V. STRUCTURE

The Layered Sequence of the Bushveld Complex generally strikes north-south and dips at low angles to the west. In the Leolo Mountains the dip is about 9-10° (Molyneux, 1970, Plate I) and it increases to between 12° and 15° in the Tauteshoogte-Roossenekal area and to 25° in the Stoffberg area (Groeneveld, 1970, p. 37). Owing to doming in the Marble Hall-Dennilton area, a shallow syncline was formed which is occupied in its central portion by the acid roof-rocks at Tauteshoogte in the north and Bothasberg in the south. Dips of the Layered Sequence west of Tauteshoogte are therefore to the east, but they swing to south-east in the direction of the Kruis River.

In order to obtain more information on the structural relationships and the sequence of rock types, the author mapped an additional small area between Tauteshoogte and Bothasberg. This has revealed that the two synclinal basins of Tauteshoogte and Bothasberg are separated by two shallow pitching anticlines (Fig. 32). The structure is complicated by several parallel faults which strike WNW - ESE. The downthrow side of the northern faults is to the south, whereas that of the southern faults is to the north. This has given rise to a graben parallel to the axes of the two pitching anticlines. These faults are situated along the continuation of, and have the same strike as the prominent Laersdrif Fault (Groeneveld, 1970, p. 38), the downthrow side of which is to the north. To the west they may possibly join up with the fault on Mineral Range 190 JS (Von Gruenewaldt, 1966, p. 95) which has the same strike and a downthrow to the south.

The most prominent fault of the area is the southward continuation of the Steelpoort Fault. Its downthrow side is to the north, and it has a horizontal displacement of about 2km in the north and about 3km in the south. Its throw is difficult to calculate because of the difficulty in obtaining dip measurements in the granophyre and leptite. The fault has a maximum horizontal displacement of about 9km farther north, where Molyneux (1970, p. 31) calculated its throw to be about 1000m. Its smaller horizontal displacement of only 2km on Groothoek 139 JS makes it doubtful whether it has a throw in excess of 500m. A prominent fault-breccia is developed on this farm (Fig. 12) on the lower slopes of Paardekop. Farther south, on Zaaiplaats 157 JS its presence is indicated by a prominent quartz vein which contains fragments of the surrounding country-rock. It dis-

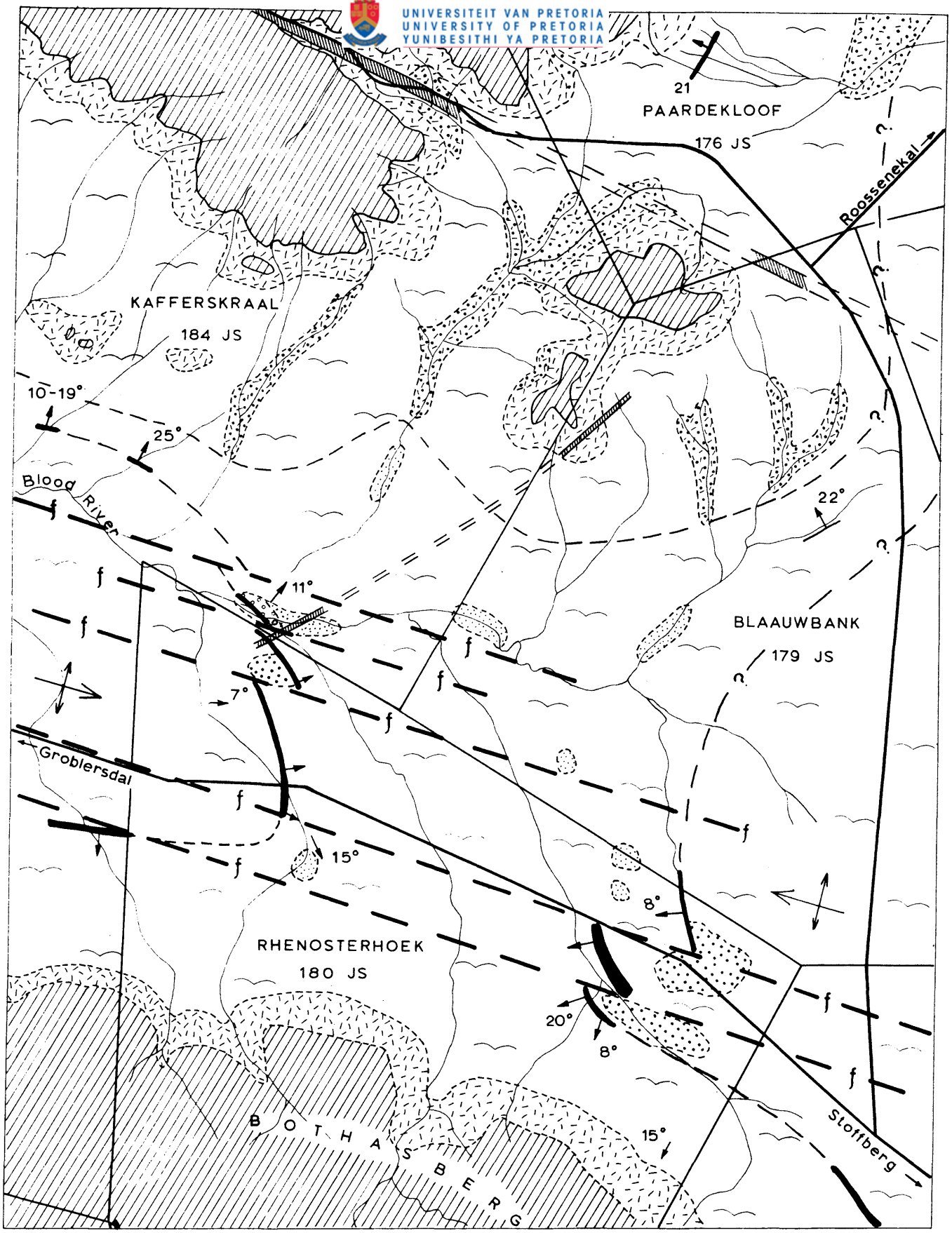

FIG. 32. STRUCTURAL MAP OF THE AREA BETWEEN TAUTESHOOGTE AND BOTHASBERG

LEGEND

Inferred fault —f—

Karroo dolerite

Roof-rocks

UPPER ZONE
- Diorite
- Olivine diorite
- Magnetite diorite
- Mottled anorthosite
- Magnetitite Seam
- Olivine gabbro

SCALE
1:50 000

0 1 2 3 4 5 km.

appears below a thick cover of alluvium on Buffelsvallei 175 JS where it is probably cut off at right angles by another fault (Von Gruenewaldt, 1966, p. 96) which strikes WNW - ESE. This latter fault was inferred by the author (ibid., p. 95) because the roof rocks north of the Blood River dip to the north, whereas rocks of the Main Zone occur south of it and have an easterly dip.

A number of smaller faults, all with their downthrow sides to the south are present on Mapochsgronde 500 JS where they displace the Main Magnetitite Seam and the over- and underlying rocks. All these faults strike parallel to the Steelpoort Fault and the Steelpoort Park Granite. A fault with similar strike, but with its downthrow side on the north, is present on Steynsdrift 145 JS where it displaces the uppermost magnetitite seam.

Some folding seems to be associated with the faults where the Mapochs River cuts across the Main Magnetitite Seam. The structure of this area is not clear, but it seems as if a shallow syncline and anticline are developed both of which dip at low angles to the north-west, i.e. perpendicular to the strike of the faults.

Duplication of parts of Subzone B of the Main Zone has already been mentioned previously as a possible explanation for its abnormal thickness of 1950m (Table II) which is about twice that in the area mapped by Molyneux. A possible strike-fault is indicated by the presence of a quartz vein on Draaikraal 48 JT, the continuation of which may be in the valley of the Klein Dwars River. The possible duplication due to this fault cannot be more than 350m because inverted pigeonite appears 350m upwards in the sequence west of the fault, whereas it is absent to the east of it.

Another possible fault could be situated in the valley of the Klip River as suggested by Willemse and Frick (1970, p. 164). Hammerbeck (1970, p. 299) reports shearing of the Steelpoort Park Granite where it is traversed by the Klip River but could find no evidence of any displacement. The very straight course of this river and the fact that its valley cuts obliquely across the strike of the Layered Sequence, seems to indicate the presence of a fault. Rocks to the east and west of the Klip River valley contain inverted pigeonite and seeing that the composition of the cumulus phases in rocks of Subzone B of the Main Zone do not change much with height in the intrusion (Folder III) it is impossible to determine whether any displacement has taken place. However, if a fault is developed, the maximum duplication may amount to about 300m. North of the

Steelpoort River, Molyneux (1970, p. 31) has located several strike-faults, the most prominent one of which is the Sekhukhune Fault. The downthrow side of this fault is to the west and it has a maximum throw of 2100m at Sekhukhune. To the south the effect of this fault decreases rapidly and at the Steelpoort River its throw is only 30m. The continuation of this fault south of the Steelpoort Fault coincides with the Klip River valley, although, if the Sekhukhune Fault does continue along this valley then its downthrow side must be to the east to cause duplication of the sequence.

These two postulated faults would still result in about 350m being unaccounted for if it is assumed that the thicknesses of the succession in the area north and south of the Steelpoort River remained the same. The thicknesses of Subzones A and C of the Main Zone agree very closely with those determined by Molyneux (Table II) and this would also favour faulting in this area, but until such time as more concrete evidence for faulting becomes available, the thickness of the Main Zone east of Roossenekal will be taken as 3940m.

A prominent joint system is clearly discernible on the aerial photographs of rocks of the Layered Sequence. The more prominent set strikes north-east to south-west, i.e., parallel to the majority of faults in this area, whereas the other set is developed at right angles to it.