Electrolytic recovery of copper (courtesy Lonrho SA Ltd)

assessment of market conditions at any given time, taking world supply and demand tendencies into account.

There are therefore between 20 and 30 large bullion-trading firms that respond to the short-term free market, which also determines future prices. Futures contracts allow protection from risk, and allow traders to shift that risk to investors, who accept the risk in order to profit from anticipated price changes. Investors (or occasionally speculators) with available risk capital are able to control large quantities of precious metals for a relatively low margin of outlay, making NYMEX attractive to both hedgers and investors. The highest level of futures trading ever recorded at NYMEX was in September 1986, when 31 000 contracts representing 48 205 kg (1,55 million oz) changed hands.

In August 1992, the Commodity Futures Trading Commission in the USA approved trading of platinum and palladium futures on the Commodity Exchange (COMEX), placing that exchange in direct competition with NYMEX. Moreover, COMEX requires a minimum metals purity of 99,5 per cent, whereas NYMEX requires a purity of 99,95 per cent. Lesser amounts are traded on the Mid America Exchange. NYMEX trades in units of 50 and 100 troy ounces of metal at the stated purity.

Delivery of the metals is again in the form of ingots or plates of 99,95 per cent purity (increased from 99,9 per cent in October, 1992), also weighing 50 troy oz (1,555 kg) ± 5 per cent, with no single piece less than 311 g (10 oz).

The rules of NYMEX require that all platinum or palladium removed from their depository be reassayed before it can be redeposited for delivery against a NYMEX contract at some future date. The actual so-called 'Standard Delivery' follows a somewhat complex scheme of notices and pricing transactions through the exchange, which need not concern us in this review.

Trading hours for NYMEX are 08h20 to 14h00 for platinum and 08h10 to 14h10 for palladium (New York time). Both platinum and palladium may be delivered in packaged or unpackaged form. If packaged, the container must be sealed by an Exchange-approved brand so that it cannot be opened without destroying the seal. The container must bear the lot or ingot number, its weight, grade, name or logo of the assayer, or the brand mark, and the symbol of the metal, just as in the case for ingots at the London market. Unpackaged plates or ingots must also be engraved with the lot or bar number and bear all the other marks noted for the container. NYMEX stipulates that contracts and options must be conducted within the nearest two or three contiguous calendar months respectively, plus the next two consecutive months of the quarterly cycle months of trading: namely January, April, July, and October of any given year.

5.3. International Metals Trade

5.3.1. *Metals Trade*

International trade in the PGM is predominantly in the form of unwrought metal, although some countries also trade in wrought metal. Unfortunately, the published trade figures do not always distinguish between the individual PGM, nor do they provide information on the amounts of wrought or unwrought metals imported or exported. Moreover, South Africa and Russia do not publish any data on PGM exports — these have therefore been estimated. The average amounts of PGM involved in the international trade for the period 1985 to 1989 (the full world trade figures were only available to 1989) are shown in Table 5.1, while the percentage distribution of the net imports and exports, as shown in the last two columns of that table, is shown graphically in Figure 5.1. Table 3.5 in Chapter 3 provides specific data for the USA.

It should be stressed that many countries that are shown as exporters of the PGM do not have any mine production. In those cases, the metals are mostly refined from ores or concentrates imported from the main producers, although refined metal may also be derived from waste and scrap imported in previous years. The UK is a good example — most of its metal exports are derived from undisclosed amounts of South African concentrates imported in previous years. The refined metal is then recorded as part of the UK exports.

The firms that trade in the PGM in the UK, the USA, Japan, and Switzerland are listed in Appendix II.

5.3.2. *Trade in Waste, Scrap, Raw Ores, or Concentrates*

The international trade figures for waste and scrap, expressed as average amounts for the period 1985 to 1989 are shown in Table 5.2. The percentage distribution of the net imports and exports of these commodities, as shown in the last column of that table, are also illustrated graphically in Figure 5.2.

The USA is an importer and exporter of ores and concentrates. Canada only exports such materials; Canadian concentrates are probably exported to the USA and Norway, where refining is undertaken — although the data from Norway does not reflect such imports. As was noted above, the UK is a major importer of ores and concentrates (sludges) from South Africa. It is probable that all metal exports from the Benelux countries and Switzerland (Figures 5.1 and 5.2) are derived from waste and scrap, but imports of ores or concentrates cannot be excluded. In recent years, Switzerland is known to have handled large amounts of Russian PGM.

It should be stressed that, in addition to the mine or primary production, PGM may also be derived from the recycling or refining of waste and scrap. This secondary production makes a major contribution to the total world PGM supplies. The fact that large amounts (in the case of platinum, upwards of 95 per cent) of the PGM employed in industry can be recovered as usable and saleable metals, illustrates the fact that many of the PGM (and particularly platinum) are virtually indestructible in the industrial environment. The fact that little of the PGM are actually consumed is something