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PRE-PERMIAN, PROBABLY DEVONIAN, PLANTS FROM NEAR GREGORY'S SALT SEA, WESTERN AUSTRALIA.

by

R.O. Brunnschweiler and J.M. Dickins

CANBERRA.

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INTRODUCTION

The reconnaissance field work of Reeves (1949) had apparently established that all the sedimentary rocks in the vicinity of Gregory's Salt Sea and along the upper reaches of Sturt Creek (Mt Bannerman, Mt. Muller) belong to the Permian System. However, while there can be no doubt that Permian rocks are present in this area, it is now equally certain that, in places, they form only a thin veneer over older Palaeozoic beds.

This discovery is the result of a study of some specimens in the collection of fossils made by Reeves and his colleagues on behalf of the Vacuum Oil Company in 1948. The collection was presented to the Geology Department, University of Melbourne, by the Vacuum Oil Company. C. Teichert had originally examined the material, and a list of the fossils identified by him is found as an appendix in Reeves' report (1949).

The critical specimen (No. 556 of Reeves' collection) is 9 miles from the Pallotine Mission on a bearing of 80 degrees, near Gregory's Salt Sea. In Teichert's list it appears as "Lepidodendron? impression". After the departure to America of C. Teichert the junior author of this report, while sorting out specimens belonging to the University from those that belong to the Bureau of Mineral Resources, noticed that specimen No. 556 looked somewhat different from the common types of plant remains he knew from Carboniferous and Permian rocks of the Carnarvon Basin area. Not being familiar with the identification of plant fossils he then consulted the senior author.

EVIDENCE (Fig.1)

Sample No. 556 consists of four rock specimens, of two quite different rock types. The two specimens which are now regarded as coming from a formation of probably Devonian age consist of a fine-grained, yellow-brown and pale red, very micaceous flaggy sandstone with plant remains. The other two rock specimens consist of a finely micaceous sandy siltstone, greyish purple in colour, which contains non-identifiable marine fossils.

On the smaller of the two flaggy sandstone specimens is an impression of a lycopodinaean plant that is known to be widely distributed in Australia, especially in Upper Devonian rocks. It is the genus Leptophloeum. This plant fossil has not only been met with frequently in Victoria, New South Wales, and Queensland but it was found not long ago also in Northern Australia (Öpik, 1950). The specimen, for example, from the early Upper Devonian Cockatoo Sandstone identified and figured as Leptophloeum cf. L. australe (McCoy) by Öpik (1950, pl. 1) is specifically identical with the specimen in the Reeves collection.

On the larger of the two flaggy sandstone specimens is an impression of another plant. Assuming that the specimen belongs to the formation which contains Leptophloeum it is likely that it belongs to the psilophytanaean genus Asteroxylon. Because of its poor preservation one could not venture to identify it as belonging to that genus if it were presented without some evidence of its age..

CONCLUSIONS.

The presence of Devonian (or Early Carboniferous?) rocks as far south-east as Gregory's Salt Sea is of some importance to the search for oil in the Kimberley Division of Western Australia because it extends the area of possible source rocks quite considerably.

Gregory's Salt Sea is about 100 miles south-east of the nearest known outcrop of Upper Devonian rocks on Christmas Creek (Fitzroy Basin).

A satisfactory correlation of this possible Devonian with parts of the known sequences to the north-west and north-east is impossible at this stage. It is nevertheless interesting to note that, in northern Australia, Leptophloeum [cf. L. australe (McCoy)] has so far only been found in rocks of early Upper Devonian age (Öpik 1950). If the beds near Gregory's Salt Sea also have that age there is a possibility that the Ordovician is not far below, and Ordovician rocks are of particular interest to oil exploration in this part of Australia.

It must, however, be kept in mind that Leptophloeum australe (a species in need of taxonomic and stratigraphic revision) is not necessarily confined to the early Upper Devonian. It may range into the Early Carboniferous. According to A.A. Öpik (oral communication) there is a non-verified record of Leptophloeum from near Fitzroy Crossing, which would, if confirmed, indicate that the genus occurs also in the later Upper Devonian. However, such confirmation has as yet not been obtained in spite of an intensive search by A.A. Öpik, the junior author of this report, and other geologists. The possibility that the specimen in question (which neither A.A. Öpik nor the authors have seen) was not Leptophloeum, or that it has been carried down by the river from not far distant early Upper or late Middle Devonian formations cannot be ruled out.

For the present, however, the exact range of Leptophloeum is of minor importance. The main point is that Devonian or Lower Carboniferous rocks are found in outcrops much farther to the south-east than was previously anticipated. Whether this extent concurrently means an extension of the structural feature, known as Fitzroy Basin, can, of course, not be evaluated.

REFERENCES

Opik, A.A., 1950 - Notes on Palaeozoic stratigraphy, Cambridge Gulf area. Bur.Min.Resour.Aust.Rec., 1950/31.

Reeves, F., 1949 - Geology and oil prospects of the Desert Basin, Western Australia. Vacuum Oil Co., Melbourne, Unpubl. rep.

Fig.1

Leptophloeum cf. L.australe (McCoy) from 9 miles N80E of Pallotine Mission, near Gregory's Salt Sea, W.A.
(x1)