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22nd March, 1946.

MEMORANDUM

REPORT OF AERIAL RECONNAISSANCE FLIGHT FROM HOBART TO SMITHON ON 20/3/46.

Under instructions from the Director of Mines, advantage was taken of an opportunity for the Government Geologist to make an aerial reconnaissance flight from Hobart to Smithon by a route specified by the Government Geologist, with the purpose of assessing the amenability of the potentially metalliferous areas of the State to geological Interpretation from the air, and to make such other geological observations as might be possible en route. Instructions limited the duration of the flight to 3 hours.

Route

The direct route from Cambridge to Smithon passes for a great portion of the way over the dolerite plateau, which is of little economic importance. The route was, therefore, plotted well to the south, as follows :-

Course 271½°, 91 miles, Cambridge to the junction of Franklin and Gordon Rivers.

Course 344°, 58 miles, Franklin-Gordon junction to 2½ miles beyond Renison Bell.

Course 93°, 14 miles, Renison Bell to Sophia Peak.

Course 51°, 23 miles, Sophia Peak to Lake Lea.

Course 235°, 22 miles, Lake Lea to the Pinnacles.

Course 350°, 16 miles, Pinnacles to Mt. Bischoff (a deviation was made in this run to examine Mt. Pearce and Moorey Mt. (extra 10 miles.)

Course 321½°, 47 miles, Mt. Bischoff to Smithon.

Total distance 281 miles, actual flying time 2 hours 50 minutes. The Geologist acted as navigator for the flight and made all course and drift corrections en route.

Weather was generally good for observation, except between Rosebery and Lake Lea where considerable low cumulus cloud hindered observation and necessitated slight deviations of course to avoid flying into obscured peaks.

General Observations

The rocks of Tasmania generally are quite amenable to geological interpretation from the air, and the examination of the aerial photographs will certainly yield a wealth of geological information. This is particularly true of the south-west region between the Lyell Highway, Port Maquarie, Adamsfield, and Port Davey. The strike and dip of the Pre-Cambrian rocks will be determinable wherever they occur, also their general character, whether quartzites or mica schists. The Dundas series makes subdued topography, which will be distinguishable on the

aerial photographs from the Queen River Series. The latter made a distintive type of dip slope pattern which is quite different in the aerial view from the older slate series. Detailed structure may not be discernible in the Dundas Series and porphyroids. The West Coast Conglomerate will be identifiable as such on the aerial photographs, and its minor folding and faulting worked out with precision and detail unattainable on the ground. This will be of considerable economic importance because the base of the formation is one of the most fruitful ore loci in the province. The old intrusive granite and porphyry at Mt. Darwin and Red Hills south of Mt. Murchison is clearly distinguishable from the other porphyroids by a quite characteristic red colour. This may not show up on ordinary black and white aerial photographs, although it could probably be brought out by selective use of filters. The later granite intrusives at Granite Tor, Mt. Ramsay, etc., will also be identifiable as such on the photographs. The newer plateau formations of the Permian and Triassic will be easily delineated from the older Palseozoic rocks and the newer intrusive dolerites, but may or may not be distinguishable from each other when photographs are received, careful study will need to be made of the outcrop patterns of the serpentine, pyroxenite, gabbro group to identify them in the Dundas areas, and of the Tertiary basalt. No limestones or dolomites were picked up as such by the observer during this flight, but from experience of other regions the writer is confident that all or nearly all limestone areas of any size will be accurately detected as such when the photographs are examined in detail.

Observations of Particular Details.

(1) Block faulting along the lower Derwent Valley:

The general impression of a fault along the NE face of Mt. Faulkner, Dromendary, and the high peak about 6 miles ENE of Gretna is strengthened by aerial observation. This fault downthrows to the NE, with a series of gentle south westerly dip slopes between the fault and the Derwent River between New Norfolk and Plenty. There is possibly another similar fault running from Collinsvale to Westerway.

(2) Tyenna Anticline:

The structure of the Tyenna-Florentine divide in the vicinity of the Adamsfield pack track shows up clearly as an aticlinal nose pitching NW. Tim Shea and the Needles are opposed flanks of the nose both being made up of Lower Ordovician quartzites with a continuous outcrop round the nose between them. The opinion of the late Dr. A.N. Lewis, that there is an inlier of Dundas Series at the head of the Tyenna valley, is confirmed. The pack track crosses the divide in the saddle between Tim Shea and Wherrett's Lookout. This saddle is composed of Lower Ordovician shales and soft sandstones, striking EW. The geology of this area has engineering significance in relation to the proposed railway tunnel about to be driven. It is clear that the geological examination of the aerial photographs of this area will greatly help in this work.

(3) Gordon Valley:

The Gordon Valley is crossed by a succession of well developed strike ridges with an approximately meridional trend. It will be possible to elucidate completely the structure of this area from the aerial photographs with comparatively little field work.

(4) Franklin Valley:

The eastern side of the Franklin Valley is composed of rocks of the Queen River Series with dips to the east at moderate to steep angles. These beds continue across the lower Jane River and along the Andrew River and the Engineer Range to the vicinity of Mt. Madge. Here they seem to be dipping to the west. It seems probable that they continue northwards to join up with the similar beds along the Lyell Highway in the upper Nelson River Valley.

(5) The Elliott Range:

This range is composed of the West Coast Conglomerate series. At the northern end in the vicinity of Scorpion Creek it has a gentle dip of about 15° to the SW. At the southern end of the range it seems to be a whale-back ridge and could be a pitching anticlinal axis.

(6) The Darwin Granite:

This granite continues northwards under the flank of Mt. Jukes and southwards from Mt. Darwin for nearly four miles. Its red colour easily distinguishes it from the surrounding porphyroids.

(7) West Coast Range:

The West Coast Range between Mt. Sorell and Mt. Farrell is not a simple structure. It is puckered by quite a number of small but sharp anticlines and synclines. These are conspicuous on Mt. Murchison and also on Mt. Farrell. These will all be picked up accurately from the aerial photographs. There is not time on a reconnaissance flight to record them in detail because about 40 square miles have to be looked at in every minute of flight.

(8) Marianoak River:

There has been a good deal of argument in the district about the mouth of the Marianoak River. Current official maps all show the Marianoak as turning west and flowing into the Huskisson, whereas many local ubshmen maintain that it turns east and joins the Pieman above the Stitt. From the air it is clear that the latter view is correct.

(9) Sophia Syncline:

The Sophia Syncline east of Mt. Farrell continues up the Mackintosh valley to Lake Lea. Hence the continuation of the Mt. Farrell mineralised zone must be looked for in the Moina district and the country between. From this point of view it should be mentioned that the proposal which has recently been publicised in the press that a road be constructed from Rosebery via Tullah to the Moina district offers considerable prospect of ppening up mineral bearing country, and would provide access for the prospecting of a promising belt of country which at present is most inaccessible.

Mt. Remus, Mayday Mt., and Bond Peak seem to be on the south east limb of the Sophia Syncline, and the ridges north west of Lake Lea, and on the north west bank of Mayday Creek and the Mackintosh below Mt. Block, seem to form the north west limb. The working out of the details of this syncline from the aerial photographs has considerable economic importance.

(10) Mt. Pearse:

The structure of Mt. Pearse shows up very clearly from the air. It is the SW end of a pitching syncline of which Moorey Mt. probably forms part of the south west limb. Mt. Pearse is made up of West Coast Conglomerate which outcrops in a cresent round the pitching end of the syncline. It seems probable that St. Valentines Peak and Mt. Everett may be on the NW and SE limbs of this syncline respectively. The area within this syncline is likely to be barren of economic minerals.

(11) Area between Mt. Bischoff and Smithon:

This area was disappointing because little in the way of structure could be seen from the air. It is probably composed largely of slates, and the older slates at that because the Queen River Series tends to form conspicuous dip ridges. It is possible that more structure will be picked up on the photographs because the impression received from that seen by an observer in an aircraft. The latter gets an ordinary human perspective, a "bird's eye view", with a 3½ inch eye base, whereas the stereoscope gives a "giant's eye view", such as would be seen by a giant with eyes a mile apart. This results in an angle of convergence of the lines of sight of many degrees instead of a few seconds or minutes.

Possible Availability of Photographs in Guilford Area:

At Smithon I learned from Mr. Needham of the Associated Paper and Pulp Mills, Burnie, that a contract has been let to Brown and Dureau to take aerial photographs of a considerable area extending from Hampshire southwards to the Hatfield River. The approximate boundaries of the area are sketched on the attached map. The photography is to be completed this month, weather permitting. The specification I understand to be identical with the Government contracts. If this area is photographed according to schedule I suggest that consideration be given to the advisability of negotiating with the Companies concerned for the supply of prints of this area, because it is likely to be a considerable period before they will be available to the Department otherwise. The area is in the mineralised belt of Tasmania, and although a good deal of it is covered by Tertiary basalt and Pleistocene glacials, there are numerous windows of older rock showing through and it is of considerable importance that these should be picked up and closely studies with a view of carrying the mining province into the basalt covered area.

Preparation for Photogeological Work:

Before a start can be made on the photogeological interpretation of any area, it will be necessary to build up a set of standard norms of topographic expression of each of the geological formations commonly occurring in Tasmania. This entails making cursory examination of as many photographs as can be obtained of as many areas as possible in the country, where the ground geology isknown, covering all formations present in Tasmania. In this way type sets of photographs will be assembled showing the range of topographic expression for the various formations of the Pre-

Cambrian, the dolomites, the Dundas Series, the porphyroids, West Coast Conglomerate, Gordon River limestone, Queen River Series, and various igneous formations etc.

This will enable each formation to be identified accurately wherever it is encountered in areas for which only scanty ground information is available. It is necessary that this foundation work be started well in advance so that the photogeological interpretations of any particular region can be undertaken as soon as the relevant photographs become available.

In this connection it may not be appreciated that the interpretation of aerial photographs is a slow and exacting job and each quadrangle will require about 60 men days.

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GOVERNMENT GEOLOGIST

The Director of Mines,
HOBART.