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BY
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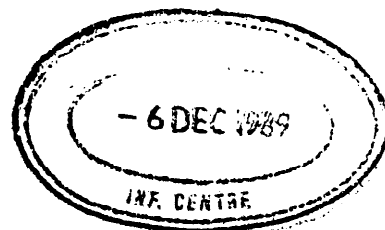
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INTRODUCTION:

Steve Tickell of the Basin Studies Section, Geological Survey of Victoria submitted two samples for palynology. Zonations used are those of Helby et al (1987) in the Cretaceous and Partridge (1976) for the Tertiary, and are shown on figure 1.

DISCUSSION:

- A. Moomowroong-1, core from 201-3m, co-ordinates 699294 5723256 : upper T. longus Zone (I. druggii Dinoflagellate Zone) : latest Maastrichtian : marginal marine : immature.

This sample yielded an abundant and diverse microflora containing 99% spores and pollen and only 1% dinoflagellates. Amongst the spores and pollen, the co-occurrence of Tricolpites confessus, and Triporopollenites sectilis with Ticolpites longus indicates the T. longus Zone. The dominance of G. rudata over N. endurus indicates the upper part of the zone. Proteacidites spp. dominate the assemblage, with G. rudata frequent. Other useful species include T. lillieii, T. waipawaensis and Proteacidites "hapukii".

The very rare dinoflagellates comprise entirely

| AGE | | SPORE - POLLEN ZONES | DINOFLAGELLATE ZONES | |
|------------------------|------------------|-------------------------------|---------------------------|-------------------------|
| Early Tertiary | Early Oligocene | <i>P. tuberculatus</i> | | |
| | Late Eocene | upper <i>N. asperus</i> | <i>P. comatum</i> | |
| | | middle <i>N. asperus</i> | <i>V. extensa</i> | |
| | Middle Eocene | lower <i>N. asperus</i> | <i>D. heterophlycta</i> | |
| | | | <i>W. echinosuturata</i> | |
| | Early Eocene | | <i>P. asperopolus</i> | <i>W. edwardsii</i> |
| | | | upper <i>M. diversus</i> | <i>W. thompsonae</i> |
| | | | | <i>W. ornata</i> |
| | | | middle <i>M. diversus</i> | <i>W. waipawaensis</i> |
| | | | lower <i>M. diversus</i> | |
| | | | | <i>W. hyperacantha</i> |
| | Paleocene | upper <i>L. balmei</i> | | <i>A. homomorpha</i> |
| | | | | |
| lower <i>L. balmei</i> | | | <i>E. crassitabulata</i> | |
| | | | <i>T. evittii</i> | |
| Late Cretaceous | Maastrichtian | <i>T. longus</i> | <i>M. druggii</i> | |
| | Campanian | <i>T. illiei</i> | <i>I. koronense</i> | |
| | | <i>N. senectus</i> | <i>X. australis</i> | |
| | Santonian | <i>T. pachyexinus</i> | <i>N. aceris</i> | |
| | | | <i>I. cretaceum</i> | |
| | Coniacian | | <i>C. porlieri</i> | |
| | Turonian | <i>C. triplex</i> | <i>C. striatoconus</i> | |
| | Cenomanian | | | <i>P. infusorioides</i> |
| | | | <i>A. distocarinatus</i> | |
| | Early Cretaceous | Albian | Late | <i>P. pannosus</i> |
| Middle | | | upper <i>C. paradoxa</i> | |
| Early | | | lower <i>C. paradoxa</i> | |
| Aptian | | | <i>C. striatus</i> | |
| | | | upper <i>C. hughesi</i> | |
| | | lower <i>C. hughesi</i> | | |
| Barremian | | | | |
| Hauterivian | | <i>F. wonthaggiensis</i> | | |
| Valanginian | | upper <i>C. australiensis</i> | | |
| Berriasian | | lower <i>C. australiensis</i> | | |
| Juras | Tithonian | <i>R. watheroensis</i> | | |

FIGURE 1

ZONATION FRAMEWORK

Isabelidinium spp., including I. druggii and I. conorata, clearly indicating the I. druggii dinoflagellate zone of latest Maastrichtian age.

Marginally marine environments are indicated by the trace dinoflagellates amongst the common and diverse spores and pollen.

These features are normally seen in the upper Timboon Sand and equivalents, although a very slightly younger assemblage has occasionally been seen in dark shales from petroleum wells.

Colourless spore colours indicate immaturity for oil generation.

- B. Gellibrand River Road outcrop in road cutting co-ordinates 70095 7232 : upper L. balmei (A. homomorphum Dinoflagellate Zone) : latest Paleocene : nearshore marine : immature.

This sample yielded an abundant and diverse microflora containing dominant plant cuticle but also frequent palynomorphs. Amongst the spores and pollen (90% of palynomorphs), the co-occurrence of Gambierina rudata with Proteacidites grandis indicates the upper L. balmei Zone of latest Paleocene age. Dilwynites spp. dominate the assemblage, with frequent Haloragacidites harrisii. Other useful species include Malvacipollis diversus, M. subtilis, Tripunctisporis punctatus and Tricolpites phillipsii. Traces of Cretaceous reworking were seen.

Amongst the dinoflagellates, oldest Apectodinium spp. (A. homomorphum, A. quinquelata) without younger markers, indicate the A. homomorphum Zone of latest Paleocene age. Cordosphaeridium spp. dominate the assemblage, with Deflandrea spp. (D. medcalfii and D. dartmooria)

subordinate.

Nearshore marine environments are indicated by the abundant cuticle, dominant and diverse spores and pollen and minor dinoflagellates (10% of palynomorphs) and their low diversity.

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APPENDIX 1

| <u>SPORE POLLEN</u> | <u>A</u> | <u>B</u> |
|--|----------|----------|
| Araucariacites australis | X | - |
| Australopollis obscurus | - | X |
| Clavifera triplex | - | X |
| Cicatricosporites australiensis | - | X |
| Corollina torosus | X | - |
| Cyathidites spp. | X | X |
| Dilwynites granulatus | - | C |
| Dictyotosporites speciosus | X | X |
| Falcisporites similis | X | - |
| Gambierina rudata | F | - |
| Gleicheniidites circinidites | X | X |
| Haloragacidites harrisii | - | X |
| Herkosporites elliotii | X | F |
| Lygistepollenites florinii | X | - |
| Malvacipollis diversus | - | X |
| Malvacipollis subtilis | - | X |
| Nothofagus brachyspinulosus | - | X |
| Nothofagus endurus | R | X |
| Periporopollenites polyoratus | X | X |
| Phyllocladidites mawsonii | X | - |
| Phyllocladidites verrucosus | X | - |
| Podosporites microsaccatus | X | X |
| Proteacidites annularis | - | X |
| Proteacidites grandis | - | X |
| Proteacidites hapukui | X | - |
| Proteacidites spp. | C | - |
| Retitriletes austroclavatidites | X | X |
| Stereisporites antiquisporites | X | X |
| Stereisporites (Tripunctisporis) punctatus | - | X |
| Stereisporites regium | X | - |
| Tricolpites confessus | R | - |

| | | |
|-------------------------------|---|---|
| Tricolpites gillii | X | X |
| Tricolpites longus | X | - |
| Tricolpites phillipsii | - | X |
| Tricolpites waiparaensis | X | - |
| Tricolporites lilliei | X | - |
| Triporoletes reticulatus | X | - |
| Triporopollenites sectilis | X | - |
| Verrucosisporites kopukuensis | - | X |

DINOFLAGELLATES

| | | |
|----------------------------------|---|---|
| Apectodinium homomorpha *(1.sp.) | - | X |
| Apectodinium quinquelata | - | X |
| Cordosphaeridium multispinosum | - | X |
| Cordosphaeridium inodes | - | C |
| Deflandrea dartmooria | - | X |
| Deflandrea medcalfii | - | F |
| Deflandrea truncata | - | ? |
| Isabelidinium conoratum | X | - |
| Isabelidinium druggii | ? | - |
| Operculodinium centrocarpum | - | X |
| Paralecaniella indentata | - | X |