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RECORDS.

1962/131

PLANT FOSSILS IN ENEABBA NO. 1 WELL (WEST AUSTRALIAN PETROLEUM PTY. LIMITED)

by

Mary E. White.

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SUMMARY

A Jurassic age is suggested for cores 6 and 8 on the presence of Araucarites sp.. An Upper Triassic or Lower Jurassic age is indicated for core 12.

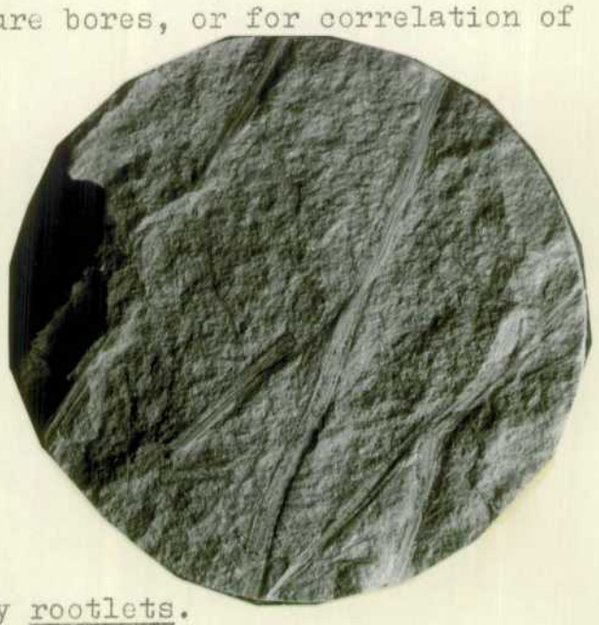
Core samples from Eneabba No.1 Well containing plant fossils were submitted by the West Australian Petroleum Pty. Limited for examination. Preliminary reports on the fossils were submitted to the company and the preparation of an illustrated Record was delayed until the Well was completed.

Details of cores and plants identified are as follows:

1. Core No.1: 414-432 feet.

(a) Stems, between 0.3 cm and 1 cm wide, vertically striated. No noding or branching. The striation is not regular as in Equisetalean stems. While these stems are indeterminate, they have a characteristic appearance. They are illustrated in Figure 1 in the belief that they might be useful for comparison with specimens from future bores, or for correlation of horizons.

Figure 1.
Striated stems.



(b) Filaments, possibly rootlets.

(c) Small triangular scales as illustrated in Figure 2. These may be cone scales or could be small leaves of the type which occur adpressed to stems in some conifers.

Figure 2.
Small Triangular Scales. Magn. X 3.

2. Core No. 2: 816 - 834 feet.

Indeterminate wood and stem fragments and macerated plant material.

3. Core No. 5: 2180 - 2194 feet.

Indeterminate.

4. Core No. 6: 2551 - 2559 feet.

(a) Indeterminate wood and stem fragments.

(b) Two small cone scales, illustrated in Figures 3 and 4. These scales are broad and shallow and not like any figured species of Araucarites. Their single seed and general appearance, however, suggest affinity with Araucarineae. Such scales probably indicate Jurassic age (or younger).

Figure 3.

Figure 4.

Magnification X 3.

(c) Detached small seed, heart shaped, 2mm x 3mm, emarginate at the micropyle, with a round macule. Similar to the seed attached to the scale in Figure 3.

(d) Large, indeterminate, branching stem.

5. Core No.7: 3085 - 3103 feet.

Indeterminate fragments.

6. Core No.8: 3388 - 3404 feet.

(a) Indeterminate stem fragments.

(b) Two cone scales, illustrated in Figures 5 and 6. The smaller, Figure 5, resembles Araucarites arberi Walk., which was described from the Burrum Series in Queensland. (Walkom, 1919).

The larger, Figure 6, is similar to Araucarites Milleri from the Upper Jurassic of Scotland. (see Seward, 1919, p.263).

It is not impossible that the smaller scale is an immature example of the same species as the larger. Whereas Araucarites is a natural genus related to the modern Araucaria, the species are Form-species to a great extent. Araucarian Cone Scales of these types first appear in Jurassic strata. An age determination of Jurassic or younger can therefore be made.

Figure 5.

Figure 6.

Magnification X 2.

7. Core No. 12: 9947 - 9955 feet.

(a) Phlebopteris polypodioides Brong. In Australia this fern is known only from the Brighton Beds in Queensland. (Uppermost Triassic age - Jones and de Jersey, 1947.) In Europe it has a Rhaetic and Jurassic distribution. Figure 7 illustrates the specimen.

Figure 7.
Phlebopteris polypodioides Brong.
Magn. X 2.

(b) "Neuropteris punctata Shirley." Leaf fragments in which secondary veins bifurcate but do not anastomose, with small, round pits, just visible to the naked eye scattered all over the cuticle surface between secondary veins, were referred to the species by Shirley in 1898. Walkom, 1917, regarded them as examples of Danaeopsis hughesi Feist. Figure 8 illustrates a specimen in core 12 with pits clearly visible. Cuticle was preserved on parts of the impression surface and Dr. P.R. Evans kindly prepared some fragments for microscopic investigation. Figure 9 shows a portion of one of the prepared cuticle fragments. Stomata with guard cells are clearly seen. Although a number of cuticle fragments were processed, some from areas of the specimen where "punctata" were present, no good preparation of the spots was possible. In one example, a round dark patch on the cuticle, approximately 100 micron in diameter was seen indistinctly. It appeared to be a bulge in the cuticle and seemed to be one of the "punctata." The "punctata" are of great interest as they may be reproductive structures. Small sporangia similarly scattered on cuticles between veins occur in "Dicroidium sp." from the Molteno Beds in South Africa (M.E. White, MS). An attempt will be made to prepare further cuticle fragments from "Neuropteris punctata." The establishment of generic identity with the South African specimens would assist greatly in elucidating systematic problems. Danaeopsis hughesi might be proved conclusively to be a Dicroidium.

Figure 8.

"Neuropteris punctata Shirley"

Magnification X 3.

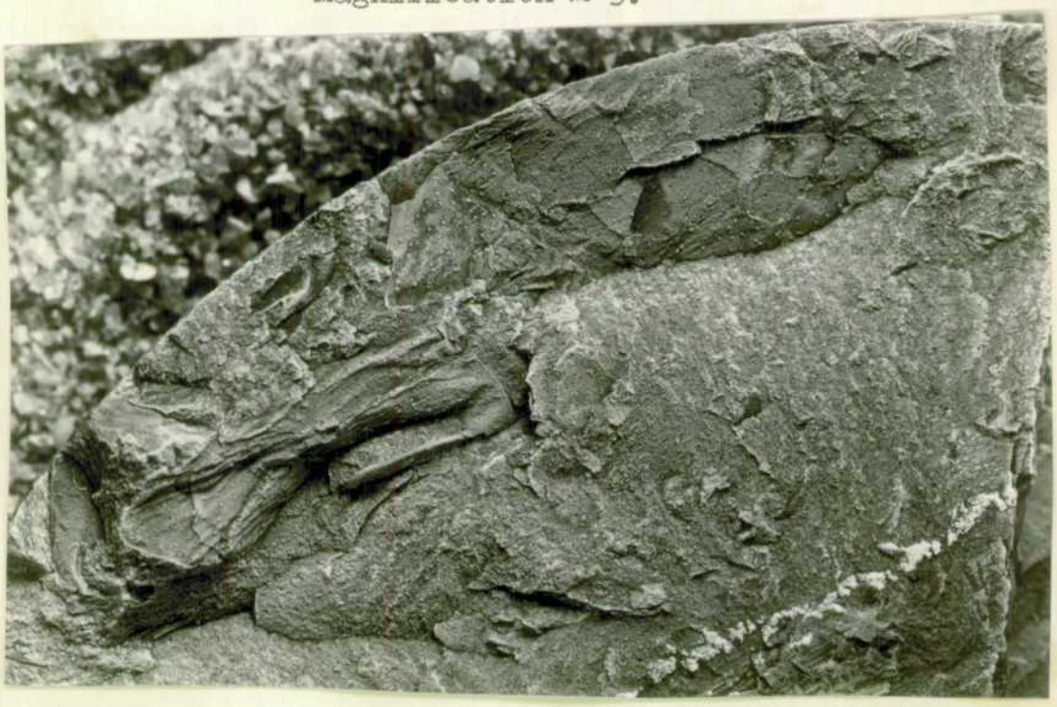


Figure 9.

Cuticle Fragment from"N. punctata"

"Neuropteris punctata Shirley" was described from the Ipswich Series at Denmark Hill in Queensland. Danaeopsis hughesi occurs in the Ipswich Series (Walkom 1917 and Jones and de Jersey 1947) and in the Culvida Sandstone in Western Australia (White, 1957); also in the Clarence Series of N.S.W.. The type material for the species was described by Feistmantel (1882) from the Middle Gondwana Series in India. The species occurs also in the Rhaetic of South Africa, China and Tonkin.

(c) Parts of leaves of Linguifolium type. Figure 10 shows an example. There is no indication whether the leaves were simple or pinnate. A single pinnule such as is seen in Figure 10 can be referred to Linguifolium Arber (Arber 1917). It resembles Linguifolium denmeadi Jones & de Jersey but could also be referred to Phyllopteris feistmanteli. Classification of parts of leaves of this type on purely morphological criteria is difficult. There is no significant difference from Danaeopsis hughesi.

Figure 10.

Leaf of Linguifolium type.

Magnification X 2.

(d) Parts of leaves of Danaeopsis hughesi type.

Figure 11 shows a leaf fragment referred to Danaeopsis hughesi Feist. A cuticle fragment from this specimen showed epidermal cell and stomata arrangement apparently the same as in Figure 9 of "Neuropteris punctata."

Figure 11.

Danaeopsis hughesi Feist.

Magnification X 2.

(e) Fragment of Dictyophyllum sp. Figure 12. The range of such ferns is Triassic to Lower Cretaceous.

Figure 12.

Dictyophyllum sp. Magn. X 2.

(f) Fragment of small pinnule of Dicroidium type. Such forms have Triassic and Jurassic range.

(g) Equisetalean stem fragments. Indeterminate, and of no value in determining age.

Age of plant fossil horizon in core 12:

Plant evidence appears to indicate an Upper Triassic age. However, it does not preclude the possibility of Lower Jurassic age.

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