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PALYNOLOGICAL ZONATION OF
UPPER CRETACEOUS SEDIMENTS
OF THE OTWAY BASIN

by

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PALYNOLOGICAL ZONATION OF UPPER CRETACEOUS SEDIMENTS OF THE
OTWAY BASIN

1. INTRODUCTION

This report includes a summarized account of the distribution of the Upper Cretaceous spore-pollen zones defined by Dettmann and Playford (1969) in subsurface sections of the Otway Basin. The report thus represents an extension to previous accounts on the palynological zonation of Lower and early Upper Cretaceous strata of the Otway Basin (Dettmann 1969a,b). The well sections and sampling depths studied have been assessed in terms of the spore-pollen zones of Dettmann and Playford (1969); this publication should be consulted for criteria upon which the zones are based, and age relationships of the zones.

2. SOUTH AUSTRALIA

South Australian sediments of Upper Cretaceous age that have been examined by the author occur in Esso Crayfish A-1 and Alliance Kalangadoo No.1. Information of the spore-pollen zones represented in the material studied is documented by Dettmann (1969b).

3. VICTORIA

3.1 Oil Exploration Wells

1. Planet Heathfield No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 1	960-75	<u>Triorites edwardsii</u> Zone of Harris 1965
" 2	1578-93	<u>Nothofagidites</u> or <u>Tricolpites pachyexinus</u>
" 3	1858-63	? <u>Tricolpites pannosus</u>

Reference: Dettmann 1965b,d.

2. F.B.H. Pretty Hill No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 2	1816-36	<u>Duplopollis orthoteichus</u> Zone of Harris 1965
" 4	2583-403	<u>Nothofagidites</u> or <u>Tricolpites pachyexinus</u>
" 6	2726-39	<u>Tricolpites pachyexinus</u>

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 7	2928-40	<u>Tricolpites pannosus</u>

Reference: Dettmann 1963b; 1964i; 1968d.

13 F.B.H. Eumeralla No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 3	2108-21	<u>Duplopollis orthoteidhus</u> Zone of Harris 1965 or younger
" 4	2835-49	<u>Tricolpites pachyexinus</u>
" 5	3311-21	<u>Tricolpites pannosus</u>

Reference: Dettmann 1963b; 1964i; 1968d.

14 F.B.H. Flaxmans No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 2	3561-73	<u>Triorites edwardsii</u> Zone of Harris 1965
" 3	4126-34	<u>Nothofagidites</u>
" 4	4309-16	"
" 5	4479-96	"
" 6	4687-95	"
" 7	4695-714	"
" 8	4974-83	<u>Tricolpites pachyexinus</u>
" 9	4983-93	"
" 10	5330-36	"
" 11	5358-76	"
" 12	5376-96	"
" 13	5458-63	"
" 14	5531-39	"
" 15	5543-46	"
" 16	5950-70	"
" 17	6375-91	<u>Clavifera triplex</u>
" 18	6606-16	"
" 19	6616-26	"
" 20	6626-36	"
" 21	6832-72	"
" 24	6882-902	not determinable
" 25	6902-13	"
" 26	6982-7000	"
" 27	7200-20	<u>Appendicisporites distocarinatus</u>

Reference: Dettmann 1964b.

1.5 F.B.H. Port Campbell No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 7	2540-66	<u>Triorites edwardsii/Duplopollis orthoteichus</u> Concurrent Zone of Harris 1965
" 8	2915-53	<u>Nothofagidites</u>
" 10	3333-40	"
" 11	3600-18	"
" 13	3997-4009	"
" 14	4280-83	"
" 15	4284-93	"
" 16	4518-36	<u>Tricolpites pachyexinus</u>
" 17	4754-64	"
" 18	4862-69	"
" 19	5018-26	"
" 20	5026-31	"
" 21	5223-33	"
" 22	5660-70	not determinable
" 23	5700-18	<u>Appendicisporites distocarinatus</u>
" 24	5932-34	"

Reference: Dettmann 1964a.

6 F.B.H. Port Campbell No.2

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 1	5340-43	<u>Tricolpites pachyexinus</u>
" 2	5355-61	"
" 3	5910-19	"
" 12	7093-103	<u>Clavifera triplex</u>
" 4	7403-09	"
" 13	7680-94	"
" 5	7885-97	"
" 6	7904-13	"
" 7	7913-30	"
" 8	8096-110	<u>Appendicisporites distocarinatus</u>

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 9	8174-88	<u>Appendicisporites distocarinatus</u>
" 10	8306-11	"
" 14	8313-19	"
" 11	8339-46	"
" 15	8409-18	"
" 16	8556-70	<u>Tricolpites pannosus</u>
" 17	8605-24	"
" 18	8826-46	not determinable

Reference: Dettmann 1964a.

7 F.B.H. Port Campbell No.3

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 1	4400-10	<u>Tricolpites pachyexinus</u>
" 2	4676-95	<u>Appendicisporites distocarinatus</u>
" 3	4781-801	"
" 4	5155-65	not determinable
" 5	5526-30	<u>Coptospora paradoxa</u> (Unnamed unit)

Reference: Dettmann 1964a.

8 F.B.H. Port Campbell No.4

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 2	2892-912	<u>Nothofagidites</u>
" 3	3206-26	"
" 4	3226-45	"
" 5	3518-19	"
" 6	3519-36	"
" 7	3821-38	"
" 8	4112-32	<u>Tricolpites pachyexinus</u>
" 9	4269-89	"
" 10	4580-600	"
" 11	4600-08	"
" 12	4894-914	<u>Clavifera triplex</u>
" 13	4977-85	"
" 14	4985-5005	? <u>Appendicisporites distocarinatus</u>

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 15	5152-67	<u>Appendicisporites distocarínatus</u>
" 16	5456-76	not determinable
" 17	5754-70	<u>Tricolpites pannosus</u>

Reference: Dettmann 1964h.

9 F.B.H. Sherbrook No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 9	3565-78	<u>Tricolpites pachyexinus</u>
" 10	3596-601	"
" 11	3825-26	<u>Appendicisporites distocarínatus</u>
" 13	4049-51	<u>Doptospora paradoxa</u> (unnamed unit)

Reference: Dettmann 1964d.

10 F.B.H. Fergusons Hill No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 1	1554-74	<u>Tricolpites pachyexinus</u>
" 2	1767-87	not determinable
" 3	2020-31	<u>Clavifera triplex</u>
" 4	2090-110	not determinable
" 5	2427-37	<u>Appendicisporites distocarínatus</u>
" 6	2437-49	"
" 7	2741-60	not determinable
" 8	3085-105	"
" 9	3105-11	? <u>Tricolpites pannosus</u>

Reference: Dettmann 1964d.

// Shell Voluta No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
sidewall	4370	<u>Trilorites edwardsii</u> of Harris 1965
core		
"	4566	lowermost Tertiary - uppermost Cretaceous
"	4587	"
"	4620	<u>Nothofagidites</u>
core 5	4631	"
"	4648	"

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
sidewall core	478½	<u>Nothofagidites</u>
"	4806	"
"	4878	"
"	4912	"
core 6	4952	"
"	4958	"
sidewall core	5086	"
"	5214	"
"	5307	"
"	5332	"
core 7	5481	"
"	5498	"
sidewall core	5530	"
"	5567	"
"	5630	"
"	5773	"
core 8	5885	"
"	5895	"
sidewall core	5971	"
"	6054	"
"	6131	"
core 9	6277	"
"	6302	"
sidewall core	6482	"
"	6562	"
core 10	6680	"
"	66843/4	"
sidewall core	6793	"
"	6917	"
core 11	7099	<u>?Nothofagidites</u>
"	7101	<u>Tricolpites pachyexinus</u>
"	7103	"
sidewall core	7320	"
"	7598	"
core 12	7598	"
"	7612	"

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
sidewall core	7755	<u>Tricolpites pachyexinus</u>
"	7971	"
core 13	8085	"
sidewall core	8224	"
"	8387	"
"	8438	"
core 14	8617	"
sidewall core	8623	"
core 15	8768	"
sidewall core	8779	"
"	8901	"
core 16	9962 1/2	<u>?Clavifera triplex</u>
" 17	10472 5/6	"
" 18	10904 3/4	"
" 20	11512 1/2	"
" 21	11989 5/6	"
Junk sample	12634	not determinable
"	12767	"
Ditch cutting	13010-20	"

Reference: Dettmann 1968e.

14 Shell Pecten No.1

SAMPLE	DEPTH	SPORE-POLLEN ZONE
sidewall core	3618	<u>Triorites edwardsii</u> Zone of Harris 1965
"	3695	lowermost Tertiary - uppermost Cretaceous
"	3735	"
"	3797	"
"	3833	"
"	3908	<u>Nothofagidites</u>
"	4044	"
"	4248	"
"	4403	"
"	4493	"
"	4618	"
"	4685	"

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
sidewall core	4785	<u>Nothofagidites</u>
"	5030	"
"	5078 5078	<u>Tricolpites pachyexinus</u>
"	5182	"
"	5300	"
"	5398	"
"	5650	"
"	5755 5755	<u>Clavifera triplex</u>
"	5827	<u>Appendicisporites distocarinatus</u>
"	5920	<u>Tricolpites pannosus</u>

Reference: Dettmann 1967a,c,d,e,

7 Shell Nerita No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
sidewall core	3704	<u>Triorites edwardsii</u> Zone of Harris 1965
"	3867	lowermost Tertiary - uppermost Cretaceous
"	4065	"
"	4245	<u>Nothofagidites</u>
"	4372	"
"	4534	"
"	4660	"
"	4782	"
"	4804	? <u>Crybelosporites striatus</u>

Reference: Dettmann 1967b.

8 Oil Development Anglesea No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 5	1506-26	<u>Triorites edwardsii</u> Zone of Harris 1965
" 6	1778-98	<u>Nothofagidites</u>
" 7	1931-51	<u>Coptospora paradoxa</u> or <u>Crybelosporites striatus</u>

Reference: Dettmann 1965c.

3.2 Government Water Bores

1 V.D.M. Timboon No.5

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core AO	2182-94	<u>Triorites edwardsii</u> Zone of Harris 1965
" AP	2283-303	lowermost Tertiary - uppermost Cretaceous
" AQ	2374-94	<u>Nothofagidites</u>
" AS	2496-516	"
" AT	2588-308	"
" AU	2710-30	not determinable
" AV	2832-52	<u>Nothofagidites</u>
" AW	2949-63	"
" AX	3072-77	<u>Tricolpites pachyexinus</u>
" AY	3163-73	"
" AZ	3286-97	"
" BA	3407-10	<u>Appendicisporites distocarinatus</u>
" BB	3500-04	<u>Tricolpites pannosus</u>

Reference: Dettmann 1934c.

2 V.D.M. Wangoom No.2

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core AK	2834-39	<u>Nothofagidites</u> (upper)
" AL	3016-35	<u>Tricolpites pachyexinus</u> (upper).
" AM	3136-53	? <u>Appendicisporites distocarinatus</u>
" AN	3225-45	? <u>Tricolpites pannosus</u>
" AO	3347-49	<u>Tricolpites pannosus</u>

Reference: Dettmann 1964f.

3 V.D.M. Wangoom No.6

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core AS	2974-94	<u>Nothofagidites</u>
" AT	3065-72	<u>Tricolpites pachyexinus</u>
" AU	3121-26	"
" AV	3126-51	"
" AW	3191-94	"

SAMPLE DEPTH (ft.)
core AX 3252-56
" AY 3314-21

SPORE-POLLEN ZONE
Tricolpites pachyexinus
?Coptospora paradoxa (unnamed unit)

Reference: Dettmann 1964f.

4 V.D.M. Mepunga No.7

SAMPLE DEPTH (ft.)
core AR 3017-25
" AS 3227-39
" AT 3413-28
" AU 3623-43

SPORE-POLLEN ZONE
Nothofagidites
Tricolpites pachyexinus
"
Tricolpites pannosus

Reference: Dettmann 1964j.

5 V.D.M. Cooriejong No.1

SAMPLE DEPTH (ft.)
core K 1535-54

SPORE-POLLEN ZONE
Nothofagidites or Triorites edwardsii

Reference: Dettmann 1964j.

6 V.D.M. Panmure No.2

SAMPLE DEPTH (ft.)
core AQ 2593-601

SPORE-POLLEN ZONE
?Tricolpites pachyexinus

Reference: Dettmann 1964j.

7 V.D.M. Yangery No.1

SAMPLE DEPTH (ft.)
core AQ 2591-99
" AP 2712-19
" AQ 2863-67

SPORE-POLLEN ZONE
Tricolpites pachyexinus
"
Clavifera triplex

Reference: Dettmann 1965a.

8 V.D.M. Laang No.1

SAMPLE DEPTH (ft.)
core AT 3532-46
" AV 3869-74

SPORE-POLLEN ZONE
Nothofagidites
Tricolpites pannosus

Reference: Dettmann 1965a.

3.2.9 V.D.M. Belfast No.4

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core AO	3561-65	? <u>Nothofagidites</u>
" AU	5065-73	not determinable

Reference: Dettmann 1965a.

Comments: Samples from between 4492 feet and 4655 feet have been examined by Cookson and Eisenack (1961) and Douglas (1962) who document data indicating that the sediments are referable to the Tricolpites pachyexinus Zone.

3.2.10 V.D.M. Heywood No.10

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core BP	4688-95	<u>Nothofagidites</u>
" BR	4809-22	? <u>Tricolpites pachyexinus</u>
" BS	4920-25	<u>Tricolpites pachyexinus</u>
" BW	5248-302	"
" BY	5380-83	"

Reference: Dettmann 1965a.

3.2.11 V.D.M. Narrawaturk No.2

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core BC	4489-500	<u>Nothofagidites</u>
" BE	4715-30	"
" BF,BG	4973-80	"
" BH	5147-50	"
" BI	5327-36	"

Reference: Dettmann 1965a.

3.2.12 V.D.M. Latrobe No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core CY	1400-15	lowermost Tertiary - uppermost Cretaceous
" DB	1627-31	? <u>Nothofagidites</u>
" DC	1735-39	<u>Tricolpites pachyexinus</u>

Reference: Dettmann 1965a.

4 REFERENCES

With the exception of the following, references cited are those documented in Dettmann 1969b.

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