Lamont-Doherty Geological Observatory
of Columbia University

Palisades, N.Y. 10964

Cable: LAMONT, Palisades, New York State

Telephone Code 914, Elmwood 9-2900
TWX: 710-576-2653

CRUISE REPORT

Ship Name: ROBERT D. CONRAD Cruise No: 21-06

Departure: March 3, 1978 (Date) from Buenos Aires, Argentina (Port)

Arrival: April 4, 1978 (Date) at Punta Arenas, Chile (Port)

Days at Sea: 32 Days Foreign Port: 4 (No. of days in arrival port)

Area of Operation: Falkland Plateau

Program Description:

A multichannel seismic reflection study of the Falkland Plateau, Falkland Trough, and North Scotia Ridge (NSF Grant OCE 77-25992)

Participants: (All L-DGO unless otherwise specified)

Ludwig, W.J.	Chief Scientist
Robinson, W.	Electronics Engineer
Gutierrez, C.	E.T.
Iltzsche, M.	Compressor/Air Gun Technician
Sindt, J.	Compressor/Air Gun Technician
Robertson, W.	E.T.
Rottier, R.	E.T.
Hutchinson, D.	E.T.
Mouzo, F.	Marine Geologist, Servicio Hidrografia Naval, Argentina

All inquiries regarding cruise should be made to the chief scientist.

Cruise Narrative: RC 21-06

ROBERT D. CONRAD departed Buenos Aires on March 3, 1978 after a 13-day delay caused by late arrival of air freight (see attachments) and arrived Punta Arenas afternoon of 4 April 1978, upon completion of a 32-day cruise leg. The Lamont 24-channel seismic reflection (MCS) system and sono-buoy reflection/refraction system were used to investigate the structural relationship of the Falkland Plateau, Falkland Trough, North Scotia Ridge, and Scotia Sea within the frame-work of plate tectonics. The objectives were to delineate depositional and erosion patterns and from them reconstruct the depositional and tectonic history of the area; distinguish acoustic basement and true crystalline basement of the Falkland Plateau and, thus, correlate structure of the plateau with that of the Agulhas shelf of South Africa; determine the veloc-ity structure across the continent-ocean juncture of the Falkland Plateau and Falkland Trough; determine the structure of the North Scotia Ridge; and determine the structure and pattern and intensity of folding and faulting in the area of a supposed extinct subduction zone which presently is manifested by the Falkland Trough. The locations of the multichannel lines were chosen to tie existing L-DGO lines of single-channel reflection and refraction measurements, to avoid duplication of effort with recently acquired Industry MCS lines in the Falkland

Islands vicinity, and to complement an L-DGO proposal for geological mapping in the offshore portion of the Magellanes Basin. Approximately 2500 miles of multichannel CDP reflection data were recorded (Figure 1); in addition, 55 sonobuoy reflection and refraction profiles were recorded along the survey route to provide information on velocity structure.

Sediment Attenuation Study

Enroute to the Falkland Plateau, a few hours were spent in the vicinity of 40°S to make a seismic refraction profile in the Colorado Basin through use of sonobuoys and the large-volume air gun system. Sonobuoy records from this and other areas develop strong curved path multiples, which are ideal for the estimation of attenuation losses. The data from three non-AGC commercial sonobuoys were recorded digitally on the DFS IV. One buoy may have successfully recorded the desired information.

KCS Streamer Ballasting

Streamer reballasting in the vicinity of 46°S required 27 hours to complete. Approximately 300 lbs of lead weight were stripped from the streamer to enable it to be towed at a depth of 45-50 feet below the surface. Our final distribution of weights consisted of one (1) lb weights evenly distributed along the tail stretch section and active sections 1-5; two

(2) lb weights evenly distributed along active sections 6-24 and the two front-end stretch sections. The streamer is still negatively buoyant.

Prior to the next MGS leg of CONRAD it will be necessary to:

a) replace head stretch section

b) replace section 20 (shark bite damage)

c) add weight to section 16 and tail section

d) subtract weight from sections 14 and 15

e) add weight to head stretch section.

MCS Recording and Sound Source Systems

The DFS IV and compressor-air gun system performed very well, largely due to the diligent efforts of Bill Robinson, John Sindt and Martin Iltzsche. 4-450 cu.in. air guns fired at 2000 psi were operated 95% time; the seismic coverage is 100%.

Successful operation of the MCS system in the future requires that a) additional people be trained (hired) in the maintenance and use of the DFS IV and compressor-air gun systems, b) there be an emergency power supply to drive the storage reel for the MCS streamer in the event of a pump failure, and c) Notice to Mariners of the intent to conduct MCS measurements be published one or two months in advance of the operation.

The notice should give area, time, description of ship, call signs and indicate ship will be towing streamer 2400 m long, 30-50 feet below the surface; request do not approach within 10 miles.

Gravity, Magnetics, PDR, and Single Channel Seismics

During RC21-06, all of the ills encountered in the previous leg (M. Langseth, Ch. Sci.) were corrected except for gravity. Upon arrival in B.A., I was informed for the first time that the gravimeter table had not functioned properly since Rio. We later concluded at sea that the trouble was due to seized bearings. This was reported to L-DGO; a factory trained technician and replacement bearings were subsequently flown to Punta Arenas where the problem was corrected.

Core Winch and Hydro Winch

No station work was done during this leg. Infrequent use of the winches will result in poor maintenance unless someone is assigned full time to care for them. Bob Crimmins, Core Bosun, departed the ship in B.A. The replacement Core Bosun served mostly as a wiper in the engine room. Hence, there is no one at present trained to properly operate the core winch and set up core pipe. There is the possibility that rough handling of the core winch (bottoming-out the accumulator for

long periods of time) during the Vema Fracture Zone dredging operations resulted in failure of the planetary gears early in the following leg.

Weather

Sea conditions during the leg ranged from moderate to gale force. Frequent heavy surging of the ship resulted in heaving of the leader and noise on the head section.

Numerous icebergs were encountered at 52°S, 40°30'W. Bergs, growlers and cubes became so concentrated at 52°30’S, 41°W that it was necessary to abandon the line and head northwestward (see attachment for information on ice coordinates and forecasting).

Highlights of the Monitor Records

1. True (crystalline) basement was traced everywhere beneath the plateau and trough.

2. Folding and faulting of sedimentary horizons are observed over basement relief, basement is often block faulted.

3. Major pinch-outs of sedimentary layers occur on the plateau.

4. A large open-ended sub basin exists just north of M. Ewing Bank at the elge of the plateau.

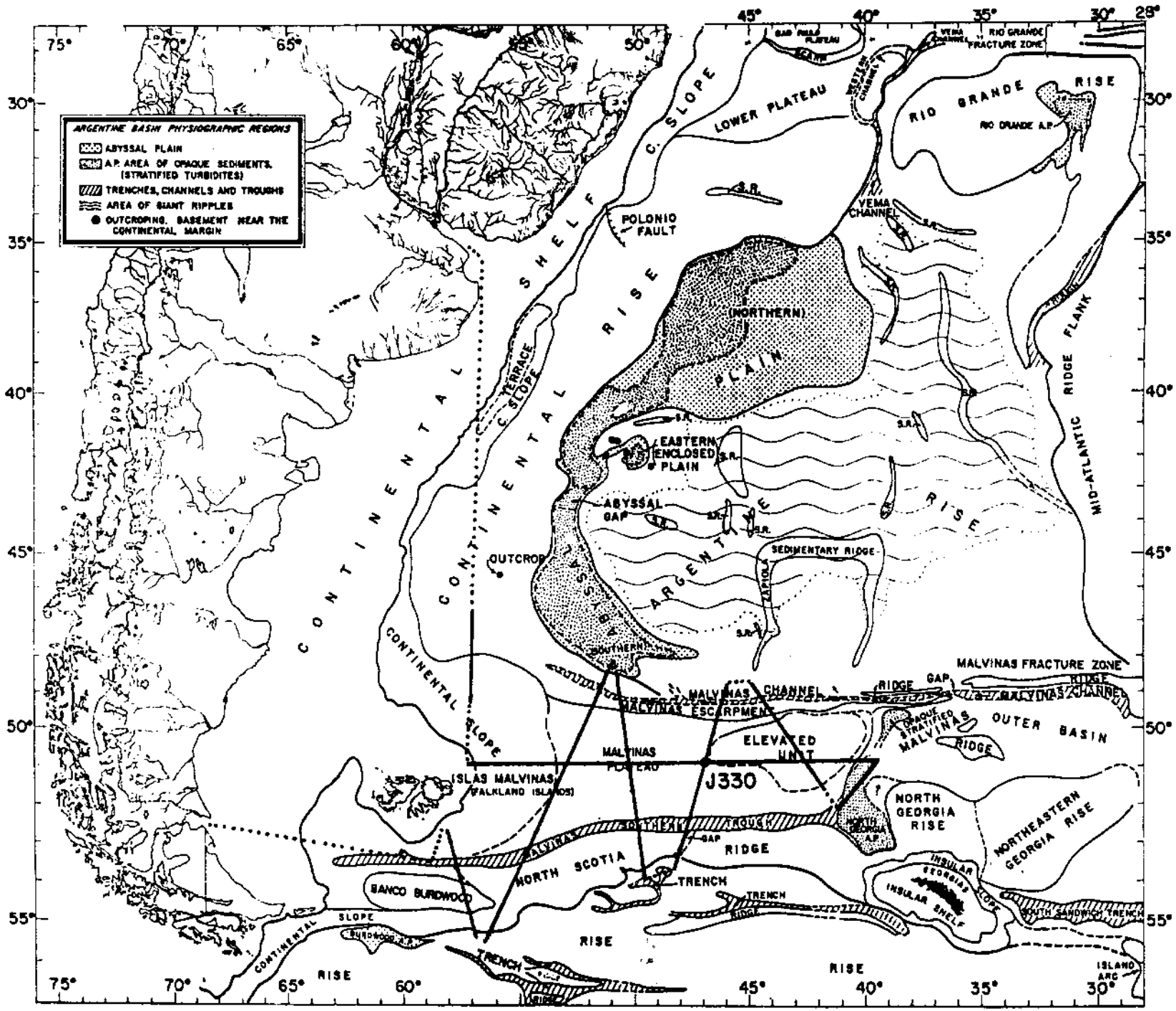
5. Basement was traced 25 miles beneath the toe of the

North Scotia Ridge to a location where the dip (on the seismic records) becomes near-vertical.

6. The northern side slope of Burdwood Bank consists of highly deformed (folded) sediments.

7. The Malvinas Basin is separated from the Falkland Plateau basin by a high presumably trending southward from Cape Meredith, Falkland Islands.

William J. Ludwig



LOCATION OF MCS LINES, RC21-06

13-Day Delay of R/V CONRAD in Buenos Aires

For what it is worth, the following is a "Monday Morning Quarterback" assessment of the cause of the big delay in B.A.

1. Failure to ascertain the condition of air cargo traffic to South America. Apparently, the Longshoremen's strike and February 6 snow storm had caused a major backup of air cargo in New York.

2. Failure to close the airfreight shipment on schedule. The shipment was sent to a broker only a few days before conrad's arrival in B.A. The GBL is dated February 7.

3. Failure to obtain a direct cargo flight to B.A. Both Braniff and Pan Am have direct flights. For some reason, the cargo had to be transferred to a non-U.S. carrier in Sao Paulo causing additional delay in arrival at B.A. Furthermore, the non-U.S, carrier was not advised of the procedure for payment; hence, they would not immediately release the cargo.

4. Failure to consign the freight as instructed. Manuel Schkulnik's lengthy telex of January 13 (copy supplied to L-DGO Shipping) advises that we consign material to the ship in care of the Argentine Hydrographic Service in order to clear Customs rapidly. The shipment was consigned instead to the Ship’s Agent. Furthermore, no copies of the shipping documents were air mailed to the Ship's Agent and to Schkulnik.

COLUMBIA UNIVERSITY
INTERDEPARTMENT MEMORANDUM

R/V CONRAD
Buenos Aires, Argentina
Date: 2 March, 1978

To Chief Scientists of Research Vessels
Subject: Customs Requirements, Port Regulations and Air Freight Shipments: Know before ye go

Before joining a research vessel in a foreign port, or immediately upon your arrival, you are advised to familiarize yourself with Customs and Port regulations. A little time spent in preparation may save you considerable time and grief.

1. Bureaucracy reigns in customs. Detailed documentation is very important. All airway bills of lading (AWB) should be accompanied for cus- toms purposes by a detailed packing list and the declared value. Listing an item(s) as simply "electronic equipment" may cause trouble. Be specific; list every nut and bolt.

The nature of the shipment should be clearly marked on the boxes as follows:

Ship Spare Parts (name of port) in Transit or Ship Scientific Material (name of port) in Transit

Only items that fit into these two categories will be cleared by Customs. Including personal items in the shipment usually results in seizure and considerable delay in port.

If you hand-carry "last minute" spare parts to the ship, be prepared for serious difficulty if not confiscation and loss of the material. You may have to pay a duty of 100-150% of the appraised value, if lucky. Confiscated material will not be placed aboard your connecting flight. Remember, you need an import license to bring merchandise or industrial parts into a country. Have all parts shipped air freight consigned to the ship and document, as indicated above. Request shipment on a direct flight to avoid airline transfer and delay. If you must hand-carry parts or equipment, arrange with the Captain to have a ship's agent or Customs broker meet you at the airport. Supply the Captain with detailed information so that documentation can be obtained in advance of your arrival. My advice is simply, avoid hand carrying parts and equipment; ship via direct air freight even if it may mean an extra day in port. Consult with the Director's office.

2. Most ports are under some type of police or military control. You must have a shore pass or stamped passport to enter most ports. Visit the ship's agent upon arrival. Your friends and invited guests may also require a pass. Unauthorized persons in a port are subject to arrest.

COLUMBIA UNIVERSITY
INTERDEPARTMENT MEMORANDUM

Date: _____.

To _____
Subject: _____.

Inviting the local repair man to repair an item of scientific or ship's equipment may not be an easy task. Repair men also require a pass; all of their tools may have to be inventoried by Customs. To most repair men, the ship's business may not be worth the effort it takes to come on board.

More Tips:

1. When on board ship, give the Captain a list of items to be shipped back to Lamont so that he can manifest and declare them before entering port. Provide dimensions and weight of each box and a detailed packing liat. Last minute items are usually impossible to get through Customs. The Ship's Agent will usually ignore non-manifested items; he knows the difficulty that he will have with Customs.

2. L-DGO Shipping distributes a notice of the name and address of the Ship's Agent and the date the air freight and (or) sea freight shipment closes. It usually requires about two weeks to process and deliver air freight to the ship, provided that there is no back log of freight at the airlines (labor strikes and closure of airports due to storms usually result in severe backlogs of freight}. Check with Shipping on the conditions of freight traffic to the port-of-call and check with them again to ascertain if the shipment has indeed been closed on the announced date and is not being held up by someone awaiting last minute items for inclusion. Last minute items should be sent separately, as indicated above.

Check with L-DGO Shipping as to the intended routing of the shipment. Request a direct flight, if available, to avoid delay and complications. Know ye all that non-U. S. carriers know little or care little for shipments covered by a U.S. Government Bill of Lading. The terms of a GBL specify that the carrier submit a bill for payment after receipt of the cargo at its destination. Payment often takes months and involves considerable paper work. If your shipment is transferred to a non-U.S. carrier somewhere enroute, the carrier might insist on cash on delivery or a guarantee of payment before releasing the shipment. Your contract/grant will have to absorb the C.O.D. charge if you are forced to pay or if the GBL does not permit transfers.

COLUMBIA UNIVERSITY
INTERDEPARTMENT MEMORANDUM

Date: _____.

To _____
Subject: _____.

Check with L-DGO Shipping a few days before departure. Obtain and hand-carry to the ship copies of all documents with AWB numbers. Ascertain if the shipment has indeed departed on the flight indicated; it might still be sitting in a cargo warehouse at the airport awaiting its turn. Request airline confirmation of departure of the shipment, via TWX if possible. Confirmation via telephone will not provide you with a document; besides, a busy clerk may give erroneous and(or) misleading information.

William J. Ludwig
Scientific Prog ram Coordinator for
R/V Vema and R/V Conrad

WJL/bh

cc: H. C. Kohler, R/V Vema
J. P. Olander, R/V Conrad
R. Gerard, Marine Supt.
T. Eberhard, L-DGO Shipping

COLUMBIA UNIVERSITY
INTER DEPARTMENT MEMORANDUM

Date: April 12, 1978

To: Chief Scientists of Research Vessels
Subject: Ice Conditions in High Latitudes

Before joining a research vessel to conduct geological/ geophysical studies in an area where there may be navigational difficulty due to icebergs, you are advised to send a copy of your track chart to:

Commanding Officer
Fleet Weather Facility
Navy Department
Washington, D.C. 20575

Attn: Ice Dept.

and request updated ice charts for the survey area. The charts are based on interpretations of photos from satellites.

Updates at sea in the South Atlantic can be provided by radio from Palmer Station, which is run by Holmes and Narver (private contractors). You can set up a communication link with them by calling 714-975-1100 ext. 2250 or 2251 and ask for Shane Williams or Dick Wallach.

Further information can be obtained from LCDR Hoffman (ice forecasting) at 202-765-5975.

William J. Ludwig
Scientific Program Coordinator
for R/V VEMA and R/V CONRAD

cc: H.C. Kohler, R/V VEMA
J.P. Olander, R/V CONRAD
R. Gerard, Marine Supt.

P.S. Stan Jacobs receives weekly reports on ice coordinates and also receives a yearly summary which is also useful.