

TECTONICS OF MYSORE STATE*

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IN a paper published by the writer in 1951 (*Curr. Sci.*, **20**, 117-19), the structural pattern of Mysore State was briefly described. By using as marker a prominent band of ferruginous quartzite which was manganese-bearing and often associated with limestones, it was shown that the Dharwar formations of the Shimoga and Chitaldrug Belts formed part of a big anticlinorium which plunged NNW. This was an over-simplification of the complicated tectonics which one normally expects in a Precambrian area, but it served to emphasize the fact that what were described so far in Peninsular India as separate schist belts should really be considered as stratigraphically and structurally united.

It was also pointed out that the quartzite beds were all older than the iron-manganese-limestone formation, and were found only within the limbs of the anticlinorium. This explained why the wide expanses of Dharwar Schists to the north-west of Kumsi in the Shimoga belt, and to the east of the Anaji-Janehar line in the Chitaldrug belt, were entirely devoid of quartzite beds. Stratigraphically, the quartzite beds are older than the manganeseiferous ferruginous quartzites, and hence occupy the centres of the anticlinal folds; a good illustration of this is furnished by the Dodguni anticline in the Tumkur District.

The writer has now prepared a structural map (Fig. 1) of a part of Mysore State which gives an idea of the main tectonic pattern of this part of the Indian Peninsula. A significant fact which emerges from this map is that the geological structure of this part of Mysore State has resulted as the consequence of folding of beds which were *already folded*. A clue to this interpretation is given by the sharp bending back of the ferruginous quartzite beds at Mertiparvata, a few miles north of Kalasa, in the Western Ghats.

The structure of the Bababudan ranges has also to be interpreted as caused by the refolding of a plunging syncline which closed eastwards, the nose having undergone concertina-like crumpling.

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The Joldhal-Ubrani area has suffered considerably when the anticlinorium was formed. The beds of quartzites and ferruginous quartzites involved in this folding have been twisted and broken up, so that there is at present great diversity in the directions and magnitudes of their dips.

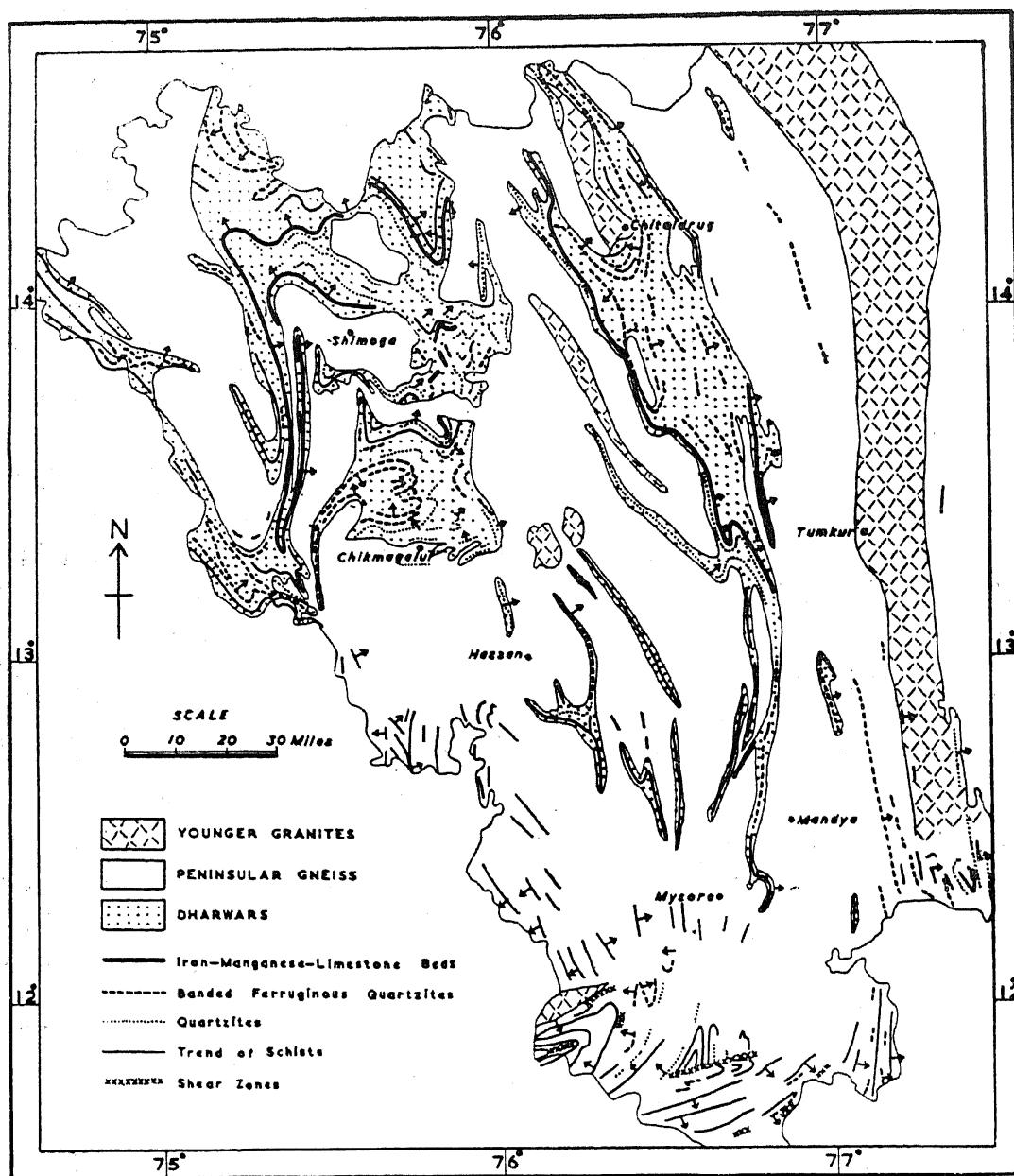


FIG. 1. Sketch map of part of Mysore State to illustrate the tectonic pattern. Only the main trends of the chief rock types are given in order to bring out the structure.

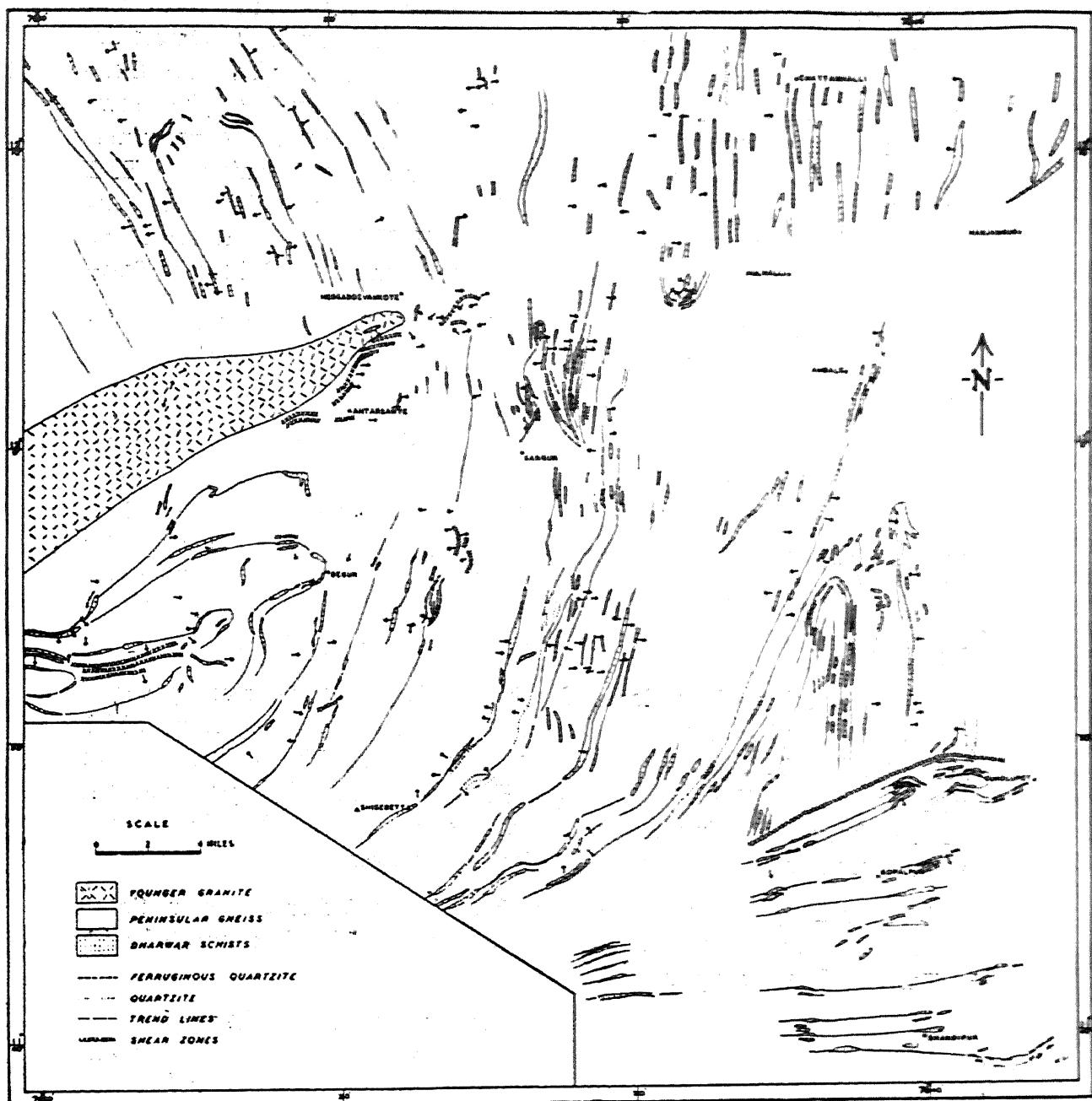


FIG. 2. Structural map of the extreme southern portion of Mysore State. The deflection of the strike directions, and the folded nature of the rock formations can be seen.

The southern part of Mysore State affords evidences of a later tectonic episode. The terrain here is extremely difficult for geological work as most of it is covered by dense forest. It is interesting, however, to note that a well-marked structural pattern does emerge from the meagre data available in this region (*vide* Fig. 2).

The general trend of the Dharwar Schists which was SSE in the west and N-S in the centre, changes first to south-west and finally to almost due west. The beds have been thrown into folds whose axial planes are themselves bent. The occurrence of mylonites and crushed gneisses gives some indication of the intensity of the disturbances in this region. A prominent shear belt can be traced for several miles near Antarsante, running in a ENE to WSW direction. A few miles WNW of Gundlupet, E-W beds are abruptly thrust against beds striking N-S. NE-SW shear zones are found also in the extreme south of the State near its boundary with Madras State.

Further south in the Nilgiri and Coimbatore Districts of Madras, the regional trend is more in accord with the abrupt change in strike noticed in this part of Mysore State.

The following tectonic episodes are envisaged in accordance with the structural interpretation proposed in this paper:

The earliest orogeny resulted in the folding of the geo-synclinal beds into a system with the axial planes disposed somewhat west-east. The folds appear to have plunged westwards. The Saulanga, Honnali, Shimoga, Jampalanaikankote, Pitlali and Bukkapatna granites and the ultrabasics of the Lakkavalli region are probably associated with this orogenesis.

This was followed not long after by a subsequent and more powerful orogeny, which folded the Dharwars into a huge anticlinorium which pitches NNW. This gave all the beds the prevailing Dharwarian strike of Peninsular India. The Chitaldrug, Hosdurga and Closepet granites, and the chromite-bearing ultrabasics of the Nuggihalli schist belt, could be considered as being associated with this orogenesis.

The third episode violently disturbed the rock formations in South Mysore resulting in twisting the beds westwards. This is connected with the Eastern Ghats orogeny.

There is an increase in the grade of metamorphism in Mysore State as one proceeds from north to south. The Dharwar schist exposures thin out considerably in South Mysore and are found only in small patches and narrow streaks. The chloritic and hornblendic schists of the north have been modified into granulites and charnockites. That we are still dealing with the Dharwars is made obvious by the occurrence of runs of such characteristic rocks as banded ferruginous quartzites, quartzites, and crystalline limestones. From Fig. 2 it can be seen that in spite of the metamorphism and the meagreness of the schist outcrops, the structural pattern can still be reasonably reconstructed.

This preliminary account of the writer's further observations on the tectonics of Mysore State is presented here for discussion and criticism.

REFERENCE

Pichamuthu, C. S. . . . "Some observations on the structure and classification of the Dharwars of Mysore State," *Curr. Sci.*, 1951, **20**, 117-19.