

SILURIAN ROCKS IN TASMANIA.

Rocks of the Silurian system are confined to the Western half of the State of Tasmania. They occur in a number of irregular areas in association with the Proterozoic and Cambro-Ordovician rocks of the western districts. The general distribution may be described as follows:-

1. A number of more or less connected areas in a general north south belt in south central Tasmania.
2. A number of similar areas in a north-south tract parallel to the central part of the West Coast.
3. A number of areas forming an east-west tract in north central Tasmania.

WEST COAST RANGE CONGLOMERATE SERIES.

As its name implies this series is prominent on the West Coast Range (Mt. Owen, Lyell Sedwick.) It is also prominent on many other mountains in the State e.g. Clear Hill, The Thumbs and Denison Range in the South, Mts. Osmund, Zeehan, Pearse in the west, and Mts. Claude, Roland, and the Badgers in the north. Its prominence on mountains is due to the resistant nature of the conglomerates which compose the greater part of it.

The conglomerates occur in massive beds and are of a very coarse grained type. They contain water worn pebbles of an average size of two to four inches. The pebbles consist mainly of two rock types - reef quartz and quartz schist. The matrix was originally sandy but has been altered to quartzitic material.

Finer grained rocks ranging down to grits and sandstones (subsequently altered to quartzites) are interbedded with the conglomerates. These finer beds are more plentiful towards the upper portion of the series.

In former years, there was considerable doubt as to the correct stratigraphical position of this rock series and it was ascribed to the Cambrian, Silurian and Devonian. Its correct position was first determined by G.A. Waller in the Zeehan field in 1903. This investigation proved that it conformably underlies the fossiliferous Silurian rocks of that field. Its relation with the older rocks was not clearly defined until Loftus Hills in 1913 and A. McIntosh Reif in 1918 proved that it contains pebbles and boulders of the Cambro-Ordovician porphyroid series. The conglomerate series is thus post Cambro-Ordovician and underlies the fossiliferous silurian rocks. It is therefore regarded as forming the basal series of the Silurian System.

It contains a few fossils in the upper parts but these consist of the "pipestems" (to be described below) and a few indefinite specimens of brachiopods.

2. (a) PIPE-STEM OR TUBICULAR SERIES.

This series includes sandstones, quartzites grits and conglomerates which are much finer in grain than those of the West Coast Range Conglomerates series. The rock types are also different in colour being either white or pink, as compared with the darker pink or red colour of the

conglomerate series. The pebbles are similar in nature but are smaller and fewer in number. The characteristic feature of this series is the presence cylindrical casts which may represent some organism.

A few of these casts occur in the upper portion of the Conglomerate series.

The tubicolar series is most highly developed in the northern parts of the State, particularly in the Middlesex district, at localities such as Black Bluff, Stormont, Five-Mile Rise, Oliver's Hill, Tin Spur, Lemon Thyme Hill and Round Hill. They are also present, but to a much less extent near Zeehan and in the valleys of the Loddon and South Loddon rivers in the western district.

Waller in 1903 proved that at Zeehan the tubicolar series - conformably overlaid the Conglomerate series and was conformably overlain by the fossiliferous limestone, slates and sandstones.

The exact origin of the forms represented by the "pipe stems" is very indefinite and they may represent either tracks or dwelling tubes of worms. Other organic remains are rare the only fossil being a *Rhynchonella boreaxis* reported by A.M. Reid Tas. Geological Survey Bulletin No. 29.

#### 2. (b) QUARTZITE SERIES.

As already stated the tubicolar series is not developed in the southern districts. In the Adamsfield District, the conglomerate series is succeeded by one of dense white quartzites. Tubicolar casts have not been discovered, but the quartzites have been found to contain numerous specimens of apparently one species of an euomphaloid gasterpod.

It is considered by the writer that these are the southern equivalent of the tubicolar series. At Adamsfield this series conformably underlies the Gordon River Limestone series.

#### 3. DISCOIDAL SERIES.

In the south Loddon valley, the tubicolar series is overlaid conformably by a series of white sandstones containing peculiar discoidal impressions. Similar forms occur in the sandstones at Zeehan and have also been reported in the Cambrian sandstones at Caroline Creek.

The available evidence does not seem to warrant the establishment of a special series for these rocks. In fact the evidence rather indicates the occurrence of the above forms in widely separated series.

#### 4. GORDON RIVER LIMESTONE SERIES.

As its name implies, this series is well developed on the Gordon River in Western Tasmania. It is exposed along the Gordon at several localities between Macquarie Harbour and the Great Bend. From the head of the Gordon to the south coast there is a N.N.W. - E.S.E. tract of Lower Palaeozoic rocks in which many areas of limestone occur. It does not seem so prominently developed in the western districts, but is present in numerous places in the northern districts e.g. Vale of Belvoir, Moina, Chudleigh, Gunn's Plans &c. (There is a certain amount of evidence which rather suggests that the limestone at Railton,

Flowery Gully and Beaconsfield are older than the Silurian and they are therefore not included in the Gordon River series.)

This series consists almost entirely of limestone of a dense dark grey or blue type. The limestones are massively bedded and highly fossiliferous. Shales or slates occur as thin beds but in no great quantity.

The limestone series is a thick one and ranges in thickness upto 4000 feet. At Adamsfield a good section of the series is exposed and the width of the outcrop of limestones from the quartzite series on the west to the Queen River sandstones on the east is 4000 feet, the limestones dipping at 70° to 80°.

Collections of fossils from the Gordon River yielded the following:-

Favosites	Eumophalus
Halysites	Helicotoma milligani
Stenopora	H. pusilla
Syringopora	Holopaea mumia
Orthis	Hormotoma nerinoea
Retzia mima	H. usitata
Ehynchonella	Hoxonema
Cryodonta auriculata	Murchisonia franklini
C. compressa	M. mimetica
C. distarto	Pleuotomaria
C. gibbosula	Raphistoma
C. inflata	Tasmanicus
C. obliquata	Sculites australis
C. pinguis	S. salteri
C. reversa	S. gouldi
Modiolopsis	Straparollus tasmanicus
Gordonensis	Trochonema bigsbyana
Tellinomya amygdale	T. etheridgei
T. antiposa	T. montgomerii lituites
T. jonesii	Orthoceras antilope
Eunema aemula	O. Murchiesoni
Bellerophon pugnus	O. theca
	O. youngii
	Phragmoceras.

At Adamsfield this series conformably overlies the Quartzite series and is itself conformably overlain by the Queen River slates and sandstone.

#### QUEEN RIVER SLATE AND SANDSTONE SERIES.

At the Queen River, Zeehan, Dundas, Heazlewood, and Middlesex, fossiliferous silurian rocks occur. These consists of sandstones, quartzites, shales, slates and limestones. The sandstones are the most common type and consist of soft friable types the colouration usually being white, while at Adamsfield it is generally green. Quartzites or indurated sandstones are present only in the Zeehan district. The shales and slates are light coloured, thinly bedded types sub-ordinate in amount to the sandstones. Thin beds of grey limestone are interbedded with the above.

Numerous fossil collections have been obtained from this series and the following list includes the principal fossils determined.

Favosites grandipora	Penetamerus tasmaniensis
Halysites	P.knightii
Pleurodictyum	P. galeatus
Crinoids	Rhynchonells antinasulu
Cornulites tasmanicus	R. borealis
Fenestells	R. capox
Atrypa hemispherica	R. cuneata
A. cuneata	R. decimflicata
Camarotechia	R. nasuata
Conchidium	Spirifera crispa
Dalmanella	S. elvata
Lingula	S. lyellensis
Meristidoe	Strophodonta
Orthis elegantula	Strophemena
O. flabellum	Strophonells
O. lata	Trematospira tasmaniensis
Cardiola	Actinoceras
Leptodomus(?)	Orthoceras
Muciformis	Amphion (?) brevispinus
Palaeoneilo	Asaphus
Tellinomya jonesi	Bromus murchisoni
Helicotoma johnstoni	Calymene blumenbachii
Harmotoma	Hansmannia
Lothospira	(Dalmanites) meridionalis
Murchisonia	Homalonotus
Loxonema	Illoenus johnstoni
Trochomema montgomerii	Phacops.
Tenaculites	

The principal determinations were made by Gould (1860), Johnston (1888), Etheridge (1896), Etheridge (correspondence 1909) and Dun (correspondence 1910). The general opinion expressed was that the species had Ordovician and Silurian facies but generally were of Silurian age.

As far as the present knowledge extends, the Queen River series represents the uppermost series of the Silurian system at Adamsfield, the series conformable overlies the Gordon River limestone series.

#### DEVONIAN ROCKS IN TASMANIA

No sedimentary rocks which can be ascribed to the Devonian system have so far been located in Tasmania.

The Silurian sedimentation was followed by a diastrophic epoch of considerable intensity during which the Lower Palaeozoic rocks were folded and faulted. Igneous intrusions were associated with the diastrophism and the Proterozoic and Lower Palaeozoic rocks were invaded by extensive bodies of magma. Considerable differentiation occurred and the resulting rocks include many plutonic types of the ultrabasic, basic, intermediate and acid divisions. The acid rocks predominate and the large bodies in north-easter, north-western and western Tasmania represent one or more granitic batholiths.

#### CARBONIFEROUS ROCKS IN TASMANIA

There is no existing record of any Carboniferous rocks in Tasmania.

(Sgd. P.B. Nye.)

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