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A number of specimens of fossil wood from different localities and from rocks of different ages were collected in 1957 and 1958 by the Georgina Geological Party under J.N. Casey; these specimens were sectioned and a summary of the descriptions and determinations made are given below. All specimens are conifers.

The slides and wood specimens are housed in the Bureau of Mineral Resources Museum, Canberra.

B349a — Mesembrioxylon-Podocarp. or possibly non-resinous Cupressinoxylon.

From 1 mile east of Bottom 6 Mile Bore, 9 miles north-north-east of Boulia, run 12, photo 5153, Boulia 4-mile sheet.

The form is a gymnospermum wood with a probable range from Jurassic to Recent (Sahni 1920 "Petrified Plant Remains from Queensland Mesozoic and Tertiary", Qld. Geol. Surv. Publ. 267). The wood is from the probable Tertiary Marion Formation. A transverse and a radial section are available. The section shows 7 rings per inch, not wavy, rings clearly marked, autumn wood brown; towards the pith there are a few tension cracks in the medullary rays and many irregular tangential breaks. No evidence of compression wood. Some black opaque material in the lumen is possibly manganese. Resinous tracheids very numerous in one section.

B349b — Cupressinoxylon - very similar to Athrotaxis.

Locality is as for B349a.

A transverse, tangential and radial sections are available.

The stem of the wood is 2 inches thick and section shows a number of fractures; rings are 10 per inch with well defined growth rings, some false. Evidence of compression which has disrupted tissues, and the displacement is in the same direction throughout. Each ring contains resin cells, mainly in tangential bands which occur in any part of the ring.

C143 — Not a typical Coniferales, but nearest to Araucarineae (Hoop Pine Gp.)

From 3½ miles north-west of Tent Hills Bore, Herbert Downs Station, on run 11, photo 5195, Glenormiston 4-mile sheet, Queensland.

The wood was lying on white siltstone of the Lower Cretaceous Wilgunya Formation; it is not certain whether the

specimen weathered from the siltstone beds or came from an eroded younger overlying formation.

Radial, tangential and cross sections are available.

Section shows 66 rings per inch, slightly sinuate; elements are arranged in festoons and radial lines. Tracheids are mostly filled with a yellow brown deposit leaving the walls colourless.

There are only 5 to 6 rows of springwood cells followed by one to three of autumn wood; the pattern of the wood is unique. The sections are very different from any modern wood; the tracheids are double the usual size. There are one or two patches without any content and these show very large tracheids.

The exceedingly fine uniseriale rays are up to 26 cells high.

The number of rings per inch, the very symmetrical arrangement of tracheids in radial and tangential directions, the very large tracheids and their pitting with exceedingly fine medullary rays, the joins of tracheid tip with tracheid, and the number of septa in tracheids are points in which this wood differs from any modern conifer.

S38 Conifer.

From 2 miles west of No. 2 Dam, Springvale Station, on run 5, photo 5191, Springvale 4-mile Sheet, Queensland.

It occurs in yellow-brown decalcified fine sandstone overlying grey siltstone of the Lower Cretaceous Wilgunya Formation; the fine sandstone is thought to be Lower Cretaceous but the Queensland Geological Map (1953) has this area shown as Upper Cretaceous Winton Formation.

Tangential, transverse and radial sections available.

No detail can be seen in the sections which are replaced by dark brown ferruginous material. The transverse section shows the wood to be a conifer but the preservation is very poor.

W103 Conifer

From 2 miles east of Sun Hill, Glenormiston Station, on the track from Glenormiston to Marked Tree Waterhole; on run 1, photo 5017, Mt. Whelan 4-mile Sheet, Queensland.

It occurs as rubble overlying Lower Cretaceous Longsight Sandstone.

Transverse, radial and tangential sections are available, but all are strongly replaced by quartz except on the edges where tracheids are visible; the tracheids are quite large and thin walled; there is evidence of rings. Not enough detail to extend identification past Conifer.

W201 Conifer

1½ miles east of Charlies Yard, Marion Downs Station, on road from Marked Tree Waterhole to Old Herbert Downs; is on run 2 photo 5019 of Mt. Whelan 4-mile Sheet, Queensland.

The sample comes from sandstone and siltstone beds over a fine conglomerate which rests on Ordovician dolomite; - sandstone and siltstone is Lower Cretaceous Longsight Sandstone.

Two radial sections available, but material badly preserved and detail poor; tracheids show it to be a conifer.

W291 Mesembrioxylon.

Two miles north of 20-Mile Bore, Glenormiston Station, on east side of track from the Bore to the homestead; on run 4, photo 5113, Mt. Whelan 4-mile sheet, Queensland.

It occurs on the surface surrounded by Lower Cretaceous Longsight Sandstone; the wood has similar sandstone cemented to the surface.

Two cross sections and two radial sections available. The Sections show 40 rings per inch, pinnate, well marked summer and autumn wood. Autumn wood 1/3 to $\frac{1}{2}$ of the ring. Some rings show lateral displacement due to compression forces. These are very good sections. The wavy rings, high number per inch, amount of autumn wood suggest a very different climate with a very marked summer and winter season of the kind we find in Tasmania today. No Queensland wood now has a structure like this. Occasional tracheids are septate and parenchyma may be without content.

A conifer - probably Mesembrioxylon.

A specimen W291a from the same locality has one radial section and it appears to be the same wood as W291.

A specimen labelled W291(4), a cross section from the same locality, shows a series of compression failures, one with each growth ring.

The deflection of the medullary rays occurs in the autumn wood in each case - tracheids and medullary rays are deviated to the right. There are 34 rings per inch. Resin-filled tracheids are fairly numerous.

HR1 Cupressinoxylon or Podocarp.

$3\frac{3}{4}$ miles south of Burnt Well, Tobermory Station and on run 1, photo 5041, Hay River 4-mile sheet, N.T.; the point is actually on the southern part of the Tobermory 4-mile sheet.

It occurs in situ in clayey sandstone, slumped in part which is regarded as basal Mesozoic in this area overlying stacks of Ordovician dolomite; the sandstones are regarded by some as Permian and of possible fluvio-glacial origin.

A cross section and radial section are available.

Rings widely sinuate; best seen with lens; one patch 40 rings per inch. Hexagonal lines of silica thickening are seen in each tracheid. Some tracheids are rounded and air spaces are common as in compression wood. Resin cells are scattered, but at times inclined to be terminal.

HR55 Cupressinoxylon or Podocarp.

$4\frac{1}{2}$ miles south of Burnt Well, Tobermory Station and $1\frac{1}{4}$ miles south-east of HR1.

Geological setting is the same as HR1 except base consists of carbonates of probably Ordovician age.

A radial and tangential section available of HR55 and similar specimen HR55a.

Radial section shows rays mostly filled with dark grey material. Parenchyma much the same as in HR1.

Tangential section shows half of section is radial and half tangential. Not much detail; tracheids mostly are not visible. Very similar to HR1. Cross section was not seen. The section HR55a has a marked incurve; rays are clear, but lumen is filled with dark grey-black material; rays seem much higher than in previous sections; vertical tracheids are almost undefined in large part; may be same as HR1 and HR55.

T72a — Probably Cupressinoxylon or Podocarp.

From ½ mile south of Cragies Dam, boundary of Marqua and Tobermory Stations but on Tobermory Station; on run 13, photo 5057, Tobermory 4-mile sheet, N.T.

It occurs in sandstone of probable Mesozoic age which overlies Precambrian fluvio-glacial boulder beds.

Two radial sections are available.

This is cut nearly radially, but the silica replacement is poor indetail; no certain ray detail can be made out.

It would be hazardous to make a determination on these radial sections only. What one can observe is not inconsistent with HR55.

Jynoomah Station — Conifer

From near top of ridge, ¾ mile south of Roundstone Dam, Jynoomah Station, Tambo area. Not in situ but lying on leached and ferruginized siltstone of Lower Cretaceous ? Tambo Formation.

Radial and tangential sections available.

The sections are bright yellow and show little detail.

The radial section is off radial; it shows no definite structure in detail. Transverse section would help. These sections are not good enough to go beyond saying it is a conifer.

RECOMMENDED LINES OF FURTHER WORK ON FOSSIL WOODS OF AUSTRALIA

There is very little literature that may be consulted especially in Australia.

Two types of material occur:

1. Preserved material, e.g. in Brown coal deposits which may be microtomed. This has suffered little change and the detail of structure may be there.

2. Lithified material in which there has been a more or less imperfect replacement of the woody material generally by silica or sometimes iron oxide. This may give all the detail or very little in the cas. of silica, and may be worthless for sectioning where dealing with iron oxide.

The fossil woods of Australia are likely to be very different from those of Europe. At present there is no type material to which one may go for reference. It is very desirable to have micro-slides of as much typical material as possible and the following suggestions may be of value:

1. Systematic examination of material available from different areas.

2. Full technical descriptions of each wood to be made using the card system and a tentative scheme of classification used. Information on correlated field data to be carefully recorded.

3. Other data bearing on conditions of growth, structural changes, stresses, etc. to be recorded.

4. Punched card system for immediate reference to be used and gradually built up.

5. Linkages with present existing woods to be stressed wherever possible.

6. Where there is any doubt about the value of sectioning only a cross section to be cut until it is seen whether radial and tangential sections would be justified.

7. Specimens of typical material or sections from the States and their co-operation would be of great value in the initial build up.

8. All material especially the microslides to be housed for reference in a slide cabinet provided with aluminium holders each taking five slides.