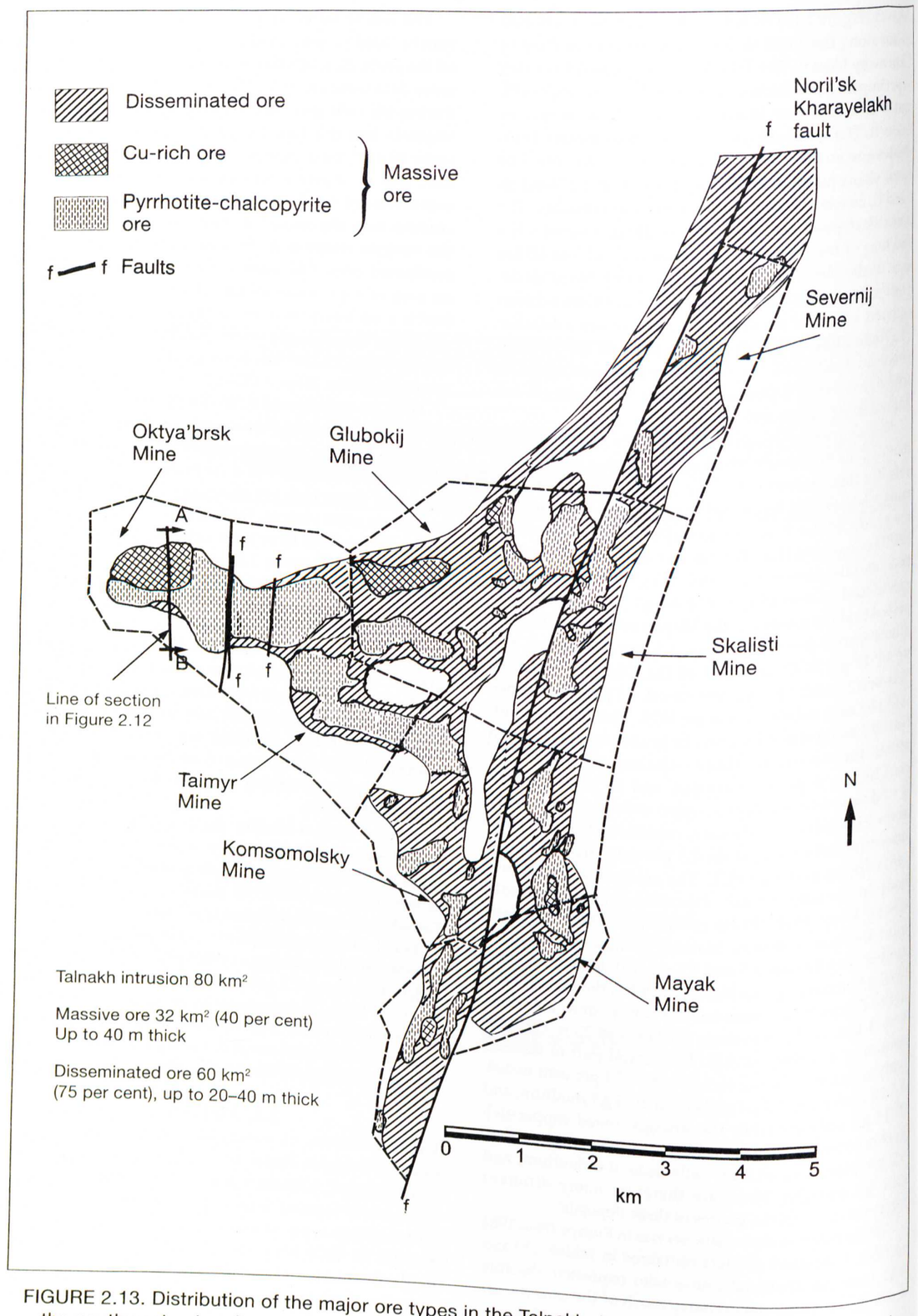


FIGURE 2.13. Distribution of the major ore types in the Talnakh deposit. The intrusion outcrops at the southwest extremity, and dips gently to the north. The main fault also forms the boundary between mines (courtesy Professor M.J. Viljoen)



**Table 2.10**

Milled tonnages and grades of the Noril'sk-Talnakh ore junctions

| Area/mine | Ore type | Host rock | Mt | Ni, % | Cu, % | Pt, g/t | Pd, g/t |
|---|---|---|---|---|---|---|---|
| Talnakh field | | | | | | | |
| Mayak Mine | Massive | Intrusive | 13,0 | 4,60 | 15,10 | 1,65 | 9,95 |
| | Dissem. | Intrusive | 59,0 | 0,44 | 0,92 | 1,28 | 3,73 |
| | Dissem. | Country rock | 7,0 | 0,57 | 3,10 | 1,90 | 6,84 |
| **Wt total** | – | – | **79,0** | **1,14** | **3,45** | **1,40** | **5,03** |
| Komsomolsky mine | Massive | Intrusive | 14,0 | 3,80 | 4,10 | 2,55 | 11,82 |
| | Dissem. | Intrusive | 102,0 | 0,61 | 1,20 | 1,21 | 4,04 |
| | Dissem. | Country rock | 28,0 | 0,83 | 1,90 | 2,40 | 8,71 |
| **Wt total** | – | – | **144,0** | **0,96** | **1,62** | **1,57** | **5,70** |
| Oktyabr'sky Mine | Massive | Intrusive | 30,0 | 4,90 | 14,10 | 5,91 | 26,13 |
| | Dissem. | Intrusive | Large (grade not qualified) | | | | |
| | Dissem. | Country rock | 50,0 | 0,91 | 6,40 | 3,11 | 11,51 |
| **Wt total** | – | – | **80,0** | **2,41** | **9,29** | **4,16** | **16,99** |
| Taimyr mine (Taymyrsky) | Massive | Intrusive | 17,0 | 3,50 | 5,30 | 1,87 | 9,95 |
| | Dissem. | Intrusive | Large (grade not qualified) | | | | |
| | Dissem. | Country rock | Very large (grade not qualified) | | | | |
| **Wt total** | – | – | **17,0** | **3,50** | **5,30** | **1,87** | **9,95** |
| **Totals (weighted)** | **Massive** | **Intrusive** | **74,0** | **4,32** | **10,36** | **3,60** | **16,86** |
| | **Dissem.** | **Intrusive** | **161,0** | **0,55** | **1,10** | **1,24** | **3,93** |
| | **Dissem.** | **Country rock** | **85,0** | **0,86** | **4,65** | **2,78** | **10,20** |
| **Overall totals** | | | | | | | |
| **Talnakh** | **All types** | | **320,0** | **1,50** | **4,18** | **2,19** | **8,59** |
| **Noril'sk** | **Dissem.** | | **450,0** | **0,31** | **0,60** | **1,65** | **9,95** |
| **Grand total** | | | **770,0** | **0,81** | **2,09** | **1,87** | **6,33** |

Wt. =Weighted

posit shows any economic promise, with average values of 1,55 per cent nickel, 0,39 per cent copper, and 3,5 g/t PGE (distribution: platinum 22,86 per cent, palladium 43,08 per cent, ruthenium 21,79 per cent, rhodium 8,52 per cent, iridium 3,03 per cent, and osmium 0,72 per cent). It is hosted by a greenstone belt in which sulphides occur in altered ultramafic bodies as small, vertical, massive and disseminated lenses, orientated parallel to the sulphide-bearing felsic-metasedimentary wallrocks (Papunen, 1988). The deposit is probably too small to warrant further consideration. The Outokumpu complex contains mainly copper deposits, but the Vuomos deposit also has a low-grade nickel component (0,20 per cent nickel, 0,04 per cent copper; Isokangas, 1978) but no PGE data are available. Information by Papunen (1988) on the ores of 14 Svecokarelian deposits indicates sub-economic PGE grades: average 1,27 per cent nickel, 0,34 per cent copper, 0,15 g/t PGE (approximate distribution platinum 14,8 per cent, palladium 60,0 per cent, ruthenium 11,9 per cent, rhodium 7,2 per cent, iridium 5,1 per cent, and osmium 1,0 per cent). The deposits occur in mafic-ultramafic complexes, fractionated to a lesser or a greater degree, that form heterogeneous ring intrusions in highly deformed geosynclinal sediments. Two of the small deposits (Hitura and Makola mines) have been described by Häkli *et al.* (1977) and Isokangas (1978) respectively.

The 2240 My early Proterozoic layered intrusions occur in three recognizable belts stretching from Sweden (one half of a Finnish complex), through central Finland and on to the Kola Peninsula in Russia (Section 2.2). These mafic intrusions represent an integral phase, generally a final one, of the extrusive and intrusive activity that produced the thick volcanic piles and layered complexes of the late Archaean to early Proterozoic greenstone belts. They are variable in size, and have all undergone complex deformation and metamorphism during three major orogenic events. These deposits were highlighted during the fifth International Platinum Symposium held in Espoo, Finland, during August 1989. Details of the deposits were comprehensively dealt with (Alapieti, Alapieti *et al.*, Halkoaho *et al.*, Huhtelin *et al.*, Iljina *et al.*, Lantinen *et al.*, and Mutanen, all in 1990) during the symposium, and also previously by Razin, 1977; Mutanen, 1981;



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