Silver Through the Ages

By Josef Charrach

In his latest article charting mankind’s love affair with precious gems and metals, Josef Charrach brings us an illustrated history of silver— as told through stamps, covers and postal stationery.

Silver (Fig 1) is a soft, white, lustrous noble metal. It occurs naturally in its pure, free form of native silver (Fig 2), as an alloy with gold and other metals, and in minerals such as argentite, Ag₂S (Fig 3), pyrargyrite, Ag₃SbS₃ (Fig 4) and proustite, Ag₃AsS₃ (Fig 5). Most silver is produced as a by-product of copper, gold, lead, and zinc refining. The highest silver concentrations are found in lead minerals, followed by copper, with the lowest concentrations in zinc minerals. Silver is a very ductile, malleable metal (slightly harder than gold) with a brilliant white metallic lustre that can take a high degree of polish. As such, silver has long been valued as a precious metal, and it is used to make ornaments, jewellery, high-value tableware, utensils and currency coins.

The history of silver

Silver was discovered about 4000BC following initial discoveries of the metals gold and copper. Silver’s main use during this period was for jewellery and as a means of exchange (Fig 6). The earliest significant silver mining was undertaken by the pre-Hittites of Cappadocia in Eastern Anatolia. The metallurgy of smelting silver-bearing lead ores began around 2000BC. The impure smelted lead-silver alloy was fire refined by cupellation; this high temperature process separates the noble metals from lead or copper leaving a slag. Important lead-silver deposits were mined at Laurium, Greece, during the period from 500BC to 100AD.

Spain dominated silver mine production up to 1000AD. From 750-1200AD several major silver discoveries were made in Europe, including the Rammelsburg deposit at Goslar, and deposits in the Fricburg region of Saxony in Germany, and the Sainte Marie aux-Mines in Alsace, France.

Fig 7 shows a double folded letter sent from Ste Marie aux-Mines in 1831, the number ‘60’ refers to the Department of Haut Rhin. This handstamp was in use from 1814 to 1831. The letter is also struck with an ‘A’ datestamp of 19 January 1831. The 7½ manuscript mark refers to the second weight class and the letter was sent for 5 décimes, as indicated by the manuscript mark, which was the rate for a distance up to 40km. This rate applied from 1 January 1828.

In 1860, the Sala mine was discovered in Sweden. Fig 8 shows a postage free folded wrapper sent from Sala to Falun, dated 29 August 1835, and cancelled with a Sala type ‘1’ arc postmark, which was used from Autumn 1830 until 1833. The wax seal on the reverse shows the coat of arms of Sala which features the crossed hammers of mining, the half moon symbol for silver, and the burning mountains—a symbol of early mining by fire-setting, whereby the rock was heated up by lighting bonfires that were quenched to fracture the rock.

As the European silver mines became depleted, new discoveries were made in the
Fig 3 Argentite

Fig 4 Pyrrhotite

Fig 5 Proustite

Fig 6 Silver coin used in the ancient Greek civilization

Fig 7 Letter sent from Sainte Marie aux Mines

Fig 8 Postage free folded wrapper sent from Sala to Falun and the wax seal on the reverse

G.S.M. September 2013
Americans following the discovery of the New World in 1492. This was a significant milestone that led to the founding of major mines in Mexico, Bolivia and Peru that were to account for over 85 per cent of global silver production and trade from 1560 to 1800 AD. During this period Mexico and Peru produced an estimated accumulated output of between 70,000 to 150,000 tons of silver.

The Pachuca—Real del Monte silver-gold district in Mexico was one of the most prolific precious metals mining camps ever discovered in the world. Over 1.4 billion ounces of historic silver and 7 million ounces of gold have been mined there. Silver mining was undertaken both sides of a mountain between Pachuca and Mineral del Monte. This folded letter (Fig. 9) was sent from Pachuca on 18 July 1862. The 1r. stamp, which shows a ‘Franco min.delMonte’ cancel, paid the single letter rate for up to 16 leagues in distance. The Pachuca district overprint was used in Mexico during the first and second issue period (1856-1864).

In 1858, silver ore was discovered in Nevada, USA, which later developed into a very important mining centre (Fig. 10). Samuel Clemens (later Mark Twain, 1835-1910) was an unsuccessful silver prospector, who wrote about his adventures in the Comstock Lode area of Nevada in the novel Roughing It in 1872 (Figs 11 and 12).

Refining techniques
Near surface silver-bearing mineralisation is mined in open pits. As the mineralisation goes to depth underground mining has to be undertaken (Figs 13 and 14). The ore is then crushed and ground to a fine powder. The powdered silver ore is then mixed with salt, roasted copper ore and mercury. This mixing was undertaken by a tethered mule walking in a circular path on a paved patio. For this reason the process was termed the ‘Patio process’ in the Americas. This process converts the ore into finely divided elemental silver dissolved in mercury. The mercury is distilled and the silver recovered by cupellation.

Above: Fig 10 Californian gold miners moved to Nevada and discovered the rich Comstock silver mine at Gold Hill.

Left:
Fig 11
Mark Twain

Right:
Fig 12
Roughing It

Below: Fig 13 A black die proof, a plate proof and the issued stamp released by Bolivia in 1943 showing the entrance to the Pulacayo underground silver mine.

Above: Fig 14 Illustrated letter card with a receiving cancellation of the railway PO at Dunedin, New Zealand, showing the copper, silver and gold, multi-bench, open pit mine at Mount Lyell, Tasmania.

Fig 15 Torah crown
In the late 19th century, processing methods were based on the fact that most of the ores are sulphide minerals, which could be floated from the ground waste rock by adding a frothing agent. The flotation process concentrated the silver-bearing minerals by a factor of 30 to 40. The concentrates were then reacted with cyanide, followed by electro-refining.

If silver is contained in lead ores, then the Parkes process is used. This involves heating the lead-silver ore until it is liquid and then adding liquid zinc. The silver migrates into the zinc to form a zinc-silver solution, that solution is removed from the liquid lead and re-heated until the zinc vaporises, leaving nearly pure silver.

**Silver alloy**

Silver is a soft metal even when it has been rolled or forged, it re-crystallises at room temperature. The re-crystallisation softens the silver making it vulnerable to scratching and deforming. Copper is added to convert the silver into a harder and stronger alloy. An alloy containing 92.5 per cent silver and 7.5 per cent copper is known as sterling silver. In the UK, sterling silver is hallmarked with a lion passant. Jewellery and ornaments require the silver to be stronger and generally contain 85-90 per cent silver and 15-10 per cent copper respectively (Figs 15 to 17). Sterling silver jewellery is often plated with a thin coating of 0.999 fine silver, to give the item a shiny finish. This process is called 'flashing'.

Coin silver is an alloy of 90 per cent silver and 10 per cent copper. This Bolivian postal stationery card printed in 1943 (Fig 18) shows a mechanically operated mint constructed in 1773 in Potosi. Silver ‘bust’ dollars were produced for the Spanish colonialists.

Today, silver metal is used in electrical contacts and conductors because it has the highest electrical conductivity of all metals. It is used in the production of high-quality mirrors due to its brilliant white metallic lustre and its possibility to take a high degree of polish. Silver is also used as a catalyst in chemical reactions. Its compounds are used in photographic film (Fig 19), and dilute silver nitrate solutions and other silver compounds are used as disinfectants and microbicicides.