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RECORD 1955/108

AIRBORNE SCINTILLOMETER SURVEY HALL'S CREEK-WYNDHAM REGION, WESTERN AUSTRALIA, JUNE TO SEPTEMBER, 1954

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Introduction.

The survey was carried out by the Geophysical Section of the Bureau of Mineral Resources, Geology and Geophysics, attached to the Department of National Development. A D.C.3 aircraft was used for the survey which was carried out in two parts. The first survey from Wyndham, between 29th. June and 10th. July, covered that part of the area lying between Wyndham and Turkey Creek. The second survey from Hall's Creek, between 23rd. August and 24th. September, covered the remainder of the area between Turkey Creek and Christmas Creek.

Region surveyed.

The survey was a systematic reconnaissance one with traverses 4 miles apart. A total of 4,300 traverse miles was flown. The region is approximately rectangular and measures about 75 miles x 240 miles and has an area of 18,000 square miles. It is positioned as follows :-

North-west corner	-	Bastion Range near Wyndham.
North-east corner	-	16 miles east of Nigger Hill or about 75 miles east-south-east of Wyndham.
South-west corner	-	8 miles south of Red Bluffs near Christmas Creek.
South-east corner	-	Beaudesert Well, 50 miles south of Hall's Creek.

Operations.

Traverses were in a general east-west direction with, as stated above, a separation of about 4 miles. Vertical aerial photographs were used for navigation. A strip camera was operated throughout the survey to record the position of the aircraft. The nominal height of the aircraft was 500 ft. above ground level. The scintillometer was operated with two crystal units coupled to a single ratemeter and with a small amount of fore and aft shielding.

Results.

An initial evaluation of the scintillometer records has been made and some 54 well defined anomalies have been selected. There is a larger number of less well defined anomalies.

The positions of the anomalies are known approximately but have yet to be accurately determined; the approximate positions will be described below.

The references to geology are based on the Geological Map of Western Australia and on the draft geological maps prepared by the Bureau in connection with the Land Research Investigations of C.S.I.R.O., the base maps used for the latter being six 4-mile sheets prepared by the National Mapping Section, Department of the Interior. Copies of these have already been sent to the Western Australian Mines Department. The localities referred to below appear on the 4-mile sheets.

About four-fifths of the anomalies fall within the large tract of country occupied by Archaeozoic rocks (mainly acid rocks); these rocks will be referred to as "granitic rocks" throughout the remainder of this report. Thirty-six of these anomalies lie within a central area of granitic rocks. This central area (i) is about 30 miles east-west x 45 miles north-south, (ii) includes the military 1-mile maps of Armanda River and Alice Downs and the southern half of the Springvale map, (iii) embraces the headwaters of the Ord and Panton Rivers and is bounded by longitude 127°30' on the west, longitude 128°00' on the east, latitude 17°20' on the north and latitude 18°00' on the south, (iv) has the Great Northern Highway close to its eastern edge, (v) lies within and occupies most of the Trigonometrical Survey Sheets of the Lands Department of W.A., numbered T.S.978 and T.S. 955.

Five of the six best anomalies, i.e., those which are most like the type to be expected from a concentrated source, occur in this area. Two of these are close to the upper reaches of the Little Panton River, about 20 miles north of the Hall's Creek Aerodrome. Three others lie about 5 miles south of the Ord River in a locality 20 miles north of Springvale Homestead. They are spaced about 4 and 7 miles apart respectively in approximately an east-west line.

The sixth anomaly lies in the rocks of the Nullagine System to the west of the Granitic rocks at a position approximately 127°10' east and 17°45' south.

The other principal anomalies in the central area of granitic rocks do not form a very defined pattern although eight of them follow a general line which commences on the Little Panton River, trends north-easterly and passes about 4 miles east of Springvale Homestead, and then curves north and west to join another group of six anomalies which lie 10 miles north of Springvale Homestead.

Several other anomalies are scattered throughout the southern part of the granitic rocks as far south as Mary River and Christmas Creek.

Three anomalies lie in rocks of Devonian age, about 20 miles east of Bohemia Downs Homestead on Christmas Creek.

One anomaly was recorded in the Pre-Cambrian rocks of the Whitestone Series, 6 miles south of the Panton River and about 16 miles south of Alice Downs Homestead.

Two other anomalies were recorded near the Elgee Cliffs, 12 miles west of Killara Spring. This locality is about 40 miles north-west of Turkey Creek post office.

Some closely spaced traverses were flown over the most important of the 54 anomalies but the results have not yet been assessed.

The full evaluation and the accurate plotting of all the anomalies recorded will take some time. The foregoing is only a preliminary statement giving a brief outline of the results and some modification to the information given above can therefore be expected.