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DEPARTMENT OF MINES

SOUTH AUSTRALIA

AIR RADIATION SURVEY OF THE MOUNT LOFTY RANGES

PROGRESS REPORT - R.S.1

by

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U.S. 330.

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INTRODUCTION:

An air radiation survey of the Mt. Lofty Range area, using an "Auster" aircraft equipped with a Brownell Aerial Scintillometer Mark VI, was commenced on April 21st. The area covered to date amounts to sixteen square miles. Total flying time has been 24 hours 25 minutes.

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EQUI PMENT:

The Brownell aerial Scintillometer is mounted on the floor of the aircraft, immediately behind the pilot and geologist, who sit side by side. A meter, in series with the meter on the instrument, is mounted on the instrument panel of the aircraft, in front of the geologist. The scintillometer has been fitted with an extra relay which comes into operation when the "count" reaches a significant figure. This relay operates a warning light (mounted on the instrument panel in front of the pilot) and a buzzer (mounted above and behind the geologist). The resplay can be adjusted so as to operate at any particular "count".

The scintillometer tube was originally protected by a thick lead shield to reduce the high background count caused by radioactive paint on the luminous dials on the aircraft instrument panel. However, permission has now been obtained from the Civil Aviation Authorities to remove the luminous paint, and this work is in hand. Future flying will be done without the lead shield, which had the effect of reducing the area effectively covered by the aircraft on each traverse.

The instrument is operated on range 2, and time constant of one second. TECHNIQUE:

The first few hours of flying were taken up in developing the technique of this new type of survey. Thanks to the co-operation of Captain Buckley, of Guinea Airways, a working combination between pilot and geologist has been established which is proving very successful.

Known uranium occurrences in the Houghton area were first flown at various heights and speeds to determine the type of reaction to be expected from such occurrences. The sensitivity of the instrument was adjusted so that the warning light and buzzer came into operation over these known occurrences. The maximum average distance between traverse lines for effective cover of this area was determined.

As a result of this preliminary testing, the technique now adopted is to fly traverse lines, spaced at intervals of 100 to 150 feet, at speeds of 100 to 120 feet per second, at elevations of between 50 and 100 feet. Any "hot spots" are immediately reflown to determine their location. If possible, they are reflown from several different directions, enabling their position to be pinpointed with considerable accuracy.

It is of interest that the No. 1 Lode at Myponga, which can be readily picked up at elevations of between 50 and 100 feet, does not register significantly on the instrument at elevations above 150 feet. This illustrates the necessity for low flying in finding occurrences of this size and character.

RESULTS:

About twelve square miles of counting have been covered in the Houghton Kersbrook area. All known important occurrences of uranium were noted. Areas characterised by the presence of thorium minerals, previously located by a Departmental Prospector, were also noted.

Some four square miles have been tested in the Myponga area, and the results of this work are shown on the accompanying plan, No. U.S. 330. Five new areas of significantly high count were located. Of these, the one immediately north of the No. 2 Lode of the Wild Dog Mine has been investigated on the ground, and found to be due to high counts from pegmatitic rocks. Ground investigation of the other four areas, situated about one mile south east of the Wild Dog Mine is proceeding. Preliminary

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samples from these areas have been tested and results suggest that the radioactivity is probably due to thorium.

CONCLUSIONS:

The results of flying to date suggest that the technique can give effective cover of most of the areas in the Mt. Lofty Ranges

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