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## 5. Anomalous magnetic field, Sideling basalt cap

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In response to an enquiry from the Forestry Commission, Launceston, a brief survey was made of the magnetic profile along the track from the Tasman Highway to the fire tower on the Scottsdale Sideling. The intensity of the vertical component of the earth's magnetic field was measured with a Jalandar Magnetometer, and concurrently an approximate value was obtained for the deflection of the needle of a prismatic compass from its anticipated position at each station. Stations were located at 250-foot intervals with closer spacing where variation was extreme (fig. 9).

No anomalies are detected until the contact between the sediments of the Mathinna Beds and the basalt has been crossed and anomalies become extreme only where the surface gradient is steep, the basalt thickness is considerable and the basalt bedrock is at, or near surface. Moderate anomalies can be demonstrated along the track to the fire tower,  $\frac{1}{2}$ -mile beyond the end of the plotted traverse, but extreme reactions are confined to the periphery of the basalt some distance from the traverse line. Values registered at a site on the north-eastern boundary of the outcrop, within 20 ft of the cliff top, show a variation from plus to minus 50,000 gammas within 20 ft.

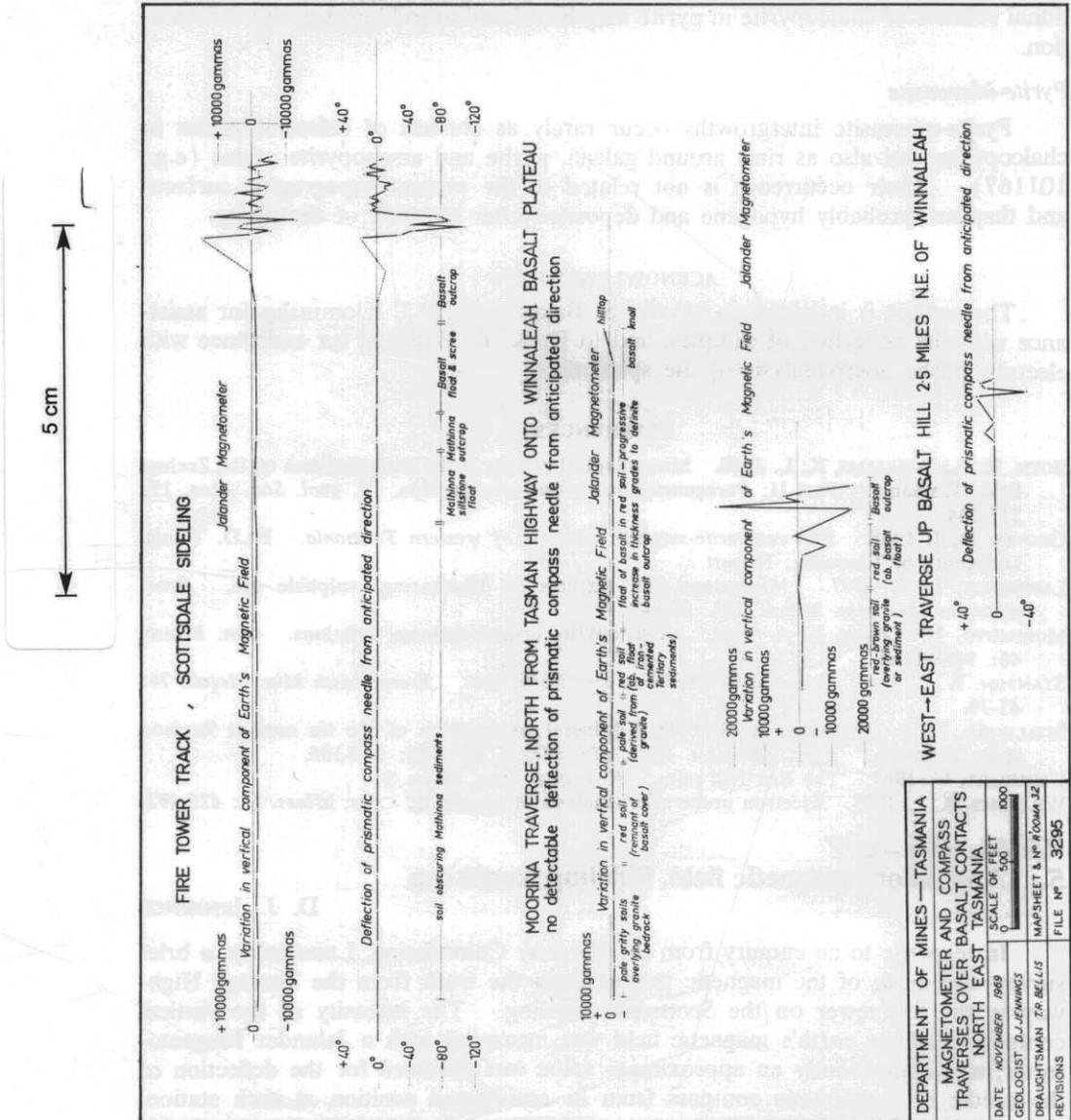


FIGURE 9

No particular geological features are observed to account for the magnetic irregularities. The two rocks are of contrasting type; the sediments of the Mathinna Beds are pale shales and siltstones, and the basalt is a very ferro-magnesium-rich variety with a local abundance of aggregates of olivine crystals. Topographical evidence, the distribution of olivine clots and the isolation from, and contrasting nature to, other local basalts, lead F. L. Sutherland (1969) to suggest that the Sideling basalt cap may overlie a volcanic vent.

Control traverses were carried out at two sites around the edge of the Winnaleah basalt plateau at Moorina (fig. 9) and Herrick, but at both localities the magnetic irregularity is slight and any deflection of the compass needle is small. At a third site  $2\frac{1}{2}$  miles NE of Winnaleah a W-E traverse was made from soil cover overlying granite, up a steep knoll of similar basalt type of the Sideling rock, with olivine nodules and the suggestion of proximity to a basalt plug. Again anomalous high and irregular readings are obtained both on compass and magnetometer on and near steep surface gradients, over considerable depths of basalts and where basalt is seen to crop out (fig. 9).

The anomalous magnetic properties of these outcrops is probably related to the mafic composition of the basalt (i.e., a high percentage of magnetic minerals); their occurrence as volcanic plugs giving an extension of the basalt at depth; and their form of outcrop as steep rocky knolls. The magnetic reversals are symptomatic of conflict between remanent magnetisation of the basalt and the earth's present magnetic field.

#### REFERENCE

- SUTHERLAND, F. L. 1969. A review of the Tasmanian Cainozoic volcanic province. *Spec. Publ. geol. Soc. Aust.* 2: 133-144.