20 Years of the *Platinum* Review

This year marks the 20th anniversary of Johnson Matthey's Platinum review. The first of the series, published in 1985, set out to "shed more light on the innumerable facets of platinum and the other platinum group metals", and that continues to be the primary purpose of the review.

In fact, Johnson Matthey (JM) has been making studies of the market for platinum for more than 75 years, starting soon after the discovery of the platinum-bearing reefs in South Africa in the mid 1920s. The first formal market analysis still present in the company's archives was conducted in 1930, around the time of the beginning of the JM's close relationship with Rustenburg Platinum.

The report describes how, in the late 1920s, the largest application for platinum was jewellery and that this accounted for almost two-thirds of demand. Other significant uses were in the electrical and chemical industries, and in dental alloys. One of the main electrical uses for platinum was in contacts for internal combustion engines, a growing market at that time. Demand in the chemical industry was primarily in catalysts for the production of nitric acid - a growing use - and sulphuric acid - a declining one.

The author of the review, Erroll Hay, expressed deep concern about the future of the platinum market, for two reasons. The first was the fear of declining industrial demand as the world moved into what became the Depression following the Wall Street collapse of 1929. The second was the potential for large increases in output from the newly discovered resources in South Africa and as a by-product of nickel mining in Canada. His suggestions to improve the market situation included supporting the jewellery market by introducing a hallmark, developing new applications for the metal, and establishing platinum as a backing for international currencies. The first of these three objectives was realised in the UK only as late as 1975, the second remains a cornerstone of the platinum industry's future, while the third disappeared from view completely.

As part of its ongoing relationship with Rustenburg Platinum, and its successor Anglo Platinum, JM has been analysing the platinum market ever since that first 1930 survey. Given the paucity of publicly available information on this market that existed even into the early 1980s, JM decided to make its analysis of the immediate past available to the public and the Platinum reviews were born, with Platinum 1985 being launched on 15th May 1985. Market data from these reviews are available back to 1975 at the Platinum Today website www.platinum.matthey.com. The article that follows discusses the very substantial changes that have occurred in the market since then.

A Brief History of Platinum

This article describes some of the most important changes that have occurred in the platinum market during the three decades for which data has been published in Johnson Matthey's **Platinum** reviews. The period has seen substantial growth in demand for platinum: in 1975 world consumption was 2.6 million oz.; in 2005 it should be close to 6.7 million oz. There have also been changes in the relative importance of the application sectors. In 1975 autocatalysts were brand new and accounted for just 14 per cent of demand; platinum jewellery purchases, which were booming in Japan, taking almost half of demand; with industrial applications accounting for the remainder. In 2005 the largest use for platinum will be autocatalyst at around 45 per cent of demand, with jewellery second at just over 30 per cent and industrial uses the remaining quarter of demand.

Autocatalyst Demand

The history of the development of autocatalysts was described in detail in Platinum 2004 and will not be repeated here. Suffice it to say that catalytic converters were first fitted to cars in the USA in 1974, spread to Japan in 1976, to Europe in mid 1980s, and are now fitted to approximately 93 per cent of new car production throughout the world. The auto industry currently accounts for just under half of the total consumption of the three autocatalyst metals — platinum, palladium and rhodium.

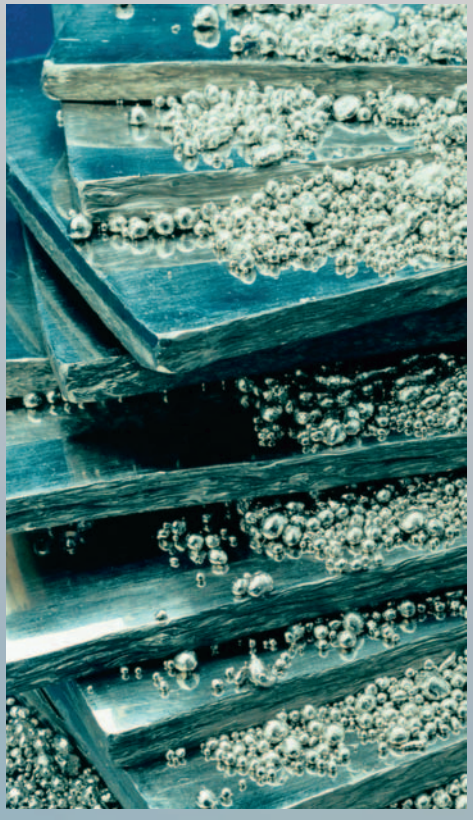
Platinum's use in autocatalysts has vied with that in jewellery as its largest consuming application over most of the 30 years in which catalytic converters have been fitted to cars. Jewellery has generally held sway except in those years when exceptionally high demand for auto use has put upward pressure on the price of the metal and squeezed jewellery demand. Thus, auto demand was the largest use for platinum in 1979 and 1980 in the run-up to the introduction of drastically tighter emission standards in the USA in model year 1981. It again overtook jewellery in the mid-1980s as voluntary fitment of autocatalysts to cars began in Europe. Latterly, in 2003, platinum resumed its premier position as demand for platinum-based diesel catalysts soared in Europe. Autocatalyst use overtook electronics as the largest application for palladium in 1996, while for rhodium it has been the principal use from the time of the introduction of the three-way catalyst in 1979/80.

Jewellery Demand

In jewellery, the use of platinum was dominated for many years by demand in Japan and as recently as 1995 some 82 per cent of platinum demand for jewellery originated in this country. Two factors have changed this outcome over the past decade. Most important has been the growth of demand in China, where the use of platinum in jewellery grew dramatically from virtually nothing in the early 1990s until it overtook Japan as the largest consumer in 2000.

"so MANY excellent properties united in a single METAL"

Antoine Baumé,
Master Apothecary, 1773



Second, has been the spread of what has been termed 'the white wave', in which jewellery made of the white metals platinum, white gold, silver and, most recently, palladium has eaten into the traditional yellow gold market. This is a phenomenon that has spread throughout the developed, and developing, world over the past decade, with white metals being seen as being modern and fashionable, and particularly appealing to the younger generation. Platinum has established itself as the most prestigious white jewellery metal, regaining the position that it held back in the 1920s.

Industrial Demand

Within the industrial sector, there have also been significant changes, both in the relative importance of the different industrial markets, as well as in the applications in which platinum is consumed within the individual industries. A good example is the electrical market where, in 1975, demand was mainly for thermocouples; now this sector is dominated by platinum's use in hard disks. The latter were not widely used before the advent of the IBM PC/XT computer in 1983 and it was not until 1989 that platinum was incorporated into the magnetic layers that store data, to increase significantly the storage capacity of these layers.

Another example is the glass industry where, in the past, demand was mainly for equipment used in the manufacture of glass fibre and optical glass. In 2004 the largest segment of demand in the glass industry was for the construction of plants to make glass for liquid crystal displays (LCD). The first operational LCD was introduced in 1968 and, in more advanced forms, the technology is now being applied to enormous quantities of consumer goods such as flat screen televisions, lap-top computers and mobile phones. Although much of the glass industry's technology is proprietary, it is believed that the first production-scale plant to manufacture the very high quality glass that is necessary for liquid crystal displays, for which platinum equipment is essential, was set up in 1984.

In 1975 the consumption of platinum by the chemical industry was led by its use in catalyst gauzes for the oxidation of ammonia, a critical step in the manufacture of nitric acid for the production of nitrate fertilisers and explosives. New gauze designs, better metal management and rationalisation of the industry have combined to reduce this segment of platinum demand. In contrast, the use of platinum in catalysts for the production of silicones has grown markedly, propelling this application to the head of a long list of uses of platinum in the chemical industry.

Investment Demand

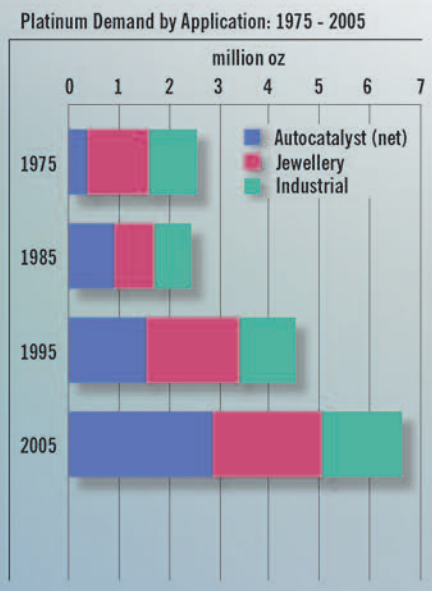
Platinum was first used for coinage by the Imperial Government in Russia in 1828 and over the next 18 years nearly half a million ounces of platinum were converted into coins. However, in 1846 minting of platinum roubles ceased and coins in circulation were recalled. It was not for another 130 years that platinum was once again incorporated into a legal tender coin. This was the Isle of Man Noble, first produced in 1977. The Noble was followed by the Canadian Maple Leaf and Australian Koala, both in 1988, and the US Eagle in 1997.

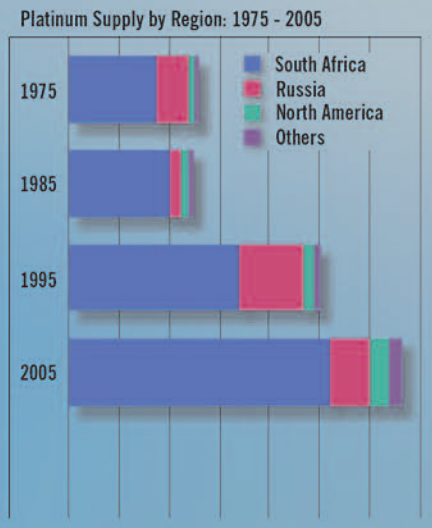
The other most popular forms of investment media for platinum are the 500g and 1kg bars sold in Japan. These first became popular at the time of the price peak in 1980, when platinum briefly exceeded $1,000 per oz.

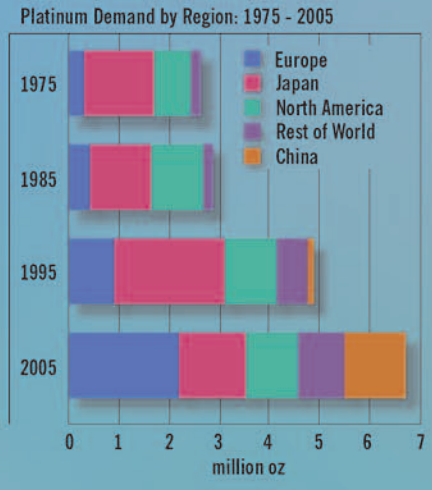
Since it first became significant in 1980, investment demand for platinum has been patchy, peaking in 1988 at 660,000 oz as the new Canadian and Australian coins were launched. More recently, limited sales of new products, offset by returns as investors sold into higher platinum prices, have kept total net investment demand below 100,000 oz a year.

Regional Demand

The chart over the page shows that Japan and North America were the leading consumers of platinum in 1975, but both have fallen behind other regions, especially over the past decade. The main reasons for this has been the growth of autocatalyst use in Europe, due in no small part to the market share taken by diesel cars, and the growth of jewellery demand in China.





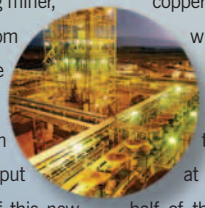


Supplies

Throughout the last 30 years South African mines have dominated supply of platinum. Russia has also been an important supplier, but its exports to the West have been erratic. Indeed, there seems to have been very little correlation between Russian production and Russian exports and this has injected a good deal of uncertainty into the market over the period.

South Africa

As recently as 1968, Rustenburg Platinum was the only producer of platinum in South Africa. However, the second half of the 1960s saw plans announced that led to the formation of Impala Platinum, which produced its first platinum in 1969, and Western Platinum (the original operation of what is now Lonmin Platinum), which produced its first metal in 1973. The initiative for these new mines, and expansion at the operations of the existing miner, Rustenburg Platinum, came primarily from the legislative decisions that led to the introduction of autocatalysts. However, the almost inevitable delays in bringing in the new technology meant that mine output expanded ahead of the establishment of this new demand sector. Fortunately this enabled the mines to supply metal to the fast growing Japanese jewellery market.



It was not until the second half of the 1980s, following a period of strong prices and with a positive outlook for future demand, that a similar spurt in production in South Africa seemed probable. At that time many companies announced plans to establish new mines in South Africa, or expand existing ones. In the event, a fall in prices in the early 1990s as Russia turned a strong seller of platinum in the period following the fall of the USSR and palladium gained market share in autocatalysts at the expense of platinum, led to a more difficult market and most of the proposed projects were shelved. It was not until the turn of the millennium that the market again looked sufficiently promising for a further wholesale expansion in platinum mining. As is discussed elsewhere in Platinum 2005, this too has not gone forward smoothly, with the sharp appreciation of the rand against the dollar making the economics of many potential new mines far less attractive than originally envisaged. It remains to be seen just how many will come on stream.

Russia

Outside South Africa, the most important producer of platinum is Russia. Platinum is the dominant metal in the two major alluvial deposits that are being exploited in the Far East Region of Russia. Mining began at the Kondyor deposit in Khabarovsk in 1984 and at the Koryak deposit in Kamchatka a decade later, in 1994. Both may already have passed their peak of production but it is entirely possible that similar deposits will be found in this vast, mineral-rich region of Russia.

Platinum is not the principal reason for mining at the operations of Norilsk Nickel in the Taimyr Peninsula in Northern Siberia. As the name of the company suggests, nickel is the prime metal, with copper also being very important. In common with other mines in the northern hemisphere, palladium is the most important of the platinum group metals in the Norilsk operations. Platinum production at Norilsk grew steadily for much of the first half of the last 30 years as major new mines at Oktyabrsky and Taimyrsky were opened and expanded. However, a sharp decline in output followed the fall of the USSR and it is only since 1998 that production has recovered, although still not to the level seen in the late 1980s.

Other

South Africa and Russia currently account for about 90 per cent of total world production of platinum, a proportion that is not much changed from 1975. However, there have been a number of significant new arrivals on the supply scene over the past 30 years. These include the Stillwater Mining in the USA, which produced its first platinum in 1987, and the various mines that have opened in Zimbabwe over the past decade. Although further expansion in Zimbabwe looks likely, especially when political and economic conditions there improve, and other prospects are currently under exploration in many places around the world, it seems certain that South Africa and Russia will continue to dominate platinum supply for the foreseeable future.

1975

Mid-1970s – New vehicle emissions legislation results in the introduction of autocatalysts in the USA and Japan

1977 – Prescription of the platinum-based anticancer drug Cisplatin begins

1980

1980 – Platinum fixing price peaks at $1,047.50 in London following a surge in speculative investment in all precious metals

1984 – The first LCD glass manufacturing plant is constructed in the USA.

1985 – Johnson Matthey publishes its first Platinum review

1985

1988 – Japanese investors purchase a record 415,000 oz of platinum bars and coins

1989 – The first hard disks containing platinum enter mass production

1990

1991 – Russian exports of platinum expand following the fall of the USSR

1993 – Euro I vehicle emissions standards, which necessitate the use of catalytic converters, come into effect in the European Union

Mid-1990s – Platinum jewellery market begins to develop in China

1995

1997 – The US Mint launches the Platinum Eagle series of bullion coins

2001 – China overtakes Japan as the world's largest platinum jewellery market

2003 – European diesel autocatalyst demand for platinum surpasses 1 million oz per year

2000

2004 – South African production of platinum exceeds 5 million oz

2005