THE ANTARCTICAN SOCIETY

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OFFSHORE OIL DEVELOPMENT IN POLAR REGIONS
APPLICABILITY OF ARCTIC EXPERIENCE TO THE ANTARCTIC

by

F. Geoffrey Larminie, OBE

Director, Environmental Control Center
British Petroleum Company
London, England

on

Thursday, April 21, 1983

8 PM

National Academy of Sciences
Joseph Henry Building, Room 451
corner of 21st and Pennsylvania Avenue N.W.

(Please note where we are meeting - we have never been there before. Same building as Adams Rib Restaurant. Parking at a cost in garage under building - entrance on I Street.)

Geoff Larminie, petroleum geologist, and a current member of the National Academy of Sciences' Polar Research Board, received the Order of the British Empire from the Queen back in 1971 for his good deeds and many accomplishments while serving in the Expedition Department of the British Petroleum Company in such fine polar places as Sudan, Greece, Libya, Thailand, Kuwait, Canada, and the USA (Alaska, California and New York City). He formerly was a lecturer in geology at the University of Glasgow and the University of Sydney, and was also past president of the Alaska Geology Society. Presentation will be given in the best of Queen's English. Translators not required.

This Newsletter is divided into two parts, the first being more or less the official part, and the second will be BERGY BITS, the unofficial part. We'll start this out with an article by Celia Heil of the Division of Polar Programs, who at the request of our President, Mort Turner, summarized published material from various sources on Latin American activities/interests in Antarctica.

ANTARCTICA AND THE LATIN AMERICAN NATIONS (by Celia Heil, DPP, NSF).

Two Latin American republics, Argentina and Chile, are consultative parties to the Antarctic Treaty. Brazil, Uruguay and Peru have joined the acceding nations but are not yet consultative parties. The most recent, Peru, acceded to the Treaty on 10 April 1981. Argentina and Chile each maintain several stations and active research programs on the antarctic continent. Argentina and Chile have overlapping claims in Antarctica and in turn these claims are both overlapped by a claim of the United Kingdom. Members of the Antarctic Treaty are both claimant and non-claimant nations and there is no broad recognition of the territorial claims.

Chile, Argentina, Peru, and Uruguay, claim to be direct and legitimate successors to the Spanish sovereignty over land and sea that included portions of the antarctic regions in direct geographic line of the South American continent. These claims are based on a historic event that took place at the end of the 15th century when the Iberic kingdoms of Castille and Aragon established their title over the "Terra Australis Incognita" through the Papal Bull of Discovery of the New World. Under the same Papal declaration, Portugal was granted new lands in the other half of the world, presumably also including corresponding portions of Antarctica. Brazil traces similar claims through succession from former Portuguese sovereignty.

Argentina's antarctic program is under the administration of the Institute Antartico Argentine (Argentine Antarctic Institute) established on 17 April 1951, a branch of the Direccio'n Nacional del Antartico (National Directorate of the Antarctic). Support and supply operations for Argentina's eight stations are provided by the three branches of the armed forces. Argentina has had the longest continuous operation of an antarctic scientific station of any nation. This dates from the occupation of Estacion Orcadas in 1904, after it was turned over to Argentina by the Scottish National Antarctic Expedition. On 13 December 1947, Admiral Gregorio A. Portillo crossed the South Pole in a Douglas C-54 plane, thus Argentina became the second nation in the world to fly across the South Pole. Since 1968, Argentina has been conducting scheduled tourist voyages to the Antarctic Peninsula during the austral summer. The first two such voyages took place during January/February 1958 and January 1959.

Chile's activities in her four antarctic stations are coordinated by two institutions, Comite' Antartico Chileno (Chilean Antarctic Committee) and Institute Antartico Chileno (INACH) administered by the Ministry of Foreign Affairs. These institutions plan and coordinate the technical and scientific activities on the antarctic continent. Logistic support is provided by Chile's armed forces. Chile's first antarctic expedition and the establishment of her first station, Base Prat, took place in 1947. On 29 May 1981, Chile celebrated the 17th anniversary of the establishment of INACH. Extensive scientific research is supported by LC-130 (Hercules), Twin Otter, and helicopter aircraft throughout the Antarctic Peninsula region. Chile has expressed her intentions to establish a scientific base close to the geographic South Pole, and plans are being considered to circumnavigate the ice continent to have a better understanding of Antarctica.

This austral season (1982/83), 40 scientists from the Federal Republic of Germany, China, Peru, and Uruguay, were participants of Chile's Antarctic Expedition. The expedition focused its research in the Drake Sea, Antarctic Peninsula, and adjacent archipelagos. The Chinese scientists are members of the National Oceanographic Institute of China. Scientists from Peru and Uruguay are members of their respective antarctic institutes.

According to a Latin American newspaper report the objectives of the Chilean expedition were to study the possible use of penguins for food consumption, to undertake basic biological, geological, and atmospheric research, to study the volcanic activity of Deception Island and the occurrences of iron and copper, and to search for indications of past human habitation. The German scientists members of the Universities of Hannover and Kiel, were interested in lichenology and glaciology.

The Institute Brasileiro do Estudos Antarticos (Brazilian Institute of Antarctic Studies) was established in September 1972. It is supported by the Government and forms part of the Comisi6n Interministerial do Recursos do Mar-(Interministerial Commission of Marine Resources) who provides the logistic support. This year Brazil is conducting its first antarctic expedition with three adequately equipped ships. The lead ship was acquired from the Lauritzen Shipping Company in Copenhagen and is the former ANARE expedition icebreaker "Thala Dan", purchased by Brazil and renamed "Barao de Tefe". The ship is carrying 67 scientists and members of the crew; a second ship, "Wladimir Bernard" of the Oceanographic Institute of the State University of Sao Paulo, has 52 members. This vessel, equipped for oceanographic research, will remain in the southern seas until March 1983.

This expedition, assisted by Chile and Argentina, is Brazil's formal application to consultative membership to the Antarctic Treaty. One objective of the expedition is to establish a base on the antarctic continent. This base is to be located outside of Argentina and Chile's claimed territories, somewhere on the Weddell Sea coast, for the purpose of exploration and exploitation of oil reserves and krill. The expedition sailed from Rio de Janeiro, with a scheduled stop in Porto Rio Grande on 26 December 1982. The University there has provided an area for storage of supplies and other material bound for the antarctic continent for this and future expeditions. The University at Porto Rio Grande will serve as a point of departure and logistic support for the Brazilian antarctic program and for personnel training. The center at the University will have facilities to process sea products harvested from the antarctic seas. British and German scientists have expressed their interest in participating in Brazil's antarctic program at the University. During the two years of preparation the expeditionary group was in close contact with the Scott Polar Institute in Cambridge, England, and Chile's Antarctic Institute and received scientific and technical advice from the United States.

At the First National Antarctic Convention in 1970, Uruguay gave official status to the Institute Antartico Uruguayo (IAU) (Uruguayan Antarctic Institute) and was officially incorporated to the Ministry of Defense in 1975. Uruguay acceded to the Antarctic Treaty on 11 January 1980. The IAU is the liaison agency with the international scientific community. Although Uruguay has established an antarctic institute and has ratified the Antarctic Treaty, no antarctic field research has been undertaken. Uruguay does not yet have a coordinated and viable program of specialized scientists and trained personnel nor the logistic support needed. However, several scientists and representatives of IAU have participated in antarctic

scientific research and expeditions through programs of other nations such as Argentina, Chile, England, and the United States.

This austral season has been witness to another first. Spain acceded to the Antarctic Treaty on 31 March 1981, and this year, on the last week of December the first Spanish antarctic expedition departed from the Port of Gijon, Asturias. The vessel, the "Idus de Marzo" (Ides of March) with 23 crew members was due to stop in Brazil on its first port of call on 15 January 1983, then proceed to Argentina, where nine Spanish scientists from the Oceanographic Institute of Spain were to join the expedition. The vessel was also scheduled to stop in Uruguay and Punta Arenas, Chile, before the expected arrival in Antarctica in early February.

Brazil's and Spain's antarctic expeditions are of great significance to the Latin American nations already involved in antarctic work. Argentina and Chile have given their support to these expeditions and it seems that the Latin American nations interested in the scientific and diplomatic participation in Antarctica are working together in this common effort.

(Information for this article was obtained from several Latin American newspaper articles; Argentina and Chile's Antarctic Research Bulletins; and from a previous article by the author, "Antarctica: Life at the End of the Earth", AMERICAS, NOV/DEC, 1981, VOL. 33, NO. 11-12, Washington, D.C.)

POLAR BOOK AUCTION. At the last Board meeting of the Society, the subject of having a polar book auction was raised, and a committee consisting of Charlie Burroughs, chairman, Bill Littlewood and Guy Guthridge was appointed to look into the feasibility of an auction. The Committee is supposed to present its plan of action at the next Board meeting, date to be set by the President. Essentially the game plan worked out by the Committee is that Society members would offer books for sale at an auction, presumably at our annual Mid-Winter picnic at Stronghold, with 20% of the sales going to the Society, 80% to the donor. Anyone wishing to participate in this venture should contact Charlie Burroughs at 686 College Parkway, Rockville, Maryland 20850. The Committee is interested in knowing who wants to submit what, who wants to participate in the auction, who wants the auction list, et cetera.

B E R G Y B I T S

This is the unofficial section of your Newsletter, mostly about people and happenings. The Society's membership, now over 420, includes members from all American expeditions to Antarctica. We strive to find some items of interest for each group, but only so much can be covered in Bergy Bits. It's essentially a potpourri of material either sent to us or given to us. We are more than willing to include more material on ongoing activities, but you guys and dolls have to get the stuff in to us if you want it to appear in our Newsletter.

ZINSMEISTER PLAYS TO OVER 200, BUT ... Bill Zinsmeister spoke to what well may have been the largest audience in the history of our Society on March 24th and 25th when over 200 people heard him tell all about the amazing discoveries on Seymour Island in the austral summer of 1982-83. That was the good news; the bad news was that the show of Society members was poor, especially in view of the fact that the discovery of the jawbone of a marsupial on this expedition was probably the most exciting scientific thing to happen in Antarctica in this century, although

"meteoritetors" might challenge this opinion. I grant you that our Society is fast becoming a broad-based society (63% of our membership is outside the Washington area), but we still have 154 local members, the largest group of which is from the US Geological Survey, and as the Survey goes, so goes our attendance at the lectures. For this lecture, we had only one member from the USGS. I was hoping our Society would turn out en masse, and that a joint Antarctican Society-Smithsonian Institution conclave might become an annual event. But we may have blown it. Maybe it was because of a phobia suburbanites of Washington have about going downtown at night; maybe it was due to the fact that Bill also spoke at the National Science Foundation and siphoned off some of our listeners there; or maybe it was because we never got on the phone and jacked up people to turn out. Those who missed one of the presentations - there were three - missed out on a thrilling story. Seymour Island is evidently about as un-Antarctic as you can get, with real badlands that would thrill only pigs and paleontologists. Zinsmeister said his idea of Heaven would be to be laid away in such an area resplendent with fossils. It is quite evident to me that he's never been to the beaches of Ft. Lauderdale during the college spring recess. Bill is going back next year, with twice as many people (20) and for a much longer period (1981-82 season was only 19 days long). Listening to Bill's enthusiasm for it all, I had the feeling that Seymour Island will become to him what Mt. Erebus became to Phil Kyle. Bill made a prediction that he will find dinosaur bones on Seymour. Now if NSF were clairvoyant, they would borrow some bones from a museum and have the Argentines fly them down ahead of the Americans next year so they'd be waiting for Bill's discovery. This way NSF wouldn't have to keep funding additional expeditions for the next decade to Seymour. After all, icebreakers are real expensive.

1983 MEMORIAL LECTURE WILL BE PART OF ANTARCTIC OCTOBERFEST. There will be a lot of polarites in Washington town in mid-October with the US Geological Survey holding a three-day polar symposium at the National Academy of Sciences and the National Academy of Sciences' Polar Research Board meeting at the same time. So the Society is going to take advantage of the influx of penguins and polar bears and hold its 1983 Memorial Lecture during that week. October is a good month in Washington, the heat and humidity of summer are passe, and it's just a great time of the year. We hope this will be a period when IGY personnel may see fit to come to Washington to reunionize themselves. At least with the polar symposium, there is a scientific excuse for the professorial types to leave their halls of learning and come to town for a sprinkling of libation and whatever.... Our Society got off to an early start in 1982-83 with a late summer lecture by Dr. Swithinbank, our first-ever summer lecture, so there is no reason why we can't close our current lecture season with our April meeting, our sixth of the year. In all likelihood the Society will again hold the annual Mid-Winter picnic sometime in June or July at Stronghold, which will officially end our activities for this season. A Newsletter in late May or early June will alert you folks on the details.

PENGUINS LIVE IN MULTIMILLION DOLLAR LUXURY IN SAN DIEGO. Thanks to Barbara Duffy Heffernan, Director, Government Affairs, Sea World, in Washington, we have a wealth of material on Sea World's Penguin Encounter which will open in San Diego in early summer, hopefully on Memorial Day, presenting fantastic exhibits of Antarctic penguins, temperate penguins, and alcids. The polar exhibit, built at a cost of seven million dollars, occupies a 28,000 square foot building in the San Diego marine park. A mini-Antarctic environment has been created within a 5,000 square foot exhibit area where the temperature will be maintained at 28°F. There is a 3,000 square foot viewing space (presumably so penguins can also watch homo sapiens), including a moving sidewalk directly in front of the viewing panels and an upper level viewing area with a bank of 12 television monitors. So one can watch emperors, Adelies, kings,

rockhoppers, macaronis, and gentoos through a 100-foot wide window (made up of 13 panels joined together with silicon) while on the moving sidewalk. There is also a 2,000 square foot outdoor exhibit area where you can watch a Humboldt penguin colony; conversely the Humboldts have a 1,000 square foot viewing area to watch us watching them. Puffins and murres, both members of the alcid family of birds, made out quite well, too, as they will have a 1,200 square foot exhibit area.

Twelve thousand pounds of snow will be produced each day. Artificial ice will simulate the edge of the polar ice shelf and fresh crushed ice will be blown over this each day to provide a realistic substrate for the birds. The ice shelf juts out over a 7 1/2 foot deep pool of water, maintained at 45°F. For the very first time in a major exhibit, guests will be able to view penguins as they swim underwater. In an upper level viewing area guests may relax on benches for extended periods of viewing, or take advantage of a bank of 12 television monitors with video presentations on various aspects of penguin biology. In addition, the video system has the capability of going live and viewing ongoing penguin research. Sea World has thirty other educational exhibits and six aquatic shows, and must be one of the truly great bargains in existence. Ms. Heffernan has indicated there is a good possibility that they could present a lecture to our Society sometime next fall, but in the meantime all roads lead to San Diego. And if you see any penguins that look like Bill Sladen or Larry Gould, please keep it to yourself!

SEA WORLD PENGUIN PROPAGATION PROJECT (Copied from Sea World News release of 9/82). Purpose: To establish and maintain a self-perpetuating colony of high Antarctic penguins available year-round for research purposes. ... Population: Seven of the 17 species of penguins are represented, including king, Adelie, emperor, macaroni, Humboldt, rockhopper and gentoo. Description of polar species: Emperor penguins; Height: 3-4 feet. Weight: from 50-100 pounds. Long, slender body with patches of orange-yellow at sides of head. Largest of the living penguins. Range: Antarctica. Hubbs-Sea World Research Institute and Sea World aviculturists made history on Sept. 16, 1980, with the hatching of the first emperor penguin chick ever to occur outside the Antarctic continent. This was soon followed with the hatching of two more emperors on Sept. 20, 1980. In succeeding years, additional hatchings have taken place. Adelie penguins; Height: 2-2 1/2 feet. Weight: from 9-14 pounds. Black-throated. Range: Antarctica. More than 120 Adelie chicks have been hatched and reared in the penguin propagation facility since 1976. Hatchings of this magnitude are unprecendented outside the Antarctic. Adelies lay two eggs — one is hatched in an incubator and the other is left with the adults. Sea World aviculturists hand fed chicks which were hatched in an incubator and later transferred to a brooder, thus allowing the collection of valuable behavioral data. A food formula was devised by the staff. This diet consists of ground fish, crustaceans and vitamin/mineral supplements. King penguins; Height: 3 feet. Weight: from 25-40 pounds. Bright yellow coloration around head and neck. Range: Subantarctic. The fifteen king penguins maintained in the facility are much like emperors but are more active and "aggressive" than their larger counterparts. Being sub-antarctic in origin, these penguins prefer ice-free areas, particularly when breeding. Several eggs have been laid by the kings in the unit, but no chicks have been successfully reared by the adults. However, in 1982, two chicks were hatched in the incubator and subsequently hand reared. Prior to this no king penguin had been artificially hatched and reared. Macaroni penguins: Height: 2-2 1/2 feet. Weight: 10-12 pounds. Orange plumes on top of head extending backwards. Range: Sub-antarctic. For some time Sea World has had three elderly macaroni penguins that are managed in the same manner as the Adelies. Although the mated pair has laid several eggs, none of these has been fertile, a condition attributed to the age of these penguins. A fourth macaroni stranded in New Jersey in August, 1981,

has been rehabilitated and introduced into the unit. Rockhopper penguins: Height: 2 feet. Weight: 5-7 pounds. Red eyes, drooping yellow crest. Range: Sub-antarctic. Nine specimens of rockhopper penguins are maintained in the San Diego park. Three of the older penguins have produced eggs. An infertile egg was once substituted with a fertile foster Adelie egg from an incubator. This egg was hatched by a pair of rock-hoppers. The foster parents attempted to rear the chick but apparently were unable to supply a sufficient quantity of food. Gentoo penguins: Height: 2 1/2 feet. Weight: 9-13 pounds. Conspicuous white marks on top of head; white band extends from eye to eye across a slate black head. Range: Antarctic and Sub-antarctic. Sea World maintains one gentoo on loan from the San Diego Zoo. It has exhibited breeding behavior with the Adelies, assisting a pair in nest building and attempting to incubate abandoned Adelie eggs. Humboldt penguins; Height: 2-2 1/2 feet. Weight: 8-10 pounds. Narrow white superciliary stripe passing well above the eye. Long, heavy bill. Range: West coast of Chile and Peru. Because this species inhabits tropical and subtropical climatic zones, the Humboldt penguins are maintained outdoors at ambient temperatures. Total world population may be less than 5,000 individuals, and it is considered an endangered species. Sea World maintains 50 of these penguins. The Humboldt is one of the most familiar "zoo penguins" because of its ability to survive in warmer climates. This species typically nests in burrows. Up until 1977, the Sea World Humboldt colony was quite productive with 10-13 young being reared a year. In the next three seasons, heavy rains flooded the burrows, resulting in the loss of numerous eggs and chicks. Since that time by utilizing techniques involving artificial incubation and hand feeding similar to that used for the Adelies, Sea World aviculturists have successfully reared Humboldts in a controlled environment.

RAISING PENGUINS AT HUBBS-SEA WORLD RESEARCH INSTITUTE, SAN DIEGO (Copied from the Institute's Currents, January 1983).... . . Dr. George Bartholomew of the University of California at Los Angeles and his associates continue to study penguin egg metabolism, and Adelie penguins have again successfully produced chicks; more than 50 were hatched last year. As Adelies usually only rear one chick, as in previous years, one egg has been removed from each two-egg clutch and placed in the incubator. When hatched, these, like more than half of the Adelies that have been raised in the Facility, will be hand-reared.

Last February two king penguin eggs were laid in the research freezer. As the care they were being given by their parents was inadequate, they were taken from the adults and hatched in the incubator. Raising the two chicks to fledgling stage has not been an easy task. King penguins in the wild inhabit subantarctic regions where they are not subjected to the climatic extremes of the Antarctic. Therefore they can take a longer time to fledge their young than species that live closer to the pole; king chicks may take up to 13 months to fledge. In the case of the two chicks, however, fledging took only seven months, undoubtedly because they were fed daily, whereas chicks in the wild may go without food for weeks at a time during the winter while the adults are at sea.

Raising these king chicks is a first-time-ever event and a major breakthrough. "We had no knowledge at all of what was required to hand-rear the larger penguins," Todd (Frank Todd, Research Fellow and Corporate Curator of Birds for Sea World) says, "and we were particularly anxious to succeed with these as we knew that we would probably have to raise an emperor by hand sooner or later. Caring for these king chicks enabled us to develop guidelines and obtain data that could be used when that day came."

The day arrived this fall. In September two pairs of emperors each produced a chick. At six weeks of age, one chick was significantly smaller than the other, and it was decided to remove it from its parents and rear it by hand. Initially the little

emperor, affectionately known as "E.P.", had a large stuffed Snoopy doll for a companion. Emperor chicks are brooded on the feet of their parents and covered with a fold of abdominal skin. The young penguin was able to nestle under the toy dog, which served as a surrogate parent and afforded the chick a degree of security. The experience gained with the king penguin chicks did, as expected, prove to be invaluable in raising the emperor. By mid-December it weighed 7776 grams, a gain of 6380 grams while under human care.

The large body of data on incubation and hand-rearing of penguins that has been amassed in the Polar Research Facility will prove inestimably valuable in the future, as live birds will no longer be imported from the Antarctic; only eggs will be brought back.....

PAUL A. SIPLE, POLAR CLOTHING EXPERT. The second president of our Society, the late Dr. Paul A. Siple, was well-known for his many polar achievements, but probably none overshadowed his interests in the health and welfare of men in the polar regions which manifested itself by his development of the windchill equation resulting from experiments he conducted while serving as leader of West Base on the Antarctic Service Expedition, 1939-41. During World War II there was an interesting exchange of messages between Admiral Richard E. Byrd and General Dwight Eisenhower which involved Dr. Siple. If you have read Alfred Chandler's The Papers of Dwight David Eisenhower; The War Years, you may recall that Byrd wrote Eisenhower on 2 February 1945 that he had been in contact with General Handy and had arranged to have Major Siple sent to the European Theatre of Operations to assist in cold weather problems. The Admiral wrote, "I can say without hesitation that he is the greatest living expert on cold and wet weather clothing." And General Eisenhower's message (#2279) to Admiral Byrd said, "Dear Admiral Byrd. Thank you for your note about Major Siple. I will see to it that his work here is facilitated."

I (pcd) hadn't known how many trench foot casualties were experienced by our troops in Europe, but there were 11,000 cases in November 1944 (L'Hollier and Park's Sealed Insulated Military Boots, Natick Laboratories, 1967); and going through Paul's papers in the National Archives I found a statement that there were 50,000 trench foot casualties in Europe in World War II. Paul, along with a physiologist at the University of Pennsylvania, the late H. C. Bazett, conceived the principle of a double vapor barrier boot - the precursor of the insulated boot - and constructed some footgear utilizing the double-barrier principle in March 1944 which were field-tested by a group of Canadian soldiers. Paul proposed the four layers of footgear used in the early studies be integrated into the wall of a waterproof boot. He and Bazett received and transferred to the Army Quartermaster Corps a patent on an insulated boot designed with an inner layer of fleece, a layer of rubber, a layer of fleece and an outer shell of rubber — all laminated together into a single boot wall. L'Hollier, then a development manager for Hood Rubber Company, carried the principle of insulation by air one step further than Siple. He devised a way to trap an air chamber within the boot wall, while keeping the insulating material dry between two impermeable layers. The standard black boot came into its own during the Korean War, while the white insulated boot was formally adopted by the Army in 1959 for military personnel. We used "formally adopted", as IGY personnel will recall that the white rubber insulated boot was available for them to wear in the Antarctic in 1957. I thought this little bit of history wouldn't hurt any of you — one should always be mindful of one's heritage. After all, aren't all Antarcticans indebted to the late Dr. Siple for the white rubber insulated boot, as I don't believe, in spite of Murray Hamlett's awful pictures, that any American has ever had trench foot in the Antarctic?

BED COUNT. Here is the winter-time census for US Antarctic stations: McMurdo 85, South Pole 20, Palmer 10, and Siple 8.

ROCK APPEARS TO BE FIRST KNOWN VISITOR FROM MARS. This headline screamed across the top of the Science section of the New York Times for Tuesday March 15, 1983. A long, excellent article by John Noble Wilford started out, "A greyish-brown chunk of rock, a meteorite found on the ice of Antarctica four years ago, has sent a shock wave of excitement through the laboratories of planetary scientists. Its drab appearance belies its apparently exotic provenance. The rock very likely comes from Mars." The 17.5 pound rock, eight inches in diameter, was picked up in 1979 at the Elephant Moraine near McMurdo Sound. It is young as meteorites go, being only 1.3 billion years old, according to radioactive dating. It was said that meteorites almost invariably date back to the beginning of the solar system 4.6 billion years ago. Since the rock appeared to be volcanic, it had to come from a body that had been geologically active as recently as 1.3 billion years ago. Scientists have found some of the so-called noble gases - neon, argon, krypton, and xeron - trapped in the glass, strikingly similar in abundance to those of the Martian atmosphere as determined by Viking missions to Mars in 1976. However, definite proofs that it came from Mars may have to await the return of Martian samples by spacecraft. At this time, the United States has no plans for such an undertaking.

Meanwhile, as evidence becomes more and more persuasive, it could be that the meteorite is the first known object from another planet to reach the Earth. Dr. Robert O. Pepin, a University of Minnesota physicist, has been doing analyses on the gases trapped in the meteorite and said "the results are ambiguously positive." They were "positive" because the spectrometer detected 15 percent more nitrogen-15 than would be found in a sample from the Earth's atmosphere; they were "ambiguous" because he needed a measurement close to 60 percent to match the Viking data from Mars. Dr. Pepin said the problem might be some contamination from ordinary nitrogen which the rock had absorbed during processing in the laboratory, while a colleague of his, Dr. Alfred O. Nier, suggested that the Martian atmosphere was different 180 million years ago when the glass trapped the gas. But Dr. Pepin put it all into its proper scientific perspective when he remarked, "That rock just smells like Mars."

MORE ON METEORITES. The Bulletin of the American Meteorological Society, one of its more prominent organs, had a rather long article on "Antarctic Meteorites from Mars" in its News and Notes section of the March 1983 issue. Robert Huguenin of the Depts. of Physics and Astronomy at the University of Massachusetts has come up with compelling evidence to support the belief that two of the meteorites found in Antarctica were once part of Mars.

> His studies involve examination of the Martian surface through remote sensing, as well as through studies of the mineralogy and chemistry of Viking-obtained soil samples. He has also participated in numerous earth-based observations of Mars via telescope.
> Through the use of spectrophotometry—the measuring of a surface's light reflectance and absorbance—Huguenin and his associates have been able to probe portions of Mars's surface the size of New England .....
> Striking similarities are revealed when reflectrance spectra of areas of Mars are compared to the reflectrance spectra of some of the Antarctica meteorites. They indicate that the meteorites are similar in major mineral makeup to broad expanses of exposed rocks on Mars .....
> Another important piece of evidence is the similarity of derived "parent magmas." ....
> Huguenin also notes that the meteorites under study are, geologically speaking, unusually young. By measuring radiogenic decay, a process similar to dating fossils through measurement of the radioactive decay of carbon isotopes, scientists are able to determine the rate of decay of elements such as uranium, argon, and strontium—isotopes of which are found

in many meteorites. Such dating methods revealed the age of the suspected Martian meteorites to be from 500 million to 1.3 billion years old — considerably younger than the 4.6 billion year old meteorites originating
from asteroids at about the time the earth cooled ....
Despite the evidence to the contrary, there are scientists who find it difficult to believe that meteorites would be able to escape Mars's strong gravitational field to intersect Earth's orbit, in the manner of asteroids. However, a research team at the Carnegie Institute of Washington, led by George W. Wetherill, calculated that such an escape was possible if the permafrost believed to pervade the Martian soil vaporized on impact, therefore creating such extremes in gas pressure, that surface material could be boosted into space and enter the Earth's orbit. He devised a permafrost model to demonstrate his explanation.
Huguenin likens the Martian climate to that of Antarctica, with temperature falling to as low as -50 to -100C during the night. . . .

Huguenin must be a master of the understatement as he said, "It's very exciting."

MAIL CALL. We have it from a most reliable source that Eddie Goodale, one of the old Harvard dog team drivers on the Byrd '28-30 expedition who continued his Antarctic activities with the Office of Polar Programs at NSF (serving occasionally as their rep at Christchurch for several years, an early-day version of Walt Seelig), was back south this winter in Mobile, but that he is feeling his age. Supposedly he does quite well physically, although this will probably be the last year he'll be able to go south (from Maine) for the winter . . . Dick Conger recently joined the Society. Dick lives here in the Washington area. He was the head Navy photographer in the Antarctic for many years — on High Jump in 1946-47, on Windmill in 1947-48, on the staff of Deep Freeze from 1954-59 (I, II, III, and part of IV), and was also up in the Arctic three times. Dick was recently out in Missouri, and he looked up Father John Condit who was the first Catholic priest at McMurdo Sound in 1956. Father Condit, as I recall, had quite a pugilistic reputation, and there weren't many fights that winter in which the good priest did not become actively involved. Now he has a parish in Taos, Missouri, which, Dick tells me, is about 45 miles from Columbia, Missouri . . . Jerry Huffman tells me that the former Antarctic Navy commander who later worked in the Office of Polar Programs at NSF, Captain Eugene Doering, died very suddenly in the past month. No details. He was particularly interested in the energy part of NSF.... While we are writing about the military, it's always good to get a copy of Doc Abbot's Christmas letter. The former Deep Freeze admiral lives the good life down on the Gulf where he still delivers Bertrams (#26 and #27 in 1983) to buyers, trades in Cadillacs, does a lot of traveling (highlight of '82 was a trip to Western Europe with 81 souls, of which 33 were Naval Academy '39 classmates, another 33 were wives or wives-equivalents and the other 15 were friendly forces). Doc says he has four jobs, all non-salaried. His Christmas "annual non-Christmas card" is just great, having a most original format which is innocuous and a pleasure to read - even though I have never had the pleasure of meeting him! .... We understand from another source that a representative of TEMCOR in Torrance, California, the good folks who built the geodesic dome at the South Pole, recently visited the station and came away with a warm feeling that the dome was doing just great, and that it would last for at least another ten years. Now that's what you'd call good news . . . . Gordon Cartwright, the first lend-lease exchange scientist whom the U.S. sent to Mirny in 1957, is being retired to pasture over there in Geneva, Switzerland. He had a real good deal going for himself, and there were only two ways they could move him — one was burning down Geneva, a somewhat drastic deed; the other was abolishing his job. So it finally came down to the latter, and his job will be wiped out at the end of this June. But is he coming home? No siree, Gordon is going to keep on living right there in Geneva. He is only 74 and feels he

has a lot of skiing left in his legs, and then there is summertime sailing on Lake Geneva. He came back to the states in mid-March when the Department of Commerce threw a big bash for him and Bob White gave him a 50-year pin. He actually joined the old Weather Bureau back in 1929. Old meteorologists like Gordon and Henry Harrison just never quit Dick Black, our poet laureate, can be found in Washington papers in all sorts of outfits. We have long been accustomed to seeing him dressed up as some Shakespearian character at a Folger theatre party, but the Alexandria Gazette of February 16, 1983 showed him dressed as Admiral John Paul Jones. He looked about as much like Admiral Jones as the two next to him looked like George and Martha Washington, a couple of local Alexandria citizens of yesteryears. Last summer (June 18, 1982) the Smithsonian Air and Space Museum sponsored a public symposium on Amelia Earhart, commemorating the 50th anniversary of her solo flight across the Atlantic, the first time a woman had flown across. Six individuals whose lives were touched by Earhart took part in the commemorative program, and Dick Black was one of the six. Dick recounted how he was on the US Coast Guard Cutter ITASCA cruising near Rowland Island, awaiting Earhart and her navigator to arrive on the one-by-three mile Pacific atoll for refueling before going on to Honolulu. But, she never reached there, and to this day no one is certain just what happened . . . . We hear from another source that Big John Stagnaro, the itinerant ham radio operator who has done such yeoman work running phone patches for the men and women on the ice, has had some health problems of late. I'm sure all Antarcticans wish Big John a speedy recovery. . . . The Antarctic Superstar, Larry Gould is going home in mid-April. Yes, he's going back to Northfield, Minnesota on a mercy trip to Carleton College where he will take part in a geology symposium, April 12-16, commemorating his establishment of their Geology Department 50 years ago. Now that should be a fun trip, even though the immortal Satchel Paige once cracked, "Never look back, someone might be gaining on you." However, Larry has the same love of living and achieving inherent in most graduate students, so they will never catch him — no way! If one needed proof that Larry was really indestructible, it was confirmed this winter when he totalled his Volvo and he walked away undaunted with a few bruises . . . . The old ice breaker, Ed MacDonald, writes that his 15-month siege of leukemia is now in remission. He's off this month for a cruise to the Holy Land, Greece, Greek islands, Istanbul, Cairo and other interesting ports. Last year while on a trip to China, his wife Jessie Bell volunteered Ed for an acupuncture demonstration in a Nanking commune of 17,000 people. It seems that Ed had arthritis in his right hip from too many rolls on icebreakers, so he went along with it. He said he felt no pain, just a mild tingling sensation. After five minutes of treatment, he felt like a new man, able to "run and leap like a mountain goat." Jessie Bell must have wondered what kind of a monster she had created by volunteering Ed! But the beneficial effects lasted only about 12 hours, and he ended up by having his second total hip replacement operation (in ten years) after he got back home . . . . John Roscoe was in town recently and attended his first ever Antarctican Society meeting. I haven't seen him in decades, and after his five-way bypass heart surgery year before last, I thought he might have aged, but he has a crew cut, looks in great shape, and walks very sprightly. John was photo-grammetrist on Operation High Jump and also Windmill, plus serving as scientific and political advisor to Admiral Byrd from 1949 to 1957. John is a fascinating person to talk to, real interesting, and I hope the Society can get him to talk on tape sometime about his relationships with Antarcticans. We talked for over an hour, and he is truly a gold mine of information about people and events. John wants to rally the Society members living in northern California for a meeting or conclave. I think it's a great idea! I'm trying to talk Frank Eden at NSF into having an all-day polar session during the December meeting of the American Geophysical Union in San Francisco. Frank is the Program Chairman for that meeting. I have an idea it won't fly, but if people like Gentleman Jim Zumberge, Bob Rutford,

Larry Gould, Bob Helliwell, Grover Murray, and other wheels would second the idea in letters to Frank, it might. After all, there really hasn't been any professional society recognition of the polar centennials, and San Francisco would be a good place to have one. And then John could stage a local gathering of Society members at the same time ..... Mike (Plateau 67) Kuhn of the University of Innsbruck is off to Kathmandu in the Himalayas, presumably with his faithful Linke Fuessner actinometer and other associated pyranometers. He duly noted before his departure that his wife is with child — nothing like leaving a little reminder at home! Mike will be here in the states for the Evanston meeting in late June (see below) ..... More woes for Elizabeth Innes-Taylor, widow of Alan. Her eldest daughter Catherine lost a baby girl in childbirth - she would have been the first grandchild in the Innes-Taylor family. There are three Innes-Taylor children, Catherine, an Associate Professor at the University of Alaska in Anchorage; Rollie, a free-lance writer living in Japan; and a daughter Kristin who lives in Whitehorse$_0$ .... John Cadwalader, an old Navy captain, says he feels old reading Bergy Bits until he sees Bud Waite's name and then he doesn't feel quite so old!

UPCOMING MEETINGS.

"The Last Deglaciation: Timing and Mechanism," Airlie House, Virginia, 2-6 May 1983.
"Symposium on Ice and Climate Modelling," Northwestern University, Evanston, Illinois, 27 June-1 July 1983.
"Fourth International Conference on Permafrost," University of Alaska, Fairbanks, 18-22 July 1983.

A very interesting 5-day workshop, funded by NATO, NSF, and others (?), coming up on 2 May will bring together leading earth scientists from around the world. The first three days will focus on data relevant to the deglaciation; the fourth day will be devoted to planning the Quaternary volume of the Decade of North American Geology series; and the last day will be a summation and analysis of the timing and mechanism of the deglaciation. The major sessions are on (1) Timing of Deglaciation: View from the Ocean, (2) Timing of Deglaciation: Ice-Sheet Areal Extent, (3) Geochemical Evidence of Existing Glaciers: Ice Elevation, (4) Climatological Evidence South of the Ice Sheets, and (5) Climatological Overview/Evaluation. Ninety people have been invited to attend, and they virtually constitute a list of who's who in glaciology and climatology. It should be a great workshop.

The International Glaciological Society and the American Meteorological Society are hosting an interdisciplinary symposium on ice and climate modelling which will be concerned with the following topics: (1) Ice Data for the Present Climate: Continental and Marine Ice Sheets, Sea Ice and Snow Cover, (2) Modelling of the Present Climate (Atmospheric climate models, Oceanic climate models, Ice models, and Coupled models), (3) Ice and Climate Data for the Pleistocene and the Holocene, (4) Climate Modelling of the Pleistocene and the Holocene. A hundred and twenty dollars will get you into this symposium.

The National Academy of Sciences' Polar Research Board and the State of Alaska are the organizers of the Fourth International Conference on Permafrost, with the University of Alaska being the host and local organizer. Six themes have been identified as being particularly timely: (1) Pipeline construction, (2) Climatic change and geothermal regime, (3) Deep foundations and embankments, (4) Permafrost terrain and environmental protection, (5) Frost heave and ice segregation, and (6) Subsea permafrost., These will be reviewed by panels of experts. In addition there will be 350 contributed papers, including 53 Russian and 40 Chinese. If pingos and ice wedges turn you on, then you have to be in Fairbanks in July. But bring money, real money and lots of money. For a starter, registration is $225.