

Summarising the principal events that occurred during the period of igneous activity in the Chalisgaon-Igatpuri area, and at the same time taking into account certain considerations with respect to the origin and mutual relations of the rocks, the following facts may be stated. That the assemblage of igneous rocks in the Chalisgaon-Igatpuri area belongs to one family as has already been discussed. The area studied, though but a small part of a vast region throughout which similar conditions prevailed contemporaneously, is characteristic enough to have furnished several facts; it is in some respects a natural district complete in itself.

Assuming all the lava flows of the present area to belong to one connected suite, we must suppose them to have had in some sense of a common origin; and the simplest form of this hypothesis is that which regards the various rocks as products of "differentiation" from one common stock, which is in harmony with conceptions now prevalent among petrologists.

The first and most obvious point concerning this initial homogeneous magma is that it must have been of thoroughly basic composition. Those flows which play the most important part as regards bulk are the basalt lavas.

Another point in the general petrography of the suite of rocks is that they belong entirely to one of the two great branches of igneous magmas, viz., to what Kennedy styles the "tholeiitic" type as distinguished from the "olivine-basalt" type.

The igneous activity in this region started with the eruption of the lavas through fissures as in the rest of the Deccan Traps. At the same time some centres were also active in the western part of the area giving rise to the compound type of flows.

The eruption of lavas might have been followed by a period of quiescence during which time the same magma of supposedly tholeiitic nature, differentiated itself into the lower basic and upper tholeiites under deep seated conditions. All other variations between these two end magmas were available for tapping throughout the period of eruption.

From the field, petrographic and the chemical study of the rock types, the following conclusions may be drawn:

- (1) Evidence has been advanced for the compound type of flows in addition to the simple flows which are common in the Deccan Traps.
- (2) From the study of compound flows and amygdale minerals, it has been found that the structure of lava

flows of the present area is closely comparable with the Icelandic flows (Skjaldbreid and Theistareykjarbunga), Hawaiian Kilauea and Mauna Loa volcanoes and the Faeroe Islands.

(3) The rock types have been classified on the basis of grain size, texture, mineralogy and chemical compositions, and it has been suggested that the most reliable classification of the igneous rocks should be based on the petrographical and petrochemical characters.

(4) The rock types present in this area are divisible into four groups which are (i) tholeiitic basalt, (ii) tholeiitic-olivine basalts, (iii) basic-phyric basalts (three-phenocryst basalt etc.), and (iv) picrite-basalts.

(5) The various types of flows have been extruded one after the other without regard to order, and the magmas which gave rise to these rock types were available for tapping throughout the period of eruptions.

(6) The overwhelming bulk of the flows are common basalts, often amygdaloidal and typical of the Deccan Trap formation, while the basic lavas consisting of various varieties are uncommon in the Deccan Trap area.

(7) There is little doubt about the fact that all the rocks present in the area represent flows and none are intrusive, except for a few dykes recorded in the Igatpuri area. The dykes are simple ones and are not of composite

type.

(8) The parent magma is shown to have been tholeiitic in nature from the study of the lava flows.

(9) Compound flows have rather limited areal extent as against the simple flows, which have been found extending 75 kilometres, and possibly more.

(10) The existence of compound flows in the area indicates that the source may be very near.