Aerial view of Zondereinde Mine, looking north towards the periphery of the Bushveld Complex, with the Amandelbult Section of Rustenburg Platinum Mines in the far distance. The mountains on the horizon are composed of sedimentary rocks of the Transvaal sequence (courtesy Gold Fields of South Africa Ltd)

Table 2.26
Estimated average annual production of platinum and osmiridium from recent and fossil placers, 1916–1934

Country	kg/y	oz/y	%	Production before 1916, oz
Alaska	15,08	485	0,41	–
Australia (NSW)	8,77	282	0,25	–
Borneo	7,12	229	0,19	187 500
California	12,07	388	0,32	–
Canada	0,87	28	0,02	15 000
Colombia	1 299,50	41 780	34,88	717 500
Ethiopia	141,71	4 556	3,80	–
India	0,87	28	0,02	–
Japan	5,32	171	0,14	–
New Zealand	0,28	9	0,01	–
Oregon	1,03	33	0,03	–
Papua	1,62	52	0,04	–
Sierra Leone	6,22	200	0,17	–
South Africa*	173,71	5 585	4,66	–
Tasmania*	37,45	1 204	1,01	(10 000)
USA†	(28,18)	(906)	(0,76)	8 621 895
USSR (Urals)	2 013,79	64 745	54,05	–
Total	**3 725,41**	**119 775**	**100,00**	

*Osmiridium only
( ) Estimate (may include PGE from smelters)

dunite. These carry up to 100 g/t platinum, but average some 5 g/t. The placers consist of residual (eluvial), alluvial, and terrace gravels of different ages and occur in four main districts: (from south to north, Nizhniy Tagil (Martian, Visim, Shaitanka, Syssim, and Tschauch rivers), Issovsk (Iss and Tura rivers and tributaries), Kitlim-Kama (Kitlim, Iov, Sosnovska, and Niasma rivers), and Soasersk (Malaya Solva, Rosemia, and Petropavlovka rivers). The largest nugget found had a mass of 427 g, but the main producer was a mineralized 0,2 to 1,5 m basal sandy layer ('peskis') under 11 m of overburden, which initially yielded about 100 g platinum per m^3. The grades eventually dwindled to about 10 g platinum per m^3, particularly after dredging started in 1908. Before that date, the deposits (discovered in 1843) were worked privately, but from 1908 to 1927 (when production data ceased) they were controlled by the Ural Platinum Trust, and the main output was marketed by Edelmetalle Vertriebs AG in Berlin. In 1923, the platinum reserves were estimated at 146 000 kg, and at the production rates then current, the main reserves could have been exhausted by 1935. However, according to Newman (1973), the Ural placers were being worked by dredges in the early 1970s, with PGE grades of between 0,31 and 2,80 g/t, but the production was small.

Colombia

These deposits were known by 1537, but were worked for platinum only after 1778. Colombia was thus the world's only supplier of PGE until the Urals started production in 1823. There is controversy regarding the primary source of the platinum; one source is claimed to be the chromite-bearing dunites and pyroxenites west of the felspathic gabbros and diorites of the Cerro Iro, the other is the Tertiary conglomerates originally worked by the Spaniards, containing 15 g/t each of platinum and gold. The placers occur west of the Cordillera Occidental (Andes) in the coastal plain, within the Intendencia del Choco (13 000 km^3), but also in the Antioquia (Cuaco river), Barbacoas, and Guapi districts. These are areas of high annual rainfall (11 430 mm) drained by the San Juan, and the Condoto river systems. The Au:Pt ratio in the San Juan system placers was originally about 1, and that in the Atrato placers about 5, 7, giving an overall value of 3; but with dredging, this would probably have dwindled. In the Nechi-Porche area, the Au:Pt ratio was as high as 10 000. Initial PGE and gold recovery was undertaken entirely by the local population, but later four companies (Anglo-Colombian Development Co. of Consolidated Gold Fields, Consolidated Colombia Platinum and Gold Mines Ltd, Paris-Transvaal Gold Mines Ltd, and South American Gold and Platinum Co.) controlled the entire field. The first three were later consolidated into South American Gold and Platinum, which was renamed Companhia Minera Choco Pacifico SA, and now trades as Minera del Choco. An independent company, Pata Consolidated Dredging Co., later dredged new placers in the Nechi-Porche drainage system in the Antioquia district, but currently all dredging is done by Compania Mineros Colombianos SA through its wholly owned