Rio Tinto Aust. Ex. Pty. Ltd

PRELIMINARY REPORT ON THE GEOLOGY OF NORTH-WESTERN TASMANIA

by

J. H. RATTIGAN.

27-11-56

CONTENTS.

002

509003

A P P E N D I X

I. Bibliography

ENCLOSURES

Table I Geological Sequence North Western Tasmania.

Plate I Index Map (Scale 8" = 1 Mile) showing Boundaries of S.P.L. 302 and S.P.L. 311, and standard one mile to one inch Map Sheets.

*Plate II Broad Structural Features of North Western Tasmania.

*(MISSING. NOT RECIEVED WITH THIS REPORT)

Refer also to Preliminary Geological Map Compilations at one inch to one mile scale and overlays showing mineral occurrences.

(Old Rio Maps

INTRODUCTION

GENERAL. Two Special Prospector's Licences covering an area of approximately 3,000 square miles in North-Western Tasmania are currently held on behalf of Rio Australian Exploration Pty. Ltd. The two licences are S.P.L. 302 held in the name of R.S. Matheson and S.P.L. 311 held in the name of J.H. Rattigan.

The terms of the licences apply to unoccupied Crown Land only within the boundaries of the S.P.L's and exclude purchased land, occupied Crown Land, Government and Municipal reservations, roads and easements, and lands held or applied for as mineral leases and prospector's licences prior to the pegging of S.P.L. 311 and S.P.L. 302.

PRELIMINARY WORK.

As a preliminary stage in the exploration of the permit a series of geological and topographical maps have been prepared from aerial photographs according to the National Military system of one mile to one inch standard map sheets. The sheets covering the area are outlined on Plate I.

The geological and topographic compilations were prepared in Hobart over the period June 6th to November 1st. This work was done by J.H. Rattigan (Geologist), R.J. Ford and B.E. Wells (part-time Geological assistants) with the assistance of A.T. Nye and J.L. Potter (draftsmen) who were in Hobart for short periods, and continued the drafting of the maps in Melbourne.

The work involved preparation of a reliable base topographic control and a geological compilation from interpretation of aerial photographs and utilising all reliable geological information where such existed.

The preparation of a topographic base was greatly aided by the co-operation of Government Departments and authorities such as the Department of Mines, Lands and Surveys, the Forestry Commission, the Hydro-Electric Commission, Town and Country Planning Section, and the Commonwealth C.S.I.R.O. These Departments supplied copies of the base maps and survey information.

DESCRIPTION OF THE REGION.

The terrain in which our licences are located is for most part extremely rugged and is covered with a thick timber undergrowth which conceals outcrops and makes ground survey difficult.

The main physiographic unit in the area is a high level peneplain developed west of the central plateau of Tasmania. This peneplain has a fairly uniform elevation in parts near Waratah where it is covered by a basalt cap. Elsewhere the peneplain is considerably dissected, particularly on the south and west. Relief ranges to more than 4,000 feet above sea level.

A narrow coastal peneplain fringes the West Coast to the south of the Arthur River, and has a variable width of up to 12 miles. This peneplain has sea-cliffs of the order of 100 feet in height on the western edge and rises gradually eastwards to the heights of up to 900 feet where it borders the higher peneplain.

Rainfall ranges up to 180" per annum distributed throughout the year, the driest months being December to March.

The drainage is controlled by two main river systems, those of the Pieman and Arthur Rivers, the main streams of which flow westerly though the chief tributary streams enter from north and the south. Other minor systems drain to the west and north coasts.

SETTLEMENT.

The area generally is sparsely populated. A narrow northern coastal strip is closely settled, with rich mixed farming areas developed on basalt soils. The main centres of this district are Smithton and Wynyard.

South of this coastal strip timber and mining are the main industries but do not support a large population. Mining forms the main support for the township of Queenstown (with its satellite Gormanston) and Rosebery (with its satellite Williamsford). Other small mining settlements are Renison Bell and Tullah. Zeehan and Waratah were, in the past, important mining centres but are now dependent on other industries for their existence.

ACCESS.

Main roads are few. The Bass Highway follows the northern coastal strip. The Lyell Highway enters the area to the south near Queenstown and has branch roads to Zeehan and Rosebery. The Waratah Highway passes from Wynyard to Corinna.

Apart from these roads access is poor. No through road or track connects the northern and southern parts of the area. The narrow north coastal strip has a network of subsidiary roads and tracks. Over the greater part of the area the few tracks which exist give access to timber and mining prospects.

The Emu Bay Railway (E.B.R.) runs on the eastern fringe of the licence area between Burnie and Strahan.

For past surveys within the area, mining companies and such authorities as the Hydro Electric Commission have had tracks cut for access and mapping. The cost of such track cutting can be quite high, depending on the density of timber undergrowth, the maximum figure being of the order of £5. per chain.

GEOLOGY.

STRATIGRAPHY.

A generalised stratigraphical table is appended (Table 1). The rocks described in this report are those developed within our permit area or its immediate environs as far as is known at present.

Pre-Cambrian

Pre-Cambrian rocks are exposed in a wide belt on the western part of our licence area extending from west of Zeehan to the north coast. They are also developed as inliers near Carbine Hill and at Mt. Bischoff.

To the east of our licence area Pre-Cambrian rocks are extensively developed in a wide belt of country passing north from the Raglan Range to the Cradle Mountain Scenic Reserve.

The stratigraphy of the Pre-Cambrian rocks is not well known but attempts have been made in several areas to name rock units. For the purpose of this report the Pre-Cambrian rocks will be sub-divided into "younger" and "older" Pre-Cambrian.

Older Pre-Cambrian rocks consisting of regionally metamorphosed, folded and faulted quartzites, quartz schist, conglomerates, micaceous schists and phyllites, with dolomites and limestones have been referred to by a poorly defined unit, the Davey Group.

The younger Pre-Cambrian rocks, generally less metamorphosed are referred to as the Carbine Group. Elliston (1954) named the Carbine Group from a type area near Dundas, but the usage had apparently been extended to include younger sequences throughout western Tasmania without any direct or reliable correlation. The Carbine Group may range into the lower Cambrian, but all sequences included within it are unfossiliferous. The Carbine Group in the type area is a sequence of slates, dolomites and quartzites flanking and unconformably overlying older schists, phyllites and quartzites of the Davey Group exposed in the core of the Dundas anticline.

A sequence of sandstone, shales, quartzites and dolomites exposed in an inlier near Mt. Bischoff and underlying the Cambrian rocks of that area has been referred to as the Carbine Group - (Knight 1953, Carey 1953).

The Bryant Hill Quartzite and Smithton Dolomite developed in the Smithton district are believed to be younger Pre-Cambrian in age and are correlated with the Carbine Group.

Near Zeehan, localised outcrops of tillite, the Zeehan Tillite, may be younger Pre-Cambrian in age, but the structural relationship to adjacent Pre-Cambrian sediments is in doubt and the tillites may be infolded rocks of lower Cambrian age.

Swarms of altered basic dykes or sills intrude the olderPre-Cambrian rocks in the western part of our permit area. These show a consistent N.E. trend. Their age of intrusion is uncertain but may be Pre-Cambrian or Cambrian.

Cambrian Layered Rocks.

As with the Pre-Cambrian very little systematic mapping has been done in the Cambrian rocks of North-West Tasmania. The nomenclature of the rock units which has been used in the past is confusing.

The Dundas Group defined from a type locality in the Dundas area by Elliston (1954) has apparently achieved an informal usage embracing the greater part of the rocks of the Cambrian period succeeding the Carbine Group.

The Dundas Group used in the above informal sense is a complex unit consisting of sediments, tuffaceous sediments, pyroclastic rocks and acid intermediate and basic (spilitic) lavas. Apart from one small area near Dundas and near operating mines as at Rosebery no detailed mapping has been done in these rocks. Systematic work is made difficult by the rugged nature of the terrain, concealment of outcrops, folding, faulting, metamorphic effects, surface weathering of the rocks, and by the complex relationships found in such mixed sedimentary, igneous and pyroclastic rock accumulations. Lithological changes are often abrupt and marked variations in thickness are common. Extrusive or intrusive relationships of the igneous rocks cannot always be clearly established.

The rocks of the Dundas Group show some degree of metamorphism and also dynamic and contact metamorphic effects locally. An aureole of hornfelsed rocks is developed about later granite intrusives and the rocks have been converted to schists in sheared zones.

Fossils within some sedimentary members has placed the Dundas Group as ranging from middle to upper Cambrian in age. Apart from fossils the main criterion for recognition of the Dundas Group has been the determination of the pyroclastic and volcanic elements characteristic of the Group.

Within our licence area the rocks of the Dundas Group are exposed in two main belts. The largest development occurs in a belt on the south-eastern margin of our permit area between Queenstown and the Valentine's Peak area. On the north coast, Dundas Group rocks are known in the Smithton and Montagu District and have been interpreted as extending southwards to the Arthur River.

The lithology of the Dundas Group in several better known areas is described below.

Dundas Area.

Elliston in his type area recognised 13 formations forming the Dundas Group for which he gave a thickness of about 11,570 feet. It is doubtful if the formations are mappable on a regional scale as there is marked lensing and variation in the thickness of the formations.

The rocks consist of tuffs, breccias, conglomerates, grits and slates. There is some evidence of cyclical sedimentation with several bands of conglomerates passing up into slates. Basic lavas generally are inter-bedded within the slate formations. Dendroids and trilobites are found in several formations of the Dundas Group.

Queenstown Area.

The Dundas Group is represented by metamorphosed "greywacke" sediments, lavas, tuffs, agglomerates, slates and conglomerates, quartz and feldspar porphyries.

An uppermost conglomerate, the Jukes Conglomerate included by some workers as part of the Dundas Group, is in places, in disconformity with the older rocks of the Group.

The strongly deformed Lyell schists, the host rocks of the Lyell ore bodies, are of controversial origin, but are undoubtedly in part metamorphosed rocks of the Dundas Group.

All basic lavas in the Queenstown area are referred to as the Battery Volcanics.

Rosebery Area.

In the Rosebery-Mt. Read area, the E.Z. Co. mine staff regard the rocks as a bedded sequence of sediments, tuffaceous sediments and pyroclastics.

The sequences they recognise (youngest above) is as follows:-

1. Massive Pyroclastic Formation.

   Agglomerates, tuffs and lavas (quartz and feldspar porphry.

2. Bedded Sequence.

   (1) "Black Slate".

(2) "Tuff", a quartz-sericite-schist regarded as altered tuffaceous slate.

(3) "Quartz Schist", a sheared sericitic quartz schist regarded as altered tuffaceous sediments.

(4) "Footwall Sediments" (slates and sandstone and tuffaceous rocks).

The mine geologists of Rosebery regarded the slates and tuffs at Mt.Farrell as equivalent to their bedded sequences.

Dallwitz, from field and petrological studies, disputes the sedimentary origin of the "tuff" and "quartz schist" in the Rosebery-Mt. Read area and claims that they result from shearing of an acid intrusive (sill?) which took up blocks of sediments during intrusion.

Renison Bell Area.

In the Renison Bell area Loftus Hills recognised a sequence of sediments and tuffaceous sediments and pyroclastics which are similar to part of the sequence mapped by Elliston at Dundas.

Zeehan District.

At the base of the Dundas Group is a sequence of melaphyre lavas and tuffs with associated black slates and quartzite (Montana Melaphyre Volcanics) which is succeeded conformably by quartzites and slates (Nubeena Quartzite), and by fossiliferous tuffs and slates of middle Cambrian age.

Waratah District.

In this district breccias, tuffs and cherts of the Dundas Group flank an anticlinal core of Pre-Cambrian rocks.

North Pieman Area.

Taylor (1954) who spent parts of 5 years on regional mapping in the North Pieman area sub-divided the Cambrian rocks and suggested corellation with other sequences on the West Coast.

At the base of his Cambrian system he places a sequence of slates, quartzites and breccia, named the "Success Creek Group" which he regarded as unconformable on Pre-Cambrian rocks (Davey Group).

The Success Creek Group is succeeded by his "Crimson Creek Argillites" consisting of shaly rocks and some tuffs. Taylor correlates both with the Carbine Group of Elliston's type area, but refers to his units as Cambrian in age.

The Crimson Creek Argillites are succeeded by the Huskisson Group which is fossiliferous in part and generally resembles Elliston's sequence at Dundas, with which it is tentatively correlated.

Another sequence (the Rosebery Group) developed along the Pieman River, west of Rosebery, consists of shales, quartzites, pyroclastics and some conglomerate, and Taylor suggests that this unit is equivalent to his Huskisson Group. It includes the bedded sequence of the Rosebery geologists.

The Smithton District.

In the Smithton District the Dundas Group is represented by sediments and tuffaceous sediments and basic lavas. Trilobites of Cambrian age have recently been discovered near West Montagu. ? Christmas Hills

Cambrian Igneous Intrusives.

Ultrabasic and Basic Intrusives.

Basic and ultrabasic rocks now commonly serpentinised, consisting of pyroxenite, peridotites, gabbro and norite (with less basic differentiates referred to as syenities) are exposed in many places, particularly west of Waratah, the Wilson River area, Dundas and near Trial Harbour.

These rocks are commonly disposed in somewhat concordant relationship to Cambrian sediments, but undoubtedly transgress middle Cambrian strata. Elliston refers to those near Dundas as "trangressive sills". Elliston regards the basic intrusives as possibly upper Cambrian in age and this view is supported by the occurrence of chromite in the Owen conglomerate near Queenstown, and boulders of serpentine in the basal Owen conglomerate near Adamsfield.

Taylor (1954) was of the opinion that they may have been Devonian in age because they are not apparently offset by two faults which displace adjacent Ordovician and Silurian strata in the Huskisson Basin.

Granitic Rocks.

Granite rocks exposed near Mt. Darwin to the south of our licence area are considered to be of undoubted Cambrian age as granite boulders are included in adjacent Ordovician conglomerates.

Ordovician.

A conformable sequence of rocks ranging in age from Ordovician to perhaps lower Silurian is known as the Junee Group. This rests unconformably on the Dundas Group.

Owen Conglomerate.

The basal unit of the Owen conglomerate varies markedly in thickness from area to area and in some is not represented within the Junee Group. The thickest developments are along the West Coast Range and the Southeast from Mt.Zeehan to Mt. Sorell. At Mt. Lyell the total thickness is about 1,800 feet.

The Mt. Lyell Mining and Railway Co's Geologists have recognised the following sequence near Mt. Lyell:-

UPPER OWEN	Linda Beds. Grey quartzites and pebble conglomerates with fragments of porcellanite and chromite. The tubicular sandstone occuring in these beds is patterned with fossil worm markings. Intraformational unconformity.
MIDDLE OWEN	Chocolate Sandstone. Conglomerate with rounded and angular phenoclasts including some haematitic boulders.
LOWER OWEN	Red Quartzite. Coarse conglomerates with boulders chiefly of quartz, quartzite and chert.

Caroline Creek Beds.

This unit consisting of flaggy sandstones and shales, is not consistently developed throughout the area. These beds are essentially transitional between the Owen Conglomerate and overlying Gordon Limestone. The rocks are fossiliferous, trilobites and brachiopods being common.

Gordon Limestone.

This formation is widespread and consists of limestone, sometimes argillaceous or silty, with some shale and sandstone bands. The formation is fossiliferous with corals, crinoids, bryozoans, brachiopods, lamelli branchs, gastropods, trilobites and ostracods being preserved.

The depositional history during the Ordovician was possibly complex, due to tectomic disturbances during the period. This is reflected by the marked thickness changes in the Owen Conglomerate, local intraformational unconformities within the Owen, and non-deposition of Owen in some areas as in the Huskisson Basin.

Silurian-Devonian Sediments.

The Eldon Group which overlies the Gordon Limestone conformably consists of a number of mappable formations, some extremely fossiliferous and which range in age from Silurian to Lower Devonian. The sequence is as set out in Table I.

The Hill shale recognised by Taylor in the Huskisson Basin between the Keel and Florence Quartzites has not been formally named in the type area south of Zeehan, described by Gill and Banks (1950), but may exist in that area expressed topographically as a valley between two quartzite ridges.

Devonian Igneous Rocks.

Granite is exposed over large areas near Heemskirk, Meredith Range, Interview River, Granite Tor, (Whitehawk Creek) and Hampshire.

The emplacement of these large batholiths is referred to the period of the Tabberabberan Orogeny in the Devonian. The rock types includes coarse orthoclase-quartz-biotite granite with associated differentiates such as granite porphyry, aplite, and quartz-tourmaline veins, dykes and nodules.

Aureoles of hornfelsed rocks are found marginal to the granite bodies.

Quartz-porphyry hypabyssal intrusives such as those at Pine Hill near Renison Bell, and Mt. Bischoff are referred to the Devonian period of intrusion.

Permian.

Permian rocks are exposed near Wynyard where the well known tillite occurs, near Preolenna, the Hellyer Gorge and the Victory Mine on the Arthur River. The Preolenna beds include coal measures.

Permian rocks (mudstones and sandstones) are known from Mt. Dundas and near the mouth of the Henty River.

Jurassic.

The dolerite sheets and sills which form a capping on the Central Plateau of Tasmania are represented at several places within our licence areas, notably along the Pieman River near Donelly's Lookout, at Mt. Dundas and near Preolenna.

Tertiary.

Tertiary rocks include marine and terrestrial desposts and basaltic lavas.

Marine Tertiary deposits, including limestone, occur in coastal areas on the Northwest and Northern Coasts, including Temma, Marrawah, Cape Grim, and the Wynyard areas. Lacustrine deposits include the Macquarie Beds near the Henty River. Other Tertiary deposits occur preserved beneath basalt near Waratah and elsewhere, and include conglomerates, gravel and sands.

The basalt is extensively developed over wide areas of our S.P.L. north of Waratah. The soil types developed on it are distinctive. Small areas are also exposed near Zeehan, Granville Harbour, near Pieman Heads, Balfour and Marrawah.

Quarternary.

Pleistocene deposits include raised beaches and marine and freshwater beds in the Mowbray Swamp Area and elsewhere on the northern coast strip. Pleistocene glacial deposits are also found near the West Coast Range on Mt. Murchison, near Rosebery, Henty River and other places.

REGIONAL STRUCTURE AND TECTONICS.

There were some crustal movements in Pre-Cambrian times such as that recorded by the unconformity between the older and younger Pre-Cambrian. Since Cambrian times there are four epochs of regional crustal disturbances recognised in Tasmania. These disturbances reached their culmination during early Tertiary, Jurassic, Devonian (Tabberabberan) and Upper Cambrian (Tyennan) times.

The Palaeozoic movements, particularly the Tabberabberan, appears to have been the most significant as regards mineralisation.

The structural units presented and originating during Palaeozoic times are discussed more fully below.

Broad Structural Units of Palaeozoic.

Carey (1953) has outlined the structural features of the West Coast district. However because of some differences of opinion between local geologists, and the information from our regional geological interpretation the structural features are discussed somewhat fully below.

The distribution of the rocks of Pre-Cambrian and Palaeozoic age has led to the definition of several broad structural units. (Plate II).

TYENNAN BLOCK.

On the east of our permit area lies the Tyennan Block defined by Carey. This forms a central nucleus of Tasmania, composed of Pre-Cambrian rocks, and it is believed that no thick sequences of Cambrian rocks were deposited on it though the Junee and Eldon Group rocks are present. Granite intrusions are small and known mineralisation is weak. Small deposits of Tin and Gold are known.

ROCKY CAPE GEANTICLINE.

Girdling the Tyennan Block at a distance of 20 to 40 miles to the west is an elongated arcuate belt of Pre-Cambrian rocks stretching from Strahan on Macquarie Harbour, to Rocky Cape on the north coast. This belt is believed to be a regional uplift referred to by Carey as the Rocky Cape Geanticline.

The trend of the Rocky Cape Geanticline is well shown on our geological interpretation from the regional "grain of country" expressed in bedding trends, fold axes and trend of basic dyke swarms.

Its histroy of sedimentation tectonics, igneous activity and metallogenesis, according to Carey, parallels that of the Tyennan Block. Igneous intrusions are lacking and the principal mineralisation appears to be gold.

HEEMSKIRK GEANTICLINE.

West of the Rocky Cape Geanticline Carey has named the Heemskirk Anticlinorium which is a structural uplift with an axis trending N.W. through the granite bodies of Heemskirk and the Interview River. Carey's name "Heemskirk Anticlinorium" for this feature was apparently based on the assumption that the structure was developed in a trough of Palaeozoic sediments. Present evidence is against this assumption as the axis follows granite intrusives in Pre-Cambrian strata. The uplift may be a broad structure unit determining Palaeozoic sedimentation and for this reason the term "geanticline" is preferred. Loftus Hills has referred to "Heemskirk Geanticline" in private reports and suggests an extension north to King Island.

Main Palaeozoic Trough.

Between the Tyennan Block and the Rocky Cape Geanticline a belt of lower Palaeozoic sediments up to 25 miles in width stretches north along the western part of our permit area fromQueenstown to beyond Mt. Pearse where it is finally concealed by a cap of Tertiary basalt.

This trough apparently developed during the Tyennan Orogeny. Deposition commenced following the Stichtan movement of the Tyennan oregeny, now recorded as an angular unconformity at the base of the Dundas Group, and continued as the trough deepened with respect to the adjacent Tyennan Block and Rocky Cape Geanticline. Thick deposts of sedimentary, pyroclastic and volcanic rocks were accumulated in the trough. Deposition of the Dundas Group ceased with the culmination of the Tyennan orogeny at the close of the Cambrian period. This culminating movement is marked by an unconformity at the base of the Ordovician and possibly by the intrusion of the Darwin Granite and the ultrabasic intrusives.

Throughout the Ordovician, Silurian and Lower Devonian the thickest deposits of the Junee and Eldon Groups were accumulated within the trough, but the depositional conditions were probably complicated by movements during the closing phases of the Tyennan and the early phases of the Tabberabberan Orogenies.

Local unconformities within the Junee Group and non-deposition of the Owen conglomerate in some areas indicate that the Dundas Group in some parts of the trough was exposed during Ordovician times.

Lower Palaeozoic sedimentation ceased with the onset of the Tabberabberan movements which caused major folding and fracturing of sediments within the trough, and intrusion of acid magmas.

The history of sedimentation, tectonics, igneous activity and metallogenesis in the main Palaeozoic trough are markedly different to that of the adjacent blocks. The only important economic mineral deposits worked at present and in the past are located within the trough.

North West Cambrian Basin.

Between the Rocky Cape and the Heemskirk Geanticlines a belt of Dundas Group sediments is exposed south from Smithton. This belt may represent a second major basin developed during Cambrian times and which might extend to King Island, to the north west.

This basin has suffered less structural deformation than the main trough.

Major Structures.

The West Coast Region has been subjected to strong folding and was intensely fractured, particularly during the Palaeozoic orogenies.

Very little geological mapping has been done in the Pre-Cambrian rocks, but Carey contends that the folding is least intense over the Tyennan Block and the Rocky Cape and Heemskirk Geanticlines. The zone of the greatest deformation follows the main Palaeozoic trough and it is in this zone that the major structures described below were developed.

King-Sophia-Mackintosh Synclinorium.

On the eastern margin of the trough adjacent to the Tyennan Block is a complex, faulted synclinical zone. The synclinical zone is best expressed in rocks of the Junee and Eldon Groups which are exposed in the troughs. The synclinorium displays a stratigraphic asymmetry since on the east Cambrian rocks are thin or over-lapped and the Owen Conglomerate is often thinned or missing. On the western flank the Owen Conglomerate reaches its thickest development and overlies great thicknesses of Dundas Group sediments.

The synclinorium is represented by the syncline along the Elliott and Craycroft Ranges east of our permit area and by the Sophia Syncline east of Tullah. Between the Murchison and Eldon Rivers its course is not so clearly expressed.

Porphyroid Uplift.

Carey (1953) has defined two units, the Porphyroid Anticlinorium and the West Coast Range Anticlinorium. The distinction, if any, between these features, is not clearly expressed in his published work. Apparently Carey refers to the Porphyroid axis as that of the main Palaeozoic trough and that with the culmination of the Tyennan Orogeny the sediments in the trough arched into a anticlinorium - the Porphyroid Anticlinorium. The West Coast Range Anticlinorium he defines as extending north from the Kelly Basin near Queenstown, beyond Mt. Black near Rosebery and finally being concealed under the basalt cap of the Bulgobac Plateau. The axial area of this

013 feature is in Dundas Group sediments and Carey has stated that the east flank of the structure is marked by the Owen Conglomerate of the West Coast Range. The western flank is not always distinct though south of Mt. Huxley the Owen Conglomerate is strongly developed on the western flank.

There is no doubt that the axial area of Carey's West Coast Range Anticlinorium is a structurally high region, but there is some doubt whether it is an anticlinorium in the strict sense. From their observations in the Rosebery-Mt Farrell district the E.Z. Co. geologists maintain that the form of the structure, across the axis defined by Carey, is synclinal.

For this reason the term Porphyroid Uplift is preferred tentatively to describe the structurally high region forming the axial area of Carey's West Coast Range Anticlinorium.

Carey's term "anticlinorium" probably resulted from the attitude of the flanking Junee and Eldon beds in adjacent synclinal zones. It is possible that the Porphyroid Uplift served as a generally positive area during Junee and Eldon sedimentation and that the flanking beds owe their attitude to the synclinal nature of separate depositional basins during Ordovician times rather than to an actual anticlinal form of the positive area.

Structures West of the Porphyroid Uplift.

Carey (1953) has recognised two major regional structures, the Zeehan Magnet Synclinorium and the Bischoff Anticlinorium. The Bischoff Anticlinorium was defined as rising out of the Palaeozoic trough and extending through the two large granite outcrops of the Meredith Range and Hampshire, the anticlinorial structure being established by the inlier of Pre-Cambrian rocks at Mt. Bischoff. However, while a structurally high area may exist at Mt. Bischoff from our regional geological compilation there appears to be no evidence to support the direction or extension of the axis of the anticlinorium as defined by Carey. The Meredith granite is emplaced in a synclinal area formed by the Castray and Huskisson basins and Carey's "granite anticlinorium" seems to have no sound basis.

The Zeehan-Magnet synclinorium as defined by Carey separates the Rocky Cape Geanticline from his Bischoff Anticlinorium in the north and from his Porphyroid Anticlinorium in the south. It is doubtful whether this synclinorium is the extensive regional feature proposed by Carey.

West of the Porphyroid uplift continuous master structures are not developed. A number of en echelon synclinal troughs and dome like uplifts are developed. To the south lies the Zeehan Syncline in which 20,000 feet of Palaeozoic sediments are represented. The axis of this feature trends for 30 miles from the King River in the south to beyond Zeehan. Rocks of the Junee and Eldon Groups are developed in the trough. The Zeehan Syncline has secondary fold structures developed and is strongly disrupted by strong cross fractures. The Zeehan Basin is a closed depression along the trough of the main axis, centreing about 1 mile N.E. of Zeehan.

The Dundas Dome is a pronounced structural high lying between the Zeehan and Huskisson synclines. This structure has a core of Pre-Cambrian rocks flanked by Cambrian.

The Huskisson Basin is devdoped north of the Pieman River. The axial trend parallels that of the Zeehan

Syncline. Eldon Group sediments occupy the trough of the basin. Near the junction of the Castray and Whyte Rivers a second basin with Eldon Group sediments forming the trough is developed and this may represent an extension of the Huskisson axis, the Castray Basin together with the Huskisson Basin forming the Huskisson Syncline.

Structures of the Waratah-Valentines Peak Area.

A capping of Tertiary basalt conceals the older rocks over wide areas east of Waratah, and the structural picture is not complete.

A well formed synclinal nose is exposed in rocks of the Junee Group at Mt. Pearse, S.E. of Waratah. The axis of the Mt. Pearse cyncline trends N.E.

Mt. Bischoff is a structurally high area but the axial trend of any anticline is not clear. The axis of an anticline developed between the Huskisson and Mt. Pearse Synclines would trend northerly in the direction of Mt.Bischoff.

The stratigraphy of the Valentines Peak area is not known from detailed ground observations. If Valentines Peak is composed of Owen Conglomerate, as has been interpreted, it is very likely that a major synclinal structure is developed between Valentines Peak and Kara Sawmill. The axis of this feature would trend N.N.E.

Secondary Structures.

Because of the limited amount of mapping and absence of regional marker beds within the Cambrian rocks, tectonic analyses of the area, such as that of Carey (1953) have been made largely from the fold patterns shown by the Junee and Eldon Group rocks. The structural pattern in the main palaeozoic trough, in both its broad features and in detail, is consistent with applied forces which were dominantly resolvable to simple shear with respect to the Tyennan Block together with a certain amount of lateral compression of the sediments within the trough (Carey 1953). The pattern of deformation produced by the same system of stresses is controlled by the thickness of the Palaeozoic sediments.

There has developed within the main Palaeozoic trough, where Palaeozoic deposition was thickest, a series of N.W. or N.N.W. trending folds as are seen in the Zeehan Syncline. Transverse to these axes are a series of tensional fractures including the Strahan Fault, the Henty Fault, and the Oceana Fault.

Marginal to the Tyennan Block a major north trending belt of yielding occurred. In this belt similar N.W. trending compressional folds were developed en echelon, superimposed on the main structure displayed by the Owen Conglomerate flanking the Porphyroid uplift. In places the overturned folds under stress became attenuated and overrode each other progressively on a series of thrust planes, resulting in a type of imbricate structure ("Owen type thrusts" of Carey).

Associated with the Owen type N.W. trending folds and thrusts are a series of N.E. trending fractures which are interpreted as tensional fractures because of the absence of drag or attenuation.

The major faults and sheared zones as at present known or inferred are shown on the regional map compilations.

One major zone, from the point of view of Mineralisation, is the Lyell Shear which trends north through the Mt. Lyell mine workings. This feature appears to be a major control in the development of the copper desosits of the Mt. Lyell area, and its extension is suspected south to Mt. Darwin and north to Lake Margaret, and possibly even to the Mt. Farrell district. The Lyell shear is a zone of steep dips, overturning and drag. The movement along the zone is interpreted as west side north and up. Carey has suggested that the zone is a deep seated shear which outcrops intermittently as a fracture.

CONTROL OF ORE DEPOSITION.

The major epoch of mineralisation in Western Tasmania is considered to be the Tabberabberan (Carey 1953) although some copper, nickel and osmiridium mineralisation is referred to the period of Cambrian basic igneous activity.

As a guide to the exploration of our permit areas an analysis of the broader controls shown by the ore deposits known in the area are set out below.

Favourable Country Rock.

Most of the important ore bodies in the West Coast mineral belt occur in the Dundas Group rocks of mixed sedimentary, pyroclastic and volcanic origin. These include the ore bodies of Lyell, Comstock, the Zeehan area generally, the Dundas area in part, Rosebery and Williamsford, Sterling Valley, Mt. Farrell and the pinnacles. The ore bodies localised in Dundas Group rocks are chiefly lead-zinc, lead-silver and copper, but the pyrrhotite-cassiterite bodies of Renison Bell are also found in these rocks.

With respect to the Mt. Lyell ore bodies the mine geologists are currently pursuing a theory that at least part of the Lyell schists, in which the copper ore bodies are located, represent metasomatised sections of the Ordovician Owen Conglomerate. At a recent symposium into the origin of the Lyell schists the theory was not generally accepted as proof of actual metasomatism was lacking. It is difficult to accept the conversion of a highly siliceous conglomerate into a sericitic schist of the "green schist facies" although metasomatism might explain the peculiar intricate relationships shown by the schist and the adjacent conglomerate.

Carbonate rocks of Pre-Cambrian Palaeozoic age are favourable host rocks in the West Coast area. The Gordon Limestone appears to be favourable for lead deposition but generally only minor lodes are known, as in the Zeehan area, the Whyte River area and at White Hawk Creek. Two major ore deposits are associated with carbonate rocks. The main ore body at Mt. Bischoff was a replacement of dolomite by massive pyrrhotite and pyrite with cassiterite. The scheelite deposits of King Island resulted from the selective replacement of limestone beds.

Occurrences of copper are also known from dolomite, as at the Victory Mine.

The ultrabasic and basic intrusives of probable Cambrian age have given rise to deposits of asbestos, copper-nickel ores, platinoids and chromite, but production of these minerals has not been important. Carey (1953) has inferred that tin mineralisation appears to be associated with ultrabasic intrusives because of the proximity of exposed basic rocks to known tin deposits near Renison Bell, X River, Mt. Bischoff, Cleveland, Wilson River and Stanley River. This is a very general empirical relationship and it is doubtful whether it would prove a reliable guide to ore finding.

Tin ores in the Heemskirk area are commonly localised in quartz-tourmaline and greisen veins in an outer marginal zone of the Heemskirk granite. The tungsten deposits of the Interview River have a similar localisation in granite.

Favourable Structural Control.

The history of sedimentation, tectonics, igneous activity and metallogenesis in the broader structural units recognised has been discussed briefly in early sections of this report.

The Tyennan Block and Rocky Cape Geanticline have similar mineral associations, but no important economic deposits have been worked. Gold, copper and tin have been worked for small returns. The magnetite deposits of the Long Plains area (Rio Tinto and Rocky River) with which are associated some pyrite, pyrrhotite, chalcopyrite, nickel, cobalt, gold, and silver are, however, extensive and are currently being investigated by the Tasmanian Department of Mines.

The Heemskirk Geanticline is considered by Loftus Hills to represent a tungsten province and that more specifically, scheelite is the characteristic and dominant mineral associated with the granite bodies which rose out of the Geanticline throughout its length.At Heemskirk and the Interview River area the known tungsten is in the form of scheelite and wolfram in equal amounts whereas at King Island scheelite is dominant. As regards our actual permit area no worthwhile ore deposits have been proved in the area covered by the Heemskirk Geanticline.

The most important mineralisation is localised in the main Palaeozoic trough. Within the trough the eastern synclinal zone (King-Sophia-Mackintosh Syncline) is practically barren of ore deposits. One occurrence of lead occurs at White Hawk Creek. The largest known deposits tend to be located in structurally high areas within the trough (the porphyroid Uplift, Dundas Dome and the Mt. Bischoff area). However, numberous small deposits were developed in the Zeehan syncline.

The minor structures responsible for the localisation of individual ore bodies, as inferred from present knowledge are described in reports on mines in the "Geology of Australia Ore Deposits" (1953). Most mineral deposits and occurrences are associated with zones of shearing or fracturing.

REGIONAL GROUPING OF PROSPECTS.

Zeehan Area.

A mineralised area covering 10 square miles near Zeehan with outlying areas to the north and east (Poseidon, Bon Accord, Success and Mariposa-Bannockburn) is characterised by lead-silver with subordinate zinc.

Dundas.

In the Comet area a zone of mineralisation characterised by lead-silver and subordinate zinc occurs.

Curtin-Davis.

A narrow mineralised belt characterised by lead-silver with antimony occurs.

Read-Rosebery.

A well defined mineralised zone characterised by pyrite-zinc deposits occurs in the Read-Rosebery-White Spur-Pinncales belt. The lead is generally subordinate to zinc.

Mt. Farrell.

A mineralised belt two miles in length is characterised by lead, silver, and zinc.

Madam Melba.

A mineralised area characterised by galena-siderite.

Magnet.

Sulphide bodies with lead, zinc and pyrite.

Mt. Lyell-Comstock.

Copper with associated gold in sulphide bodies.

Red Hills.

A mineralised area with haematite and magnetite carrying a little copper occurs near Red Hills.

Balfour.

Copper mineralisation (chalcopyrite-pyrite) in a belt near Balfour in Pre-Cambrian sediments and altered basic dykes.

Heazlewood.

Bornite and chalcopyrite segregations in ultrabasic rocks.

Mt. Bischoff.

Cassiterite associated with pyrite and pyrrhotite bodies.

Cleveland.

Cassiterite is associated with pyrrhotite-chalcopyrite and quartz-pyrite bodies.

Oonah.

Cassiterite associated with stannite, pyrite, chalcopyrite and other sulphides.

Renison Bell.

This mineralised area is characterised by massive pyrrhotite with cassiterite.

Pine Hill-Colebrook Hill.

A "boron belt" occurs in this area characterised by cassiterite-tourmaline and cassiterite-axinite deposits.

Razorback.

A mineralised area characterised by cassiterite associated with sulphides.

Heemskirk.

Cassiterite associated with quartz-tourmaline and greisen veins.

Stanley River.

Cassiterite associated with quartz-tourmaline veins and in pyro-metasomatic deposits.

Mt. Ramsay.

Cassiterite associated with quartz-tourmaline veins.

Rio Tinto-Rocky River (Long Plains).

Magnetite bodies with some associated sulphides, gold, silver, copper, nickel and cobalt.

Mt. Agnew.

A number of lenticular bodies of magnetite ore occur along the margins of basic dykes.

Mt. Remus.

Molybdenite occurs in pyrite bodies containing cobalt and vanadium.

Interview River.

Tungsten deposits are associated with granite.

Corinna-Browns Plains.

Alluvial gold was worked over wide areas from shallow gravels and deep leads.

Bald Hill, Nineteen Mile Creek, Savage River and Wilson River.

Alluvial osmiridium.

Heemskirk, Stanley River and Waratah River (North Valley).

Alluvial tin.

Five Mile.

A narrow well defined nickel-copper belt is confined to dyke-like basalt intrusives.

COMMENTS CONCERNING EXPLORATION.

As a first target for intensive regional exploration the belt of Cambrian rocks which form the Porphyroid Uplift appear to be the most promising. This belt shows a great degree of structural deformation and most of the known larger ore bodies occur within it. The belt was selected for the initial programme of electro-magnetic surveys now being carried out.

Pre-Cambrian rocks generally have proved to be relatively barren as regards ore bodies, but the two major exceptions of Mt. Bischoff and King Island, where ore is localised in carbonate rocks of probable younger Pre-Cambrian age, suggests that it would be unwise to neglect exploration of the Pre-Cambrian rocks within our permit areas. The magnetite bodies of the Rio Tinto-Rocky River area are also localised in Pre-Cambrian Rocks.

Alluvial deposits of gold, tin and osmiridium have been worked in the past but never on a large scale. Near Corinna gravel deposits are extensive, and gold, generally with low values, occurs over a wide area within these gravels. The richer deposits are probably worked out from the more accessible areas, but it is possible that some deposits remain under thick vegetation. Eluvial and alluvial tin has been worked in many areas. In some areas such as the Mt. Ramsay-Little Wilson River district good returns were made from gravels covering small clearings. The inaccessibility and high transport costs in this area restricted prospecting, and further deposits may occur. It is doubtful, however, whether the cost of clearing timber would warrant any large scale operations unless alluvials were particularly rich.

J. H. Rattigan.
27th November, 1956.

APPENDIX 1. BIBLIOGRAPHY.

A. DEPARTMENT OF MINES PUBLISHED AND UNPUBLISHED REPORTS.

Woolnorth Quadrangle 20.

Typed Reports.

Alleged Oil Occurrence at Redpa, T.D. Hughes, 12-5-48.
Possibilities of obtaining Underground Water Supplies in Marrawah District, P.B. Nye, 12-11-32.

Smithton Quadrangle 21.

Published Reports, Old Series.

North-West Coast Mineral Deposits, W.H.Twelvetrees, 1905.

New Series.

Geological Survey Bulletin No. 41 - The Smithton District; Nye, Finucane and Blake, 1934.
Geological Survey Records No. 4 - A. Monography of Nototherium Tasmanicum, H.H. Scott, 1915.

Typed Reports.

Underground Water at Brittons Swamp, F. Blake, 20-4-39.
Brown Coal and Lignite in Tasmania, F. Blake, 8-5-40.
Dolomite at Smithton, K.J. Finucane, 27-8-31.
Dolomite Deposits at Smithton and adjacent Districts, N.W. Tasmania, P.B. Nye, 5-2-32.
Dolomite Deposits at Smithton, Gepp, Stillwell and Nye 2-5-33.
Testing a Dolomite Lease at Smithton, F. Blake, 26-11-34.
Notes on Dolomite Deposits, D.E. Thomas, 31-8-43.
Dolomite in the Smithton Area, D.E. Thomas, 18-2-44.
Limestone at Smithton, P.B. Nye, 26-8-31.
Notes on Magnesium Industry, P.B. Nye, 28-3-33.
Geological Formation of the County of Wellington,NW.Coast, A.M. Reid, 27-4-27.
Supposed Oil Occurrence (Mr. Tatlow), Mengha, P.B. Nye, 8-1-30.
Sampson's Ochre Deposits, Smithton, Thomas and Henderson, 29-10-43.
Coal and Peat at Smithton, H.G.W. Keid, 27-5-47.
Dolomite at Black River, T.D. Hughes, 25-2-54.
Rock Types and Structure in Vicinity of Railway Bridge over the Black River, T.D. Hughes, 11-2-54.

Table Cape Quadrangle 22.

Published Reports, Old Series.
No. 119 - Mineral Fields of the Gawler River, Penguin, Dial Range, Mt. Houseton, Table Cape, Cam River, Etc., A. Montgomery, 1895.
No. 231 - North-West Coast Mineral Deposits, W.H. Twelvetrees, 1905.

New Series.

Geological Survey Bulletin No. 13 - The Peolenna Coalfield and the Geology of the Wynyard District, L. Hills, 1913.

Typed Reports.
Glass Sands, A. M. Reid, 20-7-26.

Table Cape Quadrangle 22 Continued.

Gemstones in Tasmania, P.B. Nye, 9-9-27.
O.R. Cameron's Prospect, Montamana, P.B. Nye, 15-8-31.
Geological Formation of North-West Coast (County of Wellington), A.M. Reid, 27-4-27.
Sand and Clay Deposits of Tasmania, F. Blake, 7-6-28.
Table Cape Mineral Field, A. Montgomery, 29-7-1895.

Bluff Point Quadrangle 26.

Published Reports - New Series.

Geological Survey Report No. 1 - The Mt. Balfour Mining Field, L.K. Ward, 1910.
Geological Survey Bulletin No. 10 - The Mt. Balfour Field, L.K. Ward, 1911.
Geological Survey Bulletin No. 44 - The Geology and Ore Deposits of Tasmania, Nye and Blake, 1938.
Mineral Resources No. 6 - The Iron Ore Deposits of Tasmania, Twelvetrees and Reid, 1919.

Typed Reports.
Iron Deposit at Nelson River, F. Blake, 9-9-47.

Trowutta Quadrangle 27.

Published Reports - Old Series.

No. 23 - Western Country, J.R. Scott and C.P. Sprent, 1877.
No. 119 - Mineral Fields of the Gawler River, Penguin, Dial Range, Mt. Houseton, Table Cape, Cam River, and portion of the Arthur River District, A. Montgomery, 1895.
No. 181 - Recent Discovery of Cannel Coal in the Parish of Preolenna and upon the New Victory Copper Mine, near the Arthur River, G.A. Waller, 1901.

Typed Reports.

Portion of Arthur River Mineral Field, A. Montgomery, 29-6-95.
Arthur River Hydro-Electric Water Conservation Scheme, P.B. Nye, 24-11-24.
Upper Portion of the Arthur River Hydro-Electric Water Conservation Scheme, P.B. Nye, March 1925.
Dolomite and Magnesite Deposits near Victory Mine, Arthur River, P.B. Nye, 14-4-25.
Geological Formation of the County of Wellington, N.W. Coast, A.M. Reid, 27-4-27.

Burnie Quadrangle 28.

Published Reports - Old Series.

No. 5 - Exploration of North-Western Country, R.C. Gunn, 1860.
No. 112 - Deposit of Iron Ore at the Blythe River, A. Montgomery, 1894.
No. 119 - Mineral Fields of the Gawler River, Penguin, Dial Range, Mt. Houseton, Table Cape, Cam River and portion of the Arthur River Districts, A. Montgomery, 1895.
No. 166 - Blythe River Iron Ore Deposit, W.H. Twelvetrees, 1901.
No. 181 - Recent Discovery of Cannel Coal in the Parish of Preolenna and upon the New Victory Copper Mine, near the Arthur River, G.A. Waller, 1901.
No. 206 - Kerosene Shale and Coal Seams in the Parish of Preolenna, W.H. Twelvetrees, 1903.

Burnie Quadrangle 28 Continued.

No. 211 - Dial Range and some other Mineral Districts on the North-West Coast of Tasmania, W.H. Twelvetrees, 1903.

New Series.

G.S. Bulletin No. 5 - Gunn's Plains, Ala, and other Mining Fields, North-West Coast, W.H. Twelvetrees, 1909.
G.S. Bulletin No. 13 - The Preolenna Coalfield and the Geology of the Wynyard District, Loftus Hills, 1913.
Mineral Resources No. 6 - The Iron Ore Deposits of Tasmania, W.H. Twelvetrees and A.M. Reid, 1919.
Mineral Resources No. 7 - The Coal Resources of Tasmania, by the combined Geological Staff, 1922.

Typed Reports.

Blythe River Iron Mines Ltd., J.H. Darby, 7-12-1900.
Blythe River Iron Deposits, P.B. Nye, 13-1-37.
Brick Works, Cooee, T.D. Hughes, 5-12-50.
Cam River Mineral Field, A. Montgomery, 29-7-1895.
Cam River and Seabrook Creek Alluvial Deposits, A.M.Reid, 11-8-27.
Clays and Sand Deposits of Tasmania, F. Blake 7-6-28.
Woodstock Copper Prospect, Natone, Q.J. Henderson, 29-7-41.
Clay Deposits of N.W. Tasmania, T.D. Hughes, 8-11-50.
Notes on Gold at Doctor's Rocks, Somerset, P.B. Nye, 10-11-32.
Glass Sands, A.M. Reid, 20-7-26.
Iron Deposit at Highclere, Q.J. Henderson, 14-12-36.
Iron Ore Deposits of Tasmania, W.T. Woolnough, 28-2-39.
Some Iron Deposits in the Vicinity of Burnie, Thomas and Henderson, 5-11-43.
Kirkups Slate Deposits (M), G.W. Williams, 14-4-17.
Operations of Meunna Coal Mining Synd., Preolenna, A.M. Reid, 18-10-25.
Meunna Coal Mine, Preolenna, A.M. Reid, 26-1-26.
Woodstock Copper Mine, Natone, P.B. Nye, 11-11-41.
Oonah Tasmanite Oil Shale Field, Q.J. Henderson, 2-5-20.
Preolenna Coalfield, Loftus Hills, 2-5-20.
Salient Features of Preolenna Coalfield, Loftus Hills, 25-3-22.
Torbanhill, late Meunna, Coal Mine, Preolenna, J.B.Scott, 3-2-28.
Preolenna Coal (Cannel), Rogers, 5-7-34.
Geology of Proposed Pet River Storage Reservoir Site, Q.J. Henderson, 24-6-43.
Development of Rock and Mineral Resources of Tasmania, Reid and Nye, 20-11-28.
Woodstock Copper Prospect, D.E. Thomas and Q.J.Henderson, 1-10-43.
Newman Prospecting Co. (West Bischoff, Waratah,) H.W.Kead 19-2-48.
Sewerage Works at Somerset, T.D. Hughes, 17-9-53.

Balfour Quadrangle - 34.

Published Reports - Old Series.

No. 94 - Country Traversed by the route of the Proposed Waratah to Zeehan Railway, A. Montgomery, 1892.

New Series.

Geological Survey Bulletin No. 44 - The Geology and Mineral Deposits of Tasmania, Nye and Blake, 1938.

Balfour Quadrangle 34 Continued.

Geological Survey Bulletin No. 10 - The Mt. Balfour Mining Field, L.K. Ward, 1911.
Geological Survey Reports No. 1 - The Mt. Balfour Mining Field, L.K. Ward, 1910.

Typed Reports.

Copper in Tasmania, F. Blake, 31-5-28.
Copper Resources of Tasmania, P.B. Nye, 19-4-33.
Balfour and Interview River Tin Fields, Q.J. Henderson, 19-2-35.
Balfour Mining Field, Thomas and Henderson, 8-9-43.

Magnet Quadrangle 35.

Published Reports - Old Series.

No. 23 - Western Country, J.R. Scott and C.P. Sprent, 1877.
No. 53 - Mt. Cleveland and Corinna Goldfields, G. Thureau, 1884.
No. 73 - Heazlewood Silver-Lead and other Ore Deposits in the County of Russell, G. Thureau, 1888.
No. 74 - Mt. Zeehan Silver and Argentiferous Lead Lodes and other Ore Deposits in the County of Montague, G. Thureau, 1888.
No. 79 - State of the Mining Industry on the West Coast, A. Montgomery, 1890.
No. 99 - Godkin Silver Mine, Whyte River, A. Montgomery, 1892.
No. 128 - Mineral District between Corinna and Waratah, 1897.
No. 158 - Mineral Fields between Waratah and Corinna, W.H. Twelvetrees, 1900.
No. 193 - The Magnet Tramway, R.F. Waller, 1902.
No. 207 - Mineral Fields between Waratah and Long Plains, W.H. Twelvetrees, 28-9-1903.

New Series.

Geological Survey Bulletin No. 10 - The Mt. Balfour Mining Field, L. K. Ward, 1911.
Geological Survey Bulletin No. 17 - The Bald Hill Osmiridium Field, W.H. Twelvetrees, 1914.
Geological Survey Bulletin No. 33 - The Silver-Lead Deposits of the Waratah District, P.B. Nye, 1923.
Geological Survey Bulletin No. 34 - The Mt. Bischoff Tin Field, A.M. Reid, 1923.
Geological Survey Bulletin No. 44 - The Geology and Mineral Deposits of Tasmania, P.B. Nye and F. Blake, 1938.
Geological Survey Reports No. 1 - Mt. Balfour Mining Field, L.K. Ward, 1910.
Geological Reports No. 2 - The Silver-Lead Lodes of the Waratah District, L.K Ward, 1911.
Mineral Resources No. 6 - The Iron Ore Deposits of Tasmania, W.H. Twelvetrees and A.M. Reid, 1919.

Typed Reports.

Bells Reward Mine, Whyte River, A.M. Reid, 30-6-24.
Caudry Osmiridium Mine Bald Hill, P.B. Nye, 1-10-26.
Interview River and Balfour Tin Deposits, Q.J. Henderson, 19-2-35.

Magnet Quadrangle 35 Continued.

Osmiridium Mining at Mt. Stewart, Nineteen Mile and Bald Hill, Q.J. Henderson, 13-9-43.
Balfour Mining Field, Thomas and Henderson, 8-9-43.
Cleveland Mine, Magnet Range, A.M. Reid, 10-3-23.
Copper in Tasmania, F. Blake, 31-5-28.
Copper Resources of Tasmania, P.B. Nye, 19-4-33.
Geological Factors Controlling the Future of Cleveland Mine, Q.J. Henderson, 25-5-37.
Chromite, Thomas and Henderson, 10-11-43.
Information for Mr. McIvor - History of Gold Discovery in Tasmania, P.B. Nye, 5-11-41.
Iron Ore Deposits in Tasmania, F. Blake, 28-2-28.
Iron Ore Deposits of Tasmania, W.T. Woolnough, 28-2-39.
Magnet Mine, P.B. Nye, 17-2-26.
Magnet Mine, P.B. Nye, 29-4-29.
Magnet Mine, P.B. Nye, 20-10-31.
Mt. Cleveland Tin Mine, S.W. Carey, 8-3-45.
Development of Rock and Mineral Resources of Tasmania, Reid and Nye, 20-11-28.
Country in Vicinity of Rio Tinto and Specimen Reef Mines, Finucane and Blake, 9-1-33.
Rio Tinto Iron Deposits, Q.J. Henderson, 18-3-37.
Bells Reward, Section 9182 (L.J. Smith), Whyte River - A.M. Reid, 30-6-24.
Track Cutting Operations in the Vicinity of Waratah, Q.J. Henderson, 27-10-37.
Mt. Cleveland Tin Mine, T.D. Hughes, 13-7-53.
Cleveland Mine, T.D. Hughes, 23-10-53.

Valentines Peak Quadrangle 36.

Published Reports - Old Series.

No. 22 - Country round Mt. Bischoff, C.P. Sprent, 1876.
No. 56 - Waratah and Penguin Mining Districts, G.Thureau, 1884.
No. 119 - Mineral Fields of the Gawler River, Penguin, Dial Range, Mt. Housetop, Table Cape, Cam River, and Portion of the Arthur River District, A.Montgomery,1895.

New Series.

G.S. Bulletin No. 34 - The Mt. Bischoff Tin Field, A.M. Reid, 1923.

Typed Reports.

Arthur River Alluvial Flats, North of its Junction Waratah River, P.B. Nye, 17-4-29.
Wollastonite at Hampshire, Thomas and Henderson, 8-10-43.
Tungsten Prospect, Hampshire, T.D. Hughes, 12-12-50.
Iron Deposits of Hampshire Hills, A.M. Reid, 21-2-24.
Limestone of Hampshire, T.D. Hughes, 11-12-50.
Mt. Housetop Mineral Field, A. Montgomery, 29-7-95.
Mt. Bischoff Extended, Waratah, J.B. Scott, 15-11-27.
Mt. Bischoff (M) C.L. Knight, 14-12-48.
Tin Lodes at Upper Natone, F. Blake, 27-7-36.
Development of Rock and Mineral Resources of Tas., Reid and Nye, 20-11-28.
Sulphide Deposits Suitable for Acid Making, P.B. Nye, 20-4-28.
Sulphide Deposits Suitable for S and H2SO4 Production, P.B. Nye, 11-7-32.
Stormont and Black Bluff District, E. Broadhurst, 1934.
Betts Lease 30M/42 Trinstone Creek, Waratah, Thomas and Henderson, 13-9-43.

Valentines Peak Quadrangle 36 - Continued.

Tin Mining in Waratah District, A.M. Reid, 12-6-22.
Sulphide Deposits of the White Face Cut, Mt. Bischoff, J. Elliston, February, 1952.
Proposed Geophysical Survey of Hampshire Magnetite Deposits, T.D. Hughes, 12-4-54.

Pieman River Quadrangle 42.

Published Reports - Old Series.

No. 179 - Wolfram Section near Pieman Heads, G.A. Walker, 1901.

New Series.

Geological Survey Bulletin No. 10 - The Mt. Balfour, Mining Field, L.K. Ward, 1911.
Geological Survey Bulletin No. 1 - The Mt. Balfour Mining Field, L.K. Ward, 1910.

Typed Reports.

Balfour and Interview River Tin Deposits, Q.J. Henderson, 24-843.
Interview River Wolfram Deposits, Q.J. Henderson, 20-8-43.
Mineral Prospects of the Pieman River Area, Q.J. Henderson, 23-5-45.
Report on Interview River Track, J. Elliston, October,1953.

Corinna Quadrangle 43.

Published Reports - Old Series.

No. 23 - Western Country, J.R. Scott and C.P. Sprent, 1877.
No. 24 - Mineral Resources of the West Coast, C.P. Sprent, 1878.
No. 26 - West Coast Progress Report on Mines, No. 1 Pieman River Goldfield, No. 2 Mt. Heemskirk, G. Thureau, 1881.
No. 53 - Mt. Cleveland and Corinna Goldfields, G. Thureau, 1884.
No. 113 - Corinna Goldfield, A. Montgomery, 1894.
No. 118 - Progress of the Mineral Fields in the Neighbourhood of Zeehan,etc., A. Montgomery, 1895.
No. 128 - Mineral District between Corinna and Waratah, J.H. Smith, 1897.
No. 158 - Mineral Fields between Waratah and Corinna, W.H. Twelvetrees, 1900.
No. 175 - On a Meteroite from the Castray River, W.F. Pettard, 1900 - 1901.
No. 207 - Mineral Fields between Waratah and Long Plains, W.H. Twelvetrees, 1903.
No. 222 - Prospects of the Stanley River Tin Field.

New Series.

Geological Survey Bulletin No. 15 - The Stanley River Tinfield, L.L. Waterhouse, 1914.
Geological Survey Bulletin No. 28 - The North Pieman, Huskisson, and Sterling Valley Mining Fields, A.M. Reid, 1918.
Geological Survey Bulletin No. 33 - The Silver-Lead Deposits of the Waratah District, P.B. Nye, 1923.

Corinna Quadrangle 43 - Continued.

Geological Survey Bulletin No. 34 - The Mt. Bischoff Tin field, A.M. Reid, 1923.
Geological Survey Bulletin No. 44 - The Geology and Mineral Resources of Tasmania, P.B. Nye and F. Blake, 1938.
Mineral Resources No. 6 - The Iron Deposits of Tasmania, W.H. Twelvetrees and A.M. Reid, 1919.

Typed Reports.

Auriferous Deposits in Tasmania, P.B. Nye, 8-12-27.
Brown and Little Plains, Rocky River District, J.B. Scott, 18-5-26.
Osmiridium Mining at Mt. Stewart, Nineteen Mile and Bald Hill, Q.J. Henderson, 13-9-43.
Chromite, Thomas and Henderson, 10-11-43.
Gemstones in Tasmania, P.B. Nye, 9-9-27.
Age and Mineral Characteristics of Granites in Tasmania, P.B. Nye, 2-5-30.
Little Wilson River and Mt. Ramsay Tin Deposits, Q.J. Henderson, 27-2-34.
Monazite in Tasmania, P.B. Nye, 26-6-25.
Mt. Lindsay Tin Mine, A.M. Reid, 24-5-27.
Mt. Lindsay Mine, Stanley River District, J.B. Scott, 31-10-29.
Meredith Range District, Q.J. Henderson, 16-10-35.
Monazite in Tasmania, H.G.W. Keid, 27-3-47.
Monazite at Yellowband, H.G.W. Keid, 22-4-48.
Iron Ore at Meredith, Paradise, Rocky and Whyte Rivers, A. M. Reid, 13-6-24.
Development of Rocks and Mineral Resources of Tasmania, Reid and Nye, 20-11-28.
Section 9578/M, J.T. Riley, Wilson River District - J.B. Scott, 31-8-26.
Shores Surprise Mine, Long Plains, P.B. Nye, March, 1931.
Upper Wilson River District, J.B. Scott, 16-11-29.
Upper Wilson River and Mt. Ramsay District, Finucane and Blake, 9-6-33.
The Mt. Lindsay Tin Mine, B.L. Taylor, 29-8-49.
Progress Report on the North Pieman River Mineral Area, B.L. Taylor, 5-11-54.
Stanley River Tin, J. Elliston, 29-4-54.

Mackintosh Quadrangle 44.

Published Reports - Old Series.

No. 3 - Exploration of the Western Country - G. Gould, 1860.
No. 24 - Mineral Resources of the West Coast - C. P. Sprent, 1878.
No. 94 - Country Traversed by the Route of the Proposed Waratah to Zeehan Railway, A. Montgomery, 1892.
No. 103 - Discoveries of Coal at Barn Bluff, and on the Progress of the Mineral Fields of the County of Montagu, etc., A. Montgomery, 1893.
No. 106 - Country between Mole Creek and the Mt. Dundas Silver Field, and the Discovery of Coal at Barn Bluff, A. Montgomery, 1893.
No. 118 - Progress of the Mineral Fields in the Neighbourhood of Zeehan, etc., A. Montgomery, 1895.
No. 131 - Mineral Fields in the Neighbourhood of Mt. Black, Ringville, Mt. Read and Lake Dora, J.H. Smith, 1898.
No. 165 - Mt. Farrell District, W.H. Twelvetrees, 1900.
No. 167 - Mineral Districts of Bell Mount, Dove River, Five Mile Rise, Mt. Pelion and Barn Bluff - G.A. Waller, 1901.
No. 225 - Mt. Farrell Mining District, G.A. Waller, 1904.

Mackintosh Quadrangle 44-Continued.

New Series.

Geological Survey Bulletin No. 3 - The Mt. Farrell Mining Field, L.K. Ward, 1908.
Geological Survey Bulletin No. 28 - The North Pieman, Huskisson and Sterling Valley Mining Fields, A.M. Reid, 1918.
Geological Survey Bulletin No. 30 - The Mt. Pelion Mineral District, A.M. Reid, 1919.
Geological Survey Bulletin No. 34 - The Mt. Bischoff Tin Field, A.M. Reid, 1923.
Mineral Resources No. 7 - The Coal Resources of Tasmania, Geological Survey Staff, 1922.

Typed Reports.

Asbestos on Pieman River, S.W. Carey, 8-3-45.
Copper Prospects North of Farrell (Tullibardine) Q.J. Henderson, 11-2-43.
Farrell Mining Co. Mines, Tullah, Q.J. Henderson, 8-10-45.
Prospecting Operations at Gold Hill, Vicinity of Que River, Q.J. Henderson, 13-5-37.
Geological Survey of Gold Hill Area, Vicinity of Que River, Q.J.Henderson, 1-12-38.
Molybdenite Prospect at Mt. Remus, P.B. Nye, 14-12- 28.
Welcome Home Copper Area, Dove River, Q.J. Henderson, 3-3-41.
Cobalt and Vanadium Content of Mt. Remus Pyrite Ore, Stillwell, 5-10-32.

Typed Reports.

Tribute, North Mt. Farrell Mine, Tullah, P.B. Nye, 18-6-31.
Sulphide Deposits Suitable for Acid Making, P.B. Nye, 20-4-28.
Sulphide Deposits Suitable for Sulphur or Sulphuric Acid Production, P.B. Nye, 11-7-32.
Sulphide Deposits in Tasmania Suitable for Production of Elemental Sulphur, F. Blake, 9-11-39.

Strahan Quadrangle 57.

Published Reports - New Series.

Geological Survey Bulletin No. 18 - Geological Reconnaissance of the Country between Cape Sorell and Point Hibbs, L. Hills, 1914.

Typed Reports.

Queensbery Mine, Henty River, A.M. Reid, 31-6-27.
Macquarie Harbour Brown Coal Deposits, F. Blake, 8-5-40.
Alleged Oil Seepages near Strahan, T. D. Hughes, 13-1-53.

Lyell Quadrangle 58.

Published Reports - Old Series.

No. 42 - Country between Lake St. Clair and Macquarie Harbour, T. B. Moore, 1883.
No. 63 - King River and Mt. Lyell Goldfields, Glover, 1885.
No. 69 - The Linda Goldfield, G. Thureau, 1886.
No. 74 - Mt. Zeehan Silver and Argentiferous Lead Lodes etc., G. Thureau, 1888.

Lyell Quadrangle 58 - Continued.

Published Reports - Old Series.

No. 79 - State of Mining Industry on the West Coast, A. Montgomery, 1893.
No. 102 - Discoveries of Coal at Barn Bluff, and on the Progress of the Mineral Fields of the County of Montagu etc., A. Montgomery, 1893.
No. 105 - Progress of the Mineral Fields of the County of Montagu, A. Montgomery, 1893.
No. 115 - Queen River and Mt. Lyell Mining Districts, A. Montgomery, 1894.
No. 164 - Mineral Districts of Mt. Huxley, Jukes and Darwin, W.H. Twelvetrees, 1900.
No. 244 - Geological Examination of the Country between King River and the King William Range, L.K. Ward, 1908.

New Series.

Geological Survey Bulletin No. 16, The Jukes-Darwin, Mining Field, L. Hills, 1914.

Typed Reports.

Country between Jane River and West Coast Road, Finucane and Blake, 1-9-33.
King River Dam Site, L. Hills, 11-6-20.
King River Gold Mine, Lynchford, Finucane and Blake, 19-12-32.
Limestones of Tasmania, P.B. Nye, 23-4-28.
Notes on Dredging near Lynchford, P.B. Nye, 22-9-33.
General Geology of Mt. Lyell District, Nye, Blake and Henderson, 6-9-34.
Economic Geology of Mt. Lyell District, P.B. Nye, 6-9-34.
Geological Features in Vicinity of Queenstown, Finucane and Blake, 21-12-32.
Sulphide Deposits Suitable for Acid Making, P.B. Nye, 11-7-32.
Sulphide Deposits Suite for Sulphuric Production, P.B. Nye, 11-7-32.
Sulphide Deposits Suitable for Production of Elemental Sulphur, F. Blake, 9-11-39.
Sulphur Resources of Tasmania, T. D. Hughes, March, 1951.
Tasman and Crown Lyell Extended, P.B. Nye, 18-6-25.
Lease No. 113M/47 - J.J. Burke, Queenstown, B.L. Taylor, 22-2-52.
S. de Bomford's Prospect, Queenstown, B.L. Taylor, 22-2-52.

Zeehan Quadrangle 50.

Typed Reports.
Silver Lead at the Argent Tunnel Near Zeehan, - B. L. Taylor, 18-3-51.
The Razorback Tin Mine, Dundas, B.L. Taylor, 8-11-51.
The Montana Silver Lead Mine, Zeehan, B.L. Taylor, and D. Burger, 16-11-51.
Report on E.J. Cornish's Show at North Dundas, D.Burger, 19-11-51.
The Montana Silver Lead Mine, Zeehan, B.L. Taylor and D. Burger, '2nd Report), 18-1-51.
Lease No. 70M/51, E.J. Cornish, North Dundas (2nd Report) D. Burger. 27-6-52.
Lease No. 101M/47, S.A. Clark, Zeehan, B.L. Taylor and D. Burger, 26-8-52.
The Five Mile Copper Nickel Deposits, B.L. Taylor and D. Burger, 12-9-52.
Lease No. 70M/51 - E.J. Cornish, North Dundas, (3rd Report), D. Burger, 17-9-52.

Zeehan Quadrangle 50 - Continued.

Typed Reports.

Lease No. 58M/48, G.W.S. and W.C. Clark, D. Burger, 18-12-52.
Report on R.B. Hill's Area, Swansea, B.L. Taylor, 18-12-53.
The Montana Silver-Lead Mine (3rd Report), B.L. Taylor and D. Burger, 3-7-53.
Area of North of Zeehan - Regional Structure, B.L. Taylor, 15-1-54.
R.B. Hill's Area, Swansea (2nd Report) B.L. Taylor, 23-3-54.
The Bon-Accord-Owen Meredith Area, B.L. Taylor, 24-9-54.
Progress Report on the North Pieman Mineral Area, B.L. Taylor, 5-11-54.

Murchison Quadrangle 51.

Published Reports - Old Series.

No. 3 - Exploration of the Western Country, C. Gould, 1860.
No. 94 - Country Traversed by the Route of the Proposed Waratah to Zeehan Railway, A. Montgomery, 1892.
No. 103 - Discoveries of Coal at Barn Bluff, and on the Progress of the Mineral Field of the County of Montagu etc., A. Montgomery, 1893.
No. 105 - Progress of the Mineral Fields of the County of Montagu, A. Montgomery, 1893.
No. 106 - Country between Mole Creek and the Mt. Dundas Silver Field, etc., A. Montgomery, 1893.
No.118 - Progress of the Mineral Fields in the Neighbourhood of Zeehan, etc., A. Montgomery, 1895.
No. 140 - Felsites and Associated Rocks of Mt. Read and Vicinity, W.H. Twelvetrees and W.F. Petterd, 1898-99.
No. 131 - Mineral Fields in the Neighbourhood of Mt. Black Ringville, Mt. Read and Lake Dora, W.H. Smith, 1898.
No. 167 - Mineral Districts of Bell Mount, Dove River, Five-Mile Rise, Mt. Pelion and Barn Bluff, G.A. Waller, 1901.
No. 210 - Primrose Mine, Rosebery, G.A. Waller, 1903.

New Series.

Geological Survey Bulletin No. 3 - The Mt. Farrell Mining Field, L.K. Ward, 1908.
Geological Survey Bulletin No. 19 - The Zinc-Lead Sulphide Deposits of the Read-Rosebery Districts, Part I, L. Hills, 1914.
Geological Survey Bulletin No. 23 - The Zinc-Lead Sulphide Deposits of the Read-Rosebery District, Part II, L. Hills, 1915.
Geological Survey Bulletin No. 28 - The North Pieman, Huskisson and Sterling Valley Mining Fields, A.M.Reid, 1916.
Geological Survey Bulletin No. 31 - The Zinc-Lead Sulphide Deposits of the Read-Rosebery District, Part III, L. Hills, 1920.
Reports No. 3 - Preliminary Report on the Zinc Lead Sulphide Deposits of Mt. Read, L. Hills, 1914.
Reports No. 7 - Preliminary Report on the Zinc-Lead Sulphide Deposits of the Rosebery District, L. Hills, 1915.

Typed Reports.

Antimony Minerals in Tasmania. P.B. Nye, 4-9-41.
Antimony Minerals in Tasmania, (Supplementary Report) P.B. Nye, 16-9-41.

Murchison Quadrangle 51 - Continued.

Typed Reports.

Drilling Policy at Butlers Gorge, F. Blake, 10-10-38.
Geochemical Prospecting, Reid and Hughes, 20-12-48.
Record of Drilling, Hercules Mine, 1913-14.
Hydro-Electric Power, Lake Rolleston District, W.R. Bell, 3-3-12.
Lake Rolleston Water Scheme, H. Condor, 11-3-14.
Supply of Electric Power from Waters of Lake Rolleston, H. Condor, 21-5-14.
Lake Dora Copper Deposits, Blake and Henderson, 19-1-39.
Some Mines in Mt. Farrell District, A.M. Reid, 25-8-27.
New Stirling Valley Mine, Murchison District, J.B. Scott, 5-4-29.
Tin Bearing Quartz Lodes, Mt. Murchison District, J.B. Scott, 8-4-29.
Mineral Prospects of the Pieman River Area, Q.J. Henderson, 23-5-45.
Mining Properties of Electrolytic Zinc Co., Read-Rosebery, C. Gibson, 1927.
Preliminary Report Geological Survey of Rosebery District, K.J. Finucane, 9-7-32.
Geology and Ore Deposits of Rosebery District, K.J. Finucane, 1932.
Red Hill Copper Deposits, F. Blake, 1-6-38.
Read-Rosebery District, Re-interpretation of Geology by Electrolytic Zinc Co., Q.J. Henderson, 6-7-39.
Sulphide Deposits Suitable for Acid Making, P.B. Nye, 20-4-28.
Sulphide Deposits Suitable for Sulphuric Acid Production, P.B. Nye, 11-7-32.
Sulphide Deposits Suitable for Production of Elemental Sulphur, F. Blake, 9-11-39.
Sulphur Resources of Tasmania, T.D. Hughes, March 1951.
Williamsford Tin Mine, A.M. Reid, 14-5-27.
Williamsford Alluvial Lead, K.J. Finucane, 7-2-31.
Additional Notes on Williamsford Deep Lead, K.J. Finucane, 7-7-31.

B. ANNUAL REPORTS OF THE SECRETARY OF MINES.

C. REPRINTS OF THE GEOLOGY DEPARTMENT, UNIVERSITY OF TASMANIA.

No. 2 - Hills, C.L. and Carey, S.W. 1949 - Handbook for Tasmania. Geology and Mineral Industry, A.N.Z.A.A.S., Hobart Meeting. pp. 21-44..

No. 3 - Gill, E.D. and Banks, M.R., 1950. - Silurian and Devonian Stratigraphy of the Zeehan area. Pap. and Proc. Roy. Soc. Tas., 1949, pp.259-272.

No. 4 - Scott, B., 1951A, - The Petrology of the Volcanic Rocks of South-East King Island, Tasmania. Pap. and Proc. Roy. Soc. Tas., 1950. pp.112-136.

No. 5 - Scott, B. 1951A, - A Note on the Occurrence of Intergrowth between Diopsidic Augite and Albite and of Hydro-Grossular from King Island, Tasmania. Geo. Mag. LXXXVIII, pp. 429-431

No. 6 - Carey, S.W. and Scott, B., 1952. - Revised Interpretation of the Geology of Smithton District of Tasmania. Pap. and Proc., Roy. Soc. Tas. Vol.86, pp.63-70.

Reprints of the Geology Department, University of Tasmania - Continued.

No. 6A - Carey, S.W. and Scott, B., 1954, - Native Copper at Smithton - a correction. Pap. and Proc. Roy. Soc. Tas. Vol. 88, pp. 271-2.

No. 10 - Carey, S.W., 1953, - Geological Structure of Tasmania in Relation to Mineralisation, Geology of Australian Ore Deposits. 5th Empire Mining Congress. Vol.I, pp.1108-1129.

No. 12 - Banks, M.R., 1952, - Permian Trassic and Jurassic Rocks in Tasmania. Symposium sur les series de Gondwana. XIX Cong. Geol. Internat., Algiers.

No. 15 - Bradley, J., 1954, - The Geology of the West Coast Range of Tasmania. Pap. and Proc. Soc. Tas. Vol.88, pp. 193-243, Pt.I; 1956 Pt.II.

No.16 - Elliston, J., 1954, - Geology of the Dundas District, Tasmania. Pap. and Proc. Roy. Soc. Tas. Vol. 88. pp. 161-183.

No. 17 - Scott, B. 1954, - The Metamorphism of the Cambrian Basic Volcanic Rocks of Tasmania and its Relationship to the Geosynclinal Environment. Pap. and Proc. Roy. Soc. Tas. Vol. 88, pp. 129-149.

No. 20 - Carey, S.W. and Banks, M.R. 1954, - Lower Palaeozoic Unconformities in Tasmania. Pap. and Proc. Roy. Soc. Tas. Vol. 88 pp. 245-270.

No. 24 - Spry, A.H. and Ford, R.J. 1955, - Geology of the Corinna Area. C.S.I.R.O., Land Research Bull (in press).

No. 38 - Spry, A.H. and Banks, M.R. 1955, - Stratigraphic Nomenclature in the Pre-Cambrian. Aust.Journ. Sci.(in press).

D. UNPUBLISHED PRIVATE REPORTS TO COMPANY SYNDICATES ETC.

The Renison Bell Pine Hill Tin Sulphur Project, - C. Loftus Hills 1952.
The Tungsten Deposits in the Vicinity of the Interview River, West Coast Tasmania by C. Loftus Hills 1953.
Report on the Geology of the Zeehan Mine Leases, Carey et alia. Unpublished Report.
Report on North-West Concession, to N.B.H.Ltd., - Carey et alia 1947.
E. Z. Co. Rosebery.
Dallwitz 1945.
Gibson 1925-27.
Mt. Lyell Mining and Railway Co.
Conolly, H.J.C. 1940-1949. Unpublished Reports on Exploration on the Mt. Lyell Field.

E. MISCELLANEOUS PUBLISHED PAPERS.

Geology of Australian Ore Deposits, Tasmania.
5th Empire Mining Congress, Vol.I, Chapter XIII.
A.I.M.M. 1953.

Browne, W.R., 1949:- Metallogenetic Epochs and
Ore Regions in the Commonwealth of Australia.
Jour. Roy. Soc. N.S.W., 83 (2).

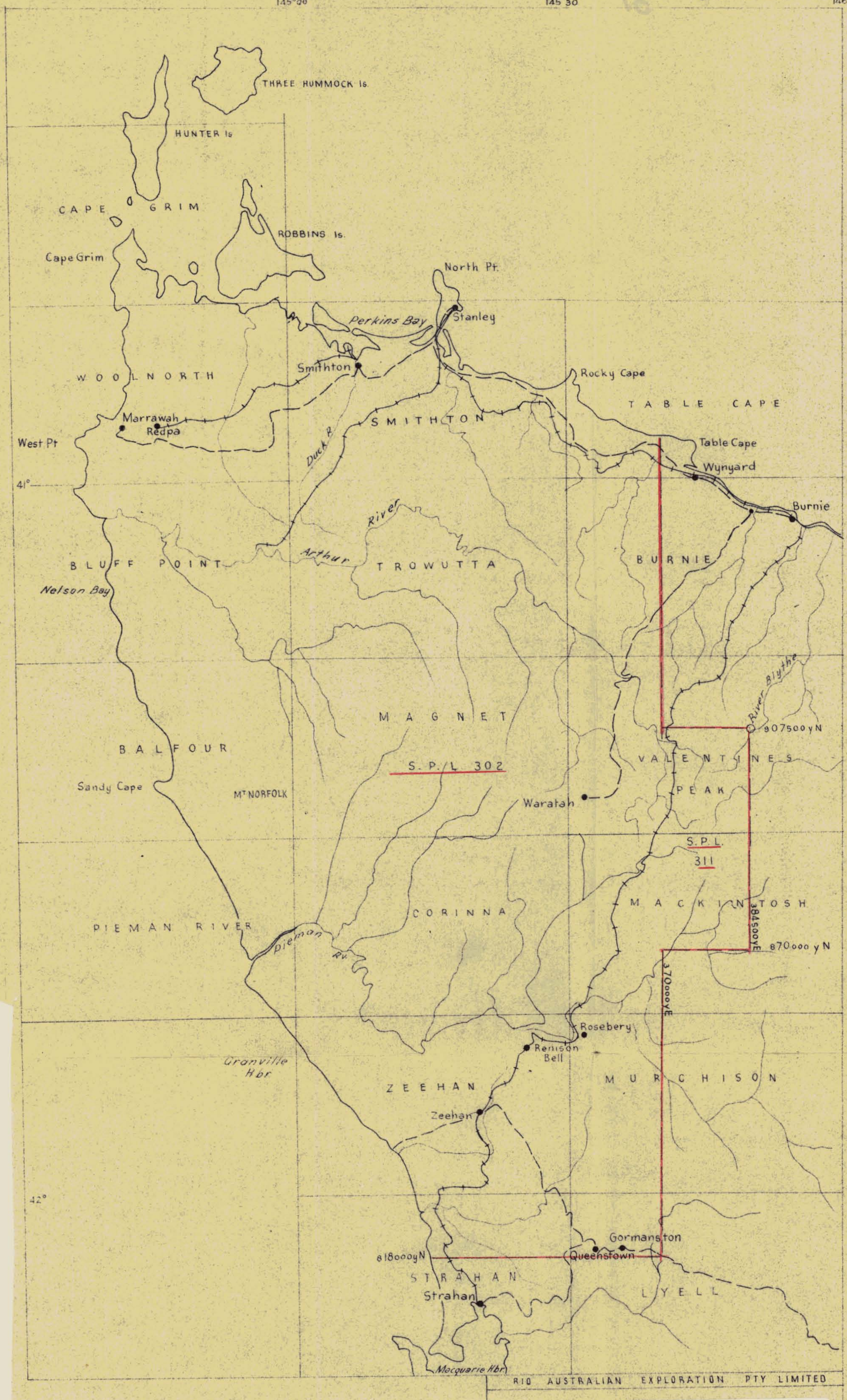
Loftus Hills, C, and Carey, S.W., 1949:-
Geological and Mineral Industry of Tasmania.
Handbook for Tasmania. A.N.Z.A.A.S. p.21.

TABLE I GEOLOGICAL SEQUENCE NORTH-WESTERN TASMANIA.

Period	Rock Units	Thickness (Maximum)	Economic Minerals
Quarternary	Glacial Deposits, alluvial and residual soils, beach sands.		Alluvial Au, Ag, Osmiridium, Sn Ilmenite from Beach sands (Strahan)
Tertiary	Basaltic extrusives Coastal Marine Deposits Lacustrine and Residual Alluvial Deposits		Deep leads Sn, Au.
Jurassic	Dolerite sheets and sills		
Permian	Preolenna Beds, Henty Beds, Wynyard Tillite		Coal
Devonian	Granite		Sn, W
Silurian	Eldon Group: Bell Shale Florence Quartzite Hill Shale Keel Quartzite Amber Slate Crotty Sandstone	6,000 ft.	Pb
Ordovician	Junee Group: Gordon Limestone Caroline Creek Beds Owen Conglomerate	3,000 ft.	Pb
Cambrian	Darwin Granite; Ultrabasic Intrusives? Dundas Group	10,000 ft. (?)	Osmiridium, Cu-Ni, Asbestos, Chromite Cu, Pb, An, Ag, Sn, Au
Younger Pre-Cambrian	Carbine Group	?	Sn, W, Zn, Au,
Older Pre-Cambrian	Davey Group	?	Cu

509035

034



RIO AUSTRALIAN EXPLORATION PTY LIMITED

5 cm

Scale 8 miles to 1 inch | PRP/7/100

56-124 plate 1

034