                        | 23,700          | 532                      | 2,200           | 9,920                    | 13             | 49,500              | 14,900           | 1,080      | 23               | 6,120               | 7,380      |

-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Unwrought and other forms of iridium.

3/ Unwrought and other forms of rhodium.

4/ Less than 1/2 unit.

5/ Less than 1/2 unit. All or part of these data have been referred to the U.S. Census Bureau for verification.

6/ All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.

TABLE 7  
U.S. EXPORTS OF PLATINUM GROUP METALS 1/

(Kilograms of metal content, unless otherwise specified)

| Period and country   | Palladium 2/ | Platinum 2/ | Platinum waste and scrap | Iridium, osmium and ruthenium 2/ 3/ | Rhodium 2/ |
|----------------------|--------------|-------------|--------------------------|-------------------------------------|------------|
| 1999                 | 43,800 r/    | 19,400      | 7,660                    | 851                                 | 114        |
| 2000:                |              |             |                          |                                     |            |
| February             | 4,280        | 1,400       | 349                      | 121                                 | 42         |
| March                | 2,990        | 1,770       | 593                      | 102                                 | 8          |
| April:               |              |             |                          |                                     |            |
| Argentina            | 3            | 3           | --                       | --                                  | --         |
| Australia            | 289          | 4           | --                       | --                                  | --         |
| Belgium              | 6            | 2           | 11                       | --                                  | 5          |
| Brazil               | --           | 44          | --                       | --                                  | --         |
| Canada               | 106          | 105         | 41                       | --                                  | (4/)       |
| China                | 179          | --          | --                       | --                                  | --         |
| Denmark              | --           | 8           | --                       | 4                                   | --         |
| Dominican Republic   | --           | 1           | --                       | --                                  | --         |
| Finland              | 1            | 2           | --                       | --                                  | --         |
| France               | 14           | 18          | --                       | --                                  | --         |
| Germany              | 294          | 117         | 87                       | --                                  | --         |
| Hong Kong            | 50           | 7           | --                       | --                                  | (4/)       |
| India                | --           | 1           | --                       | --                                  | (4/)       |
| Ireland              | 313          | 98          | --                       | --                                  | 22         |
| Israel               | 947          | 1           | --                       | --                                  | --         |
| Italy                | 29           | 11          | --                       | 1                                   | --         |
| Japan                | 1,310        | 196         | --                       | --                                  | 54         |
| Korea, Republic of   | 251          | 2           | --                       | --                                  | --         |
| Kuwait               | --           | 3           | --                       | --                                  | --         |
| Malaysia             | 6            | (4/)        | --                       | --                                  | --         |
| Mexico               | 4            | 17          | --                       | --                                  | (4/)       |
| Netherlands          | 191          | 3           | 1                        | --                                  | --         |
| New Zealand          | 11           | 2           | --                       | --                                  | --         |
| Philippines          | --           | 4           | --                       | --                                  | --         |
| Poland               | 1            | (4/)        | --                       | --                                  | --         |
| Romania              | --           | 3           | --                       | --                                  | --         |
| Saudi Arabia         | --           | 5           | --                       | --                                  | --         |
| Singapore            | 6            | 24          | --                       | --                                  | --         |
| Spain                | 10           | 2           | --                       | --                                  | --         |
| Sweden               | 17           | 7           | 4                        | --                                  | --         |
| Switzerland          | 5            | 39          | --                       | --                                  | --         |
| Taiwan               | 421          | 6           | --                       | --                                  | 10         |
| Thailand             | 7            | 2           | --                       | --                                  | --         |
| Turkey               | 1            | --          | --                       | --                                  | --         |
| United Arab Emirates | 1            | --          | --                       | --                                  | --         |
| United Kingdom       | 131          | 92          | 36                       | 39                                  | --         |
| Total                | 4,600        | 830         | 180                      | 44                                  | 91         |
| Year to date         | 16,700       | 10,300      | 1,890                    | 373                                 | 312        |

-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Unwrought and other forms.

3/ Gross weight.

4/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8  
LEADING GOLD-PRODUCING MINES IN THE UNITED STATES IN THE FIRST QUARTER OF 2000,  
IN ORDER OF OUTPUT 1/

| Rank | Mine                   | County and State       | Operator                               | Kilograms produced |
|------|------------------------|------------------------|--|--------------------|
| 1    | Carlin Mines Complex   | Eureka, Elko, etc., NV | Newmont Gold Co.                       | 10,330             |
| 2    | Betze-Post/ Goldstrike | Eureka, NV             | Barrick Gold Corp.                     | 10,270             |
| 3    | Cortez                 | Lander, NV             | Placer Dome Inc.                       | 9,700              |
| 4    | Twin Creeks            | Humboldt, NV           | Newmont Gold Co.                       | 7,620              |
| 5    | Meikle/ Goldstrike     | Eureka, NV             | Barrick Gold Corp.                     | 5,430              |
| 6    | Round Mountain         | Nye, NV                | Smokey Valley Common Oper.             | 4,480              |
| 7    | Bingham Canyon         | Salt Lake, UT          | Kennecott-Utah Copper Corp.            | 3,450              |
| 8    | Jerritt Canyon         | Elko, NV               | Independence Mining Co.                | 2,590              |
| 9    | Ken Snyder             | Elko, NV               | Euro-Nevada Mining Co.                 | 2,580              |
| 10   | Fort Knox              | Fairbanks, AK          | Amax Gold Inc.                         | 2,410              |
| 11   | Lone Tree              | Humboldt, NV           | Newmont Gold Co.                       | 1,900              |
| 12   | Golden Sunlight        | Jefferson, MT          | Placer Dome Inc.                       | 1,600              |
| 13   | Homestake              | Lawrence, SD           | Homestake Mining Corp.                 | 1,480              |
| 14   | McCoy/ Cove            | Lander, NV             | Echo Bay Mines, Ltd.                   | 1,340              |
| 15   | Barney's Canyon        | Salt Lake, UT          | Kennecott Corp.                        | 1,030              |
| 16   | Mesquite               | Imperial, CA           | Newmont Gold Co.                       | 960                |
| 17   | McLaughlin             | Napa, CA               | Homestake Mining Corp.                 | 920                |
| 18   | Beartrack              | Lemhi, ID              | Meridan Gold Corp.                     | 900                |
| 19   | Ruby Hill              | Eureka, NV             | Homestake Mining Corp.                 | 880                |
| 20   | Denton-Rawhide         | Mineral, NV            | Kennecott Rawhide Mining Co.           | 840                |
| 21   | Bald Mountain          | White Pine, NV         | Placer Dome (U.S.) Inc.                | 840                |
| 22   | Castle Mountain        | San Bernardino, CA     | Viceroy Gold Corp.                     | 820                |
| 23   | Kettle River           | Ferry, WA              | Echo Bay Mines, Ltd.                   | 780                |
| 24   | Wharf                  | Lawrence, SD           | Wharf Resources, Ltd.                  | 740                |
| 25   | Briggs                 | Inyo, CA               | Canyon Resources Corp.                 | 740                |
| 26   | Rand                   | Kern, CA               | Glamis Rand Mining Co.                 | 710                |
| 27   | Greens Creek           | South Star, AK         | Kennecott Greens Creek Mining Co.      | 630                |
| 28   | Marigold               | Humboldt, NV           | Rayrock Mines, Inc.                    | 625                |
| W 2/ | Cresson                | Teller, CO             | Cripple Creek & Victor Gold Mining Co. | W                  |
| W 2/ | Florida Canyon         | Lander, NV             | Florida Canyon Mining, Inc.            | W                  |

W Withheld to avoid disclosing company proprietary data.

1/ Data are rounded to three significant digits; these mines accounted for more than 96% of the U.S. gold production in the first quarter of 2000.

2/ Cresson and Florida Canyon are among the top 30 gold-producing mines in the United States, but are not shown in rank order to avoid disclosing company proprietary data.

Source: Company annual reports, Security Exchange Commission's 10K and 6K reports, or company news releases.