Field Study of the Western Karakorum Axial Batholith Along the Karambar Valley (Northern Pakistan)

TALK

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The detailed study of the Karakorum axial batholith undertaken by different teams for the last ten years has shown its composite character. Different plutonic units, dominantly ranging in age from Cretaceous to Miocene, have been recognized. However, their inventory is far from being over, and their extent and relationships remain often ill-defined.

Our 1992 field trip in the Karakorum range was mainly devoted to the Karambar valley (N. Pakistan), the choice of which was based on several grounds: - the Karambar valley offers a complete and easily accessible N-S section of the western axial batholith, perpendicular to its elongation; - this section, hitherto poorly known (review *in* Casnedi, 1984), cross-cuts a cartographic plutonic "blank", about 120 km long, separating two already investigated N-S sections of the batholith, namely the Yasin-Darkot and the Hunza-Batura sections. The study concerns a section around 40 km long, 28 of them for the batholith itself.

Along the Karambar valley, surrounding rocks of the batholith are essentially made up of metapelitic formations, usually trending WNW-ESE. Metamorphism is dominantly developed south of the batholith, where biotite-garnet metapelites are cross-cut by a conspicuous swarm of diversified leucocratic dykes that could be held responsible for their transformation into migmatites of the injection type. This migmatitic zone is about 4 km wide. More to the south, around 6 km far from the batholith, dykes almost completely disappear and metamorphism decreases abruptly (phyllites, slates).

At its northern and southern margins, the batholith intrudes metapelites along sharp, normal and steep contacts, roughly concordant at map scale. Metasedimentary xenoliths, a metre up to several decametres in thickness, are frequent close to either margins, particularly along the southern one where they occur within a zone some 700 m wide. Metasedimentary rocks seem to be completely lacking in the internal part of the batholith. The huge screen which, more to the west, divides the batholith into two branches, does not reach the Karambar valley.

Three major types of plutonic rocks can be distinguished along the section studied: (1) strongly foliated biotite-amphibole granodiorite, often rich in mafic enclaves, sometimes blastomylonitic, representing the westward continuation of the well-known mid-Cretaceous calc-alkaline "Hunza Granodiorite" (HG); (2) diversified foliated amphibole-biotite granite, locally porpyritic, corresponding to the mid-Cretaceous subalkaline "Darkot Pass Granite" (DPG); (3) various and more or less foliated fine grained rocks of acidic and intermediate composition (FGR). From north to south, the arrangement of the different units is: HG + metapelitic xenoliths (~ 0.2 km) / DPG, often porphyritic, + FGR + HG (~ 0.5 km) / DPG, often porphyritic, (~ ≤ 1.5 km) / DPG + FGR (+ HG) (~ ≥ 3.5 km) / FGR + HG (often as angular enclaves within FGR) (~ 5.5 km) / HG (~ 16 km) / HG + metapelitic xenoliths (~ 0.7 km). The different units usually display sharp and sinuous contacts. HG was emplaced before FGR, whereas FGR and DPG could be coeval.

On the whole, the section shows a very complex imbrication between the Hunza and Darkot Pass plutonic units, as also between them and the fine grained igneous group (FGR), of uncertain affinity.

Numerous leucocratic dykes of various composition cross-cut the batholith. At least part of them were emplaced during or before the deformation(s) responsible for the foliation of their host granitoids. Their study, in relation with deformation and metamorphism, both within and out of the batholith, remains to be done and should be of particular interest.

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