

BYTHOTREPHIS IN VICTORIA.

ON AN ADDITIONAL OCCURRENCE OF BYTHOTREPHIS  
IN VICTORIA.

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(Plate XIV.)

I am indebted to the authorities of the National Museum, Melbourne, for the opportunity of describing the following specimen.

Presumably the primitive flora of the world was entirely algal. Other forms appear to have developed from different types of algae. Hence it is of interest and importance to ascertain what types of algae flourished in the earlier times, how they were distributed, and what was their elemental structure. The evidence is fragmentary, and owing to the soft entirely parenchymatous nature of the plants but little of the structure has been preserved and revealed. The occurrence, then, of a specimen of a well grown alga in beds so adapted to the preservation of soft parts that a jelly-fish is shown in nearly its entirety in them, gave hopes that information of value might be furnished as to early algal structure. Unfortunately very little has been gained so far in this regard, but it is interesting to find an alga in the Melbournian Beds of Victoria, apparently identical with one from the Lower Ordovician of North America.

The fossil consists of two main fronds of *Dictyota* habit which diverge as if proceeding from a common attachment. They do not lie flat in one plane but are extended freely as on an undulated surface, seemingly showing that they were imbedded in rapidly accumulating sediment. One often finds recent plants like *Dictyota dichotoma* similarly half sunk in wet sand which has been poured over them by the tide succeeding that which deposited them on the beach. The fronds are compressed, repeatedly dichotomous, with acute axils, the segments not rapidly diminishing in width. Length of frond 78 mm., while the spread of the two fronds occupies a width of 94 mm. The width of the segments average about 3 mm. The length of the longest branch 60 mm. The substance is carbonaceous. A collodion film showed rounded cells loosely grouped with rather thin borders, 79–124 $\mu$  in diameter (pl. XIII., f. 3).

I venture to identify the form with *Bythotrephes gracilis*, James Hall, described and figured from the Trenton Limestone, in the upper part of the Lower Ordovician of New York.<sup>1</sup>

Hall's description is as follows :—

“Form slender, flattened, branched; branches compressed, leaflike, subdichotomous, diverging, opposite and alternate; no visible structure.

<sup>1</sup> *Paleontology of New York*, Vol. I., p. 62, Plate XXI., fig. 1, Albany, 1847.

A Carbonaceous film is all that remains of the fossil. It was probably a succulent marine plant, not unlike *Fucus*, but of a very slender form and habit."

The alga was obtained from Hoffman's Clay Pit, Brunswick, Melbourne, in the basal part of the Melbournian Beds of the Silurian Series (F. Chapman). It is bedded in a pale blue pyritous sandstone, occurring in intermittent bands in the typical blue mudstone. The sandstone is very fine grained, but the bedding is not well developed, the irregular fracture indicating shallow water conditions. The Museum is indebted for its preservation to Mr. R. Evans, one of the workmen, who had previously found Trilobites and Brachiopods in the clay pit, and who took great care to gather and preserve as much as possible of the specimen.

Mr. F. Chapman has recorded other Victorian algae which he has identified with foreign species of *Bythotrephis*. These are *B. tenuis* James Hall, present in Silurian beds in the Botanical Gardens, South Yarra,<sup>2</sup> *B. intermedia* James Hall, in Silurian beds, South Yarra,<sup>3</sup> both found in the Trenton Limestone of New York; and *B. divaricata* Kidston, from the Tanjilian of Wallhalla,<sup>4</sup> described from the Wenlock of Malvern, England.

The generic form *Bythotrephis* then seems to have been dominant in Silurian and Ordovician times in England, North America and Victoria, and we may suspect, throughout the seas of the world. By the apparent simplicity of its structure it seems to have been an elemental or generalised type.

Hall compared it with *Fucus*, a name not so definite in his time as now, but in the absence of any kind of fruit it is impossible to associate *Bythotrephis* with any living genus, even with *Dictyota*, which it resembles in form and habit and which has much simpler modes of reproduction than the present restricted *Fucus*.

It remains to me to acknowledge how greatly I am indebted to Mr. F. Chapman for the help he has given me in drawing up the present record.

#### EXPLANATION OF PLATE XIV.

Fig. 1.—*Bythotrephis gracilis*, J. Hall sp. Frond, natural size.

Fig. 2.—Portion of the same, twice natural size.

Fig. 3.—Cell structure of the carbonised surface, from a collodion film. The arrow shows the direction of length in the frond. Magnified 104 diameters.

<sup>2</sup> 1 Proc. Roy. Soc., vol. xv. (N.S.), pt. I., 1903, p. 104, pl. xvi., f. 1.

<sup>3</sup> Identified by F. Chapman, Nat. Mus., Coll.

<sup>4</sup> Rec. Geol. Surv. Vict., vol. iii., pt. 2, 1912, p. 231, pl. xxxviii., f. 1.

