each other. Under the best conditions the mass of one kilogram can be determined in terms of a reference standard to rather better than 1 part in 10^9, that is to somewhat less than 1 μg. The steam-cleaning procedure is repeated until weighings show that no further decreases in mass occur. Figure 6 shows one of the new kilogram prototypes alongside one made using the traditional methods.

The first kilogram prototype made using these new procedures of polishing and adjustment was given the number 64 in the BIPM series. Since then, numbers 65, 66 and 67 have successfully been completed. Also from the same ingot two platinum-iridium standards were made for NPL and were designated A and B. During the course of the development of the technique two standards were made whose mass was just outside the tolerance of ±1 mg. These were designated 650 and 651. A second ingot has been delivered by Johnson Matthey and the machining of a further group of kilogram prototypes is now well advanced.

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The Platinum-Zirconium-Yttrium System

For the metallurgist the availability of phase equilibrium data is an essential requisite if he is to relate the microstructure of alloys with their behaviour. While binary diagrams of the platinum group metals are now widely available, it is unfortunate that there is still relatively little published on ternary and higher order systems. It is, therefore, encouraging to find that new work on ternary systems of platinum has been undertaken. The phase equilibria of the platinum-zirconium-yttrium system at 1000°C has been reported recently by Yu. J. Konobas, M. V. Raevskaya and I. G. Sokolova of Moscow State University (*J. Less-Common Met.*, 1986, **115**, (2), L5–L6).

This ternary system is of some interest since both the platinum-zirconium and the platinum-yttrium binary systems exhibit a number of intermetallic compounds, whereas the zirconium-yttrium system is a simple eutectic.

The 1000°C isothermal section published by the authors was based on experiments on arc-melted alloys homogenised at 1000°C for 1200 hours prior to quenching in iced water. They found no new ternary phases, only those reported previously in the binary systems.

The isothermal section is characterised by regions of ternary solid solubility, based on the initial binary compounds, which spread into the ternary system along the corresponding pseudobinary section. The solubility of yttrium in platinum-zirconium intermetallic compounds is less than 5 atomic per cent whereas zirconium has much higher solubility in platinum-yttrium compounds, extending up to 18 atomic per cent in the Pt_3Y intermetallic which has a $AuCu_3$ type structure. The Laves phase Pt_2Y only extends into the ternary system to about 2 atomic per cent zirconium, not interacting with other binary compounds.

Below the solidus line, the Pt_3Zr-Pt_3Y, PtZr-PtY and the Pt_3Zr_5-Pt_3Y_5 sections are pseudobinary, as might be anticipated. At the platinum-rich corner, the platinum solid solution is in equilibrium with two three-phase regions, each containing two intermetallic compounds. This could have significance for new platinum-alloy development, possibly as an alternative approach to the high strength oxide dispersion-strengthened platinum materials which are based, coincidentally, on the oxides of zirconium and yttrium. C.W.C.