



# The Antarctic Society

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## **PRESIDENT**

Dr. Anthony J. Gow  
117 Poverty Lane  
Lebanon, NH 03766  
[petprotector@comcast.net](mailto:petprotector@comcast.net)

## **VICE PRESIDENT**

Liesl Scherthanner  
P.O. Box 3307  
Ketchum, ID 83340  
[schernli@hotmail.com](mailto:schernli@hotmail.com)

## **TREASURER**

Dr. Paul C. Dalrymple  
Box 325  
Port Clyde, ME 04855  
Phone: (207) 372-6523  
[pcdal@roadrunner.com](mailto:pcdal@roadrunner.com)

## **SECRETARY**

Joan Boothe  
2435 Divisadero Drive  
San Francisco, CA 94115  
[HooDooskr@aol.com](mailto:HooDooskr@aol.com)

## **WEBMASTER**

Thomas Henderson  
520 Normanskill Place  
Slingerlands, NY 12159  
[webmaster@antarctican.org](mailto:webmaster@antarctican.org)

## **ARCHIVIST**

Charles Lagerbom  
16 Peacedale Drive  
Northport, ME 04849  
[icechip@bluestreakme.com](mailto:icechip@bluestreakme.com)

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## **NEWSLETTER EDITOR**

Guy Guthridge  
[gguthrid@yahoo.com](mailto:gguthrid@yahoo.com)

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## **BRASH ICE**

When I joined the National Science Foundation's polar office in 1970, my starting task was to edit *Antarctic Journal of the United States*. NSF had begun the periodical in 1966 to raise the visibility of science coming out of its still new U.S. Antarctic Program. Incredible as it may seem, back then the three program managers – Ray Heer (upper atmosphere physics), George Llano (biology), and Mort Turner (geology) – spent much of their time trying to convince scientists to consider working in Antarctica, rather than spending a comparable amount of time turning down worthy proposals, an unfortunate chore of their modern counterparts who these days are besieged by requests.

By 2004 the *Antarctic Journal* had worked itself out of a job, and NSF stopped publishing it. The early low visibility of Antarctic research had been replaced by excellent representation in the mainstream journals, minimizing the need for a special vehicle to insure the reception of Antarctic science in the broader community.

This newsletter has not earned such irrelevance. While we do write the occasional research summary (see "Southern Ocean brings it all back"), the main intent is to turn your attention to some of the people who are, or have been, the backbone of Antarctic research, its support, and related endeavors. Several articles below do that. We want your suggestions for more.

Consider joining the Antarctic Society, if you haven't. You'll receive four issues of the newsletter per year and full access to the web site (see "Society's website update," below). Annual dues are \$20 (\$25 outside the U.S.) for newsletters by post, \$13 electronically. Fill out the application (see "About us" on the web site) and send it with a check to Dr. Paul C. Dalrymple (address at left). Or pay online under "About us" on the web site.

Guy Guthridge

## **Our Treasurer delivers treasures in a Port Clyde barn**

by Jim Mastro

One has to wonder where Paul Dalrymple gets his energy.

During the International Geophysical Year (1957-58), [Dalrymple](#) was the micrometeorologist at Little America V, at Kainan Bay on the eastern Ross Ice Shelf, and later at South Pole Station.

Ever since then he's had boundless energy for all things Antarctic. Nearly every July for the past couple of decades, he has hosted an Antarctic gathering at his home in Port Clyde, Maine, an undertaking of no small consequence. Now at the tender age of 91, one would think he has every right to pass the torch to someone else. But that's not Paul. The most recent shindig, open to all members of the Antarctic Society for the first time, was probably his most ambitious yet.

[Port Clyde](#), however, is not a place one would immediately associate with meetings of great import. The town is exactly what you would expect of a Maine coastal village, in a rocky-shoreline, famous-old-lighthouse, and picturesque-harbor kind of way. Dalrymple's comfortable house sits very near that [famous lighthouse](#), at the end of a narrow road, which is itself at the end of another narrow road. Easy to get to, it is not. All the more remarkable, then, that upward of 175 people made the pilgrimage this year. But then, as I have noted, this was no ordinary meeting of the Antarctic Society, which was founded in 1960 as a not-for-profit educational society.

First, though, allow me to scroll back a couple of decades. In May 1993, 20 of the 24 then-living alumni of the [National Science Foundation's Antarctic Artists and Writers Program](#) met in Boulder, Colorado for a two-day workshop. The meeting was

the brainchild of Guy Guthridge, who was then manager of the NSF's Polar Information and Coordination department. Guthridge wanted to see if the artists and writers could "...increase their effectiveness by collaborating to create a message ..." His hope was that the workshop would "...yield a vision, collaboratively expressed by these fiercely independent individuals, of America's role in Antarctica."

"Fiercely independent," of course, is the operative phrase. Of the many benefits yielded by the workshop, a collaboratively expressed vision of America's role on the seventh continent was not one of them. However, one thing became very clear as the meeting progressed. At one time or another, nearly every participant expressed a strong desire to see Antarctica's pristine condition preserved. Though it was never the intent of the workshop, a message of environmental stewardship was essentially its result.

That brings us back to 2014 and the meeting at hand. As you drive through Port Clyde's quiet, winding streets, you are tempted to label it a sleepy fishing village. But looks are deceptive. "Shake any tree," Dalrymple says, and "an artist will fall out." One of those arboreal individuals is [Greg Mort](#).

A [world-renowned artist](#) whose paintings have been displayed in the White House and U.S. embassies, as well as in prestigious galleries, Mort is well aware of the power of imagery. Early in his career, he realized that that power could be directed toward environmental protection. To that end, he and his wife Nadine established a nonprofit charitable foundation they call [The Art of Stewardship](#). The idea is twofold: to inspire other artists to use their talents to promote an environmental message, and to use art, and some of the funds collected from the sale of art, to support environmental causes.

The Morts also happen to be Dalrymple's neighbors, so they knew of the Society. Paul had even tried to convince

Greg Mort to apply for the NSF's Antarctic Artists and Writers program, but to no avail. Still, his efforts did not go to waste. In 2012, in neighborly conversation, Greg Mort suggested a joint Antarctic Society/Artists and Writers meeting, in combination with his nonprofit. They would call it [The Art of Stewardship of the Antarctic](#).

When Paul Dalrymple contacted Guy Guthridge with the idea, Guy embraced it eagerly. Now retired from the NSF, Guthridge had always wanted to have another artist and writer workshop, and the Morts' backing made it all that much more exciting. Working together, Guthridge and Nadine Mort contacted 40 Antarctic artists and writers and, with Dalrymple's help, began to organize the complex logistics of the meeting.

So it was that I found myself this past July, as the sun shone hot and bright on a rocky North Atlantic shoreline, rubbing elbows with such luminaries as artist [Lucia deLeiris](#), photographers [Joan Myers](#) and [Norbert Wu](#), authors [Meredith Hooper](#) and [Michael Parfit](#), and of course Greg and Nadine Mort, among many others. Over the throaty growl of lobster boats motoring by, I listened to a parade of distinguished artists and writers discuss, as the program said, "how their visual and literary explorations have been influenced by and reflect Antarctic environmental concerns."

Dalrymple, of course, was a constant presence. He introduced the speakers at the Society forum, and he worked the crowd at the Art of Stewardship symposium. Whatever people were discussing, they wanted his input. It is no surprise. Not only has Paul been the face of the Antarctic Society for as long as most of us can remember, but he has long been a vocal advocate of bringing artists to Antarctica. The inclusion of the Morts seems a fitting culmination of that advocacy. "It was the perfect fit," Greg says.

As was the venue. The Art of Stewardship of the Antarctic symposium

took place in Fieldstone Castle, a meeting hall and studio originally built in 1913 as a guesthouse and observatory by the Arctic artist and telescope maker Russell W. Porter. Porter had accompanied Frederick Cook (1893) and Robert Peary (1896) on their Arctic expeditions, so the castle seemed a fitting place to be discussing polar matters.

As I spoke to people, listened to the presentations, and sat in on panels and brainstorming sessions, one thing struck me. What had been only implicit in the previous artists and writers workshop was now explicitly front and center. Participants actively discussed how and why art – and why sending artists to the Ice – is important to the cause of environmental preservation, and by extension to the U.S. Antarctic Program. The Antarctic program is well known for the science it supports but, as Greg Mort says, "There is an enduring connection between art and science. Leonardo da Vinci, one of the world's greatest scientists and artists, said, 'Art is the true daughter of science.'"

The Art of Stewardship of the Antarctic, then, is all about finding ways to use art to further a shared goal of protecting the Antarctica that we love. "Artistic works reach a lot of people," Lucia deLeiris says, "and art creates emotion." Emotion is what motivates people to action, so the feeling that we were on to something good seemed to be universal. However, not everyone had a sanguine view about the chances for success.

"Art in itself won't save anything or any place," says Jason Anthony, author of [Hoosh: Roast Penguin, Scurvy Day, and other stories of Antarctic Cuisine](#), "but someone held rapt by an Antarctic documentary film, for example, may well be brought into the fold of the environmental movement trying to protect parts of the southern continent. The hard part is matching up Antarctic art to Antarctic action, as it were, since there are few concrete ways in which someone can feel

like they are helping to ‘protect’ Antarctica.”

Still, he is clear about one thing. “Antarctic art and its artists serve as media for a place few have the privilege of seeing for themselves, and in doing so hopefully convey a sense of wonder about, and the importance of, this remote, strange place.”

And that, I thought, really goes to the heart of the matter. The work done by scientists in Antarctica is incredibly important, but the general public doesn’t get to see most of it. This isn’t on purpose. Scientists publish their work in scientific journals, which are read mostly by other scientists. These journals are the place for facts, not for poetic interpretations. That is the job of artists and writers, who by the very nature of their work must bring their message to the general public.

It comes down to this: scientists deliver the facts, but artists and writers deliver the magic. It is really through their eyes and ears, through their words and images, that we truly come to understand Antarctica.

I’m sure Paul Dalrymple would agree.

### **Shackleton commemorative voyage ends early**

by Guy Guthridge

A dragging anchor and a diesel engine that failed to start brought the voyage of privately owned sailing vessel *Polonus* to a bad end on 23 December 2014 at Lions Rump, a point of land on King George Island that is Antarctic Specially Protected Area No. 151 and a research site of Polish scientists from nearby Arctowski Station.

The voyage had started in Poland on 7 July. It included a stop at Plymouth, England, where Alexandra Shackleton, granddaughter of the celebrated Antarctic explorer Ernest Shackleton, during

centenary celebrations of the *Endurance* expedition, sanctioned the Polish journey. The intention was to visit South Georgia’s port Grytviken on 5 January 2015, the 93<sup>rd</sup> anniversary of Shackleton’s death, and pay respects at his grave there.

After a stop at the Falkland Islands, the *Polonus* route toward South Georgia included the Antarctic Peninsula station Arctowski. The vessel arrived there on 22 December. The crew befriended station personnel and agreed to transport researchers the 12 nautical miles to their project at Lions Rump.

After the 44-foot ketch anchored, a sudden squall drove the boat onto the rocks ashore.

The Argentine Navy ship *Suboficial Castillo* diverted to the scene, arriving on 23 December, to evacuate stranded crew and scientists back to Arctowski. Later, on 31 December, Argentine personnel expertly removed fuel, lubricants, and food to prevent their entering and compromising the environment. Then they towed the leaking but still afloat sailboat back to Arctowski, where station members managed to get it ashore and secure it for storage of unknown duration.

Enter the 781-foot Holland America Lines cruise ship *Zaandam*, on which I was aboard as an Antarctic lecturer. In the early morning hours of 4 January, fog and ice had forced us to give up visiting Hope Bay, 90 miles east of Arctowski across Bransfield Strait. We headed for our next scheduled stop of Admiralty Bay, with splendid vistas, abundant wildlife, and research facilities operated by Brazil, Ecuador, Peru, and the United States in addition to Poland.

After *Zaandam* finished its tour of Admiralty Bay, Zodiacs from Arctowski delivered *Polonus*’s seven weary men and their possessions to our liner. For all seven, it was their first time ever aboard a cruise ship. Next morning in the ship’s theater, as we crossed Drake Passage in a calm sea, Martin, the ship’s shore excursions manager,

who is Polish, provided a spirited summary (in English) of the voyage with the aid of photographs the sailors had salvaged. In an hour's frank and open exchange, Martin served as interpreter for questions posed by a packed house of curious passengers.

Why did the engine fail? We don't know. What kind of anchor? Plow. How much chain was out? Thirty-five meters. What kind of boat? A steel ketch (Bruceo 44) built in 1991 with fin keel, 80 square meters of sail, VHF radio, and Iridium satellite phone. How badly damaged? Cracks in the hull and a loose keel. What did you do with the salvaged food and fuel? Our Christmas present to Arctowski. What about the wives left at home for such a long time? Please ask the next question.

Did you have permission from Poland for this trip? Yes, we did all the paperwork – a lot of paperwork – with the foreign affairs ministry. Was the boat insured? Yes, and this is our first mishap in 10 years of sailing the boat. Will you write a book about this adventure? No, we do not write books. What was the best part of the trip? Two: when Alexandra Shackleton came aboard and when we crossed Drake Passage in sleet and 45 knots of wind.

The sailors, all in good health, left our big blue and white ship when it docked in Buenos Aires on 11 January. There, they started arranging a way back to Poland and thinking about how to pick up their lives after a disappointing end to their Shackleton centennial commemorative voyage. See <http://shackleton2014.com/>.

## **Pole to pole and everywhere in between**

by Kip Rithner

From Nathaniel B. Palmer's profitable sealing expeditions in the 1820s to

modern science projects and innovative field operations, time spent in the Antarctic has launched or enhanced many a successful career. Polar Field Services (PFS) is an entire company born of that tradition.

In 1999, owner Jill Ferris with six friends and colleagues answered the U.S. National Science Foundation's call for proposals to provide research support and logistics services in the Arctic.

NSF's Arctic Program was about to change in response to both new research needs and a just-completed logistics study. "The PFS team had experience supporting remote Antarctic field research as well as rapport with the Antarctic research community from years working in the U.S. Antarctic Program," Ferris recalls.

## **Bothering the locals**

The first years after PFS won the contract were hectic. "No one lives in Antarctica permanently, so in the USAP we didn't have to worry about bothering the locals," Jay Burnside, a founding PFS member, notes. "In the Arctic, we were always working in someone's backyard. We had to learn the regions and the customs of those who lived there; we had to establish business contacts, processes, and inventory."

Greenland science support resembled the USAP model, with most field teams – NSF grantees, mainly – entering the country via the Air National Guard flying LC-130 airplanes to a logistics hub in Kangerlussuaq. Summit Station, a small research facility at the apex of the ice sheet, was an analog to South Pole Station.

Alaska was a different story. The state has many points of entry, and researchers were accustomed to arranging their own field logistics. To some, PFS assistance seemed like a waste of money. "It took a few years to show that our logistics experience and economies of scale added value," notes founding PFS member Tom



Quinn. “In the second year we saw a leap in the number of projects requesting support, and in the third year, we had more clients than we could handle with such a small staff.”

### Antarctic beginnings

Over 15 years, with growing interest in the Arctic and more-complex field projects, PFS has become a staff of nearly 50 full time and 50 seasonal employees. The company supports some 150 research teams per year in Alaska, Greenland, Canada, Iceland, Russia, Norway, and the Arctic Ocean and seas.

A number of staff are proudly “bi-polar,” like the founders. A common characteristic is they like to solve problems.

In the last year we have had another infusion of Antarctic energy: Martin Lewis (a 20-year USAP operations and maintenance manager) oversees Greenland facilities efforts; Kevin Pettway (former USAP safety, environment, and health leader and Icestock mainstay) heads environmental compliance and stewardship; and Jessie Jenkins (former McMurdo Station Berg Field Center manager) leads our Greenland science project managers.

“It’s our job to worry,” says Marin Kuizenga, manager of Alaska science support. “We work to think of the best way to get scientists out in the field to do the work they’ve been funded for. We want them to succeed.”

PFS now has customers outside the original suite of NSF-funded scientists who need logistics and field services in remote work locations around the world. The Antarctic beginnings have worked for us; they’ve taken the woman-owned company a long way.

## L.G. Blanchard, an incomplete obituary

by Guy Guthridge

Lloyd Gordon Blanchard, 64, died 10 February 2014 near his home in San Miguel de Allende, Mexico.

L.G. is what we called him at the National Science Foundation when he was there in the mid-1970s as assistant editor and then editor of *Antarctic Journal of the United States*. He was a young man on the rise, with writing skills, organizational savvy, and a maturity that made him effective in interactions with scientists and officials who were greatly his senior.

NSF colleagues and I found in L.G. a deep friend who melded personal and professional skills to show us the breadth and importance of our own projects, our goals, and ourselves.

Graduating from Oberlin College in 1971 with a bachelor's degree in English literature, he brought style and authority to the *Antarctic Journal*, then moved on to write speeches for officials of Exxon Corporation. Later, he was a public relations executive for medical faculties of the universities of Washington, Oregon, and finally Alabama. In this work he interviewed world leaders, Nobel laureates, medical research innovators, and more than one Antarctic scientist. He retired to San Miguel in 2009.

After he left the Science Foundation in the ‘70s, L.G. and I corresponded but never saw each other again.

Charming, funny, smart – and one complicated man. That’s how a University of Washington colleague describes L.G. in a condolence accompanying an obituary in the 15 February 2014 *Concord Monitor*. The comment is a slim clue towards knowing L.G. as he progressed through his life.

In 2009 L.G. asked me to second an application to Lindblad Expeditions to become a lecturer on a cruise ship going to the Antarctic, which I did. “Things have changed since we last corresponded,” he wrote. “The University of Alabama at Birmingham laid me off with no warning. Judy and I were divorced. I entered bankruptcy and lost everything. I worked as a counselor for a cemetery, helping families on the worst day of their lives. A beautiful 29-year-old R.N. and I were married. Her addiction to pain drugs relapsed, she got fired, and she is in a half-way house. I am in Boston with my mother, working as a grocery clerk in a supermarket near here for \$10 an hour and grateful for it.”

“My days at NSF were the best in my life,” he continued. “You and Phil Smith were a huge and positive influence. We kinda started out this life together. It is such a shame that things have turned out for me the way they are. To ‘advance’ financially, and to no avail, I went from one university or corporation to another, year by year.”

I last wrote L.G. in March 2014 and of course never heard back. Blanchard Nunataks, marking the south end of the Gutenko Mountains in central Palmer Land, commemorate his contributions to the Antarctic knowledge base and mark the memory of a friend.

### **The Southern Ocean brings it all back to the top**

from Adele K. Morrison, Thomas L. Frölicher, and Jorge L. Sarmiento

Dense, cold water exists worldwide at the bottom of the sea. The sources of this weighty water – more of it is forming all the time – are the North Atlantic and the Antarctic. How do these enormous masses of deep water escape back to the surface? The primary exit strategy turns out to be the

Southern Ocean, say more and more oceanographers.

Three nimble writers defend the idea in their illustrated six-page article in the January 2015 issue of *Physics Today*. Adele Morrison is a postdoctoral research associate at Princeton, Thomas Frölicher is a research fellow in oceanography at ETH Zürich, and Jorge Sarmiento is the George J. Magee Professor of Geoscience and Geological Engineering at Princeton.

Oceanographers used to think the deep ocean “drained” back to the surface primarily by vertical mixing of density layers throughout the global ocean. The alternative theory – and it has gained wide acceptance in the last two decades – is that the primary return pathway is the Southern Ocean. Westerly winds in the Southern Hemisphere drive a strongly divergent surface flow that draws water from below in a wide ring circling the Antarctic continent.

“Observations indicate that as much as 80 percent of deep water resurfaces in the Southern Ocean,” state the authors.

The upwelling is good for us. It exerts a huge influence on Earth’s atmosphere and climate. The newly exposed water is cold, so it absorbs heat from the air. Thanks to the decomposition of organic matter that rains continually into the oceans, it delivers nutrients that stimulate most biotic production in the global ocean. And because the upwelled water continually replaces surface water, it absorbs excess carbon from the atmosphere.

Volume conservation explains why the upwelling occurs, they write. The strength of the westerly winds, and therefore the Ekman transport, varies with latitude—the maximum northward surface transport occurs at about 50° S and decreases south of that. (Ekman transport, in the Southern Hemisphere, is northward flow at the ocean’s surface caused by westerly winds combined with the Coriolis force.) Water must be drawn up from below to balance the difference between the larger northward

transport at 50° S, say, compared with the smaller northward transport at 60° S. The broad ring of upwelling starts close to the Antarctic continent and extends all the way to 50° S.

As is true of so much these days, the authors' confidence to make these assertions is – more data. “In one of the most impressive oceanographic achievements of the past decade, physical oceanographers have developed autonomous, free-drifting Argo floats equipped with sensors for temperature, salinity, and pressure.” More than 3,500 Argo floats throughout the upper 2 km of the global ocean provide insights into heat storage and circulation.

Southern Ocean measurements of carbon uptake and nutrient resupply are still summer-biased and ship-based. In 2014, however, ten new Argo floats with sensors to measure pH, nutrients, and chlorophyll were put in, and 200 more are planned for the Southern Ocean with support from NOAA, NASA, and NSF's Division of Polar Programs.

### **Scott Borg of NSF in the spotlight**

The Washington Post and the Partnership for Public Service, a group seeking to enhance the performance of the federal government, have singled out Society member Scott Borg as an exemplary employee of the U.S. Government.

“A large and prestigious NSF research program in Antarctica has uncovered important scientific discoveries about climate change, the origins of the universe, previously unknown sea life, and two new dinosaur species,” begins an article in the newspaper's 21 October 2014 edition.

“Leading this ambitious effort is Scott Gerald Borg, a scientist who coordinates the direction of and funding for the program's entire portfolio, which includes tens of millions of dollars in awards

each year to researchers at institutions throughout the country who are involved in cutting-edge science.”

Kelly Falkner, who heads the Division, told the *Post*, “Scott is masterful at keeping the program at the forefront of science. He takes risks, puts his neck out, and tries things that have not been done before.”

Scott said this: “If you limit yourself to what is convenient or easy to do, you cut out a whole class of activity and universe of discovery that is not possible if you are not willing to stretch.”

Cora Marrett was the Foundation's deputy director at the time. She said Scott is central to the success of the Antarctic program. “He is a jewel for the foundation and a model for others to see what can be done through federal service.”

### **Society's website update**

by Tom Henderson

It has been a while since the last update, but that doesn't mean the Antarctic Society website ([www.antarctican.org](http://www.antarctican.org)) has been dormant. We continue to post unique material that is often not available anywhere else, much of it from our members. In the past year, we have added Joseph Daigle's memoir of his experiences on the 1939-41 United States Antarctic Service Expedition, a self-narrated video account by Dr. Charles Swithinbank of his experiences as an exchange scientist at the Soviet Novolazarevskaya base, a video account of the IGY Discovery Deep Traverse by Dr. Ed Robinson, and several remembrances of Operation Deep Freeze Navy veterans.

Our Time Trek application has undergone significant improvement. A new video User Guide was added that allows new users to learn how to navigate Time Trek step-by-step and returning users to



brush up on any individual function of the application. A “Tips and Fixes” reference was added to address common problems encountered in using Time Trek and how to resolve them. The remaining 800-plus events from Robert Headland’s ‘A Chronology of Antarctic Exploration’ were added to the Events section, bringing the total documented events to over 1,500. Finally, the links between all events in Time Trek and any associated stations were completed. The result: when an event is selected, the associated stations are listed under the “Stations” tab, and when a station is selected the associated events are listed under the “Events” tab. If you haven’t visited Time Trek recently, take a look. The improvements will keep coming.

Usage of our website has been steady over the last year. Statistics below are for 1 January through 5 December 2014:

- 20,486 unique visitors (60 per day)
- 8,825 new visitors (26 per day)
- 40,962 page views (120 per day)
- Top pages: Home Page (19,840, Members Info (1,536), Time Trek Browse (1,207), Time Trek Stations (1,094)
- Top visitor countries: USA (47%), China (13%), Japan (10%), Ukraine (10%), Russia (3%)
- Top visitor states: Vermont (27%), New York (9%), Massachusetts (9%), New Jersey (6%), California (5%), Florida (4%)
- Top browsers used: Internet Explorer (49%), Firefox (15%), Google Chrome (13%), Safari (8%)

The visits from China, Ukraine, and Russia are most likely largely hackers looking for vulnerable websites (our host for the website maintains a very secure environment for its clients). The heavy usage from Vermont and New York is largely because that is where the website’s webmaster has been living in the past year while maintaining the website.

Our website continues to grow in historical content, and it supports a steady

base of users. To comment or make suggestions, email Tom Henderson at [webmaster@antarctican.org](mailto:webmaster@antarctican.org).

## **Bernard Stonehouse, 1926-2014**

by Guy Guthridge

Bernard Stonehouse, Antarctic ornithologist, editor, and educator, died 12 November 2014 at the age of 88. The two important factors in his life were working in polar regions and communicating with the public on issues of biology, the environment, and conservation.

The story of Bernard Stonehouse is told well in a 13-page *Polar Record* article (38/205: 157-169, 2002) by Liz Cruwys and Beau Riffenburgh. Here is an event from early in his career.

Just after World War II, Stonehouse joined the Falkland Islands Dependencies Survey (precursor to the British Antarctic Survey) to be mainly a meteorologist and a pilot. He worked out of Base E on Stonington Island (the U.S. Ronne Antarctic Research Expedition also was stationed on the island for part of this time). Stonehouse was on what he thought would be a 2-year tour, but in early 1949 Marguerite Bay’s pack ice stayed solid, and the ship could not relieve the base. Stonehouse and two colleagues became the first to spend three consecutive winters south of the Antarctic Circle. He was in no doubt where to spend the third winter—on the Dion Islands, 80 miles across Marguerite Bay from the base, studying breeding of emperor penguins at a colony he had discovered earlier. He and his two companions thus made the first study of breeding in winter and were the first to monitor the entire breeding cycle of emperor penguins.

Living in a small, crowded tent, and working in a makeshift igloo, he collected and preserved several early embryos,

providing material that enhanced the study begun four decades earlier during the 'worst journey in the world,' when Apsley Cherry-Garrard, Edward Wilson, and 'Birdie' Bowers of Scott's *Terra Nova* expedition had been able to spend only hours at Cape Crozier.

The enforced third winter turned Stonehouse into a biologist.

Much later in his life Stonehouse joined the Scott Polar Research Institute as editor of *Polar Record*, and he headed a long-term study on the ecological impact of polar tourism. He concluded that Antarctic tourism was positive if properly managed and that it encourages public interest in polar conservation. He lectured on tourist ships for more than 20 years.

Stonehouse was a seminal part of the bridge between the Heroic Age and the modern period of continuous research in the Antarctic by national programs.

Cruwys and Riffenburgh, authors of the *Polar Record* article noted above, argue that that period, lasting a decade after World War II, was a time of change when the men (they were men only, then) who went south had the courage, ability, and tenacity of the great explorers, but the intellect, imagination, and focus of a modern scientist. When a party went into the field it was more or less on its own, but science came to the front, and many concepts of the new era were conceived and refined.

### **2014 discovery of the year: ice loss from West Antarctica**

by Guy Guthridge

In 2014 the rate of loss of ice from West Antarctica received attention in several published reports. We covered some of the story in the October issue, but more was to come. The findings taken together make West Antarctic ice loss the Antarctic science

story of the year, in this writer's humble opinion.

We reported in the last issue that Eric Rignot and collaborators have "observational evidence that a large section of the West Antarctic Ice Sheet has gone into irreversible retreat." Four feet of ocean rise will be the likely outcome over the next couple of centuries from the six outlet glaciers they examined. Disappearance of those six will destabilize other sectors, and the ultimate rise could be triple that. Ian Joughin came to similar conclusions about Thwaites Glacier.

Here is the update, which, like the earlier news, made headlines like this one on the front page of the 5 December *Washington Post*: "Pace of Antarctic melt sets off alarm; research suggests potential for a drastic acceleration of seas' rise":

S. Schmitdtko *et al.* in the 5 December *Science* evaluate hydrographic ocean data since 1975 to show that Circumpolar Deep Water – a source of heat – has warmed at all longitudes around Antarctica.

In coastal regions that are warming, such as by the Amundsen Sea, Circumpolar Deep Water slopes upward to the shelf break, possibly as a response to strong winds from the west that would induce upwelling. In regions without shelf warming, including the Ross and Weddell Seas, Circumpolar Deep Water slopes downward to the shelf break, consistent with winds from the east that limit onshore flow. Local winds play a key role in bringing water onto the Antarctic Shelf.

The work highlights the critical role of wind forcing. Winds north of the shelf break determine the properties of water that in turn influence basal melting of ice shelves.

Both greenhouse warming and ozone depletion can intensify the Southern Hemisphere westerly winds and displace them southward, so the worst may yet lie before us.