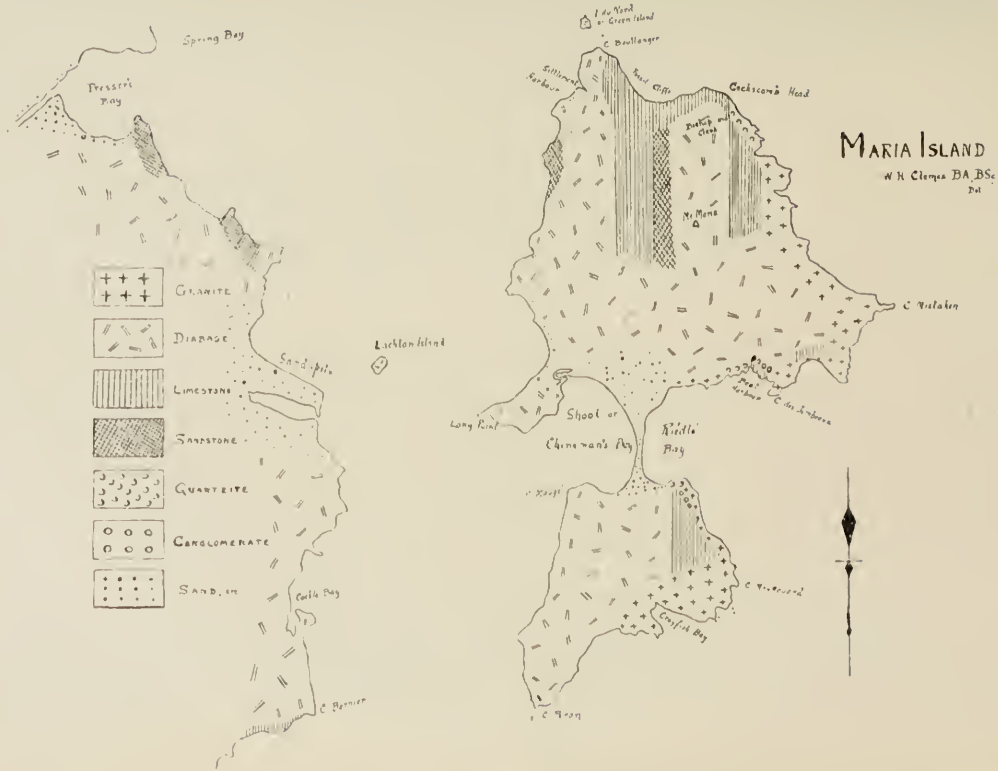
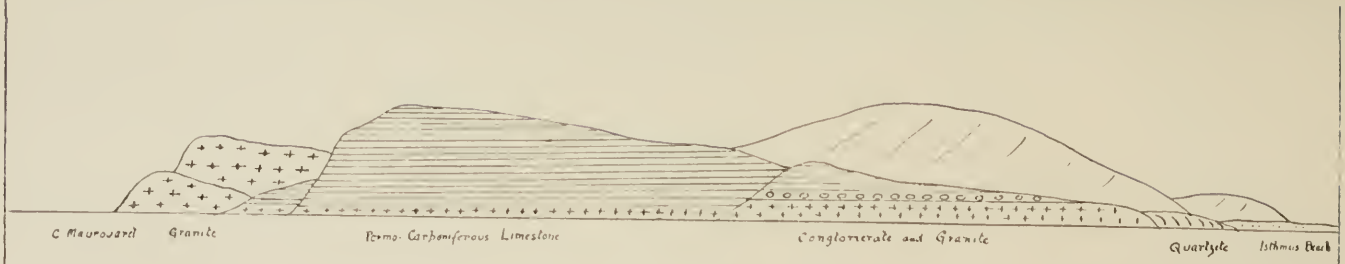

MARIA ISLAND
W H Clemes BA BSc Del
Spring Bay
Lachlan Island
Cockscomb Head
C Boullanger
Long Point
Shoal or
Chinaman's Bay
Riedle Bay
Mt Maria
Bishop and Clerk
Fossil Cliffs
Castle Bay
C Bernier
Sand-pits
Granite
Diabase
Limestone
Sandstone
Quartzite
Conglomerate
Sand, etc
C Peron
Cross-fish Bay



SOUTH RIEDLÉ BAY MARIA ISLAND

NORTH RIEDLÉ BAY MARIA ISLAND

NOTES ON THE GEOLOGY OF MARIA ISLAND.

By W. H. Clemes, B.A., B.Sc.

Plates XI., XII.

(Received 2nd June, 1919. Read 14th July, 1919.)

These notes are intended as an incentive to future study rather than as a complete record of the geology of this interesting locality. They are the result of several holidays spent on the island, and particularly of two yachting trips undertaken recently. In many places the record is meagre, as I was unable to land and examine the rock formations in detail, but had to rely on observations made while sailing along, often in somewhat troubled waters. Still the description is complete enough to be of value, especially as no previous record has been made, with the excepton of the late R. M. Johnston's description of the Fossil Cliffs in his Geology of Tasmania. There is brief mention of a paper read by him before the Royal Society on Riédlé Bay, but unfortunately it was not printed and his valuable observations have been lost.

Maria Island is situated on the East Coast, almost opposite to Spring Bay and Orford. The passage between it and the mainland varies in width from three to eight miles. In the narrowest part, off Long Point, is Lachlan Island, a small diabase rock covered with sparse vegetation. This passage is the result of excessive wave-erosion acting on the sandstones and diabase which are now found fringing either shore. There is little doubt that the Orford sandstones were once continuous with the sandstones at the Crayfish Rock, a little to the south of the Settlement, and those on the flank of Mt. Maria. The passage itself is extremely shallow with a moderately flat floor, the average depth being about six fathoms. A shoal stretches across from the Sandspits to beyond Lachlan Island, the water on which is in places only one fathom in depth. The sediment here deposited was largely brought down by the Sandspits River, which has, at the same time, built up a large alluvial flat and ti-tree swamp covering many acres. The ti-tree is growing on soft oozy mud, which quivers and shakes as one passes over, and it is quite easy to shake a considerable area and make the trees bob and curtsy in a rather alarming fashion. There

is a fine beach here ending in a long sandy hook. In northerly and southerly weather an ugly sea gets up quickly owing to the shallowness of the water.

Maria Island is one of those curious "tied-islands" to be found in Tasmania. The reason for their formation has not yet been determined, though it is usual to ascribe it to the sinking of the land, and, though not sufficient data has been collected to dogmatise on the matter, there is no reason to suppose that there have been any other forces in operation. It is interesting to note that at the present time the shore is sinking both in Shoal Bay and also at Orford, on the opposite side of the passage. The same thing is taking place near the mouth of the Huon at Garden Island Creek, and at Kelly's Basin, Port Davey. The isthmus is narrow, low-lying, and sandy, and scarcely raised above sea-level. Shoal Bay is very shallow, though there is a deep channel off its south-western extremity. At the head of the bay is a beach, the sand of which is largely composed of shell-fragments. Riédlé Bay is much deeper, and well scoured by the south-easterly gales. Its beach is composed almost entirely of quartz grains from the granites that fringe its shores. The most prominent feature of the North Island is the great central mass of Mt. Maria and the Bishop and the Clerk, the highest point of which is about 3,000 feet high, and from which the land slopes, in parts precipitously, in parts gently, down to the sea. High hills also cover the South Island, which is smaller and not so elevated. The coast line is most irregular with high cliffs on the north, south, and east, and low-lying rocks to the west, interspersed with fine white beaches.

The densest vegetation is to be found on the slopes of Mt. Maria, especially on the east where it intercepts the breezes from the sea. Here the Oyster Bay pine is a prominent feature. The rest of the island is well-wooded with eucalypts and she-oaks, though thinning out on the poorer soils of the granite areas.

The geology of the east is quite distinct from that of the west. The rocks on the western half of the island are almost entirely made up of Mesozoic sandstone and diabase of the usual type, while on the east Permo-Carboniferous mudstones and conglomerates are interspersed with Devonian granites and older quartzites. The south-western end of the island, Cape Péron, ends in a magnificent pillar and archway of diabase, from which it runs back to a pyramidal peak above. The diabase continues in a north-easterly direction as a steeply-sloping and precipitous hill-side for about a mile where it junctions with the

granite of Barren Head. This forms bold headlands and rocky islands round the coast to Riédlé Bay and Cape Maurouard. It is generally massive in formation, but varies in places and becomes highly jointed and, in consequence, much hollowed by the waves, Sea Elephant or Crayfish Bay being a notable example. As far as I could judge the granite was of the usual type, though somewhat coarser grained, in which orthoclase felspar predominated, giving it a distinct reddish tinge.

Riédlé Bay is of surpassing interest to the geologist as well as to the artist and the lover of beauty in Nature. The granites of Cape Maurouard are succeeded by Permo-Carboniferous marine mudstones. These first appear as a narrow band lying horizontally on the low coastal cliff of granite but rise later to a cliff, beautifully laminated, fully 100 feet in height, extending for about a mile along the shore and resting on a shelf of granite. Later the mudstones disappear, the granite rises up to a cliff about 40 feet in height, on which is resting a narrow layer of coarse pebbly conglomerate, of which mention will be made later on. Then the granites give place to earlier quartzites, which have been tilted up on edge and otherwise deformed by the intruding granite. The highly crystalline nature of this rock testifies to the intensity of the metamorphosing action. With the limited time at my disposal I was unable to collect sufficient material to determine the age of these rocks, and can only say that they are earlier than the granite. The rocks in the same meridional line to the north are given in the Geological Map of Tasmania as Silurian, and there is no reason to suppose that these are of an earlier horizon than that. They form the outer edge of a well-sheltered corner, whose beach continues over the isthmus to the northern side of the bay. Here it is met by an immense heaped-up pile of boulders, mostly of diabase, an eloquent tribute to the force of the southerly gales. The diabase is again succeeded by a very coarse-grained granite, on the top of whose wave-worn surface are stranded great diabase boulders, which at first sight appear to have been hurled there by the force of the waves, but later examination leads one to suppose that they are either a talus from the high diabase cap of Mt. Maria behind, or perhaps a small sill or dyke sent from the same source. As we approach Boat Harbour there appears to be another occurrence of the quartzites which were found on the opposite side of the bay. Here they are resting on the granites but tilting steeply southwards. These are succeeded by the gritty basal beds of the Permo-Carboniferous series with its

embedded ice-borne detritus. Above there is a magnificent cliff of conglomerate about 40 feet high consisting of pebbles and boulders set in a matrix of calcareous and felspathic sandstone, which has decomposed by the action of percolating water and formed numerous stalactitic growths descending from the overhanging projections. The pebbles are mostly quartzose, ranging in size from the tiniest particles up to large boulders, interspersed with boulders of granite and pieces of slate, schist, and quartzite of the older formations. It is resting in a kind of pocket scooped out in the granite, and is no doubt contemporaneous and homogeneous with the conglomerates across the bay. A dyke of diabase comes right through the middle and a sill of the same material is resting on the top. The granite of Boat Harbour is a very coarse-grained tourmaline granite of handsome appearance. The felspar crystals which predominate are often two to three inches long, and the crystals of the other constituents are correspondingly large. This granite should make a valuable commercial product quite equal to any of the imported article. It is very striking in appearance and should take a splendid polish. It is by far the finest granite I have seen on the East Coast. It extends round Cape des Tombeaux and passes under the Permo-Carboniferous basal beds which appear in the next little bight, and which are themselves capped by Cretaceous diabase which forms an overlying spur from Mt. Maria. Between the next point and Cape Mistaken, usually known as Ragged Head, the granite has suffered a certain amount of deformation, but whether during consolidation or subsequently is hard to determine. The jointing is most irregular and in places highly contorted. Around Cape Mistaken, a bold granite headland, we come in sight of a magnificent panorama. The great mountain-mass of the Bishop and the Clerk here approaches the sea, and slopes precipitously from its summit down to the water's edge. It consists of Permo-Carboniferous limestones and marine mudstones, resting on a bed of granite, and capped by Cretaceous diabase exhibiting columnar structure in the cliffs along its summit, forming the cockscomb-like Bishop and Clerk.

Right under the eastern end of the latter mountain the granite gives way to a series of rocks which Dr. Clarke informs me are quartzites. These will probably then be of the same horizon as those of Riédlé Bay. They have been highly contorted by the intruding granite; anticlines and synclines are frequent and the plications are most intricate. Where not folded the strata are all standing on edge. Great blocks are also to be seen em-

bedded in the granite, showing conclusively that they belong to an earlier age, but to what age is a matter for future investigation. Permo-Carboniferous limestones are resting unconformably above them, and, on the far side, come down below sea-level, the granites having finally disappeared. They continue round the corner of Cockscomb Head and form a huge semi-circle of cliffs extending almost to Cape Boullanger and the Ile du Nord, which are of diabase. These cliffs are the finest example of the Lower Marine beds that we have in Tasmania. They are regular and almost horizontal, though one or two examples of lenticular deposition are apparent. There are no striking examples of faulting or deformation such as appear at Eaglehawk Neck and other localities. The cliffs slope down gradually to the west from a height of about 1,000 feet, with flat ledges underneath almost buried in a huge talus of fallen blocks, some of which weigh many tons. These rocks and the cliffs around them are studded with fossils, brought into relief by weathering, and are simply one solid compact mass of shell-remains, among which the Eurydesmas with their thick globose forms predominate. "Blocks of 40 and 50 tons weight seem to be simply made up of a compacted conglomerate of this genus" (R. M. Johnston). The basal beds are the usual gritty mudstones more highly studded than usual with ice-borne detritus; some of the granite blocks embedded in the mud of this old sea-floor must weigh many tons. Their angular nature shows that they have been transported by ice-action, as that is the only agency which could have carried them for such a distance and preserved their shape intact. The way in which the surrounding mud has been pressed up around their edges also proves that they have been dropped from melting floes and sunk to their present resting place.

Three zones are represented:—

1. Eurydesma Zone.
2. Fenestella Zone.
3. Crinoidal Zone.

The first two zones have been well described by the late R. M. Johnston in his Geology of Tasmania and so I need not elaborate on them here.

The principal families represented in the first zone are *Spirifers*, *Pachydomus*, *Eurydesma*, *Notomya*, *Aviculopecten*, *Stenopora*, and *Favosites*. In the second the *Fenestellas* and *Protoretepora* are interspersed with *Spirifers*, *Productus*, *Strophalosia*, etc. The Crinoidal Zone is composed almost entirely of a compacted mass of

Crinoid remains. No traces of the flower-like head have been found but fossils of the main stem and branching arms are very frequent. It would appear as if these remains had collected on some outlying reef where the waves had broken them up into fragments and destroyed the softer parts. It makes a splendid crystalline limestone, exceeding hard to quarry out, which was at one time worked for lime, but the collapse of the kilns led to its abandonment. The limestones seem to persist along the western base of the mountain, and resting on them is a band of Mesozoic sandstones, and above those the diabase cap so frequently found in Central and South-Eastern Tasmania. Frequently between the limestone and sandstone is a band of Permo-Carboniferous gritstone.

The only other feature of interest is a curious reddish coloured stone appearing under the diabase near the jetty at Shoal Bay, and at Bloodstone Point on the other side of Long Point. It has the appearance of a highly decomposed granite. If so, it is the most westerly exposure on Maria Island.