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#### A BRIEF NOTE ON THE GEOLOGY AND OCCURRENCE OF URANIUM AT BODAL, DISTRICT RAJNANDGAON (M.P.)

IN the course of radiometric survey in the year 1973 in parts of Rajnandgaon District (M.P.), moderately high radioactivity was discovered by the author in hornblende-quartz-biotite rocks—an uncommon host for uranium—exposed SW of Bodal village. Some of the surface samples have assayed more than 0.1% U 308 (Chem).

The outcrops showing uranium mineralisation exhibit shades of dark green colour with reddish-brown and yellowish encrustations of hydrated oxides of iron. They are generally fine-grained, with occasional porphyritic texture and are composed of hornblende, quartz and biotite in a groundmass of fine-grained equigranular quartz, Pyrite, ilmenite, Fe-oxides, occasional feldspar and calcite occur as accessories. Hornblende occurs in prismatic and acicular forms and sometimes in resette clusters. Under the microscope, hornblende is seen to alter to biotite and chlorite and the released calcite and iron oxides permeate into the microfractures. Wherever the rock is mineralised, the black oxide of uranium is found to be associated with the iron oxides. Quartz is often brecciated and crushed and the microfractures as well as the intergranular spaces are often occupied by veins of hornblende quartz and pennenite.

In the area under consideration, the radioactive hornblende-quartz-biotite rocks form a part of the geological setting comprising—(a) Ferruginous rhyolitic rocks together with quartz porphyry—their hypabasal equivalents. The former is profusely intruded by quartz veins containing frequent shows of Pb-Cu mineralisation, as in Karamtara, 8 km. NE and Thekhadand, 6 Km. south of Bodal. (b) Basic rock complex occurring as extensive massive bodies or huge dykes cutting across the quartz porphyry and ferruginous rhyolitic rocks and chiefly made up of pyroboles, biotite and Ca-plagioclase. (c) Light coloured biotite granites,

which are presumably the southward continuation of Dongragarh granites, occurring in the southern and western margins of the area.

The basic rock complex shows frequent textural and compositional variations and the uraniumiferous hornblende-quartz-biotite rocks are by far the most conspicuous and easily discernible member of this complex. They display numerous vertical to sub-vertical joints and shear fractures, the most dominant shear direction being N40° W. This shear-zone is characterized by the presence of brecciated and recrystallised quartz and is marked by the crude alignment of the lath-shaped minerals and moderately high radioactivity.

From the field and laboratory investigations of various rock types it appears that the radioactive hornblende quartz-biotite rocks are a hybrid product resulting from partial melting and assimilation of quartz porphyry by some basic intrusion. This view is supported by the presence of xenoliths of the latter enclosed in these rocks as well as traces of poorly assimilated rocks found sporadically in the area.

It is suggested that the origin of uranium and other polymetallic mineralisation may be associated with the late hydrothermal phase related to granitic intrusions along the main N 40° W shear zone, during orogenic cycles in the post-Amgaon period. The evidence of hydrothermal activity is afforded by the presence of criss-crossing quartz veins, appearance of chlorite, biotite and pennenite veinlets and ferrugination of the rocks, especially along the shear zone.

Detailed radiometric survey indicated that the surface manifestation of radioactivity can be followed along N 40° W trend intermittently for a strike length of 750m. Further, to the north-west and south-east, the rocks go under thick soil cover. Radon emanation survey was undertaken to investigate the soil-covered area. In the north-western soil-covered portion of the area, the radon values in a few patches exceed 200 times the background value, forming a 300 m. long anomalous zone in the N 40° W direction.

Sub-surface exploration by borehole drilling is in progress for proving the potentiality of this deposit. Results so far achieved have been reported to be encouraging. There is every likelihood that this interesting uranium occurrence may, in near future, turn out to be an economic deposit.

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