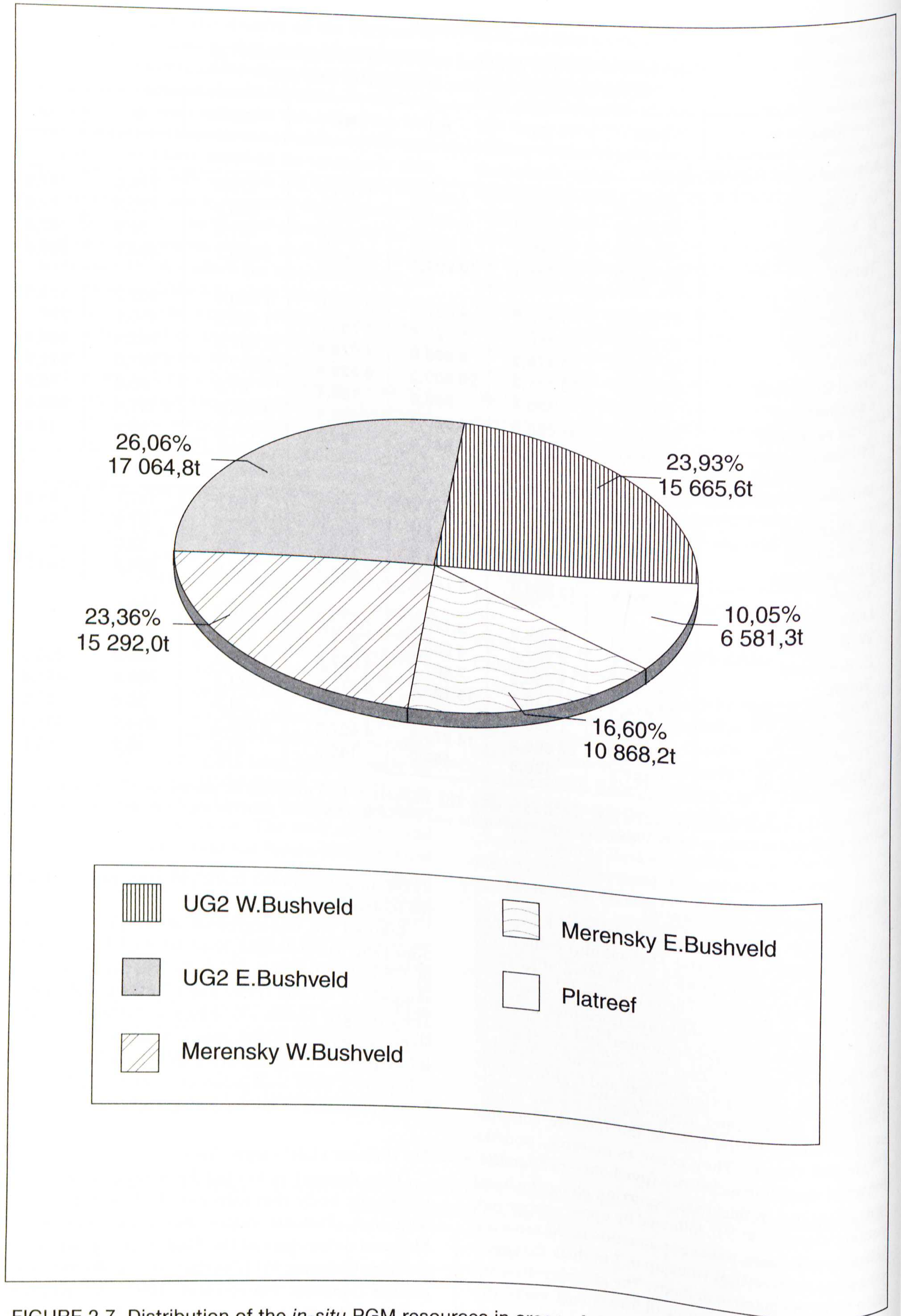

FIGURE 2.7. Distribution of the *in-situ* PGM resources in areas of the Bushveld Complex, to a depth of 1200 m

Table 2.8

PGE grades and distribution in chromitite layers of the Bushveld Complex below the UG2. Iridium and Osmium were only present in trace amounts (after Von Gruenewaldt and Hatton, 1987)

Layer	PGE g/t	Distribution, %			
		Pt	Pd	Ru	Rh
UG1	3,43	39,4	24,2	27,7	8,7
MG4	1,97	52,8	15,2	21,8	10,2
MG3	2,03	45,8	22,2	21,7	10,3
MG2	2,71	59,8	22,5	12,9	4,8
MG1	1,51	37,2	16,4	39,8	6,6
LG6	0,52	43,8	22,5	30,2	3,5

Table 2.9

Analyses of the nickel–copper ores from the old mine workings at the base of the Insizwa Complex (after Scholtz, 1936, and Lightfoot *et al.*, 1984)

Ore type	Ni %	Cu %	Co %	PGE g/t	Distribution, %					
					Pt	Pd	Ru	Rh	Ir	Os
(1) Ni-rich [7]	4,48	2,70								
(1) Ni-rich [2]	5,13	2,33	–	7,29						
(2) Ni-rich [7]	4,95	1,76	0,14	7,02	50,30	9,24	18,68	6,00	9,43	6,35
(1) Cu-rich [3]	5,00	16,89	–	28,00						
(2) Cu-rich [8]	7,71	18,20	0,09	5,67	44,99	35,00	10,49	5,73	2,36	1,42
(1) Massive [2]	5,08	3,45	–	2,57						
(2) Massive [9]	0,62	8,51	0,13	3,36	64,00	22,77	4,83	4,38	3,06	0,96
(1) Dissem. [9]	1,24	0,91	–	–						
(1) Dissem. [3]	1,09	0,85	–	2,23						
(2) Dissem.[13]	6,32	6,26	0,28	11,59	62,46	24,61	4,51	2,80	3,57	2,05

[ ] Number of samples

thickness of 150 m and reaching a maximum of 300 m. Stratigraphically, the complex consists of a basal gabbro zone, followed consecutively by pyroxenite and chromitic pyroxenite zones and capped by a peridotite zone. This inverted sequence is hardly likely to be the result of a similar inverted fractionation, so it is more likely to be the result of sequential magma impulses younging downwards. The main sulphides occur in the three lower zones, but their copper content increases upwards in keeping with the inverted sequence. The sulphides occur as disseminated blebs, stringers, or irregular aggregates interstitial to the silicate minerals of the mineralized rocks. Wagner (1929) provided the only available ore analysis; 2,8 per cent nickel, 1,72 per cent copper, and 10,97 g/t PGE. He maintains that the ore minerals are irregularly distributed in pyroxenitic rocks over a thickness of some 10,5 m. Kenyon *et al.* (1986) indicate that the best mineralization occurs in the most altered talc-carbonate and serpentine rocks adjacent to the dolomites, and suggest that a full-scale exploration programme indicated a high-tonnage, low-grade orebody, but they provide no tonnage or grade data. Overbeek (1990) reported the results of beneficiation tests on two samples of ore from Uitkomst. A so-called preliminary sample, consisting of selected lumps of ore collected from dump material immediately adjacent to the exploration adit, assayed 0,23 per cent nickel, 0,11 per cent copper, and 1,6 per cent sulphur. A 15 t bulk sample assayed 0,22 per cent nickel, 0,11 per cent copper, and 1,6 per cent sulphur. These two samples are certainly more representative of the ore at Uitkomst.

Figure 2.8 shows the distribution of the individual PGM in South African ores.

2.2. Russia

The former USSR is referred to here simply as 'Russia'. Since the PGE deposits to be described all fall within the Russian republic (the former Russian Soviet Federated Socialist Republic), the term is appropriate. These deposits include those of the Kola peninsula and Karelia, the latter area (146 600 km^2) having been formally annexed by the USSR from Finland at the Moscow Peace Treaty on 12 March 1940. They are an