Draft Minutes of the Sediments and Ocean History Panel (SOHP)

Meeting held February 21-23, 1985

Cambridge, U.K.; Godwin Laboratory

In attendance (Panel Members):

M. Arthur
W. Hay
Y. Lancelot
L. Mayer
P. Meyers
W. Ruddiman
R. Sarg
M. Sarnthein
E. Suess
Y. Takayanagi
L. Tauxe

PCOM Liaison
H. Schrader

ODP Liaison
E. Taylor

Guests

N. Schackleton
R. Kidd (ODP)

"EXECUTIVE SUMMARY" of SOHP Meeting

February 21-23, 1985; Cambridge U.K.

I. Recommend to ODP (Equipment/Techniques for Shipboard Use

A) Development of "sand core-catcher" to enhance recovery in unconsolidated sand-dominated sequences.

B) That continuous "strip" photography (e.g. Tom Chase method) be considered for more routine shipboard use.

C) That palynology be considered as a staffing position on board ship more routinely.

II. Recommendations for Co-chiefs (for Legs in which SOHP has strong interest)

A) Leg 107 (Tyrrhenian Sea): Bob Thunell; Maria Cita; Kim Kastens; Jean Mascle

B) Leg 108 (NW Africa): Michael Sarnthein
William Ruddiman

C) Leg 109 - no suggestions

D) Leg 110 (Barbadoes North): Casey Moore

E) Leg 111: no suggestions

F) Leg 112 (Peru Margin): Erwin Suess; Laverne Kulm

G) Leg 113: no suggestions

H) Leg 114 (Weddell Sea): James Kennett; Dieter Futterer

III. Recommendations for Panel Membership (new members)

A) John Barron (USGS; diatom biostratigraphy-Pacific paleoceanography) (alternate: R.C. Thunell, University of South Carolina; foraminiferal biostrat-paleoceanography).

B) Pierre Biscaye (LDGO: clay mineralogy, sedimentary processes) (alternate: R.E. Garrison, U.C.S.C.; carbonate diagenesis, sed. proc.)

IV. Short-range Planning Recommendations

A) Galicia(Leg 103): advise continuous coring at and below Cenomanian-Turonian boundary.

B) Baffin Bay(Leg 105): request 70 days for BB-3 and LA-5 drilling; emphasize that paleogene

records from both sites are necessary.

C) Northwest Africa (Leg 108): a comprehensive late Paleogene-Quaternary package proposed by Sarnthein/Ruddiman is strongly endorsed.

D) Weddell Sea(Leg 114): Site priority ranking (see detailed minutes for reasoning)

Entire program ranks above proposed Subantarctic traverse

1. W1
2. W2
3. W4
4. W5
5. W10
6. W6
7. W7
8. W8

Operations times suggested by SOP are optomistic and should be recalculated by factor of about 1.5.

Would rank above W5 if it can be demonstrated that objectives can realistically be achieved.

E) Sub-Antarctic Transect;

1. SA8
2. SA2
3. SA3

Remaining sites not ranked-may be possible to pick-up these 3 sites if W6,7,8 not drilled in Weddell Sea program.

V. Long-term Planning (SOPH considered COGS-2 document for both A & B below.

A) Indian Ocean Drilling: rankings as follows:

1. Amery (Antarctic) margin-Southern Kerguelan transect
2. Oman-Owen Ridge-Somali margin-Indus Cone Neogene package
3. Somali Basin deep hole (Mesozoic Tethys)
4. North Kerguelan-Southeast Indian Ridge Transect polar front
5. Exmouth Plateau-Argo Abyssal Plain Transect
6. Chagos-Laccadive Ridge (or 90oEast Ridge)

B) Western Pacific

In addition to areas of interest summarized at last meeting; further discussion (prioritization will await formal liaison with WPAC and CEPAC); has a strong interest in:

1. Great Barrier Reef program
2. Queensland Plateau-Ontong Java Plateau
3. Scott Plateau and environs
4. Pore water chemistry-diagenesis in accretionary (generic) prisms.

5. Volcanic episodicity, eolian transport, tephrochronology (generic).

VI. Riser Targets:

A). With stated limitations (1800 water depth; 1992 start)

1. Penetration of evaporite sequences (Med.; Red Sea; S. Atl.)
2. Penetration of gas hydrates (Sea of Japan, Sea of Okhotsk; Cariaco Trench; Chilean Margin).
3. Continental slopes (Niger Delta; NW Africa Mesozoic)

B) SOHP argues strongly that longer riser (3km) would significantly enchance capabilities and number of attractive targets.

VII. Next Meeting: July 24-26th, 1985; LDGO

DRAFT MINUTES

Thursday, February 21, 9:00 a.m.

A. The meeting was called to order; the minutes of the Carmel Meeting approved as read and the tentative agenda for the Cambridge meeting adopted. The problem of non-participation by U.K. and ESF in ODP was noted, and N. Shackleton was welcomed as a guest.

B. Reports

1) NSF-no report available

2) ODP (Kidd, Taylor)

R. Kidd reported on the results of the Shakedown Cruise of the Resolution including the sucessful operation of the core-orientation device, and E. Taylor described and showed pictures of the lab facilities and core processing program aboard ship. The SOHP complimented ODP on having assembled a remarkable array of equipment. Kidd outlined the present schedule through Leg 105 and named co-chiefs and ODP staff scientists for the legs. He noted that some recent scheduling changes necessitated by PCOM decisions had created some problems with staffing and schedules of individual scientists; SOHP was properly sympathetic with both sides.

The SOHP recommended three items to OPD

a) Developement of a "sand core catcher": recovery of unconsolidated sand remains a problem - preservation of original grain size and sedimentary structure relationships is critical for interpretation of the process.

b) Continuous strip photography should be considered as a rountine technique on board ship (similar to T. Chase design used on DSDP Leg 64) - prints from present whole core color slides are not sufficiently clear for reproduction.

c) That a palynologist be considered as a more rountine statfing objective in future ODP legs. Palynological studies can contribute much to understanding paleocurrent and paleowind directions and provide additional stratigraphic control.

d) A question was raised about availability of proposals and especially cruise prospectuses to both panel members and other interested scientists. It is recommended that ODP send copies of each cruise prospectus directly to all panel members, 3 months precruise if possible. A panel "watch dog" will be assigned for future legs. SOHP informed about developments particular to each leg. This should help improve information flow between SOHP, ODP, and leg Co-chiefs.

3. PCOM Report: Due to the delay of H. Schrader's flight, there was no summary, except that given by M. Arthur who attended the January PCOM meeting in Austin. He reviewed the presentation he had made

on behalf of SOHP and provided a summary of the requests by PCOM to provide them with recommendations for co-chiefs on upcoming legs, ranking of sites for the Weddell Sea and sub-Antartic transects, priorities for Leg 105, Indian Ocean program, etc.

C) Recommendations for co-chief scientists

1. Leg 107 (Tyrrhenian Sea): Bob Thunell, Maria Cita; Kim Kastens; Jean Mascle
2. Leg 108 (NW Africa): Michael Sarnthein Both William Ruddiman on leg
3. Leg 109 (Kane F.Z.): no suggestions
4. Leg 110 (Barbadoes North): Casey Moore
5. Leg 111 (EPR, 23oN): no suggestions
6. Leg 112 (Peru margin): Erwin Suess; Laverne Kuln
7. Leg 113 (Chile Triple Junction): no suggestions
8. Leg 114 (Weddell Sea): James Kennett; Dieter Futterer

SOHP is recommending co-chiefs mainly for legs in which it has primary interests.

D) Panel Membership:

SOHP regrets that it has become necessary that the U.K. and ESF representatives can no longer formally be members of our panel. Their expertise will be sorely missed, and we hope that they can participate as guests as the need arises. In the meantime we suggest the following as additional members (and provide alternates in the event that they are not available).

1. John Barron (USGS; diatom biostratigraphy; paleoceanography of Pacific; hiatuses).
   Alternate: Robert C. Thunell, University of South Carolina; planktonic foraminifers, stratigraphy, paleoceanography.

2. Pierre Biscaye (LDGO; clay mineralogy, sedimentary processes).
   Alternate: Robert E. Garrison, U.C. Santa Cruz; carbonte diagenesis; sedimentary processes and basin analysis.

3. Panel liaisons:

L. Tauxe	IOP
Y. Lancelot	CEPAC
*P. Meyers	ARP (needs to be formally named)
E. Suess	SOP
R. Sarg	WPAC (to replace Shackleton)

*was R. Sarg orignially an ARP member? If so, we still see need for liasion and would like P. Meyers formally named as previously requested.

E. Galicia Objectives - Leg 103: (we were asked to make recommendations by PCOM)

SOHP advises continuous coring be done from the Turonian-Cenomanian boundary to basement to provide a record of Mesozoic paleoenvironments and to calibrate subsidence curves. No advantage is seen in spot-coring above this boundary.

F. Baffin Bay Objectives - Leg 105:

In view of time and weather constraints, SOHP advises coring BB-3B at least 1500m if weather permits, then coring LA-5 with remaining time, expecting a total leg time of 70 days. Paleogene sequences from both sites are important for paleoceanography, and older sections provide unique information as well. In the event Batfin Bay is not open, then as a contingency plan, we suggest that the Labrador Sea first priority sites LA5, LA-9, LA-2A be considered for drilling, with reoccupation of site 603 and drilling of NJ6 being reserved for contingency back up.

G. Northwest Africa Objectives - Leg 108:

Logging of all holes is recommended to calibrate seismic stratigraphy and can probably be accomodated in projected time. Sarnthein noted that MAU-1 objectives are not central to overall objective of this leg and might best be deferred to next Atlantic pass. SOHP agrees. We adopt the plan as proposed by the site proponents. (Appendix I) The total Leg proposed will take about

TABLE 1 ODP-LEG 6 PROPOSED SITES

SITE	PRIORITY	LOCATION	WATER DEPTH (M)	NEAREST LAND MASS (N.MI.)	LOCATION	MAXIMUM PENETRA. (M)	DRILLING TIME (DAYS)	PRIMARY OBJECTIVES
139-R	1	23°22.3'N 18°25.5'W	2887 (Ex. Spanish Sahara)	100	Outer rise off ex-Spanish Sahara	350 (Middle Miocene)	3.5	Reference position for non-upwelling location in Canary Current; Trade wind history; Contour current.
MAU-6	1	20°56.5'N 18°40.0'N	2662	93 (Cape Blanc)	Upper Rise W of Cape Blanc	300 (Middle Miocene)	3.0	Persistent Upwelling Cell; Trade wind history; Fluvial sediment supply from Central Sahara
MAU-5	1	21°20'N 20°45'W	4023	220 (Mauritania)	Outer Rise W of Cape Blanc (close to Site 140)	250 (Early Miocene)	2.5	Reference location for non-upwelling conditions in outer Canary Current. Eolian-sand lenses.
MAU-4	1	18°04.5'N 21°01.5'W	3050	130 (Cape Verde Islands)	Cape Verde Rise (close to Site 368)	300 (Miocene basalt)	2.5	Deepwater paleoceanography; Circulation history of Saharan Air Layer
SLR-1	1	9°58.9'N 19°15.3'W	4300	220 (Guinea-Bissau)	Northeastern Sierra Leone Rise; Kane Gap	300 (Middle Miocene)	3.0	Bottom-water circulation between southern and northern East Atlantic; Trade wind history
EQ-3	1	04°45'N 20°58'W (at DSDP site 366)	2650	480 (Sierra Leone) Sahara)	South Slope of Sierra Leone Rise	400 (Upper Eocene)	4.0	Bottom-water response eolian, and surface-water fluxes.
E	1	04°12'N 20°35'W	3900	500 (Sierra Leone)	South slope of Sierra Leone Rise	150 (Late Miocene)	1.5	Bottom-water response
EQ-5	1	03°30'N 20°10'W (at WHOI core 36GG)	4300	520 (Sierra Leone)	South slope of Sierra Leone Rise	150 (Late Miocene)	1.5	Bottom-water response
EQ-6	1	02°45'N 19°04'W (at WHOI core 29GGC)	4800	540 (Sierra Leone)	South slope of Sierra Leone Rise	150 (Late Miocene)	1.5	Bottom-water and surface-water responses
EQ-9	1	00°12'S 23°09'W (at L-DGO core V30-40)	3706	810 (Sierra Leone)	West flank Mid-Atlantic Ridge	180 (Late Miocene)	1.8	Surface-water and eolian responses.
EQ-7	1	01°21'S 11°55'W (at L-DGO core RC24-7)	3899	390 (Sierra Leone)	East flank mid-Atlantic Ridge	150 (Late Miocene)	1.5	Surface-water and eolian responses.

TOTAL: ≈ 26.5 DAYS

after Sarnthein, Ruddiman et al. (2/85)

+ 11.5 DAYS transit between sites
+ 4.0 DAYS logging
42.0 DAYS total

H. Weddell Sea (Leg 114) and Subantarctic Traverse

Drilling times used in SOP ranking and summary are very optimistic; when more realistic times are used the proposed sites probably cannot be accommodated in a 70 day leg.

Priority	Sites	Objective	(meters) Water Depth	(meters) Depth Penetration	New* Estimate	SOP Time
1.	W1 (Maud Rise)	(Mesoz.-Cenoz.	3000	500	5-1/2	3-1/2
2.	W2 (Maud Rise)	(paleoclimates-- (most complete record	3500	500	6	4
3.	W4 (Caird Margin)	Antarctic glacial sedimentation on margin	3040	900	8-1/2	6 (dipping reflectors)
4.	W5 (Weddell Basin)	Onset glacial seds.	4950	1000	13 +	9-1/4 (basalt)
5.	W10 (Bransfield Basin)	Quat. high resolution seq. w/hydrothermal alteration of O.M.	2000	600	4	3-1/2
6.	W6)		3500	500	6	4
7.	W7) (S. Orkney Plat.)		2100	500	5	3
8.	W8) (AABW from history)		700	500	2	2
					50 days	

*Estimates based on new tables supplied by ODP; do not include logging or transit.

W6, W7, W8 are moved to lower priority; we would rank them above W5 (i.e. priority #4) if it can be shown that the objectives can be achieved (using grain size and magnetic fabric in order to monitor AABW production through time and examine water masses at different depths). We consider this an important objective, but are skeptical of the ability of proposed methods to solve the problem. Part of site survey requirement should be to demonstrate method on piston or gravity core samples. Need feedback from SOP. In addition, SOHP recommends that at least one site penetrate base of contourite stack to date onset of current-induced sedimentation. (Note also that W5 should be moved out of local area of faulting and structure exhibited on seismic lines.

I. Subantartic Traverse:

The SOHP considers this set of sites to rank lower in priority than the entire Weddell Sea program as well as below our first 6 priority legs proposed for the Indian Ocean. We have ranked only the top 3 sites within the transect:

	Objective	Water Depth	Penetrations	Operation Days
1) SA-8	(Paleocene-Recent carbonate record)	2500m	(500m)	4
2) SA-2	(Neogene polar front migrations	4100m	(700m)	8
3) SA-3	and AABW history)	4300m	(500m)	6
			TOTAL DAYS	18

J. Indian Ocean Drilling

Priority

1) Amery-margin southern Kerguelen transect
2) Oman-Indus Cone-Owen Ridge-Somali margin (man-mountain-monsoon-Milankovitch-Neogene package)
3) Somali deep hole - Mesozoic history and seismic stratigraphy
4) Northern Kerguelen Plateau-southeast Indian Ridge (polar front)
5) Exmouth Plateau-Argo Abyssal Plain transect (2 sites; EP-5 and AAP-1 from Australian COGS document
6) Chagos-Laccadive Ridge (latitudinal and depth HPC transects on aseismic ridge.)

Specific objectives of these regional interests were discussed at the SOHP meeting in Carmel, November 1984. They will be reviewed after SOP, Indian RP and the other thematic panels again discuss Indian Ocean sites and legs. Some objectives which are presently of great interest include:

A) Amery margin-southern Kerquelen Plateau
Polar front paleoceanography and high latitude carbonates (3 sites);
Mesozoic-Cenoizic history of Amery margin (4 sites)

B) Somali deep hole-single site (similar to Coffin and Channel proposal) for drilling to Mesozoic basement to examine seismic sequences on possible remnant of Tethyan crust, and to constrain paleolocation of Madagascar. Good seismic lines are vital to selecting this site.

A global Mesozoic ocean history proposal will be prepared by a subpanel consisting of Sarg, Hay, Lancelot and Arthur.

K. Western Pacific - (Australian proposals for consideration)

1) Adelaide Coast proposal appears to duplicate SOHP interests in the Amery margin - southern Kerquelen Plateau.

2) Lord Howe Rise and related proposals (Tasman Sea, Bounty Trough) have largely tectonic objectives and little SOHP interest. SOHP would like more information about paleoceangraphic potential of Tasman Sea sites.
3) Great Barrier Reef proposal (Sarg accepts watch-dog status) has many SOHP interests - a young passive prograding carbonate margin which could be a model for seismic stratigraphy. A series of 4 holes (1A, 2, 3 and 4) is attractive. Possibility of calibrating sea level curves exist in this transect, as well as to observe diagenetic alteration of carbonates related to variable fresh water penetration in the shallower sites. SOHP assigns a high priority.
4) Louisville Ridge proposal-little SOHP interest (sed. cover too thin).
5) Queensland Plateau margin-likely that some sites contain records of Oligocene-Eocene and later changes of oceanic circulation related to north movement of Australia which would be provided by double HPC's. Site on Osprey Block might be best for paleoceanographic history. Such a site would provide a record of pelagic carbonate deposition that would compliment the continental margin record from the Great Barrier Reef region. Move QP-1/B to northwest.
6) Coral Sea Basin proposal-little SOHP interest.
7) General comment: Opportunities to look into geochemical changes in sediments and porewaters probably exist in convergent margins in the western Pacific.

Summary

8) Scott Plateau, Exmouth Plateau, Queensland Plateau, and Great Barrier Reef are regions of SOHP interest around Australia.
9) General comment: High latitude paleoceanography objectives are very important, but proposed sites south of Australia and in SW Pacific are not necessarily optimal.
10) General comment: Australian proponents should be invited to appropriate panel meetings to present and discuss proposals for drilling.

L. Western North Pacific

1) Japanese National Drilling Committee will screen and generate proposals. Ongoing Franco-Japanese diving programs to collect supplement site survey information. Next time will summarize.

2) Questions remain about volcanic episodicity, eolian transport of ash, and so on. Many sites in the western Pacific contain information about this and tephrachronology should be part of the objectives at these locations.

3) SOHP will consider in detail and begin to prioritize at next meeting after liaisons with WPAC and CEPAC (see minutes of Carmel meeting).

M. Riser Targets - limited to 1800 water depth (1992)

1) Penetration of salt layers - Mediterranean, for example Red Sea S. Atlantic Margins
2) Penetration of gas hydrates and other gassy sediments
   Sea of Japan
   Black Sea
   Sea of Okhotsk
   Cariaco Trench
3) Penetration of continental slope structures
   Niger Delta
   other margin (NW Africa Mesozoic black shales
4) Deeper capability would expand both the number of riser targets and their scientific attractiveness. If newer technology which might be available by 1992 would allow drilling in 3000m water depth, then attractive locations would include:
   Mediterranean basin evaporites
   Red Sea evaporites
   Sea of Japan
   Baffin Ban
   many oceanic margin locations

N. Problem of acetone contamination of core sections was discussed (cf. Rullkotter's letter). Consensus was that a method using tape or heat-shrink plastic be developed by ODP and employed as needed, but not necessarily routinely.

O. Microref center in Japan should be established and little seems to be going on at present. ODP curator should continue efforts to carry this out.

P. Next meeting scheduled for July 24-26, 1985 at Lamont-Doherty Geolgical Observatory.

Q. Meeting adjourned at 11 a.m., Saturday, February 23. Nick Shackleton was given appreciation for arranging and hosting the meeting in the congenial environment of Cambridge and Godwin Lab.