

PREFACE

The Deccan Traps cover a great part of Peninsular India but their study has not received much attention till recently. In view of their importance, the Department of Applied Geology and the Centre of Advanced Study in Geology in the University of Saugar, right from the beginning, have engaged actively in research concerning problems of the Deccan Traps. The results of the investigations till now are the valuable contributions of Prof. W.D. West and his associates regarding the parental magma of the Deccan Trap region and the source of the lava flows. An International Symposium on "Deccan Traps and other flood basalts", was held in the Centre of Advanced Study in Geology, University of Saugar, in January, 1969, and great emphasis was laid upon the importance of Deccan Traps in all the branches of geology, viz., petrology, structure and geomorphology, geochemistry, hydrology and geophysical aspects. Now more attention is being paid in the research problems of the Deccan Traps. As a part of the research programme the present problem has been assigned to the author by Prof. West.

The area between Chalisgaon and Igatpuri has always been neglected assuming it to be a monotonous sequence of basalt flows. They have not so far been studied in detail by any of the earlier workers and as a result the much needed data on petrology, mineralogy and petrochemistry of these rocks are not known. As such, detailed work has been done

by the author which has yielded the results summarized below:

The concept of "compound flow", with very many divisible flow-units, has been recognised by Dr.G.P.L.Walker of Imperial College, London, for many of the flows of Central and Western Maharashtra State. Simple flows are not so divisible. Both the types of flows are present in this area.

The normal basalts have been classified into fine, medium grain and coarse-grained porphyritic flows or flow-units according to their grain size, mineralogical composition and textures. Apart from this, picrite-basalts of different types, basic phyrlic-basalts and tholeiitic-olivine basalt flows are also present.

Some dykes have been recorded for the first time in this area, previously supposed to be dyke-free. Some of them could possibly be the feeders for the flows, while others show an intrusive relationship with the lavas and cross-cutting relationship with the earlier dykes. The latter dykes may belong to a post-hypabyssal phase of the Deccan Traps, or they may have fed the higher flows now removed by erosion. The cross cutting relationship of the dykes shows them to have been intruded at more than one time.

Direct evidence of the passage of dykes into lava flows is absent, but the nice example of a dyke passing into a sill, in the Agra Road Valley near Igatpuri, provides the necessary clue; if an enormous quantity of magma is considered

to have come out through dykes, then some of the dykes could possibly be the feeders of the lava flows indicating fissure eruption.

From the available petrographical and petrochemical data, the parent magma in the region is assumed to be tholeiitic in nature.

The evidence of central type of eruption has been put forth by other workers in the area covered by compound flows, but in the area under study they are altogether lacking; if present, might be concealed or have been eroded away.

The presence of compound flows and a large number of dykes in the Igatpuri area indicate the possibility of a centre of volcanic activity in the nearby vicinity and the source may be somewhere in the adjacent area.

From the above conclusions it may be pointed out that there is remarkable similarity of this area, in the nature of igneous activity, with the Hawaii, Faeroe Islands and Icelandic Shields-Skjaldbried, Trollandynhja, Theistareykjarbunga, etc.

The present work may be viewed only as a beginning in the investigation of the Deccan basalts of these two districts of Maharashtra State. It is, however, hoped that the projects,

"Malwa Plateau Scheme" and "P.L.480 Scheme", undertaken by the Centre of Advanced Study in Geology, University of Saugar, besides other Universities and N.G.R.I., Hyderabad, would fulfil the desires of many enthusiastic workers for the advancement of the knowledge of the Deccan Trap igneous activity.