GEOLOGICAL AND GEOPHYSICAL STUDIES OF
THE MYSORE PLATEAU, KARNATAKA

ABSTRACT
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Mysore plateau forms one of the oldest terrains of the
Peninsular India. It consists largely of Archaean gneissose
and schistose rocks with a variety of associated intrusive
rocks. Besides, the Dharwar schists, the other rock formations
in this region are banded ferruginous quartzite, metabasalts and
some patches of ultramafics. Prevalent types of dyke rocks,
encountered in the plateau, are of epidiorite, dolerite,
quartz-dolerite and olivine-dolerite. The grade of metamorphism
of the Dharwar schistose rocks generally increases from north
to south in the region.

The Dharwar iron ore bearing formations of Karnataka
constitute one of the important tectonic sub-divisions of
peninsular India. In the iron ore province several synclinal
strips of gneisses and schists are conspicuous by their strike
direction which varies from NW-SE to NNE-SSW. Deformation
accompanied by uplift of the Dharwar sediments by tectonic
forces, dominantly directed from east and west, not only resulted
in the formation of several N-S trending folded belts, but also it has cross-folded older rocks in adjacent belts occurring to the north and south of the area. The Closepet granite forms a N-S trending linear belt between Chitaldurg schist belt in the north and the Kolar schist belt in the south.

Apart from obtaining geological data relevant to this topic, detailed gravity and magnetic investigations are carried out by the author in Karnataka in an attempt to collect some fresh data in order to interpret usefully the broad structural pattern and composition of the crust, and also to throw some new light on the configuration and inter-relationship between the individual supracrustal rock units. Data collected in the field are presented in the form of gravity maps and gravity-cum-magnetic profiles. An attempt is made to correlate the data obtained from these gravity and magnetic investigations with other relevant geophysical and geological data collected by earlier workers. Through this work, an effort is made to elucidate the sub-surface geology and composition of the plateau.

The subject matter of the work has been dealt with in such a way as to include in the beginning of this work a concise account of the geology and tectonic framework of the area, including a synthesis of different views expressed by the previous workers. The methods used in geophysical investigations of the terrain and the procedures adopted for the reduction and analysis of the data collected are presented. The free-air,
Bouguer, and isostatic (Airy-Heiskanen, T=30 km) gravity anomaly maps of the study area are prepared, and the results of the qualitative analysis of these maps are presented. A critical analysis of the gravity and magnetic measurements along the three carefully selected east-west profiles taken along three different latitudes and also a northwest-southeast profile cutting across the three latitudinal profiles in this region provide useful informations in respect of the subsurface causative bodies. Correlation of some of the observed geophysical anomalies with metamorphism and tectonic set-up of the predominant rock types has also been attempted. Results obtained from the present investigations are compared and contrasted with other available geophysical and geological data. Interpretation of the integrated results so obtained from the present investigation of the plateau, has led to solve several debatable problems relating to charnockitisation of gneisses and schists at depth, and the inter-relationship between gneisses, schists and granites.