

INDIAN OCEAN PANEL ANNUAL REPORT
PCOM Meeting, Sunriver (Oregon)
30 November - 4 December, 1987

1. **The Indian Ocean Panel** met twice in 1987 : 31 March-1st April, 1987 at Lamont Doherty Geological Observatory (Palisades, N.Y.), 21-23 October, 1987 at Consiglio Nazionale delle Ricerche (Rome, Italy).
2. **IOP membership rotation.** J. Curray (US) and J. Sclater (US) were replaced in 1987 by T. Davies (US) and E. Vincent (France). H. Baecker (FRG) replaced U. von Rad (FRG). Substitute of R. White (UK) to be nominated. D. Falvey (member at large), W. Prell (US), and J. Cochran (US), will rotate off the panel in 1988 ; substitutes have been proposed to PCOM.
3. **The Indian Ocean drilling program** started with leg 115 on 19 May, 1987. Legs 116 and 117 have been completed and Joides Resolution is now operating on the Southwest Indian Ridge (Leg 118).
4. **Leg 115**, 19 May-2 July, 1987 (co-chief scientists : R. Duncan and J. Backman), was successful in achieving its principal objectives of investigating the history of hotspot volcanism associated with the Reunion hotspot and Neogene carbonate production and dissolution in tropical Indian Ocean waters. A total of 21 holes were drilled at 12 sites (sites 705 to 716). Sites 705 and 706 are located on the eastern shoulder of the Mascarene Plateau (Nazareth Bank). Site 707 is located between the Saya de Malha Bank and Seychelles. Site 708 is in the abyssal plain southwest of Madingley Rise. Sites 709, 710 and 711 are located on or close to the Madingley Rise. Sites 712 and 713 are located on the northern margin of the Chagos Bank. Sites 714, 715, and 716 are located on the Maldives Ridge. Total core recovered was 3075 m, including 124 m of basement rock, with an overall recovery of 77.7 %.
5. **Leg 116**, 7 July-19 August, 1987 (co-chief scientists : J. Cochran and D. Stow), in the Central Indian Ocean Basin 600 km south of Sri Lanka, was designed to investigate both tectonic and sedimentary processes recorded in the sediments of the distal Bengal Fan in a region that has undergone significant intraplate deformation. A total of ten holes were drilled at three sites. Site 717 was a reference hole in the thickest sedimentary section on a fault block. Site

719 was drilled further up on the same block. Site 718 was drilled on a heat flow high on the next block south, to investigate hydrothermal circulation and the influence of high heat flow on diagenesis.

6. Leg 117, August-October, 1987 (co-chief scientists : W. Prell and N. Niitsuma), drilling plans have addressed two major scientific objectives : the evolution of the Indian Ocean summer monsoon and the history and origin of the Owen Ridge. Twelve sites (720 to 731) were occupied on the Oman Margin, Owen Ridge, and Indus Fan (preliminary report not yet available).

7. Leg 118, October-December, 1987 (co-chief scientists : R. von Herzen and P. Robinson), plans include one or more holes in the Atlantis II Fracture Zone of the Southwest Indian Ridge. The primary goal will be to drill a deep hole (500 m) in exposed upper mantle peridotite on a median ridge of the fracture zone with the aid of a hardrock guide base. Secondary objectives are to drill a series of shallow basement holes across the floor of the fracture zone and to sample basement in active and fossil nodal basins.

8. Kerguelen-Prydz Bay Drilling Program, Legs 119 and 120 (co-chief scientists : J. Barron and B. Larsen for leg 119, R. Schlich and R. Wise for leg 120). Legs 119 and 120 will complete a latitudinal transect in the Southern Ocean between Kerguelen Island (49°S) and Prydz Bay, Antarctica (67°S). This transect will study the Late Cretaceous to Holocene paleoclimatic history of East Antarctica, the nature, the origin and tectonic history of the Kerguelen Plateau and the Late Mesozoic rifting history of East Antarctica and India. Site KHP-1, KHP-3 (alternate), SKP-1, SKP-2, SKP-4A, SKP6A, SKP-8, PB-1 to PB-4 and SKP-6B (alternate) have been accepted by the Pollution Prevention and Safety Panel. Site SKP-3 has been limited to a drilling depth of 800 m, this precludes the original scientific objectives (Mesozoic stratigraphy and tectonics). Deepening sites KHP-1 and/or SKP-2 could provide the corresponding information ; IOP recommends to define a new locality, with thinner Neogene section to allow sampling the lower Mesozoic section.

9. Broken Ridge Drilling Program, Leg 121 (co-chief scientists : J. Weissel and J. Pierce). Drilling at Broken Ridge should allow to establish whether the sediments deposited before rifting indicate that the ridge was deepening or shallowing with time and thus to discriminate between rifting processes. IOP endorses

the proposed program but suggests to shift site BR-1 further downslope to the north, to allow the determination of detrital remnants of the truncated section which might be incorporated in younger sediments.

10. Ninetyeast Ridge Drilling Program, Leg 121 (co-chief scientists as above).

The objectives of drilling on the Ninetyeast Ridge are to better constrain the age progression along the ridge, to obtain basement samples to further characterize the basalt geochemically, and to achieve from high resolution Neogene sections paleoceanographic reconstructions of the Indian Ocean.

- . IOP recommends for the northern (90°ER-1) Ninetyeast Ridge site the proposed composite hole (NNER-9 and NNER-10) which will sample the complete upper (Neogene) and lower (Paleogene) sedimentary sections, and penetrate the underlying basement (50 m).

- . IOP endorses for the central (90°ER-2) and southern (90°ER-5) Ninetyeast Ridge sites the J. Newman and J. Sclater preferred options : central 90°E Ridge site at 17.08°S-88.11°E and southern 90°E Ridge site at 27.33°S-87.46°E.

- . If time precludes drilling all three sites, IOP recognizes that the central and northern 90°E Ridge sites have the highest priority.

- . IOP recommends HPC for the Neogene-Oligocene sedimentary sequence at all 90°E Ridge sites and double HPC (if time permits) at the northern and central sites.

- . IOP recommends, that if drilling conditions permit, the 90°E Ridge sites be drilled to more than 50 m into basement ; the highest priority for deep penetration corresponds to the central 90°E Ridge site.

11. Exmouth Plateau Drilling Program, Leg 122 (co-chief scientists : U. von Rad and B. Haq).

The main drilling objectives of the leg are : to test the Jurassic, Cretaceous and Tertiary sea level curve, to study the differential subsidence and paleobathymetric development, to study the early-rift history and subsidence/stretching models, and to study the post-breakup evolution of the plateau. IOP discussed in detail the merits of the selected sites including the new EP-12 proposed site.

- . IOP accepts the importance of the tectonic questions addressed by both EP-2A and EP-12 sites and does not consider them as alternates.

- . IOP considers that the three sites EP-6, EP-7, and EP-12 could provide data relevant to the global sealevel curve.

- . IOP notes some safety problems at site EP-12 and considers that a better formulated drilling proposal is essential to demonstrate a clear relationship between the anticipated stratigraphy and the postulated tectonic model.

. IOP recommends the following priorities (in that order) : EP-7, EP-10, EP-12 and EP-2A, if a more definitive EP-12 proposal is presented and if there are no safety concerns. If the tectonic-stratigraphic relationship cannot be demonstrated or safety considerations preclude drilling EP-12, the priorities should be EP-7, EP-10, EP-2A, and EP-6.

12. Argo Abyssal Plain Drilling Program , Leg 123 (co-chief scientists : F. Gradstein and ?). Drilling in the Argo Abyssal Plain should allow to obtain a high resolution Thethyan stratigraphic section and to sample the oldest Indian ocean crust.

- . IOP confirms the priorities of drilling first site EP-9E on the Exmouth Plateau, followed by site AAP-1B with approximately 200 m of basement penetration.
- . IOP favors, if time is available, double-coring of the critical Upper Jurassic-Neocomian section in a second Argo Abyssal Plain site (AAP-2).

13. Future of the Indian Ocean Panel - Next meeting

In the immediate future, the Indian Ocean drilling program is now set for the complete 9-leg schedule. The IOP will not meet again before the completion of Leg 123 ; at this time (November 1988) IOP desires to meet together with a co-chief from each leg to 1) evaluate the 9-leg program, 2) summarize results, 3) make recommendations about remaining important Indian Ocean program.

In the long-term future, IOP first notes the importance of this regional panel for the Indian Ocean drilling program. In fact, the entire program was constructed from proposals initiated through the IOP. We believe that the IOP must continue to exist in some form as an advocate for future programs in the Indian Ocean which address thematic objectives, to encourage workshops, increase site surveys of poorly investigated regions.

14. Structure of the ODP advisory panels

Regarding the general structure of the advisory panels, IOP supports the intended changes toward a thematically driven drilling program. In the event that regional panels are disbanded or greatly atrophy there is a danger that drilling will be focused only in the most familiar regions, without necessarily identifying the best region to investigate thematic objectives. IOP strongly recommends that the thematic panels be increased to include members with strong regional expertise and familiarity with data-sets. This membership may be tailored to true projected path of the drillship.