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OCCURRENCE OF A NEW BASE METAL MINERALISED ZONE IN THE GNEISSOSE ROCKS OF THE ASKOTE CRYSTALLINES, PITHORAGARH DISTRICT, KUMAUN HIMALAYA

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THE Precambrian rocks of Askote Crystallines constitute a detached northern outlier of the overturned Almora-Dudhatoli thrust sheet of the Kumaun Lesser Himalaya[1]. The Crystallines comprise a doubly plunging synform, thrust over the sedimentary terrain of the younger Garhwal Group of Lesser Himalaya. The area under investigation is located on the slightly overturned northern limb of the synform, near its south-eastern closure. The axis of the synform trends WNW-ESE. The rock types include coarse to very coarse grained biotite bearing augen- and porphyroblastic gneisses underlain by chlorite-sericite-muscovite-biotite-quartz schists. The gneisses occupy the core of the synform (figure 1).

Megascopically, the gneisses are leucocratic, compact, and coarse grained, exhibiting surreitic (dilation) and ophthalmitic (augen) structures. Parallel arrangement of muscovite and biotite define the gneissosity. Microscopic study reveals that the gneisses consist of subangular to angular, elongated, interlocking grains of quartz with muscovite, biotite, and large elongated porphyroblasts of potash felspars and sodic plagioclase. Felspar poikiloblasts with inclusions of quartz, biotite, and muscovite, are also not uncommon. The felspars almost always exhibit perthitic intergrowths, vein and patch perthite being the most common. Myrmekitic texture is noticed at the contact of plagioclase and K-felspars, and within plagioclase porphyroblasts. Mineralogical and microtextural studies of the rocks indicate that they have been subjected to the katazonal grade of metamorphism.

Yellow limonitic stains, indicative of a mineralised zone trending NNW-SSE, are traceable over a strike length of about 700 m along the Gurji Gad near Askote. The width of surface indications rarely exceeds 20 m. In places the mineralised zone is exposed on the surface. Nowhere else in the Himalaya has the sulphide mineralisation been reported in high grade metamorphics. Mineralogical and textural studies indicate that the sulphide minerals in the gneisses along the Gurji Gad occur as epigenetic replacements and are emplaced by the agency of hydrothermal fluids invading the country rocks. Preliminary examination reveals the presence of copper-lead-zinc minerals. The main sulphide minerals, in the order of decreasing abundance are galena, chalcopyrite, pyrite, and sphalerite. The mineralising solutions invaded the country rocks along foliation planes and joints, and replaced the rock minerals along grain boundaries, cleavages, and fractures. Large porphyroblasts of felspars have been replaced by the sulphides along fractures normal to their axes of elongation. In most cases, the replacement is readily identified because much of the original phase still remains in the form of 'islands' in the replacing sulphides.

The occurrence of copper-lead-zinc ores in sheared sericite-chlorite-muscovite-biotite-quartz schists at Barigaon, about 500 m up the slope of the Gurji valley, has been known for quite some time. The nature of the base metal mineralisation at Barigaon, its mineral assemblage, paragenesis, and associated alteration has already been described[2–6]. Detailed studies of the wall-rock alteration, gangue mineral assemblages, and textural studies of sulphides of the Barigaon mineralised zone, indicate that the mineralisation is of hypothermal grade. The discovery of a mineralised zone along the Gurji Gad attains significance by virtue of its nearness to the known occurrence of the sulphide lode at Barigaon. Sulphide and gangue mineral assemblages of the Barigaon and Gurji mineralisation are essentially identical. The emplacement of both orebodies is along the foliation, and the sulphide zones are elongated in the direction of the major fold axes, roughly trending NW-SE, suggesting thereby an identical structural control.

Similarity between the Gurji and Barigaon mineralised zones may be considered to be indicative of a common parentage. Under these circumstances, pros-

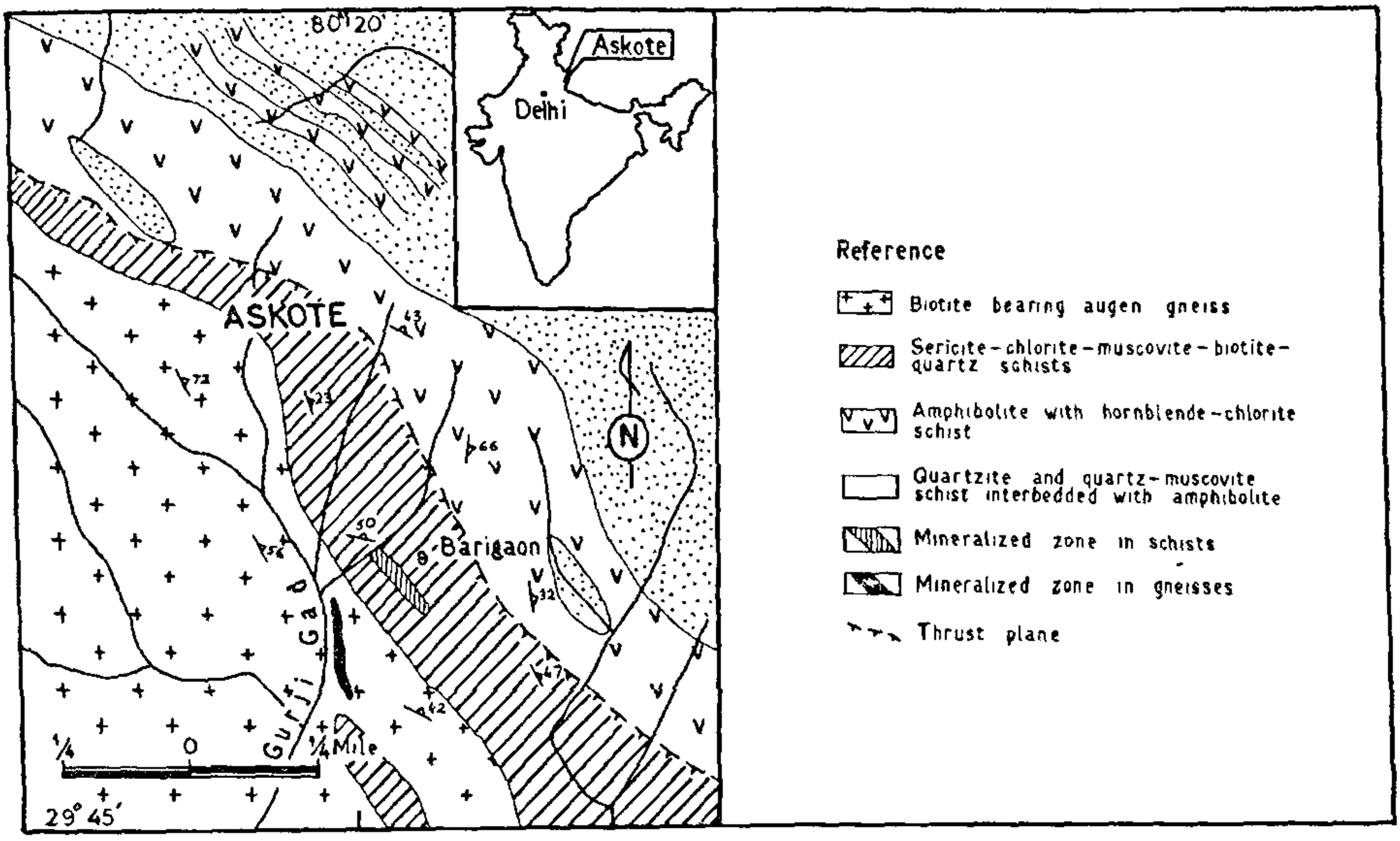

Figure 1. Location and geological map of Askote area, Pithogarh distt., Kumaun Himalaya.

pects of finding a large and rich lode beneath the one at Barigaon may be considered. Since here the rate of erosion is greater than the rate of weathering, no gossan is associated with the mineralised zone and as such, no zone of supergene enrichment can be anticipated.

Detailed investigation to establish the genetic relationships are underway. It is suggested that a detailed mapping of the mineralised zone on a large scale be carried out. If geochemical analyses of outcrop samples are indicative of ore potential, detailed geophysical investigations and drilling may be followed.

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ANORTHOSITES AROUND KARAPPADI, PERIYAR DISTRICT, TAMIL NADU.

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THE anorthosites are found to occur as differentiated band in gabbros around Karappadi, Periyar district, Tamil Nadu (Long. 77° and Lat. 11° 30′). The trends of anorthosites and associated gabbros and pyroxenites vary from ENE-WSW through NW-SE to NNE-SSW.

Field Relationship

Anorthosites are generally found as a band in close association with gabbros. The contact between anor-