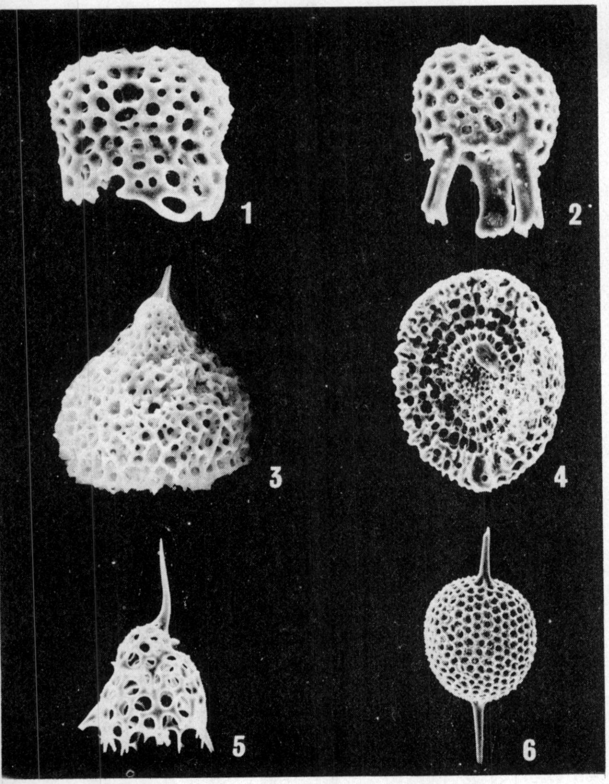

Figure 2. (1) ***Dendrospyris haysi.*** (2) ***Triceraspyris coronatus.*** (3) ***Theocalyptra bicornis spongothorax.*** (4) ***Prunopyle hayesi*** **(interior view).** (5) ***Lithomelissa sp. c.*** (6) ***Stylatractus universus*** **(Pliocene form). For taxonomic details, see Chen (1974, 1975) and Weaver (in preparation.)**

occurring radiolarian species that become extinct at this time are illustrated in figure 2).

A more detailed discussion of data presented here will be included in the *Initial Reports of the Deep Sea Drilling Project, Leg 35.* This research was supported by a Penrose grant from the Geological Society of America, and by National Science Foundation grant OPP 74-20109.

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Oligocene unconformity in southeast Indian Ocean piston cores

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During Deep Sea Drilling Project (DSDP) legs 21, 26, and 29, a regional unconformity of Eocene-Oligocene age was noted in the southwest Pacific and south Indian oceans. The unconformity was observed as sediment disconformities or as dissolution facies barren of calcareous microfossils (Luyendyk and Davies, 1974). Examination of four USNS *Eltanin* piston cores (table) indicates a similar unconformity dated between late Eocene and early Oligocene age.

Distinct lithologic changes across the unconformities were observed in all cores. Cores E45-16, E45-19, and E48-49, located in a basin southeast

USNS *Eltanin* piston cores E45-16, E45-19, E48-49, and E55-41.

Core	Latitude	Longitude	Length (centimeters)	Water depth (meters)
E45-16	35°7.2′S.	101°58.2′E.	685	4,313
E45-19	37°38.7′S.	103°6.2′E.	1,000	4,507
E48-49	34°28.9′S.	100°3.0′E.	581	4,347
E55-41	33°1.0′S.	110°52.0′E.	632	2,758

of Broken Ridge, show a distinct change from Eocene carbonate rich sediment to "red" clay above. In core E55-41, located on Naturaliste Plateau, a calcareous nanofossil ooze is overlain by a foraminiferal ooze.

Calcareous nanofossils were examined below each lithologic change in each core. A late Eocene age was determined for the nanofossil ooze in E55-41 on the basis of the common occurrence of *Discoaster saipanensis* and the presence of *D. barbadiensis* in association with *Chiasmolithus altus* and *C. oamaruensis*. The age of the sediment below the hiatus in cores E48-49, E45-16, and E45-19 is between late Eocene and early Oligocene. The common occurrence of *Isthmolithus recurvus* and *Cyclococcolithina formosa* suggests a late Eocene age (similar to DSDP leg 28, hole 267B). The absence of *Discoaster saipanensis* and *D. barbadiensis* is probably due to paleolatitude rather than to the extinction of both species.

The unconformity in cores E45-16, E45-19, and E48-49 is expressed as a dissolution facies. A rise in calcium carbonate dissolution (CCD) resulted in the deposition of red clay onto the underlying late Eocene calcareous sediment. A similar change in CCD is suggested by Constans (in press) for the eastern Diamantina Fracture Zone. The red clay/calcareous sediment contact contains a very etched assemblage of calcareous nannofossils and micromanganese nodules. No siliceous microfossils were noted, but an abundance of zeolitic crystals was observed.

The calcareous nanofossil ooze/foraminiferal ooze contact in core E55-41 samples includes both Neogene and late Eocene nanofossils. This floral mixing suggests that the lithologic change at this site is probably erosional in origin.

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Regional deep-sea dynamic processes recorded in *Eltanin* sedimentary cores from the southeast Indian Ocean

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The USNS *Eltanin* deep-sea sedimentary cores and bottom photographs from the southeast Indian Ocean, between 70°E. and 120°E. and between Antarctica and 30°S., have been analyzed. Cores from the crest and flanks of the midocean ridge are mostly Late Quaternary in age with only rare breaks in sedimentation. In greater contrast, flanking this zone in deep basins immediately to the south of the ridge in the South Indian Basin, and in a broad zone in the western sector of South Australian Basin, are areas where bottom currents have systematically eroded or inhibited deposition of sediments. These sediments range in age from Quaternary to Pliocene, and occasionally are Middle Tertiary (figure). This regional deep-basin erosion extends northward between Broken Ridge and the Naturaliste Plateau to the Wharton Basin, where sediments as old as Late Cretaceous are exposed. As indicated by disconformities, ocean floor characteristics, and seismic profile data, much of the shallower, north-south trending Kerguelen Plateau has also undergone widespread erosion by bottom currents.

The erosional disconformities in the deep basins have been created by a general increase in velocities of Antarctic Bottom Water during the last 2.5 million years, with apparently major separate pulses during the Brunhes epoch (t=0.69 million years before present) and part of the Matuyama epoch (t=2.43 to 0.69). Extensive areas of manganese nodules have developed in conjunction with this bottom current activity, most spectacularly as