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FRAMBOIDAL MANGANESE ORES OF ADILABAD, A. P., INDIA

J. S. R. KRISHNA RAO and B. VENKATA NAIDU

The manganese ore deposits of India occurring in crystalline complex were subjected to structural and mineralogical transforms since their formation with the result the original fabric and composition has changed considerable. Therefore, the study of structures, textures of manganese ores in less distorted and little metamorphosed terrains would be interesting in tracing the origin. During a study of polished sections of manganese ores from Adilabad District, Andhra Pradesh, some interesting forms in manganese ores are observed and considered as framboids. The framboids are described in this communication and illustrated with photos.

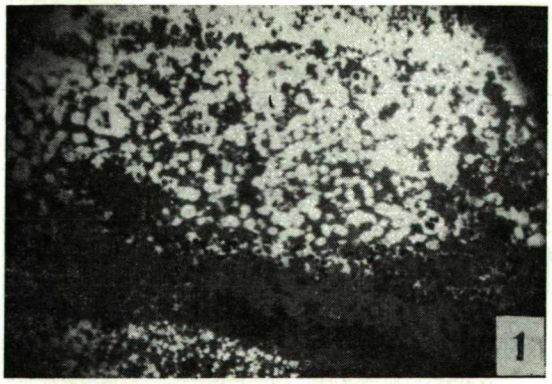

Fig. 1. The framboidal manganese oxide (white), and jasper (grey) in alternating layers. Magnification 70X.

The manganese ores located near Pipparagunta—Gotkur villages (long. 19° 32′ and lat. 78° 46′ and 47′, toposheet No. 56 I/5), Adilabad District, Andhra Pradesh were mined by Aditya Minerals Private Limited. The manganese ore is hard, compact and massive. The gangue material is siliceous. The gangue and the ore are in alternate layers of a few mm in thickness. The manganese ore mineral is pyrolusite. It is cream white in colour. Pleochroism is present particularly in oil and anisotropic under crossed nicols. Reflectivity is high. Pyrolusite is the mineral in framboidal form. The various framboids come together forming clusters or colonies; the margins are entire. The framboids are differing in their diameter as

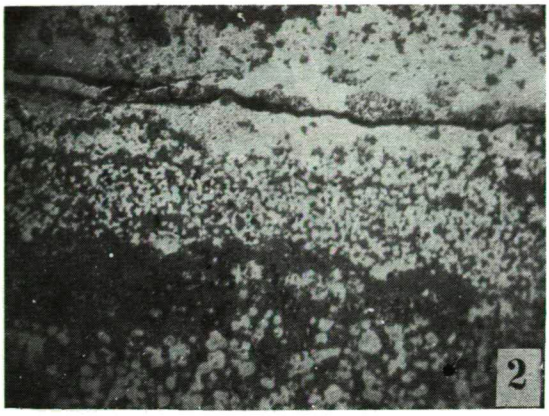

Fig. 2. The framboidal manganese oxide (white and grey) is fine grained. Various framboids coalescing and forming patches. Magnification 70X.

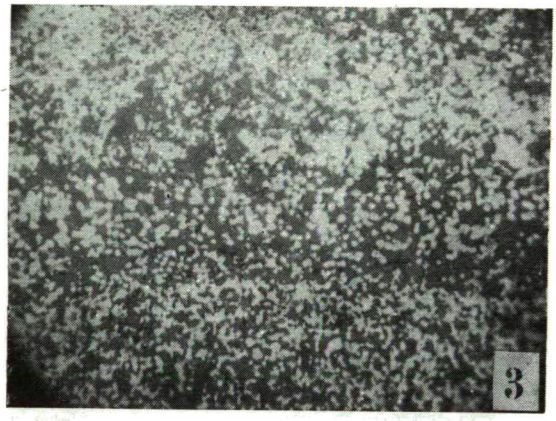

Fig. 3. Clustering of framboids in jasper bands. The jasper (grey) forms the background for the manganese framboids. Magnification 70X.

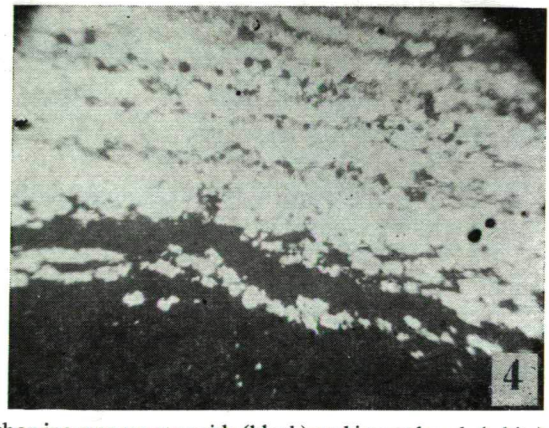

Fig. 4. A thin section showing manganese oxide (black) and jasper bands (white). Magnification 78X.

also in their lateral spread. They alternate with jasper bands which are continuous. Sometimes the manganese framboids are found to a lesser extent in jasper bands also *(Figs. 1* to *4)*. The framboidal forms (*Figs. 5* and *6*) are presented for ready comparison [AMSTUTZ, G. C. and BERNARD, A. J., 1971].

BASTIN [1950] suggested that SCHNEIDERHÖHN interpreted the small chalcopyrite spherules as replacing colonies of sulphur depositing bacteria and the tiny grains of which they were composed as "fossil bacteria". He suggested that the various sizes and the form of the spherules is in support of bacterial hypothesis. According to RAMDOHR [1969] the so called framboids are colloform bodies; however, he agreed that the smallest units observed by him are represented by minute spherical bodies having the dimensions of certain microorganisms. So, he suggested a bacterial origin for their precipitation. JOHN L. MERO [1969] described recent manganese ores as due to biological activity.

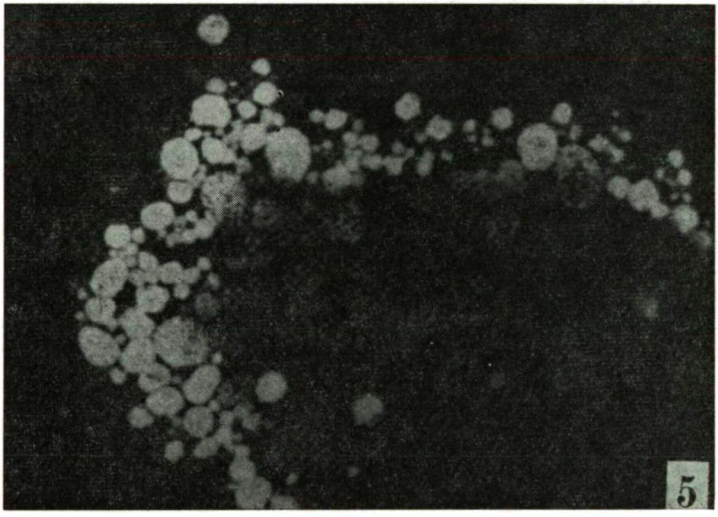

Fig. 5. Microphotograph of polished section in heavy mineral concentrate from dredged sample M_6, showing goethite pseudomorphs after framboidal pyrite; white framboids are pyrite, grey framboids are goethite. Magnification 400X.

RUST [1935] believed the framboids are probably metacolloids, crystallisation starting simultaneously at many points. It may be like bunching of tiny pyrite grains floating in chalcopyrite gel.

The manganese ores under investigation are of uniform composition. The size and shape are more or less uniform. There are no pore spaces or tension cracks or cavities or any gel structures. Further the rock formations in which they are found are of Penganga age consisting of shales, limestones, slates with pyrite, organic matter (0.315 to 1.96%) and fossil tracks. Recently BHAGABATI SARKAR [1974] reported various types of algal stromatolites, trace fossils (burrows) and some microfossils including filamentous structures and a variety of isolated and clustered spheroids of probable algal or fungal affinities and some doubtful microfossils from the lime-

stones of Madhya Pradesh, India. Thus, primitive life is indicated in and around the manganese ores under investigation. It is therefore considered possible that the primary manganese deposition at least in part may be due to bacterial activity.

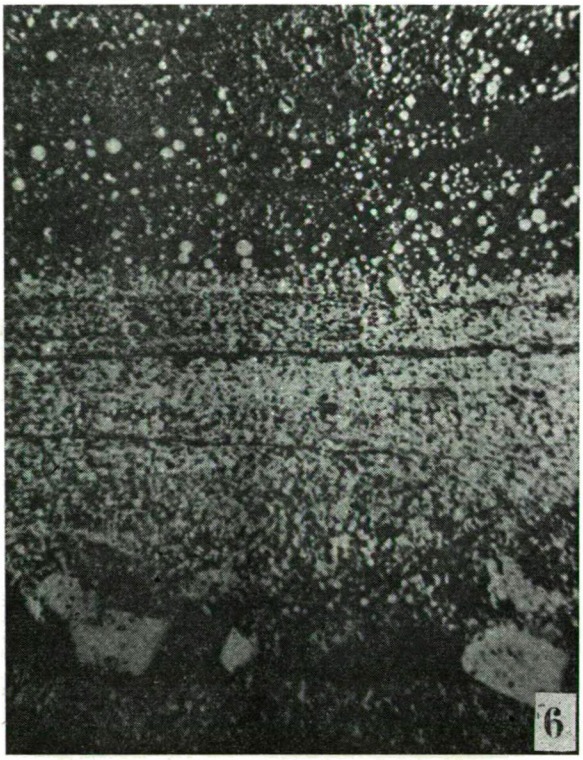

Fig. 6. Deposit Tekeli, Kazakhstan.
Pyrite ore with globules (above) thin layered (centre) and porphyroblastic (below). Magnification 40X.

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