The Antarctican Society

"By and For All Antarcticans"

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BRASH ICE. Dr. Roy Cameron recently issued a complaint that comes regularly into our office, both from old geezers like Roy and from young recruits: they find little in our Newsletters which is about events in their era. Well, we have members from fifty different years, and what we try to do is find current news which is of some current significance. If you are a true Antarctican, we feel you would like to know what we think is happening on the ice.

But as we approach the 100th anniversary of both Amundsen and Scott reaching the Pole, there may be an overload on those expeditions. But here is an anniversary story which appeared recently thanks to the AP which should be of interest to all. Ken Moulton forwarded the news about Scotch whiskey discovered recently beneath the floorboards of Shackleton's hut at Cape Royds. In Shackleton's 1907-09 Antarctic expedition, 15 men wintered at the hut at Cape Royds, as did two crates of McKinlay & Co. Scotch whiskey. After all the years of 'Scotch on the Rocks," the crates were discovered in 2006, embedded in ice beneath floorboards of the hut. The New Zealand Antarctic Heritage Trust will attempt to remove some of this treasure this coming year, perhaps returning a bottle to the company, now called Whyte & Mackay.

The biggest anniversary stories for this Newsletter are several accounts on the ill-fated DC-10 crash 30 years ago on Mt. Erebus. A couple of our "staff", namely John Splettstoesser and Tom Henderson, were actually at McMurdo on that terrible day. And it was a terrible day for many of us Polies who had gotten to love Peter Mulgrew like a brother after his elongated stay at the Pole after arriving there with Ed Hillary's party. There is a rather long and very interesting letter from Peter to PCD which appears on our web-site. Read it. And in recent days our beloved voice from Christchurch, Margaret Lanyon, has sent us many very interesting articles from their local press which updates us on several aspects of the crash.

And probably you have heard or read news items on the final disposition of the Dome at the South Pole. As we go to press, it looks like the brain trust hasn't made any final decision as to where this large piece of Antarctic history is destined. Read all about it herein, and if you feel strongly about your personal feelings, let Ballston know.

Talk has continued to arise as we approach the 100th anniversary of Amundsen's arrival at the South Pole as to whether anyone could locate and excavate his tent. An attempt was made in 1993-94, without success, but a real coup would be if they could find the tooth that had to be extracted by Amundsen after they reached the Pole.

We deeply regret to announce the passing of a most dearly beloved member of our Society, one of our past Vice Presidents and former member of our Board of Directors, Pete Barretta. He died November 16th, at age 89, after 25 years of fighting various ailments. He was a sweet, kind, most considerate person, and had the most extensive polar aviation souvenir collection of cachets in existence. Pete, we loved you, and will sorely miss you. Say hello for us to your dear friend and ours from Meadville, Ruth.

As you may have noticed, this Newsletter is getting more and more like a staff production, especially this one. John Splettstoesser wrote several articles, assembled all the inputs, and edited the material. We now have a Presidental Letter in which Charles Lagerbom reports on his fantastic freebie scanning services. Tom Henderson brings us up to date in each issue with the current on-going additions. Two ex-presidents, Art Ford and Rob Flint, have book reviews herein. Our overseas correspondent, Margaret Lanyon, is ever providing information from Kiwiland, and Polly Penhale tells us about some of the activities at NSF. Billy-Ace Baker was an unpaid consultant-at-large for this issue. Truly "By and For All Antarcticans."

I, Paul Dalrymple, have been writing Brash Ice for evermore, write an occasional anonymous article, usually assemble the Newsletters, send out membership notices, mail calendars, and answer a lot of mail A non-Antarctican, Jo Lindsay, puts the Newsletters to bed when she is not playing tennis, ice hockey, sailing, or whatever. Then the team of Grace Machemer and I put labels and stamps on envelopes, and stuff them with Newsletters. Really a team effort.

HEADS UP. *Antarctic Festival*, Christchurch, New Zealand. Commencing September 27, 2010

LETTER FROM THE PRESIDENT. By Charles Lagerbom Photos. Journals. Movie film. Letters. Patches. Slides. Clothing. Anecdotes. Any and all of these items about your time in Antarctica are unique treasures that are historically important. The Society is working hard to get members and others to identify, catalog and preserve these personal experiences. The slide scanning service is moving a tremendous amount of images onto a new digitized format, cataloging and preserving thousands of images that otherwise might be lost. Our webmaster has started a voice-recording program that enables participants to record their stories, narrate their photos and films, and air their thoughts about their time on the ice. The website has also been posting photos, diaries, philatelic material, recordings, video and other items as well. Many members (and loved ones of past members) have been willing to share their materials and tell their stories. Please join them and take advantage of these possibilities by contacting me or the webmaster, Tom Henderson. We are willing to go to great lengths to ensure that your personal experiences with Antarctica will not be lost or forgotten. On other Antarctican Society fronts, there are talks underway about the fate of the geodesic dome at the South Pole due for demolition this year. Discussions are also taking place about the possibility of getting the *Antarctic Journal of the United States* digitized with a searchable database and put on our website.

We are closing in on the 9,000th slide to be scanned. Nearly twenty collections have been or are in the process of being cataloged and scanned. Some collections contained over a thousand slides, some under a hundred. Some are from the 1950s and some from the previous decade. Some represent

just one season or a short visit while others represent an entire career of work on the continent. What I find most interesting are the shots of everyday life at the stations, in the field, on a ship, or what they did for fun or amusement. The people do not seem to change all that much, maybe clothing or hairstyles, but not the expressions and poses and backgrounds which seem to provide a continuity and a sense of timelessness about Antarctica. That is why the attempt to provide a voice-recorder to people to narrate these images and provide their personal impressions would make this an even more powerful and historically important work of preservation. So please consider contacting Tom Henderson, our webmaster, for details on making use of the voice-recorder.

WEBSITE UPDATE. By Tom Henderson. The material for Time Trek keeps coming in on a regular basis, more regular than I can keep up with. However, I have taken time since the last newsletter to completely revise the Time Trek User Guide to be consistent with the current version of the application. A lot has changed since the original Guide was posted so the revision was badly needed. Now you can follow the examples in the Guide and they will match what you see on Time Trek. You will find a link to the Guide on the left-hand column of the Time Trek main page.

More images are coming (I promise!). I am in a happy dilemma now as the Scanning Service continues to be a great success (see the update by Charles Lagerbom in this newsletter) so the pipeline of new images is full-to-bursting. I am striving to meet my goal of posting at least 30 new images each month.

Work has begun on restructuring the database tables behind Time Trek. This will allow much more flexibility in linking not only events but also stations, features and even images to all sorts of additional information. For example, a feature description could be linked with an image showing that feature, or a station description could be linked with a document from the early days of the station or an old film of the station. This is all aimed at making Time Trek a valuable multi-dimensional historical resource.

Finally, those of us who use computers extensively every day tend to forget that not everyone is "computer savvy." So here are a few things that some users of the website might not be aware of:

- Any time you see a bit of underlined text on the website, chances are that it is a link to another website page or to a document. You can tell for sure by passing your mouse cursor over the text. If it changes color, it is a link! Clicking on these links takes you to the new page or the document.
- Clicking anywhere in the banner of any page on the website (the part that has the title "The Antarctican Society" and the logo) will take you directly to the Home Page of the website.
- The "What's New" title on the Home Page is a link by itself. While items of current interest are listed below this title, there is a separate What's New page that contains a lot of additional material, including a table of changes to the website.
- Popup windows are used extensively on the website. These are windows that appear over other windows and are smaller than the main window on your computer screen. They can be expanded to full screen size by clicking the small "square" symbol in the upper right of the popup window. The size of the popup window can also be expanded to your liking by putting your cursor on the side you want to expand, holding down the left mouse button, and "dragging" the side out to make the window larger. Finally, some browsers by default do not allow popups. If you get a

message saying that popups are blocked, there is usually another part of the screen (a yellow strip near the top for the Internet Explorer browser) that allows popups if you click there.

Late breaking news! Google has just announced that Version 5.1 of the Google Earth plugin is now in final release. This update has fixed some bugs but most importantly has included support for MacIntosh right in this version (previously Mac users had to download a separate version of the plugin). Once the plugin is installed in your browser, it automatically detects and supports applications that have imbedded Google Earth – such as Time Trek. You can download the latest version at http://earth.google.com/.

WHO'S WHO AT NSF/OPP? New appointments, and one veteran departed. Karl Erb, Director of the Office of Polar Programs, recently announced some new faces. **William Colston,** Director of the Antarctic Infrastructure and Logistics Division (AIL), replaced Mr. Erick Chiang. Mr. Colston was formerly at the U.S. Department of State, Bureau of Overseas Buildings Operations, and Department of Defense Renovation Program following the Sept. 11 terrorist attack. Prior to that he was in private business and also an officer in the U.S. Coast Guard.
Brian Stone is Deputy Division Director of AIL, with 18 years experience in polar operations, logistics, and research support.
Dr. Alexandra Isern is Program Director for Antarctic Earth Sciences, was formerly at the NSF Division of Ocean Sciences, and taught at the University of Sydney.

AIR NEW ZEALAND FLIGHT 901 AND MOUNT EREBUS –30 YEARS LATER. (By John Splettstoesser, with input by Margaret Lanyon.) On flights that Air New Zealand initiated in February 1977, tourists enjoyed the long flight from Auckland to McMurdo and scenery of the Transantarctic Mountains and Ross Island and return to Christchurch. Flight 901 on November 28, 1979, was different, resulting in the DC-10 crashing into Mount Erebus at an elevation of about 1,500 feet on its southbound itinerary, killing all 257 on board – 237 passengers and 20 crew. A whiteout certainly contributed to the accident, merging the cloud layer with the white of the mountain, resulting in a 'go-around' attempt to be too late. How such a disaster, the worst aircraft catastrophe in Antarctica, could occur is still a contentious issue, even though an accident report of May 1980 resulted in pilot fault as the cause. Further investigation by justice Judge Peter Mahon, however, indicated that the airline changed the computer track of the aircraft without informing the air crew, thus placing the DC-10 east of the original route and on a collision course with Mount Erebus. Claims were made that a whitewash developed, with airline executives and management pilots acting in a conspiracy to exonerate the airline. Air New Zealand appealed to a Court of Appeal, and Mahon appealed to Privy Council in London. The upshot was that the Court of Appeal verdict was upheld, and Mahon's appeal was out of order and dismissed. This legal entanglement probably did not resolve anything, and the families of the victims are still in a quandary and not convinced of a true resolution.

Although the families that received compensation (averaging $100,000) for the victims were sworn to secrecy, the information was revealed in an article titled CRASH CASH UNCOVERED in the Christchurch Star, 18 November 2009, sent by Margaret Lanyon. The 200 New Zealanders received a total of $21 million (all these figures presumably in N.Z. dollars). About a third ($6.9 million) was paid by the Government after Civil Aviation was named in a class action by a passenger consortium. The consortium sued Air New Zealand, and also the Crown for failing to monitor the planning and preparation of the flight. Another $4 million was paid to families of the 24 Japanese. Payouts varied

depending on personal circumstances, with families of the most elderly receiving less than $25,000. After more than 2 years, compensation was settled out of court when airline insurers, Lloyds and AIG, "did a deal" with the Government.

Some unknowns still remain, even though the cockpit voice recorder and digital flight data recorder were recovered, along with the instrument panel of the wreckage. A Press Clip sent by Margaret Lanyon from the Christchurch Star, 18 November 2009, provided details of the "Notebook Mystery," involving a diary and the pilot's flight bag, found near the body of Captain Jim Collins, the man in charge of Flight 901. The flight bag later went missing and has never been found. Pages from the diary that were originally seen with wording and numbers legible, and another with Collins' name, turned up in a different condition. When a black diary found its way to Collins' widow the pages seen earlier by two individuals at the crash site were gone. An accident inspector at McMurdo declared there was nothing relevant in either of the diaries. After 30 years have passed, some of the individuals involved in researching the event have passed on, and the issue could be attributed to a conspiracy, but remains unsolved.

Because of the time of the season, field parties were waiting in line to begin field work, but delays occurred for reasons of weather and also the accident. McMurdo was experiencing a busy time, with a group of Distinguished Visitors (DVs) there on a tour of station and also to commemorate Admiral Byrd's flight over the South Pole on Nov. 29, 1929. The ceremony was held on November 28 at the bust of Admiral Byrd next to the Chalet, with speeches made by some who were on that expedition (Larry Gould, Norman Vaughan), as well as relatives of Byrd (Senator Robert F. Byrd, Jr., Byrd's great-grandson Robert Byrd Breyer), and NSF's National Science Board members Grover Murray and Norman Hackerman. NSF Rep Dave Bresnahan had the honor of guiding the distinguished group on this historic event. The original plan was to fly the dignitaries to the Pole the next day, 50 years after Byrd's flight, but was modified because of the DC-10 crash. A few individuals did visit Pole the next day, but not all of them. The quick flight to Pole, with a minimum of time on the ground, was followed by a return to McMurdo and transfer from LC-130 to a waiting C-141 and a flight to Christchurch.

News of the missing DC-10 aircraft found its way quickly around the station, and discovery of the crash site confirmed the tragedy. The outcome was the dedication of helicopters and pilots, plus a team of investigators from New Zealand, as well as the survival team of mountaineers at Scott Base and McMurdo, to spend the next days at the crash site to collect bodies and body parts for return to McMurdo, and ultimately to New Zealand. Of the passenger and crew manifest, 213 were identified. Nationalities included 200 from New Zealand, 24 Japan, 22 Americans, 6 British, 2 Canadians, and 1 each from Australia, France, and Switzerland. One of the field programs scheduled for that austral summer was a large helicopter-supported camp in the Ellsworth Mountains, with a large complement of geologists and surveyors with three helicopters and flight crew. The upshot was a late start, with me, Tom Henderson and others waiting for the season to start, having been delayed for a time by the crash and also weather problems. Good weather and generous support by helicopters and crew resulted in a successful season, despite the delay.

What has happened since? New Zealand instituted a "Special Service Medal (Erebus)" in Nov. 2006 to recognize the service of New Zealanders, Americans and others involved in participation at the crash site and directly involved in any activity related to the crash. Dave Bresnahan received the medal, whereas Billy-Ace Penguin Baker, USN communications at McMurdo who provided 'comms' during

Search and Rescue and recovery operations, did not, but knowing Billy-Ace, he would have made sure that other Navy personnel who were more directly involved received the medal.

In addition, on October 23, 2009, the Air New Zealand CEO unveiled the sculpture "Momentum" at the company headquarters in Auckland to commemorate the event and the anniversary. Meanwhile, an aluminum cross has been erected at Scott Base to acknowledge the accident, and the site of the crash itself (77º25'30"S, 167º27'30"E) has been designated as a Tomb "to be left in peace" by Antarctic Treaty Parties at its Consultative Meeting XI, Buenos Aires, 1981. In a news clipping of December 1 sent by Margaret Lanyon, a story of healing and closure was told about relatives of the crash victims who were flown to McMurdo in an effort to place a wreath and other items at the crash site, but unfavorable weather conditions on Mt. Erebus made a visit impossible. Instead, a memorial service was held for the relatives at Scott Base, and all returned to New Zealand afterward.

DOOMSDAY FOR SOUTH POLE DOME. By John Splettstoesser and a Pole winterer, Tom Henderson. The Dome at South Pole Station is about to become history. As we are writing this, snow drift is being removed from the base of the Dome in order to begin the dismantling process. It was dedicated in the 1974-75 season, and was officially replaced by the new facility in January 2009. Early on, drifting began to be an issue, as it has been with almost all Antarctic stations. The answer is the remarkable structure designed as an above-surface station that is supported on pillars, allowing blowing snow to pass beneath the station, rather than drifting upon the sides of buildings. The expert builder of the new station is to be commended for providing us and NSF grantees with a modern structure on the ice. His name is Jerry Marty, a name not to be forgotten, formerly with the NSF / OPP staff but retired as of this year. Translation: we cannot rely on Jerry to contribute to this article because of his restriction by NSF to not engage in anything related to his former employment. There is a fancy acronym for this, but it doesn't matter. Jerry is still 'Mr. South Pole' in our eyes. He also helped us in establishing the naming and the space for the 'Ruth Siple Memorial Library' at the new South Pole Station.

Now, to the point. After all the dialogue about the Dome and what to do with it, environmental reasons related to the Antarctic Treaty dictate that it will be removed. How to do it? This season, the three upper rings of the 55-foot-high Dome are to be removed and will hopefully be preserved after transport to Port Hueneme, California, to become part of a museum.

The bulk of the dome, which has 904 panels and 1,448 struts in all, is held together by about 60,000 bolts, all of which would have to be cut apart. NSF has budgeted $150,000 for the project to remove the dome, which is scheduled for completion in March 2010. That is not too far away, and NSF cannot budget the supplementary funds. NSF might already be trying to extend the March 2010 date for an additional year, but the point is that a budget of $150,000 is far under budget to remove the dome and have it transported to Port Hueneme. An estimate of $500,000 **above** the $150,000 is more like the actual cost to disassemble the entire dome bolt by bolt and shipping it stateside. The option of removing the entire dome, which is mandatory, and disposing of its parts in a landfill or recycling plant, is abhorrent to Polies, as you might expect.

ICEBERGS ARE HEADING NORTH. From Margaret Lanyon, modified by John Splettstoesser from Christchurch Press, 24 November 2009. More of Antarctica is losing its ice, as evidenced by possibly hundreds of icebergs floating toward New Zealand. The icebergs are visible on satellite images, which implies 200 meters across or more, and might have

come from the Ross Sea area and broke off the Ross Ice Shelf, floated northwest toward Cape Adare and then were caught up in the circumpolar current, but escaping in currents that brought them farther north. Another possibility is that the source could be any of numerous ice shelves around the continent's perimeter, and currents brought the bergs around the coastline to an area of currents that diverted them northward. Iceberg movement is primarily by ocean currents rather than winds, because about 90% of the ice is below the water line.

Large icebergs as much as 2 km long were seen earlier in November off Macquarie Island, so the ones recently sighted are probably broken remnants of those. The current icebergs were seen by Rodney Russ on the polar tourist vessel *Spirit of Enderby* off New Zealand's Auckland Islands, heading north toward the South Island, about 450 km away. In Nov. -- Dec. 2006, large icebergs were seen off the coast near Dunedin, South Island, and became a tourist attraction. A helicopter company flew clients to the icebergs for close viewing for up to $330, in one case landing on a berg that had Adelie penguins on it. The farthest north sighting of an iceberg was in the South Atlantic Ocean on 30 April 1894 from the vessel *Dochra* -- 26° 30'S, 25° 40'W -- between the latitudes of Rio de Janeiro (22° 57'S) and Buenos Aires (34° 35'S).

WOMEN IN ANTARCTICA – 40th ANNIVERSARY. By John Splettstoesser. It was the 1969-70 summer season in McMurdo, when something different was apparent---- there were women walking the streets of Mac-Town, something that had never occurred in the past. The U.S Navy, relaxing from its mandate of no women on board Navy ships or on Antarctic assignments, worked with NSF (and Colin Bull, Director of the Institute of Polar Studies, The Ohio State University (OSU), who promoted the idea) to agree to women on NSF-funded projects in Antarctica. Previously, Mary Alice McWinnie had the privilege of conducting her biology programs on the *Eltanin*, but never got ashore until some years later when she wintered at McMurdo. The name Lois Jones will live in immortality as the leader of an OSU field party to work in the Dry Valleys. She enlisted three other women, two of them wives of men who had already achieved reputation as researchers in the field in the Antarctic -- Kay Lindsay (wife of John Lindsay, geologist), Eileen McSaveney (wife of Mauri McSaveney, geologist), along with Terry Tickhill, an undergraduate student, for the field work. In addition, a reporter from a Detroit newspaper, Jean Pearson, accompanied the women to Antarctica to report on this historic event. Further women in the programs that year included Christine Muller-Schwarze, wife of Dietland Muller-Schwarze, Principal Investigator of a study on penguins at Cape Crozier, and Pam Young, wife of a New Zealand biologist, working out of Scott Base.

All went well, as expected, no mishaps or perturbations in the program occurred, and women have been in Antarctica ever since. For example, there were 33 women at the South Pole, photographed on November 12, 2009, on the 40th anniversary of the event in 1969-70. More than 50 women are working at the Pole this year, 2009-10. More than 160 women have wintered at South Pole since Lois's intervention in the program, including Dr. Michele Raney, M.D., who was the first woman to winter at the Pole.

"GOING WITH THE FLOE?"— An analysis of luck versus skill in the epic polar expeditions of Fridtjof Nansen and Sir Ernest Shackleton," American Scientist, v. 97, Nov.-Dec. 2009, pp. 484-493. By Stephanie Pfirman (Barnard College), Bruno Tremblay (McGill Univ.), and Charles Fowler (Colorado Center for Astrodynamics Research and developer of Ice Tracker). (Review by Art Ford)

Nansen's 1893-1895 Fram and Shackleton's 1914-1916 *Endurance* expeditions at opposite ends of the Earth had much in common, as the

authors describe, notably in that both were beset in ice, after which their travels were at the whim of the pack, driven erratically at times by winds and currents. All occupants of both ships survived, although outcomes of the two ships were far different. The restored *Fram* now resides on display in an Oslo museum; while debris of the crushed *Endurance* lies scattered somewhere across the floor of the Weddell Sea.

In order to assess various possible drift paths of these vessels under different ice conditions and the possible scenarios for their different eventual fates, the authors used a computer program, Ice Tracker, as well as modern ice variations obtained from satellite data banks. Information on this software, developed at the University of Colorado, Boulder, is located at http://tinyurl.com/icemotion and the Ice Tracker tool is at http://tinyurl.com/icetracker. Using this tool and the sea ice data, the authors produced possible ship drift tracks for the years 1981-1997 that might have occurred over different years starting from their known besetment points. Possible tracks are highly diverse. For Nansen's drift, some possible routes would have taken him to his goal of a drift across the North Pole; whereas for Shackleton, possible routes farther east would not have been in regions of thick, multiyear ice under compression near the Antarctic Peninsula, and wherein the *Endurance* might have escaped the pack to sail back home to England. Quite interesting speculation, indeed, but of course there are other considerations that might help explain differences in outcome, such as differences in ship construction.

But there is one other question to ponder: Why did Wilhelm Filchner's 1911-1913 ship *Deutschland* escape from being crushed after being beset near the edge of Filchner Ice Shelf not far from that of Endurance later? It would be interesting to plot the Deutschland's track on the authors' diagram showing drift of Endurance. This well-illustrated report is one that any Nansen or Shackleton addict would find of considerable interest.

RETURN TO ANTARCTICA: *The Amazing Adventure of Sir Charles Wright on Robert Scott's Journey to the South Pole.* Adrian Raeside, John Wiley & Sons Canada, Ltd., 2009, 324 pages hardback, $29.95 US. Reviewed by Rob Flint

In a way, Sir Charles was my first employer. When I graduated from a Master's Degree program in electrical engineering at Stanford University my first job was a research assistant at Byrd Station, Antarctica. One of the programs for which I ran equipment and collected data was the recording of magnetic micropulsations for Pacific Naval Lab of Victoria Canada. This program was under the direction of Sir Charles, who had been the physicist on Scott's last expedition. To prepare for this program, I was sent in fall of 1963 to Victoria to meet Sir Charles and to be trained on his program. We met several other times in the next few years, most notably at McMurdo Station in December of 1965, when he and I took a walk up to the gap on the way to Scott Base on a beautiful day - and inadvertently threw the McMurdo authorities into a tizzy, when the MOST distinguished of their Distinguished Visitors went missing! (We knew where we were).

It was therefore with great interest that I read Sir Charles' grandson's book. Raeside has a triple blood connection to Scott's expedition: not only is he Sir Charles' grandson, but is also great nephew to expedition members Raymond Priestly and Griffith Taylor. This book is in part inspired by a tour Raeside took in the 2008-2009 austral summer on the Kapitan Khlebnikov, when he visited the historical huts in McMurdo Sound as well as the site of the incredible survival of the Northern Party at Evans Coves.

Raeside is a political cartoonist, and his cartoonist wit and irreverence - ("The Royal Geographic Society was founded in 1830 to promote the advancement of geographical science-and as a discreet place to drink ones face off.") - makes this book a delightful entertainment as well as a good retelling of the story of the ill-fated expedition. The

book contains a thumbnail history of Antarctica, but it is mainly the story of the Scott Expedition and especially the role of Sir Charles (or Silas as he was known then). There are many quotes from Silas' diaries. Silas was well aware of Scott's weaknesses, and he did not like the strict Naval discipline that Scott enforced, but he got along well with other expedition members and was apparently well-liked and respected. Raeside does describe the squabbles among the expedition members – we are fortunately past the age in which those things were ignored or glossed over. Scott's errors are described honestly and generally sympathetically ("It is a pity that Scott was in the Antarctic before. He learned all the wrong things"). Many sidebars and asides give information about expedition members, comparisons to the 1908 Shackleton expedition, and Amundsen's concurrent progress toward the South Pole.

Pat Wright and Colin Bull's book *Silas* (Ohio State University Press, 1993) has a more complete version of Wright's memoirs, but the present book brings a unique perspective and a modern day look at Wright and the heroic age of Antarctic exploration. With many historical black and white photographs, drawings by Pat Wright and the author, and a complete index. Contains a few misprints and typos.

NASA ICE CAMPAIGN IN ANTARCTICA. By John Splettstoesser, with excerpts from NASA website and *Antarctic Sun*. 'Operation Ice Bridge' is a 6-year campaign of annual flights to each of Earth's polar regions. The Fall 2009 campaign in Antarctica, led by Principal Investigator Seelye Martin, University of Washington, already began with the first flight on 16 October, with 17 flights planned over different parts of the continent this Fall, focusing on the ice sheet, glaciers and sea ice in West Antarctica. Flights are made on a NASA DC-8 instrumented aircraft with the objective to collect data that will bridge the gap between NASA's Ice, Cloud and Land Elevation Satellite (ICESat), presently operating, and ICESat-II, scheduled for launch in 2014. ICESat was launched in January 2003, and since then, its sole instrument – a precise laser altimeter – has helped scientists map ice sheet elevation, calculate sea ice thickness, and monitor changes in both. Dr. Jay Zwally of NASA's Goddard Space Flight Center, Greenbelt, Maryland, and ICESat investigator on the mission said that shifts in surface elevation have previously revealed the draining and filling of lakes below Antarctic ice, something otherwise unknown. Robin Bell, Lamont-Doherty Earth Observatory, is another investigator on the mission.

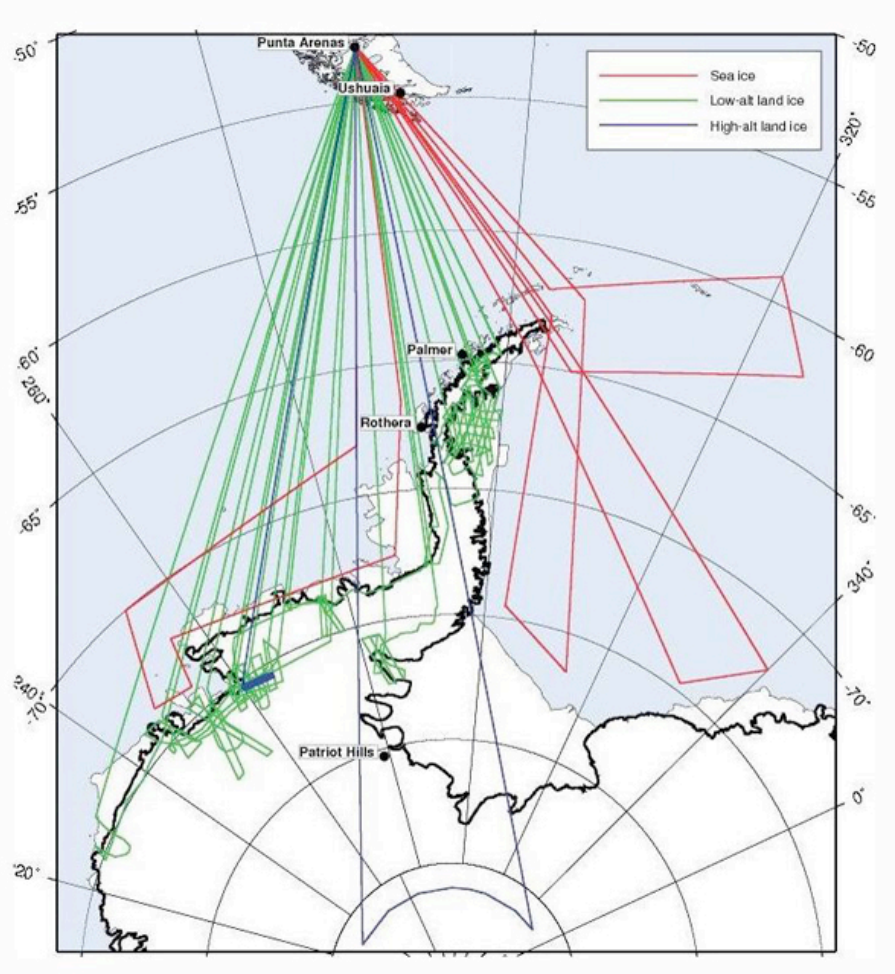
Among the variety of 'gee-whiz' equipment that includes lots of buzzwords and new acronyms, NASA's includes an Airborne Topographic Mapper (ATM), which pulses laser light to the ground that is reflected back to the aircraft, resulting in elevation maps of the ice surface. University of Kansas scientists operated a Multichannel Coherent Radar Depth Sounder, which measures ice sheet thickness and varied terrain beneath the ice. A Snow Radar measures thickness of snow on top of sea ice and glaciers, a Ku-band radar altimeter measures surface elevation of sea ice and ice sheets, and a Laser Vegetation Imaging Sensor, developed at Goddard, mapped large areas of sea ice and glacier zones from high altitudes. Finally, a gravimeter measured the shape of seawater-filled cavities at the edge of some fast-moving major glaciers. As expected, the disintegrating Larsen Ice Shelf and Pine Island Bay were major targets of the flights.

(See figure on page 10, which shows flight paths in red to measure sea ice; green to measure low-altitude land ice; and blue for high-altitude land ice.)

Think back to IGY and succeeding years when Charlie Bentley, John Behrendt and others on oversnow traverses on Sno-Cats set off seismic charges to measure ice thickness and dug snow pits for firn stratigraphy, gradually gaining point

information in remote parts of Antarctica. In the 1970s, radio-echo sounding from LC-130 aircraft advanced the state of the art even more to determine ice thickness and suspicions of subglacial lakes, on a continuous basis in a series of overflights in grid patterns. Now we no longer have to resort to Sno-Cats or Herc flights to 'read' virtually everything the ice sheet has on its surface and inner sanctum, but can fly a DC-8 aircraft from Punta Arenas, Chile, the center of operations for Operation Ice Bridge, to the Peninsula, and 11 hours later land at home base and sip pisco sours in a comfortable hotel.

It makes it difficult to tell young-uns war stories in the future, but we are grateful to advances in technology for making it all possible.



In addition to NASA, NSF was not directly involved in supporting Operation Ice Bridge, but assisted NASA with an environmental assessment of the project. Low-altitude flights at about 450 meters, one of the planned altitudes for some of the data collection, could have disturbed penguin and seal colonies, according to Polly Penhale at NSF, so by knowing where all those colonies are located along the length of the Peninsula, flights were planned to avoid them altogether.