

BOOK REVIEW

EXPLORATION AND RESEARCH FOR ATOMIC MINERALS. SPECIAL ISSUE ON "RARE METAL AND RARE EARTH PEGMATITES OF INDIA"; Atomic Minerals Directorate for Exploration and Research, Hyderabad, v.12, July 1999, 171p. Price: Rs.300

The Mines and Minerals (Regulation and Development) Act, 1957 in the first schedule, Part B, lists out Atomic minerals: (1) Beryl and Beryllium-bearing minerals, (2) Lithium-bearing minerals, (3) Minerals of the "rare earths" group containing uranium and thorium, (4) Niobium-bearing minerals, (5) Phosphorites and other phosphatic ores containing uranium, (6) Pitchblende and other uranium ores, (7) Rutile, (8) Tantalum-bearing minerals, (9) Uraniferous allanite, monazite and other thorium minerals, (10) Uranium-bearing tailings left over from ores after extraction of copper and gold, ilmenite and other titanium ores, and (11) Zircon. Grant of prospecting licenses and mining leases for these minerals require Central Government approval. Prospecting for and mining of uranium ores was entirely the responsibility of departments/agencies under the Atomic Energy Commission. In respect of other atomic minerals, by and large, these departments/agencies had sole acquiring powers from mines producing other related minerals. Under such a situation, agencies/universities/departments, other than those under Atomic Energy Commission, had no sustained interest and involvement in geological study, prospecting and mining of these minerals.

Presently the situation is undergoing change. Since 1988 the Atomic Minerals Directorate (AMD) for Exploration and Research of the Department of Atomic Energy is bringing out an annual publication on "Exploration and Research for Atomic Minerals" (EARFAM). The 12th volume of EARFAM dedicated to rare metal and rare earth pegmatites of India, is edited by T.M. Mahadevan, former Director of AMD and R. Dhana Raju. This has inputs from 39 persons for pegmatites of central India, from 62 persons for eastern India, 30 persons from western India and 44 persons from south India. These contributions cover a wide range of geoscientific disciplines – geology, mineralogy, ore dressing, geophysics, mineral physics, mining etc. Somehow there is no list of contents in the volume.

The volume has five review papers: (1) Rare metal and rare earth pegmatites of India: An overview and some perspectives by D.C. Banerjee, (2) Rare metal and rare earth pegmatites of central India by P.V. Ramesh Babu, (3) Rare metal and rare earth pegmatites of eastern India by R.P. Sinha, (4) Rare metal and rare earths pegmatites of western India by P.B. Maithani and R.K. Nayak, and (5) Rare metal and rare earth pegmatites of southern India by K.V.G. Krishna and P.V. Thirupathi.

All the regional review papers are similarly structured and cover introduction, geology and structure, belt-wise/mineral district-wise review of geology and structure of pegmatites, rare metal and rare earth geochemistry, geochronology (where available), litho-geochemistry, RM and RE minerals, description of beryl pegmatite, columbite-tantalite pegmatites, lithium-bearing (spodumene/lepidolite) pegmatites and other pegmatites, beneficiation test results, discussion and conclusions.

The review of the central Indian pegmatites covers (1) Bastar-Malkangiri pegmatite belt (BMPB) and Garda Toya area, (2) Surguja-Jashpur, (3) Orissa, and (4) Maharashtra. The eastern Indian review covers mainly Bihar mica belt and pegmatites of Purulia district, West Bengal. The very interesting and informative paper on western India covers beryl pegmatites, Na-Ta bearing pegmatites and Li-bearing pegmatites of Rajasthan and beryl pegmatites of Gujarat.

The paper on southern India covers pegmatites of Karnataka, Tamil Nadu and Andhra Pradesh. In all 217 pegmatites are described. There are 66 figures (maps, flowsheets etc.), 42 tables (mostly analytical data) and 246 references.

The AMD has exported over 15,000 tonnes of beryl and stockpiled 4,300 tonnes of beryl, 3000 tonnes of lepidolite (3% Li_2O) and 44 tonnes of spodumene (up to 5% Li_2O). There are, it appears, about 600 beryl-bearing post-Delhi pegmatites in a 320 x 90 km belt of which only six are important and 24 are very good (p.104). The minerals, both ore and gangue, are coarse grained. The ores occur in pods and lenses of variable size and extremely erratically distributed, defying sampling and valuation by simple methods. Bulk sample tests and production history are the sole guides to exploration.

It would seem (p.2) that the younger the pegmatite, the better the incidence of atomic minerals. Rb-Sr ages of 950 and 1050 Ma are reported for the lepidolite of Monghyr. Samarskite from Bajrang mine, Rajasthan yielded an age of 580 ± 20 Ma. Several rare metal pegmatites in India are of Pan African age (900-500 Ma). More extensive dating is required.

There are many geological settings for pegmatite emplacement. These host a variety of minerals. The pegmatites also host other minerals, some of which are gemstones. These pegmatites also provide excellent rare mineral specimens. The beryl crystals of Bisundi pegmatitic measure 6 m x 1.5 m. Some pegmatites are quite large (Laxmi mine pegmatite 80 m x 10 m); Kabri (180 m x 25 m), Galwa (250 m x 25 m) and Golla (350 m x 50 m). Being mega-sized veins with coarse grained minerals, some of which are rare, pegmatites fascinate geoscientists.

In the All India Seminar on 'Minerals in the Economy of India', held at the Institution of Engineers, Bangalore (1996), D.C. Banerjee et al. in their paper on placer minerals had clearly indicated that the large inputs of AEC in exploration and database generation for valuation was provided for Joint Ventures (JVs) between multinational companies, private industry and state/central undertakings for placer mining. The publication under review focusses attention on the liberalised policy to attract latest technology and investment.

T.M. Mahadevan, himself a pioneer in the study of mica pegmatites of Bihar and former Director, AMD, and R. Dhana Raju, known for his periodic and informative papers on atomic minerals, deserve our congratulations. D.C. Banerjee not only initiated this idea and motivated his team but also gained the blessings of the Chairman, AEC and Director, BARC. The publication will interest a wide spectrum of geoscientists, both in the academic and applied fields.

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CORRIGENDUM

Conodont Biostratigraphy of the Lower Triassic in Spiti Himalaya, India by D.K. Bhatt, V.K. Joshi and R.K. Arora, Jour. Geol. Soc. India, v.54, pp.153-167, 1999. In Fig.2 the range of *Neospathodus praekummeli* may be understood as extending upwards up to the level of sample no. LG 69, instead of up to LG 68 as shown.