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Reconnaissance study of Cretaceous & Tertiary Calcareous Nannofossils in three selected drill-holes, Onshore Otway Basin, Victoria.

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Aim : The aim of this first-look investigation was to determine if calcareous nannofossils were present in ?marine Cretaceous sediments in the Otway Basin. The Belfast Mudstone Formation in the Port Campbell No 1 & 2 wells and in Flaxmans No 1 well was chosen because calcareous nannofossils are often abundant and well preserved in similar facies and also because calcareous foraminifera have been previously described from the Belfast Mudstone Formation in these wells (Glaessner & Cookson, 1965).

Five cores from the Lower Heytesbury and Upper Wangerrip Groups were also examined as part of a current Eocene - Oligocene project being undertaken by DBW. Further results as incorporated into this study will be submitted to the Department of Minerals & Energy when available.

Results

Well	Core	Depth(ft)	
Flaxmans No 1	16	5950-5952	no nannofossils
	17	6380-6385	no nannofossils
Port Campbell No 1	1	421-439	Lower Miocene
	2	900-918	Lower Miocene
	3	1067-1077	NP24 Zone(Martini,1971) Upper Oligocene
	4	1457-1475	indeterminate
	5	1475-1493	<u>Discoaster tani ornatus</u> subzone of Shafik (1973)
	17	4758-4760	possible very rare extremely poorly preserved nannofossil
	18	4866-4868	no nannofossils
	19	5021-5022	no nannofossils
	20	5026-5031	no nannofossils
Port Campbell No 2	4	7403-7409	no nannofossils
	5	7885-7897	no nannofossils
	12	7093-7103	no nannofossils
	13	7683-7694	no nannofossils

Calcareous nannofossils (coccoliths,discoasters,holococcoliths etc) is a general term for microscopic fossils (Late Triassic to Recent) marine flagellate algae known as Haptophyceae. Many taxa have wide geographic distributions and short stratigraphic ranges and are therefore extremely useful for internation correlation. A description and review of the group is given by Haq(1978).

Many calcareous nannofossil zonations of Cretaceous intervals have been proposed (see Perch-Nielsen, 1978). A summary of nannofossil events recognised by Thierstein (1976) and Sissingh (1977) and collated by Perch-Nielsen (1978) is shown in Table 1.

Method

The exact depth of each sample within the cored interval is not known. Samples were collected were possible from calcareous intervals (as determined with HCl acid). Nannofossil smear slides were made using standard techniques (Burns, 1979) and examined with a transmitted-light microscope (1000 X, 100 oil immersion).

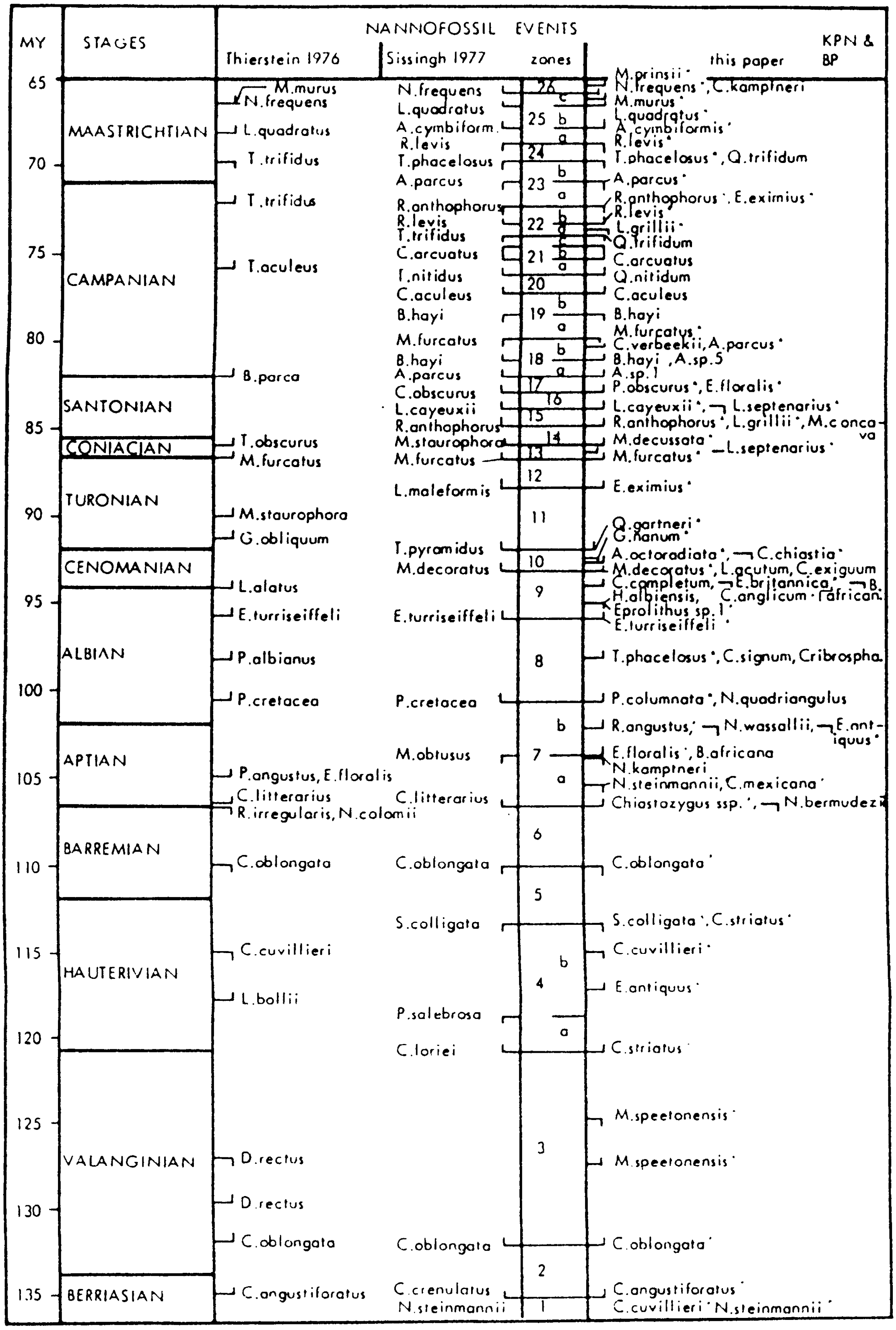
Discussion

As the cores studied have been previously found to contain a moderately diverse assemblage of both planktonic and benthonic foraminifera (Glaessner & Cookson, 1965) the absence of calcareous nannofossils is therefore surprising. It is thought that any nannofossils present in the Cretaceous water column have been removed by either pre or post depositional diagenesis. It is possible that the Otway Basin during the time of deposition of the Belfast Mudstone Formation was in part restricted as suggested by Taylor (1964). Nannofossils may have been absent from the more restricted environment (considered to be a delta front or salt marsh environment by Walton,1964) or the nannofossil lysocline may have been shallower than an equivalent foraminiferal one.

Table of results : Port Campbell No 1 : Distribution of selected calcareous nannofossil taxa

Core	1	2	3	4	5
Braarudosphaera bigelowi	x	x		x	x
Micrantholithus procerus	x	x	x		
M. vesper					x
M. sp		x			
Chiasmolithus altus			x		
C. oamaruensis				x	x
Coccolithus eopelagicus	x			x	x
C. formosus					x
C. muiri	x	x	x	x	x
Cyclicargolithus abisectus	x	x	x		
C. floridanus	x	x	x		
C. marismontium				x	x
Cepekiella lumina		x			
Clausicoccus fenestratus			x		x
Reticulofenestra bisecta			x		
R. callida				x	
R. coenura				x	
R. danica			x		
R. scissura			x	x	x
R. scrippsae					x
R. reticulata					x
R. umbilica				x	x
Discoaster deflandrei	x	x		x	
D. tani nodifer				x	
Helicosphaera euphratis			x		
H. intermedia		x	x		
H. kamptneri		x			
H. obliqua	cf	cf			
Pontosphaera multipora	x	x	x	x	
P. plana/sp B Bybell		x		x	
Transversopontis obliquipons					x
T. pulcher				x	
Blackites tenuis					x
Rhabdosphaera vitrea		cf	x		
Sphenolithus ciperoensis			x		
S. distentus			x		
S. moriformis	x	x	x	x	x
Coronocyclus nitescens		x	x	x	
Isthmolithus recurvus					x
Lanternithus minutus				x	x
Zygrablithus bijugatus			x	x	x
Holodiscolithus macroporus			x		
Orthozygus aureus			x		
Abundance	F	F	F	C	F
Preservation	-1.5	-1.0	-2.0	-2.0	-1.0

Key : **R**are,**F**ew,**C**ommon & **A**bundant,Preservation scale after Bukry 1973



Calcareous nannofossil events according to Thierstein (1976), Sissingh (1977) and this paper. Correlation to stages and numeric time-scale after Thierstein (1976), used as scale. * = species also useful in the boreal area.

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