FRESH CONTRIBUTION TO OUR KNOWLEDGE OF THE CHARACTER AND THE RELATIONSHIP OF THE UPPER PALÆOZOIC AND MESOZOIC FORMATIONS OF TASMANIA WITH THE ASSOCIATED DIABASIC ROCKS.

By Robt. M. Johnston, F.L.S.

(Read April 14, 1885.*)*

Recently I have devoted a considerable portion of my time to the renewed study of the relation of the prevailing diabasic rocks of the Southern portion of Tasmania, for which I have also recently had further opportunities afforded me by Webster, who most kindly took me in his yacht Ella to many places of interest in the numerous bays, channels, and arms of the sea towards the Southern part of the Derwent and Huon.

The relations of the lower marine beds to the diabasic greenstone between Passage Point and Long Bay in the accompanying diagrams unmistakeably show that the greater mass of the greenstone, as also shown by the recent bore test at the Cascades, is older than the overlying mudstones which quietly repose upon it. In one section, however, opposite Half-moon Bay, both the older greenstone and the mudstones are penetrated by an intrusive sheet of greenstone of later date. After abruptly ascending through the older greenstone, the later eruptive rock suddenly bends round, and forms a horizontal sheet of considerable extent between, and exactly parallel to the horizontal bedding of the mudstone and limestone series. This is the best example with which I am acquainted of the relation of the older and newer intrusive rocks with the marine sedimentary formation of upper palæozoic age.

I have also examined carefully the line of country between Hobart, Richmond, Constitution Hill, and Spring Hill. In many sections between the two latter places, the upper coal measures repose quietly upon the underlying diabase. The best example of this nature occurs in a cutting of the main road near Lovely Banks, where the unaltered shales and sandstones are seen to repose upon the diabase. The only exception noticed by me in this district occurs at the head of Spring Hill, where the later intrusive greenstone, apparently identical in character with the older, bursts through, dislocates, and overspreads certains beds of sandstone, which I believe to belong to the lower part of the coal measures.

At a section immediately beyond Mr. Bisdee's residence, at the foot of Spring Hill, Mr. T. R. Atkinson and myself

discovered a very interesting series of finely laminated carbonaceous shales, which proved to be rich in plant remains. Various species of ferns of a new and interesting character were obtained belonging to the genera Pecopteris, Thinnfeldia, Odontopteris, Tæniopteris. One splendid specimen, with ovate lanceolate pinnules, which have peculiar laciniate margins, is peculiarly interesting, and may prove to belong to the genus Otopteris.

The distribution shows nothing but the remains of Phyllotheca and Zeugophyllites in certain beds and localities, while in contiguous or closely related beds hardly any other forms than those of Pecopteris, Thinnfeldia, and Tæniopteris, therefore great caution must be exercised for the present in separating beds of this system upon the evidence of organic remains only.

The restriction of particular forms to particular beds may only indicate a slight local difference in vegetation rather than difference in age or even horizon. However, on a future occasion, I will deal more fully with this important subject, for which I am now provided with many rich and interesting materials.

In conclusion, I draw attention to figures of some of the new plant forms from Spring Hill, Porter Hill, and the lower coal measures of the Mersey. The large imperfect frond from the Porter Hill beds, cythere shales, appears to belong either to the genus Cyclopteris or Gangamopteris. The spathulate frond found associated with Glossopteris Browniana from the lower coal measures of the Mersey is, I believe, identical with Noeggerathiopsis media of New South Wales.

The large equisetaceous impression from the same place, at the Mersey, is closely allied, if not identical, with a form of Schizoneura, figured by Feistmantel from the Lower Gondwana series, India.

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*JUNGERMANNIA RETICULATA.

By R. A. Bastow.

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The specimen now submitted for your observation under the microscope was gathered from the Springs on the side of Mount Wellington, on the 10th March last, close to a clear

*This genus is named in honour of Louis Jungermann, a German botanist.