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DRAFT OF MINUTES  
INDIAN OCEAN REGIONAL PANEL, OCEAN DRILLING PROJECT  
19-20 MARCH 1984, WASHINGTON, D. C.

APR 17 1984

MEMBERS PRESENT

Warren Prell  
Jim Cochran  
Bob White  
Ulrich von Rad  
Roland Schlich  
Hedi Oberhaensli (Alt. for Rene Herb)  
Lubomir Jansa (Alt. for Felix Gradstein)  
Joe Curray - Chairman

OTHERS PRESENT

Jose Honnorez (PCOM)  
Herman Zimmerman (NSF)  
Ken Hsü (ESF)

INTRODUCTIONS AND DISCUSSION OF AGENDA:

Most members of the panel had not previously met, although knew of each other by reputation. The agenda proposed by the Chairman was accepted with modifications, as follows through these minutes.

PANEL MANDATE, FROM JUNE '83 TERMS OF REFERENCE:

"Regional Panels: Mandate

The Regional Panels are responsible for:

- a. Helping Thematic Panels to translate their broad thematic programs into concrete regional drilling plans.
- b. Identifying regional problems not covered by Thematic Panels.
- c. Recommending integrated drilling programs in their regions.
- d. Monitoring the status of knowledge on regional geology and geophysics.
- e. Advising on regional and site surveys needed for future drilling.

PCOM chooses panel members for their expertise and experience in a region. Each non-U.S. JOIDES member can nominate one member to each Regional Panel, and PCOM will name a subequal number from the U.S. and from non-member countries. Members normally serve for two years; the chairman may be held for a third year.

Regional panels meet at the request of PCOM as frequently as required by ship scheduling and routing.

PCOM will establish liaison between Regional and Thematic Panels by overlapping memberships.

The map shows the general areas of prime responsibility for the Regional Panels, but the boundaries are not fixed limits: Panels should view their responsibility as including all areas relevant to their regional problems. The Regional Panels are:

- a. Atlantic Ocean
- b. Central and Eastern Pacific Ocean
- c. Western Pacific Ocean
- d. Indian Ocean
- e. Southern Oceans"

PCOM REPORT - JOSE HONNOREZ:

- EXCOM has delegated more authority to PCOM than in the past: for example, naming panel members, and has agreed not to interfere with PCOM decisions.
- PCOM membership will rotate on a 4-year cycle, in an attempt to demonstrate to the community that the system is open.
- The advisory structure is different now from previously during DSDP, with two kinds of panels: Thematic and Regional, plus ad hoc task groups and service panels. Thematic panels are Ocean Lithosphere, Tectonics, and Sediments and Ocean History; regional panels were listed above. This was an attempt to make operations as efficient as possible, to minimize transit time, and to assure that good geological and geophysical problems do not fall between the cracks. Terms of office will normally be two years, but because of scheduling and the fact that our panel's efforts will not see fruition for well over two years, we may expect somewhat longer appointments.
- Downhole measurements (well logging) are now an integral, separately budgeted part of the project, and will no longer be vulnerable to being the first item cut during efforts to save funds.
- Working groups will be appointed as appropriate by PCOM, but disbanded when their job is done.
- We should expect to meet two times per year at first, but increase that to three times per year before and during drilling operations.
- Our job is to solicit, process, and prepare proposals.
- We must pay attention to the major logistical, and timing problems of drilling in the southern oceans and in remote areas of the Indian Ocean.
- Riser drilling is presently available to a limit of 6,000 feet. PCOM will attempt to schedule riser drilling legs as nearly consecutively as possible at a later stage in the project.
- Our proposals to PCOM can be in the form of individual sites, overall regions, or coordinated legs. Proposals can be submitted by one panel alone or jointly by two or more panels.
- SEDCO-471 has been selected as the drilling ship. It can accommodate a scientific party up to 50 people, including technicians, and can handle a drill string of approximately 30,000 feet. Lab space is approximately the same as Glomar Challenger. Drilling rates will be approximately the same, but deep holes, e.g. 1200-1400 meters, should be easier. The first drilling leg, Leg 101, will start in January 1985 with Site 625. The

large scientific party will make it possible on occasion to add scientists for special projects, including biologists, physical oceanographers, etc. Legs will continue to average 55-56 days, as in the past.

- At the present time, the only non-U.S. member of ODP signed up is West Germany, but it is hoped that Britain, France, Japan, the European Science Foundation, and Canada will join.

#### PANEL NOMINATIONS:

At the present time, our panel counts only eight members. We would prefer to stay small and request that the Planning Committee appoint two additional members at the present time. We ask that one of them be in the field of hard-rock petrology, to act as liaison with the Ocean Lithosphere Panel. Our suggested nominations to PCOM include Frey, Delaney, and Duncan. We ask that a second member, representing either Australia and/or the specialty of chemistry or geochemistry, be appointed. Our suggested nominations to PCOM are Von der Borch, Falvey, and Exon.

To facilitate liaison with the Tectonics Panel, we will ask our member Jim Cochran to communicate regularly, as is his usual practice, with Jeff Weissel. To facilitate the Sedimentary Panel, we ask that Warren Prell communicate regularly with Mike Arthur. For liaison with the Southern Oceans Panel, we ask that Warren Prell communicate regularly with Jim Kennett.

#### HOW TO SOLICIT INPUT FROM THE COMMUNITY:

Some proposals have already been received, but we need to advertise broadly to encourage members at large of the geological community to submit their ideas and proposals. The following letter was drafted to be sent for publication in journals and newsletters:

"Tentative plans for the Ocean Drilling Project (ODP) are for the drilling vessel SEDCO-471 to work in the Indian Ocean during all or parts of 1987 and 1988. The Indian Ocean Advisory Panel of ODP solicits letters of intent or proposals for possible scientific ocean drilling during that period. All areas within the Indian Ocean and any important problems, including tectonics, nature of the lithosphere, paleoceanography, and sedimentary processes will be considered. Please send proposals, with appropriate charts and copies of pertinent data, in triplicate to the Office of Joint Oceanographic Institutions Deep Earth Sampling (JOIDES Office, Rosenstiel School of Marine and Atmospheric Science, University of Miami, 4600 Rickenbacker Causeway, Miami, Florida 33149), and if possible, also send one copy to the chairman or to any other members of the panel. Proposals and letters received before 1 September will be reviewed at the panel meeting scheduled for the first week of September." -- Listing of Panel Members and abbreviated addresses.

#### PROPOSALS AND PROGRAM:

Our procedure in discussing and setting up a preliminary program proposal was first to review proposals and/or letters of intent already in hand, second to supplement with ideas of our own not presently in written form; third to establish general themes and objectives for drilling-related projects; fourth to prepare a list of primary areas/problems; and fifth to prepare a straw-man

proposal for a drilling program in the Indian Ocean. These items will be taken up in order, represented by Tables 1, 2, 3, and 4 and Figure 1.

## Program and Proposals - Discussion

- Schlich asked Honnorez about requirements for site surveys. Honnorez replied that the needs are extremely variable, that they will differ for programs without a riser, that MCS and SEABEAM may or may not be needed. Our panel will be the first to specify the site survey needs for each site we propose, and we must use our best judgment regarding the needs, depending upon scientific objectives and local conditions and variability. The drilling ship will have limited surveying capabilities and should, in general, be used only for surveying to approach and/or identify a pre-selected site, and for transits between sites.
- Honnorez suggests that we propose transit leg targets of opportunity for drilling with HPC. These sites would require only a couple of days and would be shallow penetration. They would be located on pre-existing seismic lines, and would be intended to bring the level of reconnaissance, especially for paleoceanographic studies, up to the same level of coverage of the Atlantic Ocean as of a few years ago. The sites should, if possible, be selected to be in shallow water -- less than, for example, 3000 m -- and shallow penetration, 200-300 m, thereby not requiring logging.
- The tables constituting our program were formulated and adopted, with the following understanding and philosophies:

### Table 2, General Themes and Objectives

These are what we consider to be the important geological and geophysical problems represented by proposals received to date and/or conceived. The table as presently constituted is not necessarily all-inclusive, and we will expect to supplement and modify it during future deliberations. General themes and objectives have been grouped into Tectonic, Lithospheric, Paleoceanographic, and Sedimentary Process problems, to conform with organization of the Thematic Advisory Panels. In general, the problems and themes listed are those which are both present and important in the Indian Ocean and can be attacked or solved through drilling, combined with necessary prior geophysical and geological studies. The second column represents the best areas in the Indian Ocean, in our present judgment, with priority areas underlined. These priority areas are areas we consider to be either unique to the Indian Ocean or among the best places in the world to attack these particular problems.

### Table 3: A Listing of These Priority Areas Extracted from Table 2, Not Necessarily Listed in a Priority Order

These are not necessarily the areas we will propose for drilling, but represent what we now consider to be the areas, as related to themes and problems in Table 2, for which we should be assembling additional information before our next meeting. Our listing of bad weather months was made strictly from knowledge present in the room, and must be investigated much more factually by the "watchdogs" before the next meeting. Site surveying status is also listed from information present in the room and is also subject to correction and supplementation. The "watchdog" assignments are for purposes of taking primary responsibility for organizing reviews of proposals, assessing weather, logistic, and site survey status and plans, and if necessary for instigating or actually doing the preparation of proposals before our next meeting.

#### Table 4

Our "strawman" drilling proposal is an example, for purposes of presentation to PCOM, of a viable drilling program in the Indian Ocean to demonstrate that a reasonable logistical plan can be compatible with attacking the first-order scientific problems represented in the Indian Ocean.

- We believe that the Red Sea studies will warrant recommendation for appointment of a Red Sea Working Group, and we intend to propose such a working group to the Planning Committee following our next meeting. Our current recommendation is that Jim Cochran be made Chairman of this working group, but we are not yet prepared to suggest names of other members.

Problems of especial importance in the Red Sea include the following:

1. The type of crust underlying the main trough
2. Deep versus shallow water evaporite formation
3. Metallogenesis
4. Early syn-rift sediments
5. Diagenesis
  - a. Sediments
  - b. Organic matter
6. Vertical tectonics
7. Paleoceanography
8. Carbonate banks

- The Chairman was briefed by members of the panel for his presentation to PCOM, to appeal for scheduling of drilling in the Indian Ocean. Some items which were suggested for inclusion in his report are as follows:

...In the past, only 54 of 624 sites have been in the Indian Ocean.

...In the past, only 6 out of 96 legs have been in the Indian Ocean.

...In the past, only 1 year, 1972, out of 15 years was in the Indian Ocean, and that was 11 years, or 70 drilling legs, ago. The inequity is far more serious than these numerical statistics, however, because at the time of that one year of drilling, the philosophy, objectives, and mode of observation of the Drilling Project were entirely different: namely reconnaissance drilling, spot coring, and minimal penetration into basement.

...Many first-order scientific objectives remain unsolved in the Indian Ocean while proposals are now being submitted for second, third, and fourth-order problems in the North Atlantic, Mediterranean, Gulf of Mexico, etc.

...The Indian Ocean has had a complex and interesting history. It was formed in the wake of dispersing fragments of the Gondwana Continent. Some fragments closed Tethyan Seaways, while other seaways between oceans opened in their wakes.

- ...While some parts of the Indian Ocean are logistically remote and politically difficult, the scientific problems are extremely important. We must understand Indian Ocean paleoceanography before we can understand global paleoceanography. We must understand Indian Ocean tectonic evolution and history before we can understand global plate reconstructions.
- ...If the geological history of the Indian Ocean as presently proposed appears to be simple and solved, it is only that our information is so fragmentary that we do not yet know the problems and the contradictions.
- ...Many of the problems that are apparent in the Indian Ocean are virtually unique to that ocean, or represent the best places in the world to attack those problems.

#### SCHEDULING OF NEXT MEETINGS:

It was agreed that we will request permission to hold our next meeting in Strasbourg, France, on 5, 6, and 7 September, to precede the PCOM Meeting to be held in Hawaii 25 through 27 September. Our subsequent meeting will tentatively be scheduled for 20-21 February 1985 in Miami.

Table 1 Proposals on Letters of Intent Received by IORP

p.1

No.	Name	Title	Date Rec'd	Objectives
1	Jim Cochran	Memo	19 Mar 84	Prionites, guidelines, continental margins, non-rigid plate tectonics: Makran, Madagascar, central Indian Ocean deformed area, Red-Sea, etc.
2	Curran, Thienshain, MacKenzie, Mahoney	Broken R. dgc	19 Mar 84	Basement, stratigraphy, paleoceanography
3	Carol Stein	African-Arabian cont. margin	"	Cont. margin and adjacent oceanic lithosphere
4	Millard Coffin	Potential ODP Western I.O. Sites	"	Cont. margins, ridges, basins, etc. Long skipping list.
5	H. Obenkänslä	Suggestions	"	Paleoceanography and biogeography, latest Mesozoic and Cenozoic.
6	V. Rad and Hinz	Tentative ideas	"	S. China Sea, Banda/Arafura, N.W. Australia S. Australia, W. Indian margin, Mozambique + Agulhas Plateaus, Mascarene Plat., Kerguel
7	P. Guennoc	Red Sea	"	Red Sea
8	J.K. Leggett [and R. White]	The Makran Fore-Arc, Pakistan	"	Makran



No.	Name	Title	Date	Objectives
9	J.k. Weissel et al	Intraplate deformation, Central Indian Ocean	19 Mar 84	Intraplate deformation
10	G. Peltzer P. Tapponnier G. Jacquot	Andaman Sea	"	Andaman Sea
11	P. Huchon	Sunda Strait	"	Sunda Straits area
12	D. Falvey	Suggested ocean drilling	"	Exmouth Plateau, Wallaby Pl., S. Mascarene, W. Tasmania.

	General themes and objectives <u>Table 2</u>	Best areas in Indian Ocean (priority areas <u>underlined</u> )
A. TECTONICS	<ol style="list-style-type: none"> <li>1. Kifted margin evolution               <ol style="list-style-type: none"> <li>1.1 early rifting history                   <ul style="list-style-type: none"> <li>different tectonic styles</li> <li>different tectonic(1.1.1 narrow styles</li> <li>1.1.2 wide styles</li> </ul> </li> <li>post-breakup cover(1.2.1 starved</li> <li>1.2.2 fat</li> </ol> </li> <li>1.2 post-breakup(drift)history</li> <li>2. Sheared margins</li> <li>3. Accretionary prism end members:                   <ul style="list-style-type: none"> <li>-- starved</li> <li>-- fat</li> </ul> </li> <li>direction of convergence (normal vs. oblique)</li> <li>4. Intraplate deformation</li> <li>5. Continent-Island arc collision</li> <li>6. Back-arc basin (special Indian type)</li> </ol>	<p><u>Red Sea</u></p> <p>Madag./Tanz., S Austr., Red Sea  <u>NW Australia</u>  <u>NW Australia</u>, S Austr., Red Sea</p> <p><u>NW Australia</u>, S Austr.</p> <p><u>Madagascar</u>, Tanzania</p> <p>E Sunda, Banda Arc  <u>Makran</u>, Java  <u>W Sunda</u></p> <p><u>Central Indian Basin</u></p> <p>N Australia/Banda-Arafura  <u>Andaman Sea</u></p>
B. LITHOSPHERE	<ol style="list-style-type: none"> <li>1. Mantle heterogeneities and magma generation across the spreading axes of a triple junction</li> <li>2. Hot spot traces</li> <li>3. Oceanic plateaus</li> <li>4. Metallogenesis</li> </ol>	<p><u>Rodriguez Triple Junction</u></p> <p><u>Ninety-east Ridge</u>, Chacos-Laccadive R.</p> <p><u>Kerguelen-Broken Ridge</u>, (Wallaby Pl.)  <u>Erozet-Madagascar Plateau</u></p> <p><u>Red Sea</u></p>
C. PALEOCEANOGRAPHY & SED. PROCESSES	<ol style="list-style-type: none"> <li>1. Monsoonal upwelling and climates</li> <li>2. Glacial paleoceanogr. of the mid-latitude oceans</li> <li>3. Interoceanic seaways</li> <li>4. Tethys-Superocean remnants</li> <li>5. Mesozoic-Cenozoic paleoceanography and paleobiogeography               <ul style="list-style-type: none"> <li>- temperature gradients</li> <li>- productivity gradients</li> <li>- circulation patterns</li> <li>- CCD changes</li> <li>- biological responses</li> </ul> </li> <li>6. Diagenesis               <ul style="list-style-type: none"> <li>- of sediments</li> <li>- of organic matter</li> </ul> </li> <li>7. Deep vs. shallow-water evaporites</li> <li>8. Carbonate banks (bioherms)</li> <li>9. Deep-sea fan processes relative to tectonics and climate</li> </ol>	<p><u>Arabian Sea</u>, Bay of Bengal</p> <p><u>SE Indian Ridge Transect</u>  (50° S to 20° N)  Agulhas Pl., Indonesian area,  Red Sea</p> <p>Argo Ab.Pl., ? NW Somali Basin</p> <p><u>Ninety east Ridge N-S and E-W Transect</u> Red Sea</p> <p>} underway HPC Sites over  oceanic ridges,  Argo Ab.Plain</p> <p>all sites  <u>Red Sea</u>, <u>Arabian Sea</u></p> <p><u>Red Sea</u></p> <p><u>Red Sea</u></p> <p><u>Bengal Fan/Indus Fan</u></p>

Table 3

Primary target areas	Bad weather (months)	Site Survey Status	IOP "watchdog"
1. Red Sea	III/IV	good regional, but site survey needed: SONNE '84, CONRAD '84 ? CONRAD '86, SUROIT/ CYANA '85	COCHRAN & W.G.
2. NW Australia	I - III	excellent regional survey, site survey needed: CONRAD '85 + Austr....	v. RAD/GRALSTEIN
3. Makran	VI-IX	Site Survey planned & funded: DARWIN '85/86	WHITE
4. Madagascar	-	good regional, site survey needed: M. DUFRESNE	COCHRAN/SCHLICH
5. Central Indian Basin	-	good regional, some site survey needed: CONRAD '85/86	COCHRAN
6. Ninetyeast Ridge	-	poor to fair regional, more needed: CONRAD/WASHINGTON 1985/86	HERB/CURRAY
7. Arabian Basin + Fan	IV-IX	fair regional, more needed: CONRAD 85/86, ?SONNE 1986/SAGARKANIA??	PRELL
8. Rodriguez Triple Junction	-	good regional, site survey planned by CHARCOT '84, DARWIN '85/86	SCHLICH
9. Kerguelen Pl.	VI-IX	fair to good regional, more needed: M. DUFRESNE '85/86	SCHLICH
10. Broken Ridge	-	fair regional, more needed: CONRAD/WASHINGTON '85/'86	CURRAY
11. SE Indian Ridge	VI-IX	poor, but adequate for purpose, site survey needed	PRELL
12. Bengal Fan	VI-IX	good regional, site survey possibly needed, none planned, could be proposed	CURRAY
13. Agulhas Plateau	VI-IX	status unknown, some data (commercial) from SAfrica	HERB
14. Crozet Plateau	VI-IX	very little, poor coverage, nothing planned	SCHLICH

Straw Man Schedule of Legs in Indian Ocean

IORP  
20 March  
1984

Table 4  
Weddell Sea

Jan-Feb 87

Mar-Apr 87

Agulhas Plateau, Madagascar Ridge, Crozet Plat.

May-June

Triple Junction

July-Aug

Madagascar-Tanzanian margins

Sept-Oct

Australian Sea

Nov-Dec

Red Sea

Jan-Feb 88

Makran, Indus Fan

Mar-Apr

Bengal Fan, Ninetyeast Ridge

May-June

Ninetyeast Ridge, Central Indian Basin

July-Aug

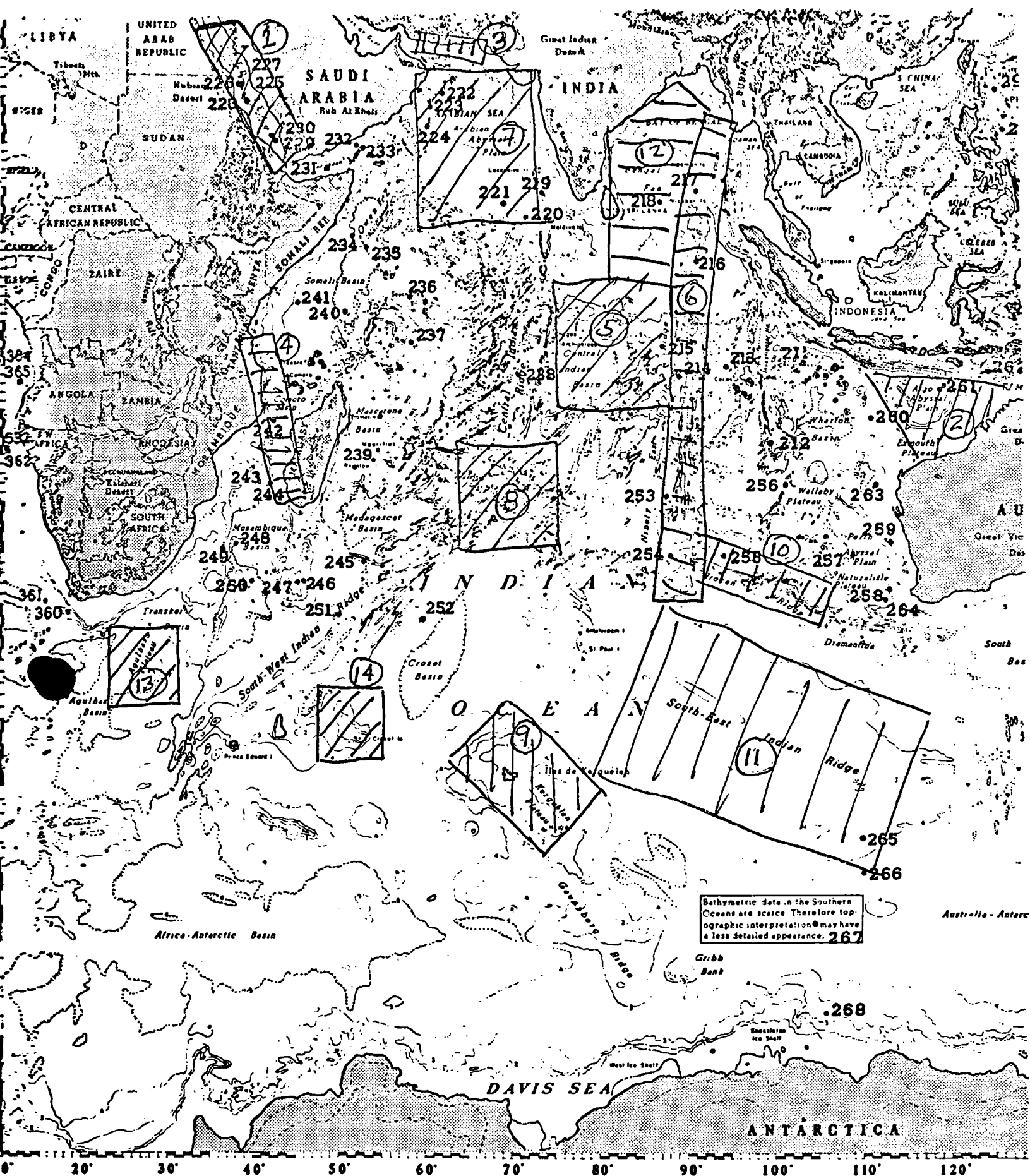
N.W. Australia

Sept-Oct

Broken Ridge, S.E. Indian Ridge

Nov-Dec 88

Kerguelen Plateau



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