EXECUTIVE SUMMARY

13th MEETING OF THE SHIPBOARD MEASUREMENTS PANEL

COLLEGE STATION, MARCH 8-10, 1995

The shipboard Measuremnets Panel (SMP) met in College Station with the aims to interact both with ODP/TAMU Personnel and with the Information Handling Panel (IHP).

Detailed information on the status of shipboard measurement programs was provided by Jamie Allan, and SMP notes that the good spirit of co-operation with ODP/TAMU continues to exist.

Below the most important results of this meeting are briefly summarized:

1. Present Status of Shipboard Measurements:

SMP notes that much of the recommendations of the last meeting of SMP have been acted upon, inter alia:

1. The MST is undergoing modernization and renovation;

2. Sun SPARCstations have been obtained, thus making data integration a much more feasible excercise;

3. Progress is being made on the development and updating of cook books for the various laboratories. This item led to the following SMP recommendation:

Recommendation 95-1

During each cruise there should be a direct interaction between the Laboratory Officer, the appropriate Laboratory Specialist, and the participating Scientist(s) regarding potential changes and improvements of a cook book. The most appropriate time for such interactions would be about half-way the cruise. Any questions should be referred to the appropriate Staff Scientist of ODP/TAMU and/or appropriate SMP members.

SMP will discuss this item further in Bremen this autumn, but wishes the endorsement of PCOM of this item;

4. SMP discussed the status of the "Explanatory Notes" and recommends:

Recommendation 95-2

SMP recommends that one set of Explanatory Notes be produced each year and that this set should be sent out to participating scientists in a floppy disc or hard copy format prior to the legs. During each leg participating scientists are required to record any changes in procedures made during the leg, so that a record is available on this for future reference.

5. The status of the X-Ray laboratory was discussed in detail, with the observation that

a. The X-Ray Fluorescence equipment is presently in reasonable shape. The RF coil bead fluxer will be tested during Leg 160. SMP, however, wishes to reiterate its concern that the equipment is aging:

SMP does wish to reiterate, that the present XRF equipment is aging. This was pointed out in the last Minutes of SMP (9/94) - see also Appendix 1 of these minutes - and the situation will arise that a major breakdown of this old equipment will occur. Hence PCOM must be aware that in the future an emergency situation may arise that requires quick action with regards the replacement of this equipment, which is considered essential, especially during hard rocks legs.

b. The X-Ray Diffraction equipment will need greater attention in the near future, again because of the old age of this equipment and the need to replace this much used equipment with an up to date version. Thus SMP wishes to stress the following:

The XRD equipment is more than 10 years old and much more efficient designs are presently available on the market. There is no doubt that there will arise, in the near future, a situation that forces the consideration of a replacement. New, up to date equipment, with a more accurate laser-guided goniometer and an X-Ray dispersive capability, is presently available. Such equipment will not only allow better high quality data, but will also yield semi-quantitative information on chemical composition.

SMP wishes to go on record that serious consideration be given to the future purchase of a new XRD system. ODP/TAMU will investigate in detail the most appropriate replacement and more detailed information will be provided at the next SMP meeting. Up-to-date equipment will serve a wide community of users, particularly sedimentologists, mineralogists, and petrographers. Though presently SMP does not suggest immediate purchase, it is necessary for PCOM and JOI to be aware of the potential emergency need for replacement of this equipment.

6. The Petrographic/Paleontology Laboratory has received a new Zeiss Axioplot Paleontology microscope, for which a special cook book is being developed.

7. The Chemistry Laboratory (new HP 5890 Series II Gas Chromatograph for head space analysis) and the Physical Properties Laboratory have undergone improvements.

SMP did discuss the need for a smoother operation of the shipboard pycnometer and recommends:

Recommendation 95-3

SMP urges the update of the shipboard pycnometry through the introduction of computer pycnometer control. The costs of the system are relatively low, but the pay-off in much improved data will justify this purchase.

8. Improvements in the Underway Geophysics Laboratory were discussed and SMP discussed several items that would need upgrading for better operation of this laboratory:

1. New streamers - these will allow better data acquisition and replace old, worn out streamers: $ 40,000.
2. Upgrade the magnetometer to a new state of the art 886 model: $ 24,000.
3. Replacement of Versetec HP 650 Printer: $ 24,000.

SMP is sympathetic towards these purchases, but expresses the opinion that, perhaps, these items should be funded out off Operational Budgets.

2. Paleomagnetic Equipment.

SMP discussed the need to replace the presently available Cryogenic Magnetometer by a new 2G system, which will allow much more precise measurements, thus enabling the data to become part of the overall data integration excercise on board ship.

Detailed reasons are presented in the main text of the minutes, but here SMP wishes to draw attention to its highest priority:

Recommendation 95-4

SMP strongly recommends the replacement of the present aged Cryogenic Magnetometer by a modern new version of the 2G Cryogenic Magnetometer. This equipment will allow a much higher precision (by about 100 fold) in geomagnetic data and will allow a better integration of these data into the data base that underlies the data integration efforts currently underway in the Ocean Drilling Program.

3. Future of Shipboard Measurements.

SMP did discuss the possibility that in the future some measurements may have to be curtailed on the ship as a result of lack of operating funds. For these reasons SMP has requested ODP/TAMU to help in the determination of shipboard measurements priorities. However:

SMP wishes to stress that hitherto the Panel, justifiably, has advocated the full scale of measurements on board ship, thus providing an opportunity to a large number of scientists from different disciplines to produce a product of first class scientific value in an unique environment that stimulates collaboration. This has served very well also in the training of young scientists and graduate students. Thus, though economic necessities may force some reductions in these efforts, SMP wishes to use the above requested information in a very carefully considered manner. The philosophy should remain that the shipboard party should produce a first rate scientific result through collaborative science on board the JOIDES Resolution.

4. Status of the WSTP.

The WSTP, a much used downhole equipment (also of interest to DMP), especially during high temperature legs, needs updating of this equipment through the purchase of more accurate

data logging devices, such as the ADARA device used with the heat flow equipment in the hydraulic piston core shoe.

Recommendation 95-5

SMP recommends that the upgrading of the temperature recording devise in the current WSTP to a devise based on the ADARA temperature tool be executed in the near future. The importance of this project is especially geared to a more precise recording of in-situ temperatures during the sedimented ridge Leg 169.

5. Data Base Upgrade.

SMP discussed the progress of the Data Base Upgrade after the presentation on this subject by Panel Member Terri Hagelberg during the joint session with IHP.

As a result of this joint meeting SMP further discussed in detail the problem of better preservation of original detailed core descriptions and the informaton on structure (see also section 5.3.6, these minutes). Kevin Brown (TECP) expressed the concerns of the Tectonics Panel regarding this issue. It is the preservation of these primary data that will be of importance to both SMP and to IHP. In order to lay the groundwork for the user group concerned with Item 4b - "Sediment Description and Structural Description" it will be important to discuss this problem in greater detail prior to establishing a "user group". For these reasons SMP recommends:

Recommendation 95-6

SMP strongly recommends to PCOM/JOI that as soon as possible a working group on the problem of preservation of detailed core descriptions and structural information be formed. This group should consist of

2 Sedimentologists
2 Structural Geologists
1 Paleoceanographer
1 SMP Representative
1 TAMU Representative

The working group should meet for 2 days and during the latter part of the workshop should consult with a representative of TRACOR on the problem of compatibility with the data base.

6. Other items.

1. Whole Core X-Ray Imaging:

Though SMP decided to defer the proposal by Frank Rack to the opinion of the appropriate thematic panel (OHP), the subject of whole core imaging was discussed in some more detail. SMP has requested ODP/TAMU to furnish some information as to costs, space, etc., with regards this equipment. This topic will be discussed further in Bremen during the Autumn SMP meeting.

2. Improvement in the Organic Geochemistry Laboratory:

SMP discussed the potential need to expand or re-focuss the emphasis of the Organic Geochemistry Laboratory. It was decided that the Chair would poll the organic geochemical community on the following:

a. The need for a Gas Chromatograph with Mass Spectrometric Capability (GCMS). A proposal was received from Dr. Berndt Simoneit on this topic and SMP concurs that a GCMS would be extremely beneficial to the shipboard organic geochemistry program, particularly during high temperature legs (e.g., Leg 169).

b. The need and means to obtain improvements in the shipboard analysis program, with emphasis on more quantitative estimates of dissolved gas concentrations.

The chair of SMP will poll respected members of the organic geochemical community with regards these problems, preferably by mail, sothat a further discussion on this topic may be held at the 14th meeting of SMP in Bremen.

7. Data Integration (DICOM).

The chair discussed the consensus of PCOM re the establishment of a Data Integration Working Group (DICOM) to oversee development of a computer based data integration capability.

Upon further discussion SMP was of the opinion that the establishment of this working group may be slightly premature:

1. Peter Demenocal of Lamont-BRG has just initiated the programming phase for the next step after core-core data integration (c.f., CLICOM Report). Testing of this program should be carried out first before further discussion;

2. One of the next concerns for data integration will be the introduction of structural data into the framework of data integration. SMP urges that this be considered during the proposed Workshop as described in Section 10, Recommendation 95-6. Indeed, this should be among the mandates to this group.

SMP will monitor progress in this area and hopes that items under points 1 and 2 will progress rapidly during the interim between this meeting and the Fall meeting to be able to return to this topic and to give PCOM advice on the constitution and the mandate of the proposed DICOM.

8. Wish-list on Equipment

During SMP's discussions three major items have been identified that will need the attention of PCOM and JOI with regards to funding. These items are are chiefly directed towards improvement of shipboard science as described in these minutes. This applies particularly to the measurements associated with the Paleomagnetic Laboratory, but also with the Shipboard Heat

flow Program. Below SMP recapitulates these recommendations.

1. Paleomagnetics Laboratory

As has been argued in Section 6 of these minutes, paleomagnetic data play an important role in data integration procedures, quite apart from their own importance to the paleomagnetic discipline. In carbonate sediments much larger precisions are necessary than hitherto possible. SMP strongly urges that the presently available equipment, which is out-dated, be replaced by a new system that has 100 times the sensitivity. Suggestions by BCOM that year end funds might be used towards this goal are appreciated, but it will probably still be necessary to make extra funds available. SMP reiterates that this item is of primary importance and urges PCOM to fund this item.

2. Pycnometer control

SMP supports the purchase of a computer pycnometer control device for the Physical Properties Laboratory. These measurements have always been very hard to do, the data are necessary, and easier operation will not only enhance the data quality, but will also lessen the time involved in the present day operation of the measurements.

3. WSTP Temperature Logger

The purchase of new ADARA type temperature loggers will lead to vastly improved temperature measurements by the WSTP. This is a particularly important problem for the Sedimented Ridges Leg 169, but sufficient lead time is necessary for obtaining and installing this equipment.

In Summary:

1. Cryogenic Magnetometer	$ 250,000
2. Computer Pycnometer Control	$ 15,000
3. ADARA Temperature Loggers (6)	$ 42,000

9. Next Meeting

SMP proposes its next meeting to be held in Bremen on September 27, 28, and 29, 1995.

Heinrich Villinger has agreed to be the host for this meeting.

SMP is looking forward to get familiar with the new Bremen Core Repository.

MINUTES

13th MEETING OF THE SHIPBOARD MEASUREMENTS PANEL COLLEGE STATION, MARCH 8-10, 1995

Members present	Members absent
Robin Brereton (UK) Ronald Chaney (US) Terri Hagelberg (US) Satoru Nakashima (J) Janet Pariso (US) Mike Rhodes (US) Jean-Pierre Valet (F) Heinrich Villiger (G) Dominique Weis (ESF)	Ellen Thomas (US)

Joris Gieskes (US), Chairman

Liaisons present	Liaisons absent
Kevin Brown (TECP) Jamie Allan (ODP/TAMU)	Jeff Fox (PCOM) Paul Dauphin (US-NSF)

Guests

Lucy Edwards (USGS)

Peter Blum
Randy Current
John Firth
Brad Julson
Linda Weatherford All at TAMU/ODP

1. Opening of the Meeting

The chairman welcomed all panel members, liaisons, and guests. Unfortunately both the PCOM and US-NSF liaisons were unable to attend the meeting.

2. PCOM/NSF reports

Because of the absence of the representatives of PCOM and US-NSF there are no reports under this item.

3. Minutes of the Las Palmas meeting

The minutes of the 12th Meeting of SMP were accepted and the chairman promised to make sure that all members will receive a copy of the "final" minutes after the chair has received the comments on the "draft" minutes.

4. PCOM/PANCH Meeting November/December 1994

The chair reported on the meeting of PCOM Nov./Dec., 1994 in College Station. SMP provided a summary of the recommendations made during the year of 1994 (**Appendix 1**).

Minutes of the PCOM meeting were recently received and SMP notes the following:

1. PCOM endorses the upgrade of the MST device; this already has received attention at ODP/TAMU and will be discussed further in this report.

2. PCOM endorses the development of cookbooks; this again has received attention at ODP/TAMU as discussed in this report.

3. PCOM noted and endorsed the SMP recommendations on software development. As will be discussed in this report, the development of Fossilist has made great strides towards a final product.

A question of Dr. Kudrass regarding the data obtained on the color-scanner was raised re its inclusion in the ODP data base:

It is SMP's opinion that this data set is an essential component in core-core data integration projects, so that it will be imperative to include these data in the data base.

5. ODP/TAMU Report

Jamie Allan reported in detail on the activities of ODP/TAMU with regards items of concern to SMP.

5.1. Budget Update

Jamie Allan reported that the FY96 Base Budget will be $ 35.8M, down from $ 36.9M in FY95.

Items of concern to SMP are SOE (Special Operations Expenses) funding:

a. Janus Upgrade: $ 1.6M
b. Special Drilling Operations - corks and re-entry holes ($ 0.56M)
c. No new funds for DCS
d. No new funds for the Cryogenic Magnetometer (see below, Section 6)

SMP does note that the number of Marine Specialists will remain at 17/Leg. This number has always been considered essential by SMP.

The Cryogenic Magnetometer could, in principle, be funded from FY95 Cost Savings

(if possible). Below we present arguments on the importance of obtaining an up-to-date magnetometer.

5.2. 1992-1995 ODP Major Scientific Purchases

Jamie Allan reviewed some of the major scientific instrument purchases made by TAMU over the period 1992-1995 - most of these items having been advocated by SMP and endorsed by PCOM. **Appendix 2** presents a summary of these purchases.

These expenses have all been justified by their continuous intensive use and have helped to keep the drill ship in a scientific shape commensurate with the importance of the program.

5.3. Status of SMP recommendations

5.3.1. MST Workstation/Track Development

In response to SMP Recommendation 94-7 ODP/TAMU has initiated the upgrade of the MST device.

Peter Blum informed SMP on the status of the MST. The present system is undergoing an update with purchased equipment for improvement of the track. In addition new LabVIEW-based MST control software, running on a single PowerPC 8100/80, will be tested on the Leg 160 transit along with new MST hardware modules. The hardware upgrades include a new encoder and a new indexer microprocessor stepper/motor driver; spectral Natural Gamma data will be collected on a multichannel buffer that links directly to the PowerPC. Other MST software is still in development and in the testing stage.

SMP members indicated the importance of quality control as well as further development of user control mechanisms.

Some of the further software development will be contracted out in the near future, thus rapidly improving the performance of the MST.

Peter Blum described preliminary plans for the further development of the split core track and the need to test this device onshore prior to putting it on board ship. SMP encourages this development and will explore this further during the next SMP meeting.

As the MST is a quid-pro-quo for core-core and core-log integration efforts, SMP has encouraged ODP/TAMU to obtain new computer equipment for core-core integration efforts (SMP Equipment list 9-94). This has been accomplished:

Three Sun SPARCstations 5 Model 70 workstations have been obtained, with 70 MHz microSPARC II processors. This equipment will be installed during Legs 16 and 162, thus enabling the running of the data integration package Splicer. ODP/TAMU has also identified funds (JOI has been approached for approval) for a Sun SPARCstation 20 Model 61 workstation with a 60 MHz SuperSPARC processor with a super cache, which is designed to serve as the main data integration computer on the ship. To this will be linked the above three SPARCstations to be housed in the Co-Chiefs Office, the Library (or user room), and in the Core Laboratory. Installation of this equipment is planned for Leg 161.

Two Bartington Time Attenuator Modules for Magnetic Susceptibilty have been obtained and will be integrated into the MST system in the near future.

SPECIAL ACCOLADES go to **Bill Mills** who has put much effort into the upgrade of the MST as well as of the Physical Properties Laboratory.

5.3.2 Cook book developments

Linda Weatherford reported on the status of the "cook book" project at TAMU/ODP.

The progress on the work is summarized in **Appendix 3** of these minutes.

Linda discussed the composition of the working groups, as well as the definitions of the different types of manuals to be discussed, i.e., Operation Manuals and actual Cook Books.

Linda reported on the current status of the projects and indicated that at present a specially dedicated person (Shaune Webb) is sailing on the Leg 160 transit from Gran Canaria to Marseilles to construct an up-to-date catalogue of manuals and cook books (see Appendix 2).

SMP suggests to ODP/TAMU that these cook books be reviewed by appropriate members of SMP. SMP realizes that the time availability for this project may hamper the speedy development of the cook books, but the importance of maintaining or developing new cook books in cases where none exist, or associated with newly acquired equipment, is of the utmost importance for running a well functioning scientific laboratory at sea. SMP hopes that substantial progress will be made during the next few months, so that some of the cook books can be discussed during the Fall Meeting of SMP in Bremen.

Further discussion of cook book development led to the following recommendation by SMP:

Recommendation 95-1

During each cruise there should be a direct interaction between the Laboratory Officer, the appropriate Laboratory Specialist, and the participating Scientist(s) regarding potential changes and improvements of a cook book. The most appropriate time for such interactions would be about half-way the cruise. Any questions should be referred to the appropriate Staff Scientist of ODP/TAMU and/or appropriate SMP members.

5.3.3. Explanatory Notes

SMP discussed the status of the Explanatory Notes. It was agreed that one set of these notes could be produced each year, without necessitating an entire re-write for each leg by participating scientists.

Recommendation 95-2

SMP recommends that one set of Explanatory Notes be produced each year and that this set should be sent out to participating scientists in a floppy disc or hard copy format prior to the legs. During each leg participating scientists are required to record any changes in procedures made during the leg, so that a record is available on this for future reference.

5.3.4. X-Ray Laboratory

SMP discussed in detail the X-Ray Laboratory - X-Ray Fluorescence and X-Ray Diffraction. Both methodologies are of importance to the shipboard analytical programs and, as pointed out below, as well as in the minutes of the 12th meeting of SMP, concerns about the future of these instruments are relevant to the future of the program.

X-Ray Fluorescence

Jamie Allan reported that arrangements have been made for the lease of the RF coil bead fluxer for making XRF pellets (Tokyo Kagaku Co., Ltd.). Testing of the equipment will commence on Leg 160. If appropriate, the negotiated price is now $24,000.

With the acquisition of the new bead fluxer, all components of the XRF laboratory are in reasonable condition. New XRF software is PC based and much more user-friendly than the previous system. Most of the hardware on the XRF has been upgraded within the last few years, and the XRF/Petrology laboratory working group considers the XRF to be in good condition. The equipment has steadely performed during the last few legs.

A most useful addition to the X-Ray laboratory would be a software package that eliminates the need for time consuming weighing practices (indeed the most time consuming part of the shipboard analytical procedure) by corecting for marginal sample weights. A system like this is in use at the University of Hawaii and ODP/TAMU will pursue acquisition.

SMP does wish to reiterate, however, that the present XRF equipment is aging. This was pointed out in the last Minutes of SMP (9/94) - see also Appendix 1 of these minutes - and the situation will arise that a major breakdown of this old equipment will occur. Hence PCOM must be aware that in the future an emergency situation may arise that requires quick action with regards the replacement of this equipment, which is considered essential, especially during hard rocks legs.

X-Ray Diffraction

Jamie Allan pointed out that the XRD part of this laboratory needs greater attention.

New software has recently been installed, which again is PC based and significantly more user-friendly. SMP urges consideration of obtaining further software such as JADE to improve on this user-friendliness. Recent hardware related failures (e.g., XRD tube,

autosampler) have inhibited the use of the XRD, which is heavely used during each leg.

The XRD equipment is more than 10 years old and much more efficient designs are presently available on the market. There is no doubt that there will arise, in the near future, a situation that forces the consideration of a replacement. New, up to date equipment, with a more accurate laser-guided goniometer and an X-Ray dispersive capability, is presently available. Such equipment will not only allow better high quality data, but will also yield semi-quantitative information on chemical composition.

SMP wishes to go on record that serious consideration be given to the future purchase of a new XRD system. ODP/TAMU will investigate in detail the most appropriate replacement and more detailed information will be provided at the next SMP meeting. Up-to-date equipment will serve a wide community of users, particularly sedimentologists, mineralogists, and petrographers. Though presently SMP does not suggest immediate purchase, it is necessary for PCOM and JOI to be aware of the potential emergency need for replacement of this equipment.

5.3.5. Petrographic/Paleontology Laboratory

Jamie Allan announced the delivery of the new, complex, Zeiss Axioplot Paleontology Microscope. John Firth is developing an appropriate cook book for its use and, when complete, the equipment will be put on the ship. The versatility of this microscope will significantly enhance the capability of this laboratory.

Recently obtained higher resolution video capture boards will allow more effective capture of thin section immages. This, in turn, will allow images approaching photographic quality. This will be useful for publication as photographs or as files on CD-ROMs.

5.3.6. Sediment Laboratory

The new Lasentec PC-2000 particle sizer has been installed during Leg 159.

Jamie Allan indicated that the structural VCD-s have been used routinely during Leg 159. The system appears to work well, but the scanned images are large (250-300 kbytes), so that for a heavely stuctural data oriented leg, there may be a problem including all of the images on a single CD-ROM. Steve Hurst (TECP) and Peter Clift (TAMU/ODP) will be writing a technical note on the new structural VCD.

ODP will provide funds in support of deploying a Split Core Analysis Track (SCAT) on Leg 162, dedicated to measuring core color reflectance. The system was developed by Allan Mix (Oregon State University).

5.3.7. Chemical Laboratory

A new HP 5890 Series II Gas Chromatograph has replaced the old Carle chromatograph, used for head space analysis. This instrument will allow resolution of C-1, C-2, and C-3 peaks. The analysis will be automated, the timing of the valve switching can be

changed by software, and the maintenance will be simplified - all existing gas chromatographs being of the HP 5890 Series II.

All seagoing Marine Specialists of the chemistry laboratory have attended a week long Hewlett-Packard training course in Gas Chromatography.

5.3.8. Physical Properties Laboratory

Jamie Allan reported on the status of several devices in the Physical Properties Laboratory:

1. The new thermal conductivity system from Teka Geophysical Instruments has not yet been delivered.

Panel member Heirich Villinger will enquire into the delivery of this item upon his return to Germany.

2. The split core micro-resistivity device from Volkhardt Spiess of Bremen has been delivered and a cookbook for its use is in preparation.

One problem is that the probes only allow measurements in soft sediments, whereas it is often desirable to make measurements in more indurated sediments.

Heinrich Villinger indicated that appropriate elecrodes could be obtained from Dr. Spiess and that he would pursue this matter in Bremen. He also indicated that Volkhardt Spiess was anxious for feed-back on the performance of this system. This ought to occur after Leg 163, when this apparatus is first scheduled for deployment on the ship.

3. New transducers for digital sonic velocity (DSV) have been obtained and an instrument stand for both the vane shear and the DSV has been manufactured.

Ron Chaney requested that good contact be assured with the sediment through the application of springs.

4. A new pycnometer has been purchased for installation on Leg 160. It replaces the older, less user friendly instrument.

Jamie Allan suggested that a new computer pycnometer control should be obtained. This will make the handling of samples much easier and will assure more reproducible results in this measurement in the future.

Recommendation 95-3

SMP urges the update of the shipboard pycnometry through the introduction of computer pycnometer control. The costs of the system are relatively low, but the pay-off in much improved data will justify this purchase.

5.3.9. Underway Geophysics

Randy Current discussed the acquisition of the Real Time Navigation software package Winfrog from Pelagos Corp., San Diego. The system is operational. A demonstration of this system was organized during lunch break.

Underway magnetic data will be archived on Sun SPARCstation 10's. From Leg 160 these data will be put directly into the navigation software Winfrog, for real time display and storage with all navigation data onto magneto-optical discs.

Several additional items were discussed with regards future improvements of the Underway Geophysics Laboratory:

1. New streamers - these will allow better data acquisition and replace old, worn out streamers: $ 40,000.
2. Upgrade the magnetometer to a new state of the art 886 model: $ 24,000.
3. Replacement of Versetec HP 650 Printer: $ 24,000.

SMP is sympathetic towards these purchases, but expresses the opinion that, perhaps, these items should be funded out off Operational Budgets.

6. Paleomagnetic equipment

SMP discussed in detail the state of the Paleomagnetic Measurement Equipment on board ship. This subject has already been treated in some detail in the minutes of the 12th Meeting of SMP in Las Palmas and the essence of that discussion has been summarized in Appendix 1 of the present minutes:

"3. Paleomagnetic Equipment.

The equipment present in the Paleo-magnetics laboratory was state of the art when it was obtained by ODP. Again this equipment is aging and much more sensitive equipment is nowadays available. The latter would be most useful for measurements in carbonate sediments, often the target of paleoceanographically oriented legs. Again, SMP wants to urge PCOM to be aware of the necessity of future replacement of the present equipment."

SMP received a letter from Dr. Brad Clement summarizing a recommendation of a recent Workshop on Paleomagnetism held in Miami in January 1995 with regards the importance of an equipment renewal on board the "JOIDES Resolution" (**Appendix 4**, these minutes). The potential costs are summarized in **Appendix 5**.

As a result of further discussion by SMP, the Paleomagnetist members of SMP, Drs. Jean-Pierre Valet and Janet Pariso, have expanded on the scientific reasons for the necessity for such an equipment renewal, as described below.

Introduction

The primary goal of paleomagnetic studies on board the ship is to provide precise

ages to stratigraphic levels, where geomagnetic features (mostly reversals) have been identified. This is critical not only for dating but also to provide unambiguous tie points for detailed correlations between holes drilled at the same site and ultimately between sites. The magnetic measurements on board the ship must thus be considered as a priority all the more increasingly important within the framework of the program for core log integration. The recent development of a borehole magnetometer is a major step in this direction. The question arises whether the present shipboard magnetic equipment is presently adapted to achieve this goal ? The major instrument of the paleomagnetic laboratory on board the ship is the 2G cryogenic magnetometer for measurements and demagnetization (in line with the magnetometer are three AF demagnetization coils) of whole sections of sediment. The laboratory is also equipped with a spinner magnetometer (Molspin). Some other instruments have been acquired to perform rock magnetic analyses (electromagnet, coils for anhysteretic remanence, rock specimen demagnetizer, anisotropy of magnetic susceptibility). These latter pieces of equipment are for specialized studies, and the 2G cryogenic magnetometer is by far and large the most critically important instrument in the laboratory. Below we outline problems with the present system which limit the laboratory's ability to achieve its primary goal of developing a high resolution magnetostratigraphy for each ODP hole drilled.

The present system

It is clear that the present system installed on board the ship fails to achieve the primary goal of the paleomagnetic laboratory because of its low sensitivity. As a result it is often not possible to perform accurate measurements of sedimentary cores after the first demagnetization steps. Another direct consequence is that it is impossible to use the system to measure single samples of sediment because of the weak signal induced by the small volume of sediment far away from the sensors. The two major reasons for this are:

1- The pick-up coils were designed for long core measurements with a large volume of sediment within the sensitive region while typical single samples have a small volume and thus induce a much weaker signal; in addition, they are also further away from the sensors.

2- In principle, the measurements should be performed in zero field achieved by u-metal shields outside the magnetometer and a superconducting shield around the sensors. However, the original design of the superconducting shield was not optimized for shipboard measurements. As a consequence the background level of the magnetometer is quite high and there is a large drift which prevents measurements of weakly magnetized material. This remark holds for long core as well as for single sample measurements.

It is often argued that the Molspin spinner magnetometer offers the possibility of measuring single paleomagnetic samples. However, this instrument was originally designed for field work; it has a very limited sensitivity and, therefore, poor capability for measuring sediments with magnetization intensities lower than 10^{-6} A/m (i.e., in fact most sediments after demagnetization in low peak alternating fields). In addition, it is extremely time consuming (about 10 minutes per sample with hundreds of samples to be measured). In the present configuration it is thus not feasible to use single samples for magnetostratigraphy and other high resolution studies. Finally, it is also notable that the AF coils for demagnetization housed within the present 2G cryogenic magnetometer only provide capability for demagnetization to 15 mT, while overprints induced by the coring processes generally require higher levels of demagnetization (for both cores and single samples).

In conclusion, the present system on board the JOIDES Resolution is operative, but

often cannot provide records which are suitable for interpretation in terms of magnetostratigraphy. One option to improve this situation is to replace or modify within the present system. However, this option would not yield major improvements, particularly for measurements of single samples and weakly magnetizedcores, as the geometry and basis design of the system would essentially remain the same. Therefore, it is our recommendation that the current system be replaced by a new, improved cryogenic magnetometer as desctribed below.

The new system

At the time of its acquisition by ODP, the current shipboard magnetometer system was the first one installed by the 2G company. Since then 2G Enterprises has built 7 long-core pass-through magnetometers and 42 discrete sample rock-magnetometers. Much has been learnt about optimal design in terms of cryogenic developments, squid sensors and their associated electronics. This experience has led to significant improvements in operation, sample handling and reliability. If the present ODP system would be replaced by a more up to date 2G system, the benefit to the shipboard magnetic measurements program would be the following:

- New dc squid sensors: among the technical advances by 2G is the recent development of dc squid sensors (as opposed to ac squid sensors). The achievable noise level of the new dc sensors ($3x10^{-9}$ emu instead of 10^{-7} emu) would increase the sensitivity of the magnetometer by almost a factor of 100 allowing accurate measurements of magnetization even in weakly magnetized sediments such as carbonates. The new magnetometer would also have a different geometry of the pick-up coils optimized for half cores and discrete samples.

- The new dc squids are less prone to shipboard RF interferences and will be surrounded by a longer and better superconducting shielding. The field attenuation would be considerably improved by a factor of 50 and, therefore, the instrument drift would be considerably reduced. This leads to considerable improvements in stability and background level.

- The new system would be equipped with larger AF demagnetization coils in line with the magnetometer. Demagnetization would thus be possible in much higher fields, up to 150 mT.

- Measurements would take less time since the speed and the design of the tracking system have been improved. This would allow to keep up the measurements with core retrieval during busy legs and the possibility of performing more detailed sequences of measurements.

- The run time per fill with helium liquid would be much longer (40 months instead of 10 months). A direct budgetary consequence on the long term is that expenses inherent to helium fills (travel and per-diem costs from California for one member of the company, maintenance of the equipment, liquid helium) would be four times lower.

- The software of the cryogenic magnetometer has always been a problem. Improvements have been attempted by successive shipboard scientists since leg 101. There is overall agreement that the present version is very long, not flexible, does not provide a possibility of plotting the results and requires a substantial amount of work to transfer data

with an appropriate format into other computers (vax and macs). 2G has agreed to provide new software, based on the experience acquired from the current shipboard system and other shore based laboratories with a similar system.

It is thus clear that most, if not all the problems would be solved after replacement of the present system. A total of 9 magnetometers with the new sensors have already been installed and tested with great success at the universities of Utrecht, New Mexico, Buenos Aires, Postdam, Kobe, Utah, Oklahoma, Davis, and Munich. According to 2G a new magnetometer for ODP could be delivered in about 12 months from receipt of the order. It would be installed in place of the present magnetometer in a 5 days port call. There is unanimous agreement in the paleomagnetic community (see the attached letter endorsed by 33 paleomagnetists involved with ODP - **Appendix 4**) that the replacement of the present system is a crucial need for the future of magnetic studies and their impact on results obtained from the Ocean Drilling Program.

What should be done with the present system?

In conjunction with the acquisition of a new system the paleomagnetic community strongly emphasizes the importance of installing the old system at College station. This is fully justified by the fact that magnetic measurements could not be performed for many legs, either because the demagnetization level was originally limited at 5mT (a value by far too low to remove overprints) or mostly because the magnetometer was not functioning in optimal conditions (sometimes not at all) for reasons as described above. Consequently, an enormous amount of very promising information has been lost. Should this situation be left like that for ever ? Long core measurements performed with the same system are the only possibility to remeasure those cores. Because the performance of the magnetometer on shore would be greatly enhanced, it is possible to retrieve good records by measuring (or remeasuring) and demagnetizing properly the archive halves.

It is understood that there may be no support to maintain the old system at ODP. However, it can easily be envisaged that paleomagnetists interested in such measurements take care of the cost inherent to maintenance (i.e., mostly helium refills) of the magnetometer.

SMP strongly supports this equipment replacement and wishes to make the following recommendation:

Recommendation 95-4

SMP strongly recommends the replacement of the present aged Cryogenic Magnetometer by a modern new version of the 2G Cryogenic Magnetometer. This equipment will allow a much higher precision (by about 100 fold) in geomagnetic data and will allow a better integration of these data into the data base that underlies the data integration efforts currently underway in the Ocean Drilling Program.

7. Future of Shipboard Measurements.

SMP is well aware of the budgetary constraints put on ODP as a result of funding reductions. In order to study the future of Shipboard Measurements in greater detail under

these constraints, SMP deems it appropriate to request ODP/TAMU to provide information to be discussed in detail during the next meeting of SMP:

1. It is requested that a list be made of all major equipment, emphasizing the following:

   a. Life expectancy;
   b. Changes required for future use;
   c. Availability of spares;
   d. Software requirements;
   e. Necessary care or special requirements.

2. SMP also would like more information in the form of flow-charts of the various laboratories, indicating contributions to the final product of a cruise, as well as the necessity of performing the measurements on the ship.

3. In addition SMP requests information on technician support needs associated with each item of major equipment or laboratory area.

SMP wishes to stress that hitherto the Panel, justifiably, has advocated the full scale of measurements on board ship, thus providing an opportunity to a large number of scientists from different disciplines to produce a product of first class scientific value in an unique environment that stimulates collaboration. This has served very well also in the training of young scientists and graduate students. Thus, though economic necessities may force some reductions in these efforts, SMP wishes to use the above requested information in a very carefully considered manner. The philosophy should remain that the shipboard party should produce a first rate scientific result through collaborative science on board the JOIDES Resolution.

8. Status of the WSTP - Water-Sampling-Temperature-Probe

The status of the WSTP probe was discussed in some detail. This tool is of interest both to SMP and DMP and has been discussed also at the meeting of DMP, which was held at the same time as the present SMP meeting.

Randy Current pointed out that a replacement of the temperature recording devise in the present WSTP is highly necessary. He proposes that a replacement by the recording devise associated with the ADARA tool is most appropriate. This will improve the functionality, ease of use, and ease of maintenance of the instrument. This, in turn will improve the reliability and robustness of the tool. SMP agrees with this evaluation and notes that the temperature measurements and in-situ fluid samples are of a high priority, especially in the sedimented ridge area of Leg 169.

Recommendation 95-5

SMP recommends that the upgrading of the temperature recording devise in the current WSTP to a devise based on the ADARA temperature tool be executed in the near future. The importance of this project is especially geared to a more precise recording of in-situ temperatures during the sedimented ridge Leg 169.

SMP was also informed about a proposal for the construction of a new temperature probe (Earl Davis, Canada) with an associated new temperature recording devise (Heinrich Villinger, Germany). This devise would rely on the original WSTP housing and should, therefore, be compatible with this device. The development would be of a third party nature and its funding and development should be monitored by DMP, SMP, and ODP/TAMU under third party rules.

Joris Gieskes has been in contact with Mr. Patrick Fisseler, a graduate student in Engineering at the Civil Engineering Department of TAMU. Mr. Fisseler has designed a novel in-situ water sampler, based on a syringe type sampling mechanism, rather than the WSTP type "flash" sampling mode. This device, therefore, could lead to a vast improvement in the sampling of dissolved gases under in-situ conditions. Such information would be of vital importance to the Hydrate Leg 164. The instrument, again, is of a third party nature, but its development and construction have been closely monitored by Mr. Tom Pettigrew, Chief Development Engineer at ODP/TAMU in an advisory capacity. If this tool can be tested prior to Leg 164, it could, if successful, provide a valuable addition to the hydrate studies program.

SMP supports the development of these tools, but also is aware that the existing, proven WSTP sampler needs to be upgraded to ensure the availability of an in-situ device, capable of sampling for temperature and fluids, particularly for the Sedimentary Ridges Leg-2.

SMP also notes that the Pressure Core Sampling Device is being tested in Woods Hole for a study of potential gas fractionation during gas recovery from the pressure core sampler.

9. Joint Session with IHP

9.1. Results of the ODP Depth Workshop

As a basis for Data Integration it is necessary that very precise definitions are made with regards primary and derived depth scales. CLICOM (the core-log integration committee established by PCOM) was mainly concerned with core-core integration for paleoceanographic purposes. To a large extent this workshop relied on a document on depth scales developed by Peter Blum and Andrew Fisher of TAMU/ODP.

Peter Blum reported on a more detailed workshop convened by ODP/TAMU and concerned with more precise depth definitions. Peter presented an overview of the results of this Depth Workshop and a copy of the report is attached as **Appendix 6** to these minutes. This report should serve as a template for any further discussions of core-log or rather of data integration excercises.

SMP is grateful to **Peter Blum** for his careful work and his dedication to this problem.

9.2. Fossilist

John Firth presented a report on the software package Fossilist, which was also discussed in detail during the paleontologists workshop preceeding IHP.

The program is still under further development, but at this time a very useful product has been achieved, which is capable of providing hard copy of publishable quality. This aspect is of importance with regards the apparent mandate to produce as much "camera ready" copy on board ship as possible. The use of the program by shipboard paleontologists should be strongly advocated.

SMP congratulates **John Firth** on this achievement and wants to express its gratitude for persisting in the development of this important software. Included in these thanks, of course, is **Lisa Patton**, who did much of the related programming at ODP/TAMU.

9.3. Commonality in Geoscience Data Bases

SMP endorses strongly this proposed workshop and hopes to convince one of its members or one member of the science community interested in data integration to participate in this workshop.

9.4. Data Base Upgrade

Terri Hagelberg presented the joint meeting with an overview of the Computer Upgrade Steering Committee as well as the proposed user groups, constituted for advise on the various data groups identified by the steering committee. Information on this is summarized in **Appendix 7** of these minutes.

John Coyne of ODP/TAMU and representatives of TRACOR followed this presentation with an overview of planned activities over the upcoming first year of the contract recently signed with JOI and ODP.

As a result of this joint meeting SMP further discussed in detail the problem of better preservation of original detailed core descriptions and the informaton on structure (see also section 5.3.6, these minutes). Kevin Brown (TECP) expressed the concerns of the Tectonics Panel regarding this issue (**Appendix 8**). It is the preservation of these primary data that will be of importance to both SMP and to IHP. In order to lay the groundwork for the user group concerned with Item 4b - "Sediment Description and Structural Description" it will be important to discuss this problem in greater detail prior to establishing a "user group". For these reasons SMP recommends:

Recommendation 95-6

SMP strongly recommends to PCOM/JOI that as soon as possible a working group on the problem of preservation of detailed core descriptions and structural information be formed. This group should consist of

2 Sedimentologists
2 Structural Geologists
1 Paleoceanographer
1 SMP Representative
1 TAMU Representative

The working group should meet for 2 days and during the latter part of the workshop should consult with a representative of TRACOR on the problem of compatibility with the data base.

SMP will be glad to aid in the formulation of a mandate and in the composition of this workshop.

10. Whole Core X-Ray Imaging

Just prior to the SMP meeting the chair received a proposal by Frank Rack of the Ocean Mapping Group of the University of New Brunswick, Canada. This proposal pertains to an excercise that would involve the storage and transport of a series of uncut piston cores in an upright position for on-shore X-Ray analysis. Such imaging would be carried out with the specific aim of detecting ice rafted debris as well as aid in the study of any physical properties that may be associated with ice loading. The work would be carried out on cores from the Arctic Gateways Leg, Leg 162.

The proposal received a mixed reception, especially because of somewhat incomplete documentation using previous information. SMP, however, defers to the thematic Ocean History Panel and the Co-Chiefs of Leg 162 with regards the scientific merits of this particular proposal.

The proposal did, however, bring up a point of interest to the panel. X-Ray imaging, a practice common in the study of physical properties of near shore sediments in particular, is capable of providing a detailed description of the core in essentially a three dimensional manner prior to any further handling of the core (including the MST). In principle, therefore, it would be appropriate to start an investigation of the potential use of this technology in the future. SMP and ODP have previously considered this problem, but SMP urges ODP/TAMU to prepare information on the possibility to introduce the potential of X-Ray Scanning of Piston Cores on a regular basis on board ship. With such information (including estimates of space needed, costs, etc.) the SMP can then revisit this topic during the next meeting of SMP.

11. Proposal for Improvements in the Organic Geochemistry Laboratory

During the last meeting of SMP the purchase of a Gas Chromatograph with a Mass Spectrometric Capability (GC-MS) was proposed for introduction to the Chemistry Laboratory. The chairman has solicited the opinion of Bernd Simoneit of Oregon State University, who, as a participant on the Sedimented Ridges Leg I, encountered the problem of a diminished capability for compound identifiction as well as the problem of loss of more

labile components during transport to the shore laboratory. This information as well as the justification for the introduction of a GC-MS on board ship is described in **Appendix 9**. SMP will pursue this issue and urges Dr. Simoneit as well as ODP/TAMU to contact Hewlett Packard re the potential lease of this equipment for the second Sedimentary Ridges Leg 169. Dr. Simoneit would be a potential participant in this cruise and could be of help in writing a cook-book, if a permanent acquisition of the apparatus is deemed appropriate.

The chair of SMP will contact a number of Organic Geochemists re shipboard practices in general with particular attention to potential improvements in procedures, including more quantitative gas sampling, emphasis on more detailed organic geochemical studies on board, etc. A small number of Organic Geochemists will be polled and the Chairman of SMP will report back to SMP during its next meeting in Bremen.

12. Data Integration

The chair discussed the consensus of PCOM re the establishment of a Data Integration Working Group (DICOM) to oversee development of a computer based data integration capability.

Upon further discussion SMP is of the opinion that the establishment of this working group may be slightly premature:

1. Peter Demenocal of Lamont-BRG has just initiated the programming phase for the next step after core-core data integration (c.f., CLICOM Report). Testing of this program should be carried out first before further discussion;

2. One of the next concerns for data integration will be the introduction of structural data into the framework of data integration. SMP urges that this be considered during the proposed Workshop as described in Section 9, Recommendation 95-6. Indeed, this should be among the mandates to this group.

SMP will monitor progress in this area and hopes that items under points 1 and 2 will progress rapidly during the interim between this meeting and the Fall meeting to be able to return to this topic and to give PCOM advice on the constitution and the mandate of the proposed DICOM.

13. Wish-list on Equipment

During SMP's discussions three major items have been identified that will need the attention of PCOM and JOI with regards to funding. These items are chiefly directed towards improvement of shipboard science as described in these minutes. This applies particularly to the measurements associated with the Paleomagnetic Laboratory, but also with the Shipboard Heatflow Program. Below SMP recapitulates these recommendations.

1. Paleomagnetics Laboratory

As has been argued in Section 6 of these minutes, paleomagnetic data play an important role in data integration procedures, quite apart from their own importance to the paleomagnetic discipline. In carbonate sediments much larger precisions are necessary than hitherto possible. SMP strongly urges that the presently available equipment, which is out-dated, be replaced by a new system that has 100 times the sensitivity. Suggestions by BCOM that year end funds might be used towards this goal are appreciated, but it will probably still be necessary to make extra funds available. SMP reiterates that this item is of primary importance and urges PCOM to fund this item.

2. Pycnometer control

SMP supports the purchase of a computer pycnometer control device for the Physical Properties Laboratory. These measurements have always been very hard to do, the data are necessary, and easier operation will not only enhance the data quality, but will also lessen the time involved in the present day operation of the measurements.

3. WSTP Temperature Logger

The purchase of new ADARA type temperature loggers will lead to vastly improved temperature measurements by the WSTP. This is a particularly important problem for the Sedimented Ridges Leg 169, but sufficient lead time is necessary for obtaining and installing this equipment.

In Summary:

1. Cryogenic Magnetometer	$ 250,000
2. Computer Pycnometer Control	$ 15,000
3. ADARA Temperature Loggers (6)	$ 42,000

14. Panel Membership

A notice was received from the JOIDES Office with regards the Panel Membership.

The following persons are ready for potential replacement:

Mike Rhodes(US)	Petrologist/XRF
Ellen Thomas (US)	Paleontologist

SMP suggests the following candidates for these positions:

Petrologist/XRF	James Hawkins (US) still being approached
Paleontologist (Proposed)	Lucy Edwards(US) U.S. Geological Survey Alternate: David Watkins University of Nebraska

In addition the following panel members are scheduled to rotate of the panel:

Dominique Weis (ESF)	Replaced by Massimo Sarti Sedimentologist/Paleoceanography
Jean-Pierre Valet (F)	Replaced by Siegfried Lallemant Structural Geologist
Kate Moran (CAN-AUS)	Replaced by Ian McDermott Memorial University New Foundland

16. Next Meeting

SMP proposes its next meeting to be held in Bremen on September 27, 28, and 29, 1995.

Heinrich Villinger has agreed to be the host for this meeting.

SMP is looking forward to get familiar with the new Bremen Core Repository.

16.Acknowledgements

SMP wishes to express its appreciation for the excellent co-operation received from the TAMU personnel. Especially Jamie Allan has gone out of his way in preparing the ODP/TAMU report to SMP. Peter Blum was most helpful in his presentation of the results of the Depth Workshop. John Firth is thanked for his presentation and work on Fossilist. The participation of Randy Current and Brad Julson was most helpful to the panel. Finally Linda Weatherford explained to SMP the status of the "cook book" development and SMP appreciates these efforts.

APPENDIX 1

IMPORTANT ITEMS ARISING FOR PCOM FROM SMP

EQUIPMENT NEEDS

SMP WISHES TO STRESS THE NEED FOR CONSIDERATION OF THE FOLLOWING ITEMS:

1. Multi Sensor Track (MST).

SMP considers the further development of the MST to be an item of the highest priority. ODP/TAMU is giving this high attention and we wish to emphasize the need for PCOM to endorse this. The MST will play a key hole in data integration procedures. Data integration will be one of the most important achievements of ODP in the next few years.

2. X-Ray Fluorescence Laboratory.

SMP wishes to point out that, notwithstanding the working state of the present XRF apparatus, it is important to consider the potential need for the replacement of this aging equipment. SMP suggests that PCOM should be aware that in the case that an emergency arises, funds should be earmarked for the replacement of this equipment, which is quintessential for the success not only of hard rock legs, but also for sediment oriented legs.

3. Paleomagnetic Equipment.

The equipment present in the Paleo-magnetics laboratory was state of the art when it was obtained by ODP. Again this equipment is aging and much more sensitive equipment is nowadays available. The latter would be most useful for measurements in carbonate sediments, often the target of paleoceanographically oriented legs. Again, SMP wants to urge PCOM to be aware of the necessity of future replacement of the present equipment.

SOFTWARE NEEDS

SMP is aware that limited time is available to the ODP/TAMU computing staff for software development, especially because of the intense interaction with TRACOR. For these reasons SMP considered the need for the present further development of programs such as Etch-a-Sketch, etc. and concluded:

Recommendation 94-10

SMP urges that the further development of Etch-a-Sketch and similar programs be put on hold. SMP considers it of importance that for the capture of data on VCD, Etch-a-Sketch, Rocky, or Structure Data, the capability be explored by TAMU of commercially available CAD programs.

SMP, however, does urge the continued development of the program **FossiList**, which is well on the way and needs urgent further attention.

The FossiList software holds much promise to become very useful, but it needs a considerable amount of work to become fully operational. It can, in its present state, not be considered fully operational, especially because of several problematic features, such as the loss of data.

Recommendation 94-12

SMP recommends that the development of the FossiList software continues in the near future. SMP urges that, in order for Fossilist to become operational, due attention be given to inclusion of the prime data fields as defined by IHP/SMP. IHP urges that ODP give first priority to the continued development of Fossilist, sothat the impetus will not be lost and the program will become fully functional in the near future.

SMP also wishes to emphasize the need for the shipboard testing of any such software by the pricipal person involved in the development of the software, whether from TAMU or TRACOR.

Recommendation 94-3:

SMP recommends that whenever new software is placed on the ship the principal programmer will go out to sea with this software, so that problems arising can be solved by direct interaction with the shipboard scientific party.

DATA BASE UPGRADE

SMP has been involved in the data base upgrade project. New member Terri Hagelberg is the SMP representative. During the Fall Meeting of SMP the upgrade was discussed and a priority list of projects was established. This list has been further discussed via e-mail and a satifactory answer has come about.

SMP proposes to meet with IHP for one day during its Spring 1995 meeting for further interaction with SMP on this topic.

One point came up during the discussions, i.e., representation by the other member countries in the Steering Committee:

Recommendation 94-11

SMP urges PCOM/JOI to consider the appointment of one extra member of one of the other member countries to the Data Base Steering Committee, having obtained the assurance of active participation in this effort.

CORE-LOG OR DATA INTEGRATION

In August 1994 a meeting of the socalled CLICOM (Core-Log Integration Committee) was held. The mandate of the committee, as defined by PCOM Chair Brian Lewis, was as follows:

Mandate to the committee

1. A definition of the concept of core-log integration.

2. What inputs are needed for a successful shipboard (and subsequent shore based) effort towards core-log integration ?

3. A recommendation with respect to proper asignment of personnel responsible for shipboard data integration efforts.

Summary and Recommendations

CLICOM recommends:

1. The CLIP program, developed by Peter deMenocal in collaboration with Terri King Hagelberg, after extension of this program in the future, will be an important feature of data integration efforts. CLICOM realizes that the CLIP program is still in a development stage and can be made available to shipboard scientists, especially for core-core data integration. However, CLICOM is satisfied about the future prospects of the CLIP platform and, therefore, **CLICOM recommends** that CLIP be recognized as an important component of the future data base update and that the future contractor remain in full contact with BRG-LDEO with regards the future implementation of this program;

2. **CLICOM agrees and recommends** that a very careful record be kept of depth changes achieved during the manipulations necessary to reach the common depth scale of cores and logs and that each Initial Report of ODP contain a separate chapter on core-log integration or any other Shipboard Data Integration (SDI) effort;

3. **CLICOM recommends** the maintenance on board ship of three work stations available for dedicated data integration, especially during drilling legs in which core-log integration plays a major role:

1. In the core laboratory;

2. In the scief scientists office;

3. In the library.

This item is presently being realized by TAMU.

4. With the Multiple Sensor Track (MST) being one of the most important components of SDI **CLICOM recommends** that attention be given to:

1. Dedicated technical support through a well trained ODP MST specialist;

2. Dedicated future support for continued further software and hardware development (MST track improvements).

5. Though staffing of a cruise, during which core-log integration is envisaged to be of importance, is usually done in collaboration with the co-chief scientists of that cruise, CLICOM recommends special attention to the following aspects of this staffing:

Shipboard data integration requires the co-ordination by a dedicated Shipboard Data Integration Specialist, who will have the sole responsibility to carry out the shipboard program of data integration, in collaboration with scientists operating the MST, the physical property experts, as well as shipboard biostratigraphers, paleomagnetists, chemists, and, of course, the logging specialists. The Shipboard Data Integration Specialist will end up defining the depth scales - working together with all other shipboard scientists to confirm/validate and even constrain depth scales.

Data Integration is presently most feasible and constitutes a major advance in a subject long advocated, but presently achievable. SMP strongly endorses the further development of the Data Integration Platform (formerly CLIP).

CLICOM realizes that this report is mainly directed towards consideration of the state of development of the CLIP platform, conform with the directives of the PCOM Chair. However, this report should also serve as a potential basis for future more extensive discussion on data integration. This should be discussed in greater detail by the SMP and IHP panels.

SMP is aware of the recent suggestion of ODP/TAMU to hold a "depth workshop" at ODP/TAMU prior to the Spring 1995 SMP and IHP meetings. This workshop will aim at the problem of the implementation of "depth manipulations" through the ODP operator. A membership of 7 (including 3 from other countries than the US) is proposed. SMP strongly endorses this meeting and will collaborate in setting up the membership.

Appendix 2

1992-1995 ODP Major Scientific Equipment Purchases
*= SMP Recommendation

Geophysics Lab

1*. Underway Geophysics System (153) $100,000

2*. Real-Time Navigation (159) $85,000

Physical Properties Lab

1*. Natural Gamma System (149) $35,000

2*. TeKa Geophysical Instruments Thermal Conductivity System (1995) $39,000

3*. Sediment Resistivity System (1995) $18,000

4*. MST Hardware+Software Upgrades (1995/1996) $100,000 Alloted

5. Replacement Pycnometer (160) $15,000

Core Lab

1*. Lasentec Particle Analyzer (159) $7000 w/trade

2*. 2 Minolta CM2002 32-band Spectral Analyzer/ Spectrophotometers (146) $25,000

Magnetics Lab

1. Kappabridge for Magnetic Anisotropy (147) $24,500

X-Ray Lab

1*. XRF Upgrade- (149) $62,000

2*. Tokyo Kagaku RF XRF Bead fluxer (159) $24,000

Microscope Lab

1*. Zeiss Axiophot Paleo Microscope (1995) $73,000

2. Two Zeiss SV-11 Stereo Microscopes (147) $30,000

3. Zeiss Axioplan Microscope (147) $38,000

Chemistry Lab

1*. Brinkmann Auto-Titrator (152) $15,000

2*. Autosampling Dionex Ion Chromatograph (148) $37,000

3. Two 486-based PC Chemstations (149) $31,000

4. ROpure/Nanopure Water Purification (153) $5000

Computers

1*. Sun SPARCstations for Data Integration (Sparc 10 (shore), 1 Sparc 20, 3 Sparc 5's, peripherals) (1995) $60,000

2*. Ship PowerPC, Pentium Upgrades (1995) $123,000

Appendix 3

SHIPBOARD LAB MANUAL LWG

MEMBERS:

- Marine Laboratory Specialists
- Staff Scientist (to be named)
- Linda Weatherford - Facilitator

PURPOSE:

- To study the current system for maintaining shipboard lab manuals and cookbooks and to make any recommendations for improvement.

DEFINITIONS

MANUAL - general guideline for a piece of equipment.

- There are two types of manuals - operations and service. Operations manuals outline how to run a piece of equipment and service manuals outline how to maintain and service the equipment.

- Manuals are produced by the company that built the equipment (this may include ODP).

COOKBOOK - detailed guide to running a piece of equipment.

- Cookbooks are written by the technicians and scientists who operate the equipment, and contain descriptions, observations, and tips. Cookbooks are written by equipment users to facilitate the use of the equipment.

CURRENT STATUS

- Manuals and cookbooks are stored in the labs. They are located on shelves above the equipment in use.

- There is an operation and service manual for almost every piece of shipboard lab equipment.

- There is a cookbook for most pieces of equipment that the technicians feel needs one (Physical Properties and Underway labs are currently being upgraded. Cookbooks have not yet been written for the new equipment).

- Cookbooks are continually updated by the technicians on ship or on shore as time permits.

PROJECTS

- Create a style manual that states the minimum requirements for cookbooks.
- Store all cookbooks on a electronic file server (shipboard).
- Get a copy of all cookbooks on shore.

LAB _____

EQUIP _____

TITLE _____

TYPE Cookbook ☐ Manual ☐

Other _____

_____

AUTHOR _____

DATE _____

CURRENT Yes ☐ Needs Upgrade (major or minor?) ☐ Can't assess ☐

Other_____

_____

FORMAT

Tech's Formal Notes ☐ Tech's Random Notes ☐

Tech's Handwritten Notes ☐ Scientist's Handwritten Notes ☐

Scientist's Formal Notes ☐ Scientist's Random Notes ☐

ODP Tech Note ☐ Manufacturer's Manual ☐

Text or Reference Book ☐

Other_____

_____

ACCURACY Annotated by anyone? ☐

Other_____

_____

EASE OF USE Easy ☐ OK ☐ Impossible ☐

PRESENTATION

Bound & Labelled ☐ Bound & Unlabelled ☐

Loose-leaf & Labelled ☐ Loose-leaf & Unlabelled ☐

Other_____

_____

CONDITION Pages ☐ Torn / Missing Worn/Dirty ☐

Other_____

LOCATION _____

NOTES _____

_____

_____

Appendix 4

Copy to
Jack Baldauf
Jamie Allan
Bob Olivas

FYI

December 5, 1994

Dr. Joris Gieskes
Chair, Shipboard Measurements Panel
Scripps Institute of Oceanography
University of Califomia, San Diego
La Jolla, CA 92093-0215

Dear Dr. Gieskes:

The participants of the JOI/USSAC Geomagnetic Polarity Reversal Workshop (held in Miami November 7-8, 1994) advocate the installation of a new pass-through cryogenic magnetometer on board the JOIDES Resolution. The existing 2G Enterprises cryogenic magnetometer was installed in 1985. Since that time, 2G Enterprises has built 7 long-core pass-through magnetometers and 42 discrete sample rock magnetometers, and much has been learned about optimal cryogenic magnetometer design.

Notable among the technological advances is the recent advent of DC (as opposed to AC) SQUID sensors. The achievable noise level of the DC squid magnetometers is about $3*10^{-9}$ emu in contrast to about 10^{-7} emu for systems using the standard AC squids. The cryogenic magnetometer on board the JOIDES Resolution is particularly noisy due to its hostile environment, inadequate magnetic shielding and RF interference. The DC squids are less prone to shipboard RF interference, and the new magnetometer would have improved (superconducting) magnetic shielding. These features further improve the sensitivity of the new system, and would allow the magnetization of a wider range of weakly magnetized sediments to be measured with precision.

In addition to the advent of DC squids, improved dewar insulation in the new magnetometers reduces liquid helium boil-off. For the new shipboard magnetometer, liquid helium refill would be necessary every 3.5 years, as opposed to the present 10 month refill interval. This will result in substantial savings, reducing the refill frequency and the necessity for refills at remote ports. The present shipboard cryogenic magnetometer cannot be used to measure the remanence of weakly magnetized (<1 mA/m) discrete samples. The shipboard (Molspin) fluxgate magnetometer can only be used for relatively strongly magnetized sediments and is extremely slow. The new cryogenic magnetometer would measure discrete samples quickly and with high precision.

The processing of sediment cores using the present shipboard magnetometer is very often too slow to keep up with core flow, especially for legs with high rates of sediment retrieval. The tracking speed on the new magnetometer would allow the core measurement process to keep up with core retrieval. The in-line core demagnetization capability will be greatly improved with the new system, from 30 mT maximum peak field to 70 mT. This will be important for sediments with high coercivity magnetic overprints. Such overprints are common and may often be attributed to the drilling process.

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The on-board magnetometer software has been progressively improved over the last ten years, mainly through the efforts of shipboard scientists. It has never been optimal however, and needs to be completely rewritten, preferably in conjunction with the installation of a new magnetometer. We advocate that the existing shipboard magnetometer be placed at College Station preferably in a magnetically shielded room. In this optimal environment, the instrument's performance would be greatly enhanced compared to its shipboard performance. At College Station, it could be used for analysis of archived cores, and for detailed post-cruise studies.

According to 2G Enterprises, a new DC SQUID magnetometer could be delivered in 12 months and could be installed during a 5 day port call. All participants in the Geomagnetic Polarity Reversal Workshop strongly advocate this purchase. We believe that it would substantially improve the data quality of shipboard magnetostratigraphies, and would improve the rate at which sediment cores could be processed in the shipboard paleomagnetic laboratory.

Sincerely,

Dr. Bradford M. Clement
Convener, Geomagnetic Polarity Reversal Workshop

cc. Rob Kidd, PCOM Chairman
Tim Francis, ODP
Audrey Meyer, USSAC Chair

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APPENDIX 10

2G Enterprises

Appendix 5

Ms. Margaret Hastedt
Ocean Drilling Program
TAMU
Discovery Park
College Station, TX

November 2,1994

Dear Margaret:

I have attached a letter to Jean-Pierre and a draft quote for a new system as we have discussed. Please let me know if you have any comments or questions.

All the best,

Bill

William S. Goree, Partner

2G Enterprises

FAX 011-33-1-44277463

November 2, 1994

Prof. Jean-Pierre Valet
Institut de Physique de Globe de Paris
4, Place Jussieu
75252 Paris Cedex 05
FRANCE

Dear Jean-Pierre:

I am finally responding to your last letter with more information about the new magnetometer for ODP. We had a very useful visit from Mike and Margaret several weeks ago when they were able to witness the Mexico system in partial operation. Also, we discussed many of the features that a new system must have to make it fit the ODP requirements. In the following paragraphs I have tried to summarize these discussions and review several critical aspects of a new system which must be considered. I have attached a draft quotation for a new system to provide a budgetary cost.

We have done several important experiments with the Mexico magnetometer that are relevant to ODP.
First, we rotated the magnetometer thru plus/minus 90 degrees about a vertical axis to determine the magnetic field attenuation that a single layer Hypernom shield and the superconducting shield provided. The results was that the signal detected by the transverse SQUIDS was about 100 times larger than the DC SQUID noise level. Thus, we recommend that a new system have at least a factor of 100 better transverse field attenuation. The axial field attenuation is more than adequate in the present design. For a superconducting shield the transverse field attenuation is a factor of 35 per shield diameter, thus if the superconducting shield is made somewhat more than one diameter longer on each end the attenuation should be good enough. We recommend that the extra length be 2 diameters (or 25 cm) per end to provide a 10 to 1 safety factor. This will increase the magnetometer length by 50 cm to 2.0 meter.
Second we have measured the peak magnetic field obtainable with the AF coils using a space of 8.1 cm. This would be for a magnetometer access diameter of 8.1 cm or 0.2 cm larger than the present ODP system. The measured peak field is 60 mT for the transverse coils, and 140 mT for the axial coil. We believe that the peak field could be increased to about 80 mT with a few changes in the coils design and the AF shield length. This would make the AF shield about 80 cm long. I have included the cost for this longer AF shield in the draft quotation.

From our meeting with Mike and Margaret the following factors seem to be most important to the ODP.
1. Better sensitivity, by a factor of at least 100 over the present system when at sea.
2. Longer operating times between helium refills. This will result from lower loss rate and possibly increased helium volume. Note that the new DC SQUID system with 7.6 cm access have an operating time between 4 and 5 years for a single fill, so it is critical that we investigate ways to minimize the loss caused by ships motion.
3. Higher AF fields.
4. Better magnetic shielding of the AF region.

5. Simpler and more trouble free helium refills.
6. Reconsider the pickup coil construction, to optimize its response for cores.
7. Reconsider the sample handler to optimize its use for split cores. That is , should we position the split core so that it is more closely centered in the pickup coil region.
8. Improve the ease of the helium transfer, and incorporate heaters to make clearing plugged fill/vent lines faster. This has already been accomplished in the most recent 2G magnetometers.

The only design change that will add to the cost of the new magnetometer is the additional length, since this requires special components for the vacuum jacket, thermal shields, superconducting shield and pickup coils. The cost listed on the attached draft quotation are based on our anticipated 1995 prices, the receipt of an order within about 3 months, and delivery in early 1996, hopefully to allow the installation during the scheduled Miami port call. If this port call occurs in December 1995, we could possibly have the system cready, but would need a formal purchase order befor the end of 1994.

Another topic for discussion is the performance improvement that can be expected from the present ODP system when operated on land. I have been unable to locate the noise data that we took at 2G after the system was rebuilt, when the access was increased 7.60 to 7.9 cm. I am certain that we have strip chart records of this noise and will probably locate them in a few days. If so, I will FAX the data to Brad Clement. As an approximation, the noise and loss rate should be the same as for the Scripps 2G system.

Please give me a call from Miami if you have any questions etc. Note that we have a toll free number from within the states: 1-800-222-7034 for the lab and 222-7035 for my office at home.

Best regards,

Bill

William S. Goree, Partner

Copy:
Mike Fuller, U.C.Santa Barbara
Margaret Hastedt, Texas A&M

2G Enterprises

Ocean Drilling Program
Texas A&M University
College Station, TX

November 2,1994

DRAFT Quotation.2G Enterprises # 110294-1

item	description	cost
1.	2G760R Superconducting Rock Magnetometer with 50 cm extra length, DC SQUIDS.	$ 130,000.
2.	2G760H Two Layer Magnetic Shield for 760	$ 15,000.
3.	2G600 Automatic Degaussing System.	$ 23,000.
4.	2G601T Transverse Degaussing Coil, 3 sets at $3,300.	$ 9,900.
5.	2G615H 3 Layer Shield for Degaussing Coils.	$ 10,000.
6.	Computer, software and system integration.	$ 6,000.
7.	2G768 Aluminum Stand for 760R.	$ 1,800.
8.	2G620 Aluminum Stand for Degaussing Coils.	$ 1,300.
9.	2G 810 long core sample handler with electronics.	$ 23,000.
10.	2G 810H 2 layer shield for long cores.	$ 9,000.
11.	2G765H Magnetic Shield for Cryocooler.	$ 1,000.
	TOTAL SYSTEM COST	$ 230,000.
	Estimated additional cost for packing, shipping, insurance and installation.	$ 7,000.

TERMS and CONDITIONS:
1. Cost is in USA dollars.
2. Cost is Ex Works, Mountain View, CA.
3. Delivery is estimated to be within 12 months from receipt of firm order.

Respectfully yours,

William S. Goree

William S. Goree
Partner

Appendix 7

Overview of Computer Upgrade Steering Committee

presented to SMP/IHP by Terri Hagelberg

Definitions:

Steering Committee (SC):
"a group of experts appointed by JOI, Inc. representing the ultimate end users of the Ocean Drilling Program committees and panels and providing definitive direction to ODP/TAMU on the conduct of the project"

User groups:
"User groups will be established by the SC for the purpose of preliminary definition, testing and evaluating the products developed by TRACOR"

ODP Data Management System - Statement of Work

0. The scope of this Statement of Work (SOW)

The intent of this statement of work is to define, in various degrees of detail, the tasks that need to be undertaken to accomplish this Project, who will be responsible for the tasks, what the deliverables will be and the schedule for their delivery.

It is understood in this SOW that some details of the SOW can only be specified after the work has started and input from the user community has been acquired. These details will be specified through discussion between TRACOR, ODP/TAMU and the Steering Committee(SC).

1. Project Goals and proposed method of achieving these goals

The primary project goal is to improve the quality, productivity and visibility of the science resulting from ODP drilling by providing a data management environment which meets current and future needs of the scientific user community.

The ODP Data Management Project, hereinafter referred to as Project, stipulates that a new database system, including both hardware and software, be installed on the JOIDES Resolution, as well as at the ODP facilities located in College Station, Texas at Texas A&M University. This system will be integrated into heterogeneous computing environments at both sites, and shall be usable by all platforms in the respective networks. The shipboard system will support data acquisition and retrieval through both manual and instrumentation interfaces. Both sites will be equipped with custom data retrieval applications that can be used from remote sites. Applications and graphical user interfaces will be developed or modified as required in order to make use of the new system and its capabilities.

TRACOR's Incremental Build Development Methodology (IBDM) will be used as the development philosophy. The IBDM uses repeated cycles of analysis, rapid prototyping and development, which produces the final system as a series of "builds". In this philosophy, analysis and development are continuous and concurrent. The user interface and core functionality of each original portion of the system is jointly specified by ODP/TAMU, SC and developers (TRACOR) using TRACOR software engineering techniques. Rapid prototyping of individual applications allows immediate user testing and feedback.

The scope of this Project is defined in the Technical Proposal, Best and Final Offer, presented to the Ocean Drilling Program, April 29,1994. TRACOR Proposal number 035-751-30-11.

2. Project Participants

There are four principal Technical Participants in this Project:

a) TRACOR - the developer, and may be referred to as the Developer, Subcontractor or TRACOR throughout this SOW.

b) ODP/TAMU - the Science Operator for the Ocean Drilling Program. Only ODP/TAMU employees have been authorized by TAMRF to be the technical representatives of TAMRF.

c) Steering Committee (SC) - a group of experts appointed by JOI Inc. representing the ultimate end users of the Ocean Drilling Program committees and panels and providing definitive direction to ODP/TAMU on the conduct of the project.

d) User Groups - User Groups will be established by the Steering Committee (SC) for the purpose of preliminary definition, testing and evaluating the products developed by TRACOR.

Close cooperation between all four participants is essential to the success of this Project.

2.1 The Role of the Steering Committee (SC)

The overall mandate of the JOI Inc Data Management Steering Committee (SC) is to guide the development of the ODP DataManagement System and to ensure that TAMU receives appropriate input from the final user community.

The overall mandate has two specific components. A) To supply overall guidance and review for this project. B) To co-ordinate user information into the specification of data types and information query requirements, and to coordinate and review user testing of the products in the IBDM process.

Specifically the SC will;

A) Provide guidance for development of the ODP Data Management system.

In particular they will;

a) Review System Requirements and Design documents.

b) Provide guidance to TAMU and it's developer in the nature and priorities of various user requirements.

c) Review progress and technical reports

d) Provide JOI Inc. with progress reports at least quarterly and report to PCOM at each of their meetings

B) Represent the user community in terms of ;

a) Receiving information and requirements from the user community (JOIDES panels and users), coordinating this information and requirements, and passing it to TAMU and TRACOR for use in the development of the ODP Data Management System. This will be facilitated by the SC maintaining liaisons to appropriate JOIDES panels.

b) Specifiying user groups who can serve as, reviewers, testers and evaluators of the products to be developed by TRACOR.

c) Serve as the conduit to the user science community for information on this system and its progress.

2.2 The role of ODP/TAMU

ODP/TAMU is the Science Operator and has been assigned by TAMRF to contractually monitor the technical progress on this Project. ODP/TAMU authorized technical representatives are the only personnel authorized to give TRACOR technical direction. Information received from any other sources is to be reviewed by TRACOR, but should not be acted upon without TAMRF approval, if said information changes the SOW or total estimated cost to complete .

ODP/TAMU will:

a) Implement the transition plan developed by TRACOR.

b) After acceptance, operate and maintain the final system.

c) Supply TRACOR with information regarding the ship and shore environments, insofar as they affect this Project.

d) Direct the purchase and installation of the hardware and software specified by TRACOR, via the TAMRF Purchasing Department.

e) Provide information received from the SC to TRACOR.

f) Implement the written direction received from JOI which may result from JOI's review of the SC's recommendations.

2.3 The role of TRACOR

TRACOR is the Developer in this Project and is responsible for:

a) Detailed specifications of the hardware and software

b) Designing the overall data management system

c) Developing specific data capture and information retrieval applications

d) Supplying appropriate training and documentation for the system

2.4The role of User Groups.

User groups will be established by the SC (with input from JOIDES) for each one of the SC defined data groups. Each user group will consist of about 10 to 15 persons selected from the international user community to represent expertise in a particular data area and to represent the wider scientific communities interests. From each user group a subgroup of 3 to 4 persons will be selected by the SC to interact directly with TRACOR in the testing and evaluation of software application products. In each subgroup a chairperson will be selected to chair the whole user group and to interact directly with the SC. The chair, with help from the subgroup, will in turn interact with the rest of the user group to evaluate and test products, thereby achieving as wide a consensus as possible on the usefulness and quality of the TRACOR products. This interaction should for the most part occur over the computer networks. Travel for the subgroups to attend TRACOR testing sessions will be incorporated in project funds.

3. Project management

3.1 Project guidance

The SC will provide overall guidance for this Project. ODP/TAMU will consult with TRACOR as to the most appropriate method of incorporating the guidance into the Project. This consultation shall include the overall impact on the Project from both a technical and cost impact point of view. If ODP/TAMU feels it cannot follow the guidance of the SC it will bring the matter to JOI for resolution.

3.2 Contractual responsibilities

JOI Inc. has the overall contractual authority with TAMRF. TAMRF will have overall contractual authority with TRACOR. TRACOR shall not perform any work which shall cause the actual costs to exceed the funding limitations set forth in the subcontract, (figure 1).

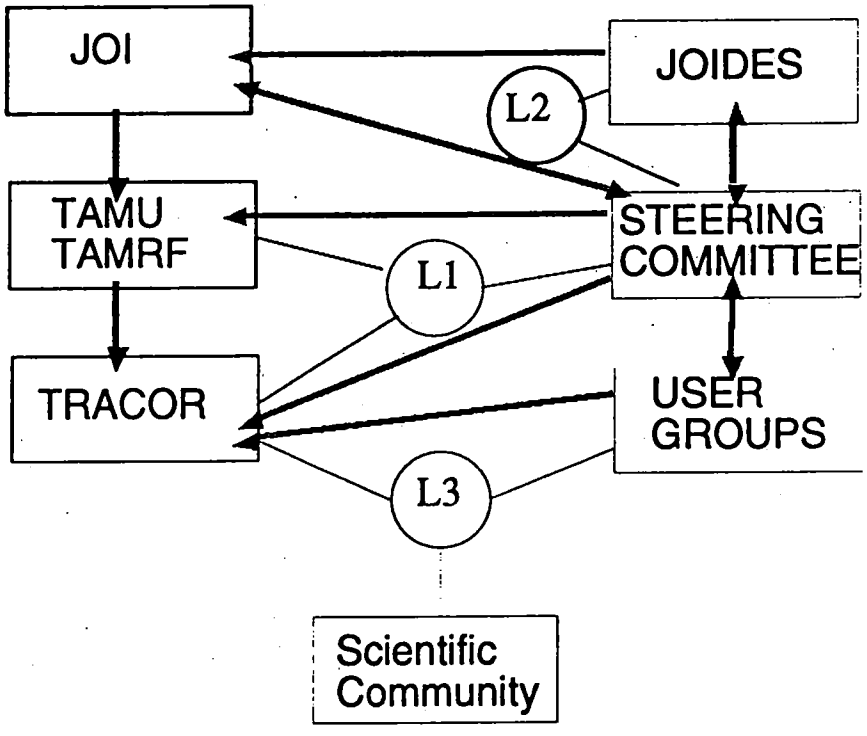
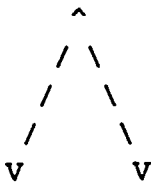


Figure 1. Diagram showing the information flow relationships between JOI Inc., JOIDES, SC, ODP/TAMU, TRACOR and SC designated user groups (thick dotted lines), contractural relatioships between JOI Inc., TAMRF and TRACOR (solid lines) and information flow to electronic listservers (thin dotted lines).

Group 1. Corelog data
Leg/Site/Hole
Sample Data
Chemical Samples



Group 2a. Grape
P-Wave
Magnetic susceptibility
natural gamma
color reflectance
paleomagnetics
geochem and quad-combo logs

Group 2b. Paleontology
ageprofile
smearslide

Group 3. Adara
WSTP
thermal conductivity
sonic velocity
shear strength
index properties

(continued work on 2b)

Group 4a. Rock eval/Geofina
carbon/carbonate
gas chromatography
gas chromatography
interstitial water
XRF/XRD

Group 4b. sediment
description
structural
description

Group 5. Hard rock description
thin section description

(continued work on 4b)

Group 6. tensor/sonic core monitor
underway geophysics
seismic
core photos
FMS logs

USER SUB GROUPS

GROUP 2A: MST/LOGS/PALEOMAG

T. HAGELBERG (SMP)*
A. MIX (PCOM)*
A. HAYASHIDA (JAPAN)
P. BLUM (TAMU)
ALTERNATES: J. KING*, R. WILKENS (IHP), J. BLOEMENDAL (UK)

GROUP 2B: PALEONTOLOGY

P. WEAVER (UK)*
W. RIEDEL (IHP)*
J. BACKMAN (OHP, ESF)*
W. HAY (SGPP, GER)
J. FIRTH (TAMU)
ALTERNATES: B. HUBER (IHP), T. SAITO (JAPAN), W.WISE

GROUP 3: PHYS. PROPS

K. MORAN (AUS/CA)*
J. HOOD
F. RACK (AUS/CA)*
W. MILLS (TAMU)
ALT: H. VILLINGER (GER, IHP), R. BRERERTON (UK, SMP), L. MEYNADIER (FR), R. CHANEY (SMP)

GROUP 4A: CHEMISTRY

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P. FROELICH
M. MOTTL
J. MILLER (TAMU)
ALTERNATES: H. BRUMSACK (GER), M. TORRES

GROUP 4B: SEDIMENTS/STRUCTURES

S. O'CONNELL
T. LOUTIT (AUS/CA)
STRUCTURES:
TAMU REP
ALTERNATES: R. TIEDEMANN (GER), P PEZARD (FR), C. GLENN

GROUP 5: HARD ROCKS

J. LUDDEN (AUS/CA, LITHP)
D. KELLEY
M. RHODES (SMP)*
J. ALLEN / J. MILLER (TAMU)
ALT: J. NATLAND, C. MCLEOD, D. WEIS (SMP, ESF), P. AGRINIER (FR)

GROUP 6: DOWNHOLE / UNDERWAY

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W SAGER (IHP)
K. TAMAKI (JAPAN)

USER GROUPS

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J. BLOEMENDAL (UK)
K. BECKER
P. DEMENOCAL (BRG)
A. FISHER
P. JACKSON
N. PISIAS
N. SHACKLETON (UK)
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F. BASSINOT (FR)
K. KASTENS
M. LYLE
J.P. VALET (SMP) (FR)
J. PARISO (SMP)
J. ALI (FR)
L. TAUXE
S. ALLERTON
J. CHANNELL
D. MCNIELL
D. SCHNEIDER
J. OGG

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L. EDWARDS
D. WATKINS
D. KROON
C. FOSTER

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R. CORFIELD (UK)
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R. GERSONDE (GER)
E. ERBA (ESF)
J. AITCHISON (AUS/CA)

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E. TAYLOR
R. BRERERTON (SMP) (UK)
H. VILLINGER (SMP) (GER)
V. SPEISS (GER)

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H. BRUMSACK (GER)
M. TORRES
R. STEIN (GER)
J. FARRELL (AUS/CA)
G. WHEAT
J. WHELAN
P. SWART (UK)
R. STAX (GER)
T. PEDERSON (AUS/CA)
J. GIESKES (SMP)
G. HAMPT
D. MURRAY

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R. TIEDEMANN		(GER)
P PEZARD		(FR)
C. GLENN		
R. HISCOTT		
M.A. HOLMES		
A. KEMP	(OHP) (UK)	
L. KRISSEK		
K. MARSAGLIA		
D. REA	(OHP)	
J. ZACHOS	(OHP)	
T. JANECEK		
K. PICKERING		
G. ROTHWELL		
M. UNDERWOOD	(SGPP)	
L. WATNEY	(IHP)	
J. THURGOW		
S. LALLEMENT		(FR)
S. HURST		
S. ALLERTON		(UK)
K. BROWN		
S. PHIPPS		
T. BICKERT		(GER)

GROUP 5: HARD ROCKS

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D. KELLEY		
M. RHODES	(SMP)*	
J. NATLAND		
C. MCLEOD		(UK)
D. WEIS	(SMP) (ESF)	
P. AGRINIER		(FR)
D. VANKO		
D. TEAGLE		
P. KEMPTON		(UK)
C. STEPHENS		(AUS/CA)
K. NILLSON-FARLEY		
J. BROPHY		
M. FISK		
C. MANNING		
K. GILLIS		
S. BLOOMER		
I. GIBSON	(IHP)	

GROUP 6: DOWNHOLE / UNDERWAY

R. SCRUTTON (SSP)
W SAGER (IHP)
K. TAMAKI (JAPAN)
G. MOUNTAIN
G. SHARMAN
G. MOORE
K. MACINTOSH
M. MARLOW
N. BANGS
A. TREHU (SSP)
A. CAMERLENGHI (SSP)
S. KURAOTO (SSP)
H. TOKUYAMA (SSP)

Appendix 8

Tectonic Panel Liaison Report to SMP

Kevin Brown (TECP)

The tectonic panel considers structural data to be a prime data set that is of considerable importance to the panels general scientific objectives and would like to be represented at a reasonably high level in the structure that will oversee the implementation of the TRACOR contract. Structural data have not been regularly collected during ODP drilling in the past and much prime data will have unwittingly been lost because of this. We are endeavoring to rectify this situation and the TECP has chosen to take a proactive stance on the issue of structural data collection and archiving. The TECP is committed to processes that will promote the regular and accurate collection of structural data where tectonic deformation is observed in the cores during ODP drilling. We are also strongly committed to the general concept that such data should be collected in a format that will allow it to be closely integrated with other data sets. The significant benefits of data/core integration are self evident, particularly now that it is established that high quality data (e.g., logging-while drilling) can be collected in unstable but highly interesting tectonic environments such as the Barbados Ridge Accretionary Wedge.

The newly developed structural data archive program is seen as a stop-gap measure to insure that further data are not lost while a comprehensive and integrated archiving program is developed as part of the TRACOR contract. On seeing the proposed work order for the TRACOR contract the TECP expressed concern that much of the primary core observation data (sedimentology, structural data, hard rock data) was so low down on the work-order list. If the funding for the project runs out before these primary data sets are incorporated then the other data sets (logging etc.) will be difficult to interpret and largely useless for many of TECP concerns. We suspect that LITHP will feel much the same in this regard. We would also note that the items lower on the list are probably going to be the hardest to deal with (i.e., scanned figures and cross sections, core and thin section photo images etc.) and will take probably a disproportionate number of man hours in terms of software development. Many of the basic technical hurdles are similar (in terms of inclusion of core and petrographic descriptions, sketches, structural measurements, and photographs etc.) between the hard rock and structural data. The TECP would like to see the basic technical software problems involved in these aspects being dealt with early on in the developmental process, perhaps in tandem with the more number oriented data sets listed at the top of the work order.

Appendix 9

Proposal to Ocean Drilling Program for New Instrumentation Onboard the Drilling Ship *Resolution*

Bernd R. T. Simoneit, Proponent

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This is a proposal to justify the addition of a mass selective detector to the Hewlett-Packard gas chromatograph onboard or to add a separate gas chromatograph-mass spectrometer (GC-MS) to the instrumentation in the organic geochemistry laboratory. The cost of such instruments is currently quite reasonable ($40-80 K), operation and maintenance are routine and reliable, and benchspace needed is about twice that of a gas chromatograph (GC).

I base this request on shortcomings after sailing on ODP Leg 139 – drilling the hydrothermal system in Middle Valley, NE Pacific. Onboard we were analyzing interstitial gas from cored material and encountered two ephemeral peaks in the gas chromatograms (e.g., Figure 1). These were interpreted to be H_2S and CS_2 based on retention time (Davis *et al.*, 1992). Samples were taken back to my shore laboratory for confirmation by GC-MS, but these compounds were no longer detectable. If we had a GC-MS system onboard they could have been confirmed and possibly other labile trace components could also have been detected. Another compound set off the H_2S alarms but was not H_2S as determined by GC and odor (it gave no peak in the GC). Sulfur dioxide was assumed but not confirmed. MS could have identified such a component. Thus, an onboard GC-MS could define the suite of volatile compounds such as aliphatic hydrocarbons (alkanes, CH_4-C_8H_{18}, alkenes, alkynes), aromatics (e.g., benzene, toluene, naphthalene, etc.), thiocompounds (CH_3SH, CS_2, COS, etc.), and unknowns encountered in hydrothermal and other higher temperature drill sites.

The heavier bitumen (lipids, solvent soluble organic matter) extractable from core material is also amenable to GC analyses (examples are shown in Figure 2, Simoneit, 1994). A diverse set of GC patterns is evident and, of course, an onboard GC-MS could provide additional insight immediately. This would be especially useful to assess thermal maturity of the biomarkers as illustrated in Figures 3 and 4 for the hopanoids and steroids, and to detect and characterize polycyclic aromatic hydrocarbons for the ultra high temperature window (cf., Figure 5).

I propose the acquisition of a GC-MS-computer system for trials on the next sedimented ridges drilling leg (ODP Leg 169; possibly 168). I recommend that Hewlett-Packard be approached for a loan of one of their instruments (an HP 5971A GC/MS or current version) to try out, possibly with an option to buy. I request Hewlett-Packard because we have such an instrument working in our laboratories at OSU and I could give its equivalent a rigorous test during the next cruise to a sedimented ridge system.

References

Davis, E., M. Mottl, A. Fisher, P.A. Baker, K. Becker, M. Boni, J. Boulègue, C.A. Brunner, R.C. Duckworth, J.M. Franklin, W.D. Goodfellow, H.M. Gröschel-Becker, M. Kinoshita, B.A. Konyukhov, U. Körner, S.G. Krasnov, M. Langseth, S. Mao, V. Marchig, K. Marumo, H. Oda, C.A. Rigsby, B.R.T. Simoneit, D.S. Stakes, C.G. Wheat, J. Whelan, H.W. Villinger and R.A. Zierenberg (Shipboard Scientific Party) (1992). *Proceedings of the Ocean Drilling Program, Initial Reports*, Vol. 139, Ocean Drilling Program, College Station, TX, p. 482.

Simoneit, B.R.T. (1994). Lipid/Bitumen Maturation by Hydrothermal Activity in Sediments of Middle Valley, Leg 139. In: *Proceedings of the Ocean Drilling Program, Scientific Results*, Vol. 139, M. Mottl, E. Davis, A. Fisher and J. Slack, eds., Ocean Drilling Program, College Station, TX, pp. 447-465.

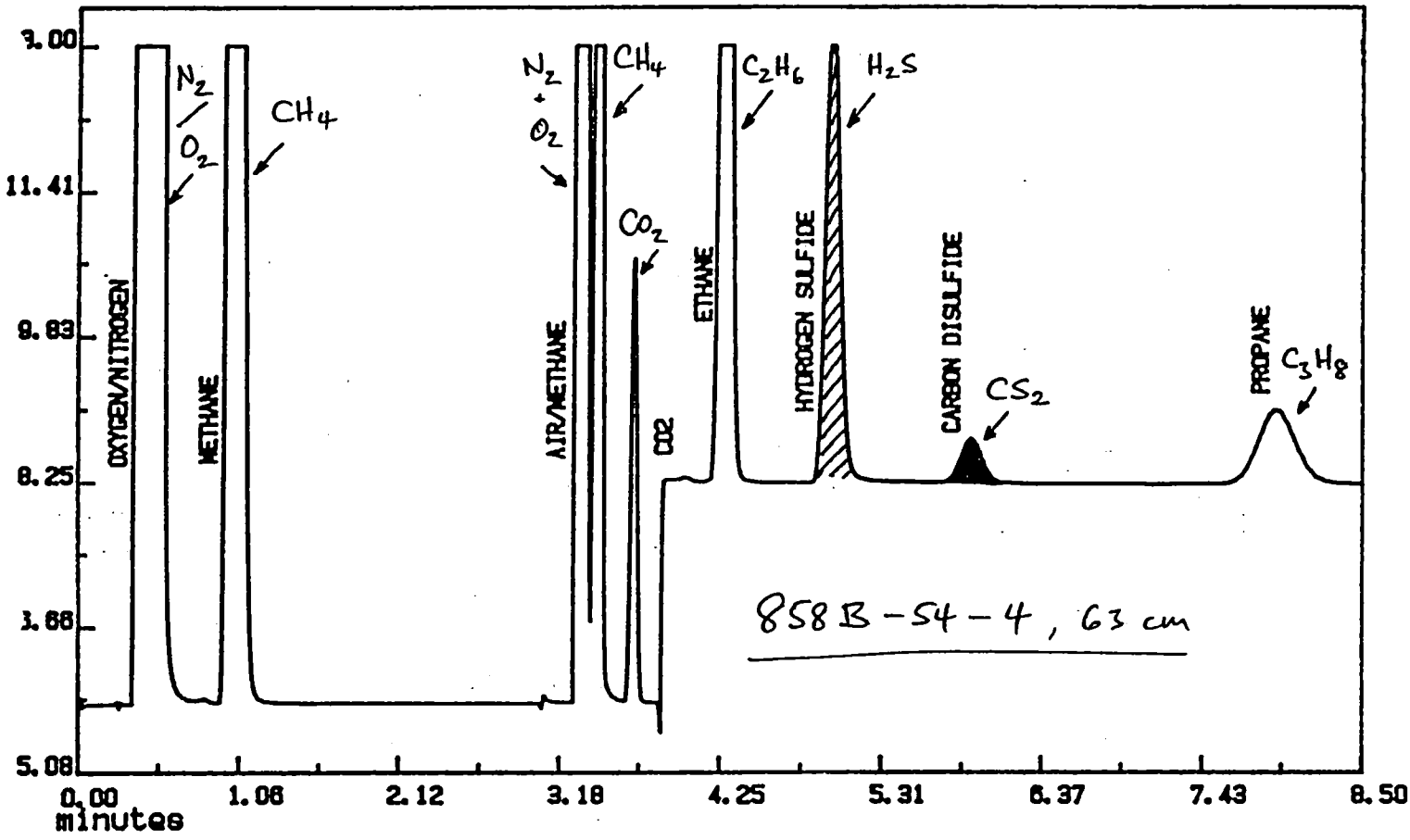

Fig. 1. Gas chromatogram of the headspace gas from sample 139-858B-54-4, 63 cm. The following components were detected: CH_4-C_3H_8, CO_2, H_2S, and CS_2 (by retention time), and air.

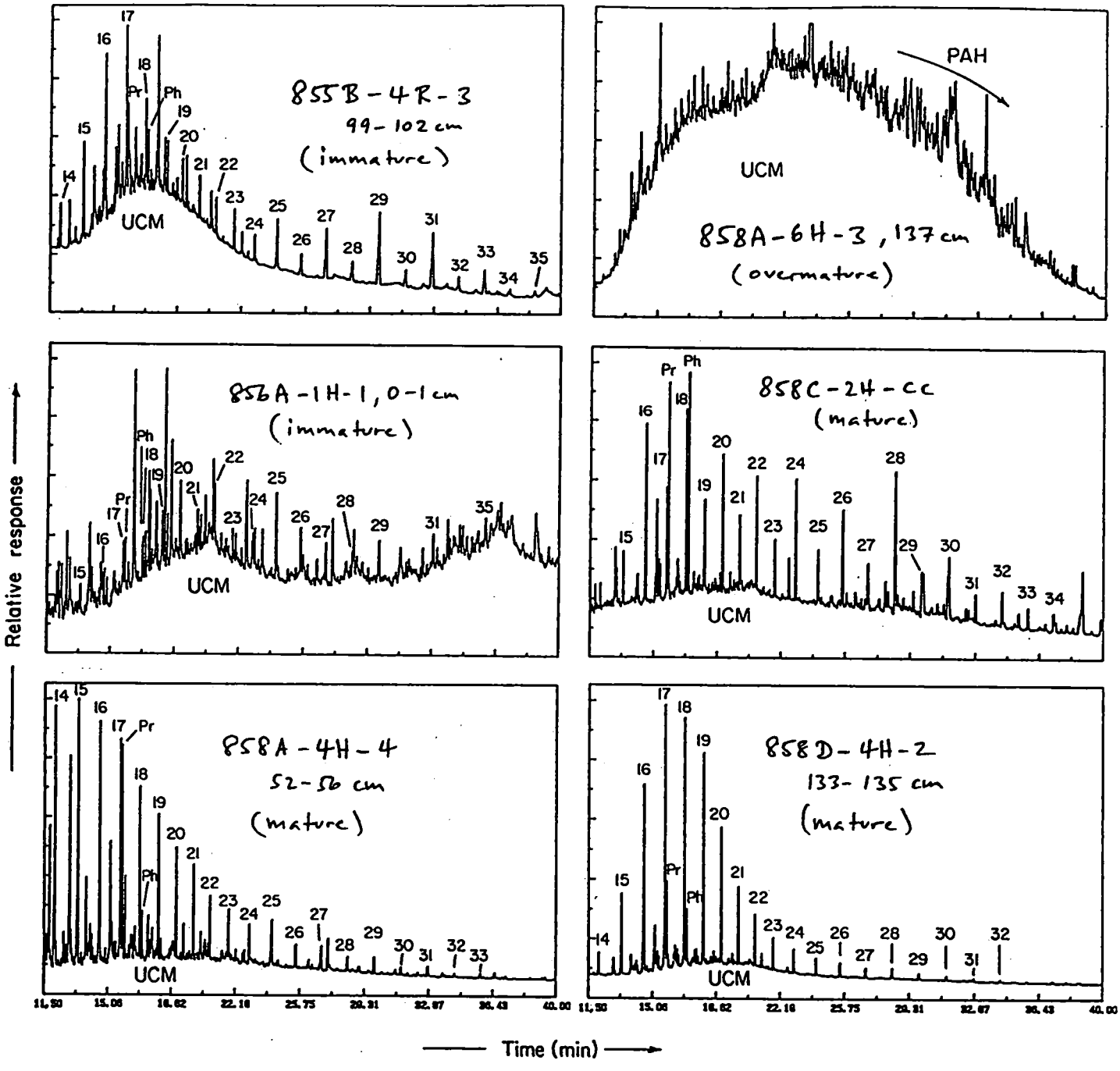

Fig. 2. A selection of GC traces for bitumen extracted from ODP Leg 139 samples. Carbon number range from C_{14} to C_{35}, GC's show alkane maturation trends.

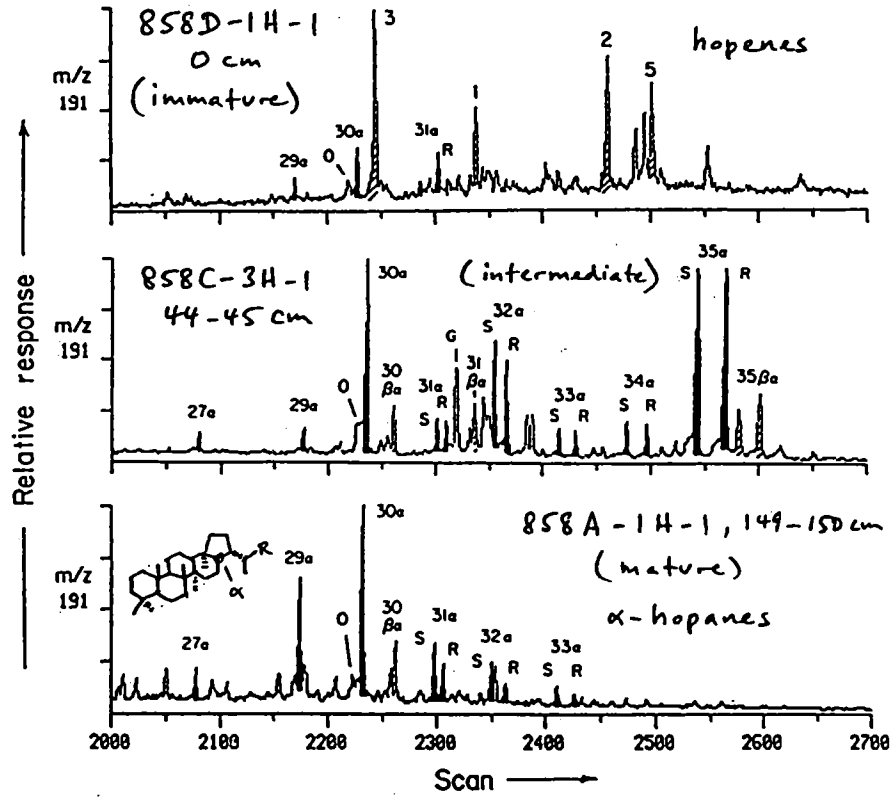

Fig. 3. GC-MS fingerprints for biomarkers showing the maturation trend from hopenes to the 17α(H)-hopanes.

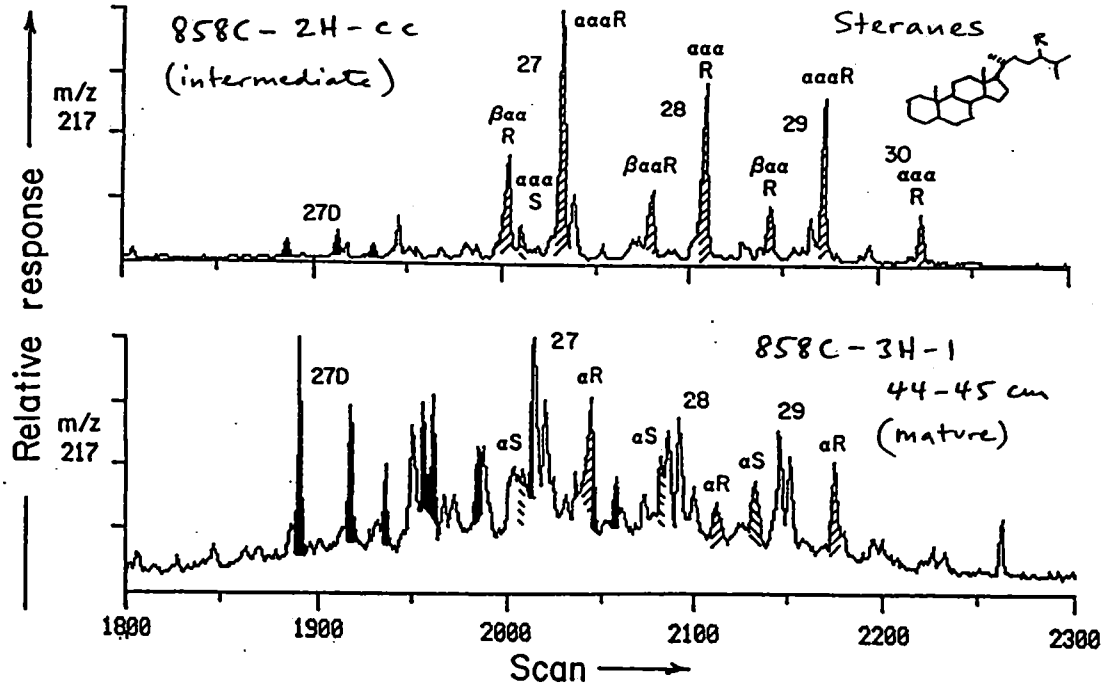

Fig. 4. GC-MS fingerprints for the sterane biomarkers.

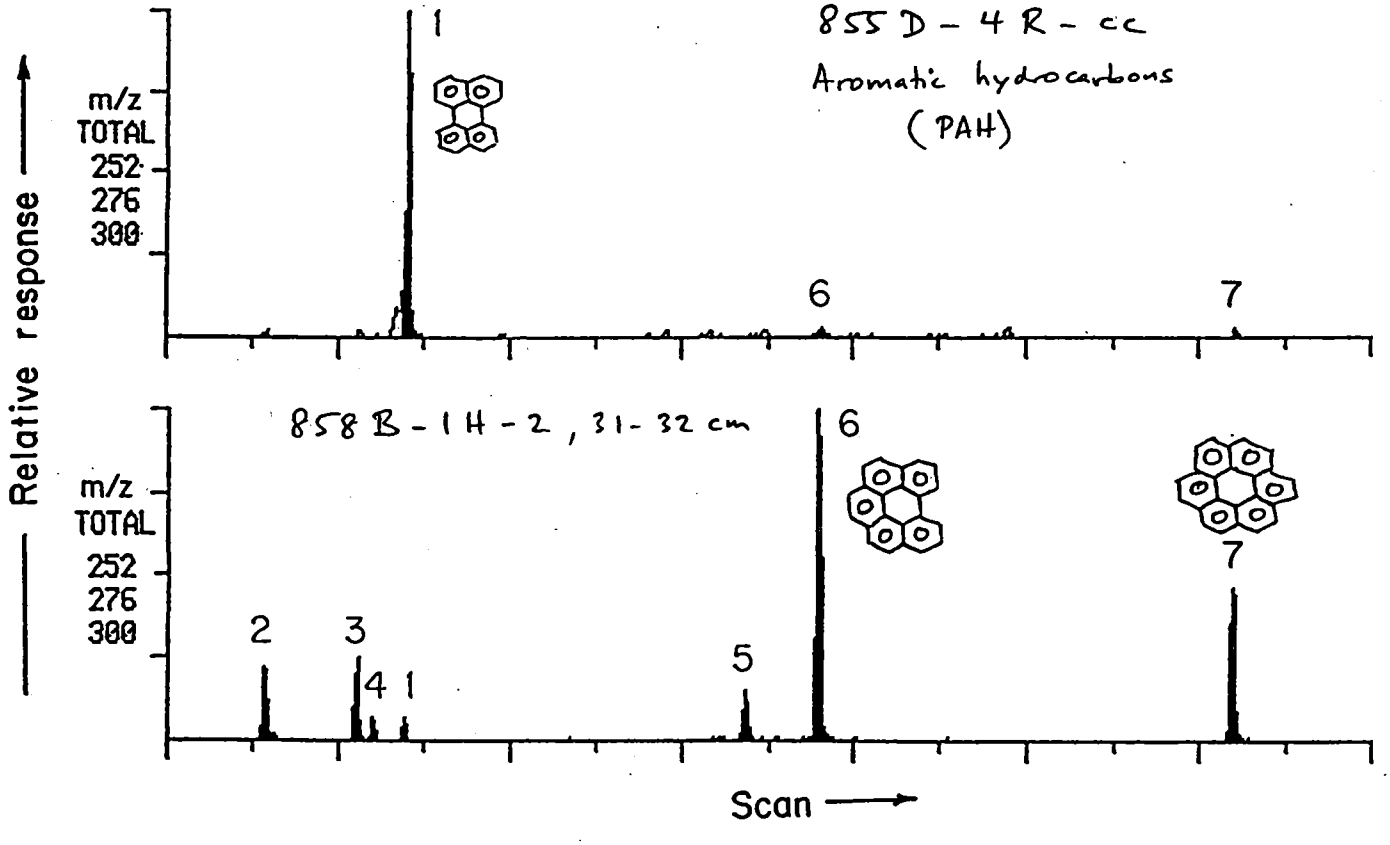

Fig. 5. GC-MS data for two examples of aromatic hydrocarbon (PAH) distributions in Leg 139 samples (1 = perylene, 2 = benzofluoranthene, 3 = benzo(e)pyrene, 4 = benzo(a)pyrene, 5 = indenopyrene, 6 = benzo(ghi)perylene, 7 = coronene).