



The Antarctic Society

VOLUME 23-24

JANUARY 2024

NO. 2

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Roo-ahld.....	1	Vodka in a Vegemite Jar.....	6
2024 Gathering Update.....	2	Mass Deaths of Elephant Seals.....	7
2024 Gathering - Auction News.....	2	Antarctic Seas' Acidity Could 2x.....	7
Treasurer's Report for 2023.....	2	China's New Base / A23a Freed.....	9
Shades of Antarctica.....	3	Colin Monteath's New Book.....	9
Hero Update.....	4	Steering U.S. Antarctic Research.....	11
The SCAR Songbook.....	5	2024 Gathering Registration Form ..	13

ROO-AHLD

While "you people" (as Paul Dalrymple would say) were celebrating Thanksgiving, your co-editors travelled to Oslo for a very enjoyable and informative visit focused on the first people to reach 90° South. One month before the solstice, southern Norway offers sunrise at 8:41 a.m., sunset at 3:26 p.m., overcast skies and winter temps, but hey — flights are quite reasonable.

First stop on our pilgrimage was Uranienborg, Roald* Amundsen's home on the Bunne Fjord in Svartskog, 12 miles south of the capital. As we made our way down the steep hill from the main road, we were surprised to see that the fjord was covered in ice that had been rafted by the northerly wind right up to the lovely pebble beach in front of the house. From the small wharf, Amundsen once ferried supplies out to *Fram* anchored just 50 yards offshore. Although "Amundsens hjem" was closed for the season, curator Anders Bache kindly agreed to give us a private tour. The very handsome house, built around 1865 in Swiss style, remains virtually as it was when Amundsen left it in 1928 on his fateful search for the missing Italian Umberto Nobile (who was rescued later). Among Uranienborg's treasures: Amundsen's personal, annotated copy of *Scott's Last Expedition*. For a look at the house, watch "Amundsen: The Greatest Expedition" (2021) which was partially filmed there. Uranienborg's [website](http://www.uranienborg.no) also has a good virtual tour.

Next was the singular FRAM Museum, regularly voted Norway's #1 attraction — for very good reason. Dick says it's the best museum *in the world*. It houses not only *Fram*, the ship Amundsen borrowed from Fridtjof Nansen to go to Antarctica, but also *Gjøa*, the former herring fishing boat in which Amundsen and six colleagues were first to transit the Northwest Passage over three years ending in 1906. The Museum's deeply-researched exhibits, housed in two buildings connected by an underground gallery nicknamed "the Northwest Passage," require the better part of a whole day to appreciate fully. There is so much polar history here, both north and south. Led by director Geir O. Kløver, the Museum also has an impressive publishing program, including the diaries of each member of the polar party (only Amundsen's, unfortunately, is translated into English). Exit through the bookshop — and just *try* not to overfill your suitcase!

Centerpiece of the trip was RAML, the Roald Amundsen Memorial Lectures, a two-day conference held annually at the Museum since 2012. Half a dozen speakers presented engaging talks on polar topics. A highlight was the celebratory dinner re-creating the one that King Haakon VII held in Amundsen's honor upon his return from the Pole. Seated with nearly 130 other people at long beautiful tables set beside *Gjøa*, we enjoyed nine courses, each with a paired wine, including a 1912 Madeira. It was fabulous. Speeches and songs were interspersed between each course, echoing those spoken and sung back in 1912. Dick, who donated to the Museum a Norwegian flag that flew at Pole during the changeover from the undersnow station to the Dome in 1975, was invited to give Amundsen's speech of thanks, a signal honor. He did us proud.

* Pronounced "ROO-ahld," not "Rolled" as Americans usually do.

2024 Gathering Update



Colorado Chautauqua Community House

The 2024 Gathering in Boulder, Colorado has reached a milestone with the 100th registrant and all 45 of the Colorado Chautauqua lodging units reserved. If you'd like to get on the waitlist for a Chautauqua unit, please contact antarctican.org.president@protonmail.com.

We are approaching the venue maximum occupant limit (125). **There is a chance that we will have to restrict registration**, so if you haven't registered yet, do so soon!

Registration is currently \$275, but it will increase to \$300 on June 1, 2024.

The 2024 Gathering Planning Guide has a wealth of information, including on the [Colorado Chautauqua](#) venue and other area lodging and transportation. The Guide, and a preliminary list of the speakers, along with their bios, is here: <https://www.antarctican.org/2024-gathering>

2024 Gathering - Auction News Gathering Momentum!

What might you have? What might you be searching for?

The Auction Committee is eager to add to its collection of Antarctica-related donations in the following categories:

- Books
- Services
- Antiques
- Artwork
- Clothing & Accessories
- Music
- Tickets & Travel
- Your special expertise!

In search of something?

What items might you find irresistible to bid on? Are you looking for something specific to complete a collection? Have you been searching for particular Antarctic memorabilia? Let us know!

There will be a silent auction, a live auction and a "skua table" (a place to feature smaller-ticket items for donations) as well as the usual mugs and hats for sale. Proceeds help support the Society and offset costs for the gathering, so your donations are very much appreciated.

Got some spare miles?

Do you have airline miles you might be willing to donate? The auction committee is scheming and would like to know...

Thanks for your donations!

Contact Diana Logan, Auction Committee Chair antarctican.auction@gmail.com.

2023 Treasurer's Report

By Tom Henderson

The Society remains on good financial footing. Our investment in the Vanguard Wellesley Income Admiral Fund increased in value by a little over 7% in 2023. Adding in reinvested dividends and capital gains, the fund is now above its original invested amount. Our liabilities are significant as a result of

the 2024 Gathering which includes balances for housing and catering. However, we're currently on track to at least break even on the Gathering. To see a more detailed version of the Treasurer's Report, login to our website and go to Members > Society Documents and look under Treasurer's Reports.

I want to thank the generous donors to the Society in 2023: The Bear Gulch Foundation (managed by the Rob Flint family), Bill Spindler, Dr. John Middaugh and Diana Pettiti, Dr. Gary Hermalyn, T.H. Baughman, LCDR Bill Blackwelder (USN, Ret.), Richard Wolak, Gisela Dreschhoff, Tom Frostman, Larry Lackey, Marjory Spoerri, Alan Campbell, CDR Trina Baldwin (USN, Ret.), Skip Johnson, and Jerry Mullins.

Finally, the Antarctic Society Board, at its December 10, 2023 Board meeting, approved increasing electronic members' dues from \$13.00 per year to \$15.00 per year and hard copy members' dues from \$25.00 per year to \$27.00 per year.

These changes will take effect on January 1, 2025 and help to cover our increased costs for printing, postage and services. We hope the membership will understand the reason for these modest increases. Anyone who renews membership for multiple years prior to the dues increase will lock in the old rate for that period of time.

2023 ASSETS & LIABILITIES

As of December 31, 2023

Assets

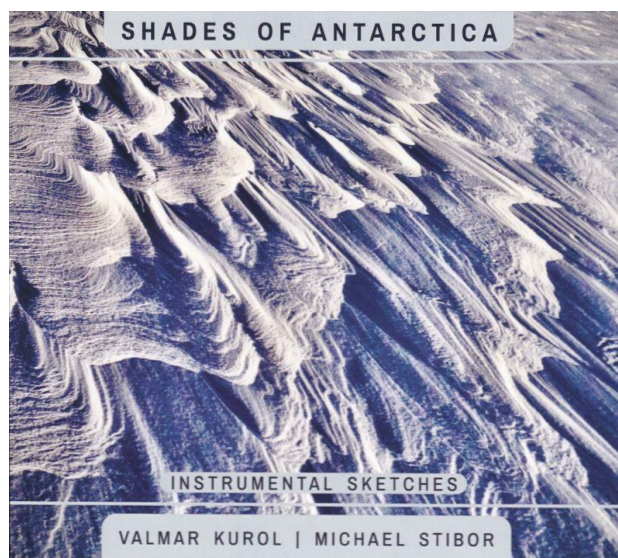
PayPal Cash Account	\$281
Bank Accounts	
Antarctican Society Checking	\$15,521
Antarctican Society Savings	\$0
Ruth Siple Fund	\$4,446
Dr. Gary Hermalyn Fund	\$500
Investments	
Vanguard Wellesley Inc. Fund	\$64,299
U.S. Treasury Bills	\$34,066
Total Assets:	\$119,113

Liabilities

RV Hero Recovery Fund	\$205
2024 Gathering Registrations	\$21,336
2024 Gathering Lodging	\$25,554
Total Liabilities:	\$47,095
BALANCE:	\$72,018

Shades of Antarctica

Review by Tom Henderson



Most of us who have been fortunate enough to experience Antarctica return with at least an awe of the place but often with an emotional connection. Antarctic Society members Valmar Kurol and Carole Desmarteau certainly fall into the latter category. As musicians, they have drawn from their connection to create a series of musical CDs themed entirely on Antarctica. With the assistance of musical collaborator Michael Stibor, they have produced a sixth album in that series. *Shades of Antarctica* is yet another eclectic musical tribute to the Seventh Continent.

This album is, as Valmar says in the liner notes, “a fusion of rock and quiet orchestral with a dip into jazzy waters.” There is even a little reggae in the opening track, “Reggae Party on The Ice.” The music paints a sound montage of Antarctica with colors and shades. Carole Desmarteau has made many significant contributions to the album, composing five of the tracks and contributing to three others.

If I had to classify *Shades of Antarctica*, I would probably have to say, “easy listening.” I believe that was the intent of the composers. The music follows the emotional flows of the Antarctic landscape from subtle to playful to awe-inspiring.

All in all, this album is pleasant on the ears and may even strike a harmonious chord of memory of what may be your favorite place on earth. If you have collected the first five albums, you need to complete your set!

To learn more and hear the tracks, go to www.shadesofantarctica.com

Hero Update

By Charles and C.E. "Charlie" Lagerbom



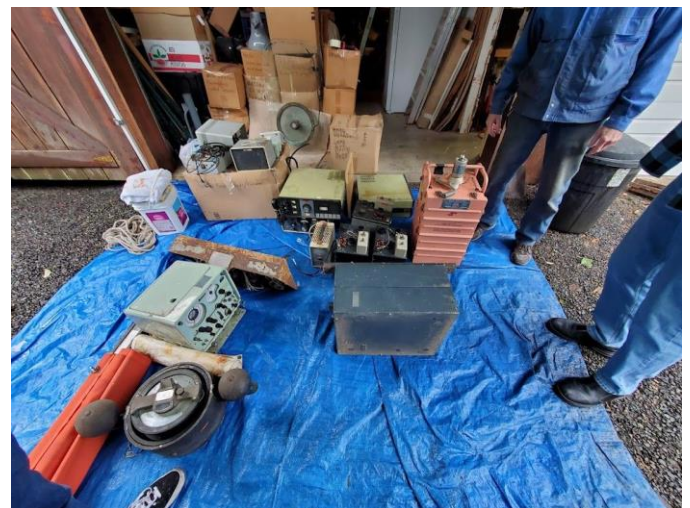
Charlie, Charles and Atreus

Kent Yates contacted me to say he had saved some *Hero* things; he was not kidding. When he decided to donate them to the Antarctic Society's growing collection of *Hero* materials, I enlisted the help of my son Charlie who lived a state away. He traveled from just outside Portland, Oregon to Kent's place in Washington State. They packed up the *Hero* materials and transported them back to Oregon where they will be held until shipped east to Maine. Here is his account...

What would you do if adventure came knocking at your door? I jumped at the chance! When my father told me about this ship and offered

me the opportunity to travel and meet up with someone who had been aboard it and then help relocate some of the ship's gear, I was totally on board. I went from not knowing much about the *RV Hero* to becoming highly invested in its story and involved with its rescue and restoration.

My adventure began with renting and driving a U-Haul van for the first time, an experience in itself! I woke up early, grabbed my friend Atreus and hit the road. When we arrived, Dr. Kent Yates greeted us and we all went to his garage where the gear was located. We took out a few pieces and got an idea of how much cargo we would be transporting, including radios, compass and other gear. We learned how radio communication worked back in the day, very interesting to me as a recently graduated Media Communications major. Then William Wilson arrived. He'd been Chief Mate aboard *Hero* and shared our excitement to see all of the gear Kent was able to save. As a fellow history buff in the footsteps of my father, I found the stories he and Kent told incredibly **interesting**.



Equipment from the *RV Hero*

We spent the afternoon loading up gear and listening to Willie's experiences and memories. I could tell this had been a big part of his youth. Willie gave me a *Hero* T-shirt and a beautiful illustration of *Hero*. In addition, we all made plans to meet at my place in Oregon and thoroughly catalog the gear.

On the journey home, as Atreus and I listened to sea shanties, we talked about what it might have been like to have worked on and sailed aboard *Hero*. Now part of the *Hero* story, I am invested in keeping its memory alive.

The SCAR Songbook

By Guy Guthridge

A slim booklet, 6½ inches tall and 4 inches wide with a glossy white cover, has been in my desk drawer for years. The only identifying mark is the word SONGBOOK printed in black on the front.

Someone gave it to me years ago when I still worked at the National Science Foundation. He'd picked it up at a meeting of the Scientific Committee on Antarctic Research (SCAR), the nongovernmental outfit that helps to coordinate Antarctic research internationally.

The table of contents lists 65 songs in alphabetical order, from "America The Beautiful" to "You Are My Sunshine." Words (no music) are in the 48 pages that follow. The SCAR Marching Song, occupying more than three pages, is by far the longest in the book. It's the only hint of a date of publication:

*And soon we'll meet in Jackson Hole,
In nineteen seventy-four.*

The responsible party was Dr. James H. Zumberge, who lugged his full-size 120-bass accordion to SCAR meetings in the 1970s and 1980s and led singing sessions at many of them. Dr. Zumberge was chancellor of the University of Nebraska Lincoln 1972-1975, president of SMU 1975-1980, president of USC 1980-1991, and president of SCAR 1982-1986. He died in 1992 of a brain tumor, age 68.

In the Society's newsletter, he was Gentleman Jim. He got a lot of ink over the years. In the September 1979 issue, editor Paul Dalrymple writes that when Gentleman Jim showed up at Little America V in 1957, "even before he took off his backpack, he had opened a bottle of Scotch to help ward off any infectious diseases that might be running rampant at Little America. It was obvious that he was a health nut." Next morning at the

station chapel, Gentleman Jim "played the Wurlitzer and sang hymns like he was right out of the Mormon Tabernacle."

In the October 1981 newsletter, Gentleman Jim is recruited for the 25th IGY anniversary "to play the piano and to lead us singing ribald tunes of old."

The SCAR Marching Song as it appears in the Songbook, though politically incorrect, is not ribald. In the July 1992 newsletter, Robert H. Rutford explains that Gentleman Jim wrote the original (probably in the early 1970s) and in 1985 was involved "in the cleansing of the then-existing verses, much to the dismay of some of the old Antarctic crew!" Here is the "cleansed" first verse, sung to the tune of Happy Wanderer:

*We are the men of SCAR we are
Antarctic is fraternity
We leave our homes for many months,
'Way from women's liberty.*

The sixth verse explains:

*Our meetings are away from home:
There's a reason, don't you see?
At home, we're just a bunch of blokes.
But here – we're company.*

The science disciplines get their due in five of the verses. Here's one:

*Geophysicists do a job,
They measure sound through ice.
And when you see the results they get,
It's the same as shaking dice.*

The world was younger then, perhaps more willing to have fun, maybe simpler. SCAR certainly was less complex. Today the organization has 46 member countries, whereas for its first twenty years the number was twelve. From the song:

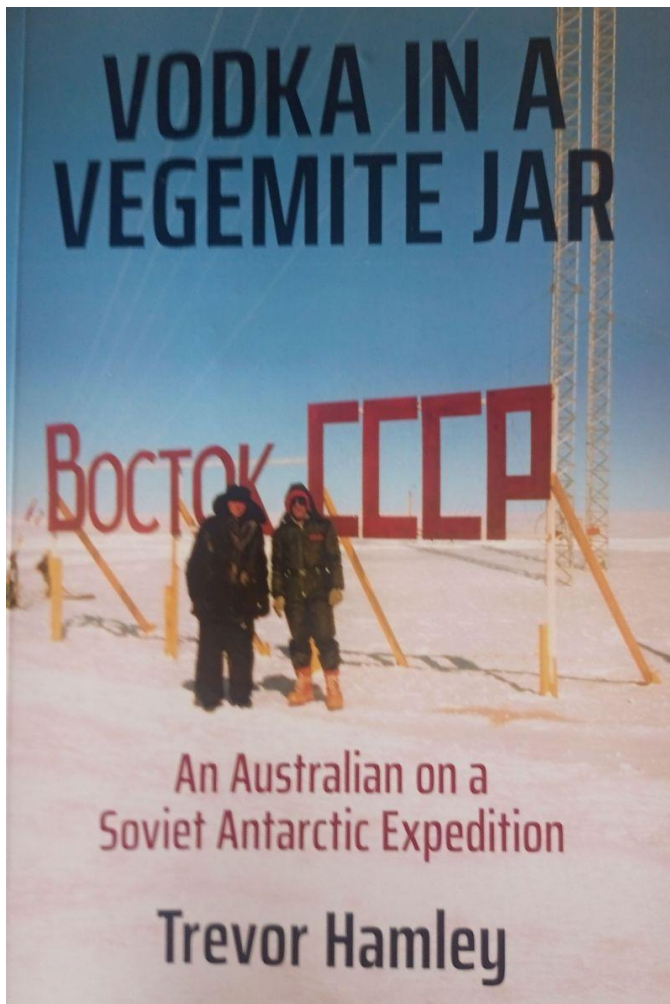
*There's hardly room for any more,
Let's keep it all that way.*

The Songbook and the SCAR Marching Song seem anachronistic, but they held sway with delegates of an earlier era. Bob Rutford wrote, "Jim was a musician of international reputation, at least among the SCAR nations."

I've held on to the booklet as an old friend for many years. Now it's time for me to pass this rare item forward. It will be a featured item in the auction at our Gathering this summer. Thanks, Gentleman Jim!

Vodka in a Vegemite Jar

Review by Matt McArthur



In 1983 Australian glaciologist Trevor Hamley joined a Soviet traverse from the Russian coastal station, Mirny, to Dome Charlie high atop the Antarctic plateau. Bouncing about in the back of a Soviet T-55 tank converted into a living quarters/galley/dining space/lab, recording locations on audio cassette tape, wielding a hammer, and ignoring the ideological and political drivers of the Cold War in the name of survival, camaraderie, and science, Trevor experienced Antarctica in a unique context at a unique point in history.

His new book, *Vodka in a Vegemite Jar*, recounts his experiences during both the preparation for the traverse and its actual accomplishment in compelling prose that keeps one eye on the

immediacy of the narrative and another on the forty year perspective that 2023 affords on his time in the back of a Kharkovchanka. Already a veteran of a winter at Australia's Casey Station, Hamley accepted the invitation to join the traverse out of the same sense of adventure that wound up the clockwork of all my favorite high latitudes operators. Scientific curiosity, human interest, and financial considerations also show up, but the main thrust behind the author's decision to head south again seems to be that it sounded like an interesting thing to do.

And it was.

Flying to Vostok Station the same year that the survivors of the difficult 1982 winter (following the disastrous fire in April 1982 that destroyed the station's power plant, killing one man and nearly dooming the rest, who were left in the dark, without electricity) flew out and their replacements got things running again borders on fascinating. And that's just a preliminary chapter.

The main feature, the Kharkovchanka-propelled traverse to Dome Charlie, provides enough of the repetition of trail life to give the reader a taste for how days merge and how the world shrinks while working on trail without transcribing an entire diary's worth of that repetition. The minutiae of scientific work and daily vehicle and equipment maintenance are punctuated by major events, (Spoiler Alert: skip to next paragraph if you want to avoid it) the most dramatic being the appendectomy performed on the dining table in the back of one of the vehicles.

The narrative also incorporates insights on the home front's counterpart to Antarctic isolation. Trevor's wife Kerry received QSL cards from radio hams whom Trevor contacted but no direct word from the traverse party.

Liberal illustrated with color photographs and sparingly garnished with the five letter codes Australian expeditioners used to compress information in their monthly word allowance for telex messages home, the book strikes a neat balance between inviting the reader into the journey while maintaining a sense of Antarctic strangeness. Hamley provides ample context for the text in the form of maps, glossaries, and essays offering

perspectives on his experiences, with the benefit of four decades of hindsight.

Vodka in a Vegemite Jar stands out from many recent Antarctic memoirs for the unique adventure it shares with the reader and for its carefully curated prose. It is an outstanding addition to polar literature. To purchase, go to:

<https://www.trevorhamley.com/store/p/vinavjbook> .

To listen to a one-hour interview with Trevor, go to Episode 152 of my podcast “Ice Coffee”: https://worldslaziestbusker.libsyn.com/152_vodka_in_a_vegemite_jar.

Mass Deaths of Elephant Seals Recorded

By Sophie Kevany, *The Guardian*, Jan. 10, 2024.

A virology team has confirmed the first bird flu infections in elephant and fur seals in the sub-Antarctic region, as the highly contagious H5N1 virus continues to spread around the world.

Researchers previously reported the mass deaths of seals and that a number of elephant seals on South Georgia island – a UK overseas territory in the southern Atlantic Ocean – had been exhibiting symptoms of avian flu. But while seabird cases were confirmed, the seal infections were classed as suspected, pending lab results.

The first known cases of H5N1 were detected in the Antarctic region in October among brown skua on Bird Island, off South Georgia. Two months later, hundreds of elephant seals were found dead. There have also been increased deaths of fur seals, kelp gulls and brown skua at several other sites.

Marco Falchieri, a scientist in the UK Animal and Plant Health Agency’s (APHA) influenza and avian virology team, which collected the South Georgia samples that tested positive for bird flu. He said he saw about 20 dead elephant seals.

Other seals were showing respiratory signs of bird flu, he said, citing “coughs, sneezing, ocular discharge, nasal discharge, slow head shaking and tremors.”

Falchieri said the death toll on South Georgia was probably about 100, mainly elephant seals, which appear to be more affected than fur seals.

“My worst fear is an adaptive mutation to mammals, which we are not seeing in these new

samples, but we need to keep monitoring,” he said. An adaptive mutation, he added, “could mean it becomes a mammalian-adapted virus, and consequently increases risk for humans too.”

The spillover to the South Georgia mammals is “a reflection of what’s going on globally”, said Ashley Banyard, an APHA virologist. Banyard’s team diagnosed the samples brought back from the island in mid-December.

Spillovers occurred, Banyard said, “when too many birds have bird flu [and] mammals come into close contact with sick birds’ poo or when the mammals eat [an] infected bird carcass.”

In December, the death of a polar bear from bird flu in Alaska was confirmed, and an estimated 20,000 sea lions have died from the virus in Chile and Peru. Although the sub-Antarctic seal and bird deaths are a concern, Banyard said it was good news that the virus had not spread to other species. “Two years ago, we were worried about the penguins being infected and dying from the disease in the region, but that has not happened, so this is almost a positive outcome.”

If bird flu continued to spread throughout the sub-Antarctic region, however, he said it “could significantly threaten the fragile ecosystem, and potentially put a number of very large populations of seabirds and sea mammals at risk.”

Norman Ratcliffe, a seabird ecologist with the British Antarctic Survey, said about 98% of the global population of fur seals were found in South Georgia, and that the region hosted “globally important populations of elephant and fur seals [and these] populations are now at risk from large declines.”

Ratcliffe said there was no way to know total seal deaths, either due to deaths at sea or carcasses being scavenged, “but we know the number of dead is far higher than what we see – and the mortality is much higher than normal rates for this time of year.”

Acidity of Antarctic Seas Could Double

By Yvaine Ye, University of Colorado at Boulder, *Phys.Org*, Jan. 10, 2024

The acidity of Antarctica's coastal waters could double by the end of the century, threatening whales, penguins and hundreds of other species that inhabit the Southern Ocean, according to new research from the University of Colorado Boulder.

Scientists projected that by 2100, the upper 650 feet (200m) of the ocean — where much marine life resides — could see more than a 100% increase in acidity compared with 1990s levels. The paper appeared Jan. 4 in *Nature Communications*.

"The findings are critical for our understanding of the future evolution of marine ecosystem health," said Nicole Lovenduski, the paper's co-author and the interim director of CU Boulder's Institute of Arctic and Alpine Research (INSTAAR).

The oceans play an important role as a buffer against climate change by absorbing nearly 30% of the CO₂ emitted worldwide. But as more CO₂ dissolves in the oceans, the seawater becomes more acidic. "Human-caused CO₂ emissions are at the heart of ocean acidification," said Cara Nissen, the paper's first author and a research scientist at INSTAAR.

The Southern Ocean is particularly susceptible to acidification, partly because colder water tends to absorb more CO₂. Ocean currents in the area also contribute to the relatively acidic water conditions.

Using a computer model, Nissen, Lovenduski and the team simulated how the seawater of the Southern Ocean would change in the 21st century. They found it would become more acidic by 2100, and the situation would be severe if the world fails to cut emissions.

"It's not just the top layer of the ocean. The entire water column of the coastal Southern Ocean, even at the bottom, could experience severe acidification," Nissen said.

The team then investigated the conditions specifically in Antarctica's marine protected areas (MPAs). Human activities, such as fishing, are restricted in these regions to protect biodiversity. Currently, there are two MPAs in the Southern Ocean, covering about 12% of water in the region. Scientists have proposed designating three more MPAs to an international council in the past years, which would encompass about 60% of the Antarctic Ocean.

The team's model showed that both adopted and proposed MPAs would experience significant acidification by the end of the century.

For example, under the highest-emission scenario, where the world makes no efforts to cut emissions, the average acidity of the water in the Ross Sea region—the world's largest MPA off the northern tip of Antarctica—would increase by 104% over 1990s levels by 2100. Under an intermediate emissions scenario, the water would still become 43% more acidic.

"It's surprising to me how severe ocean acidification would be in these coastal waters," Nissen said.

Previous studies have shown that phytoplankton, a group of algae that forms the basis of the marine food web, grow at a slower rate or die out when the water becomes too acidic. Acidic water also weakens the shells of organisms like sea snails and sea urchins. These changes could disrupt the food web, eventually impacting top predators like whales and penguins.

The Weddell Sea is one of the three proposed MPAs located off the coast of the Antarctic Peninsula. Nissen said scientists think the Weddell Sea region could act as a climate change sanctuary for organisms, mainly because this area has the highest levels of sea ice coverage in the Antarctic. The ice shields the ocean from warming and prevents the seawater underneath from absorbing CO₂ from the air, thereby reducing the rate of acidification. In addition, the region has little human activity to date.

But the model suggested that as the planet continues to warm, the sea ice will melt, and the Weddell Sea region will experience acidification on par with other MPAs under intermediate to high emission scenarios, but with a slightly delayed progression.

"The result shows that establishing the Weddell Sea region as a protected area should have high priority," Nissen said.

"As a scientist who typically studies the open ocean, I tend to think of Antarctic coastal areas as a conduit for climate signals to reach the global, deep ocean. This study reminded me that these dynamic

Antarctic coastal areas are also themselves capable of rapid change," Lovenduski said.

The study suggests that the world could only avoid severe ocean acidification of the Southern Ocean under the lowest emission scenario, where society cuts CO₂ emissions quickly and aggressively.

"We still have time to select our emission pathway," Nissen said, "but we don't have much."

China Aims to Build New Base by Feb. 2024

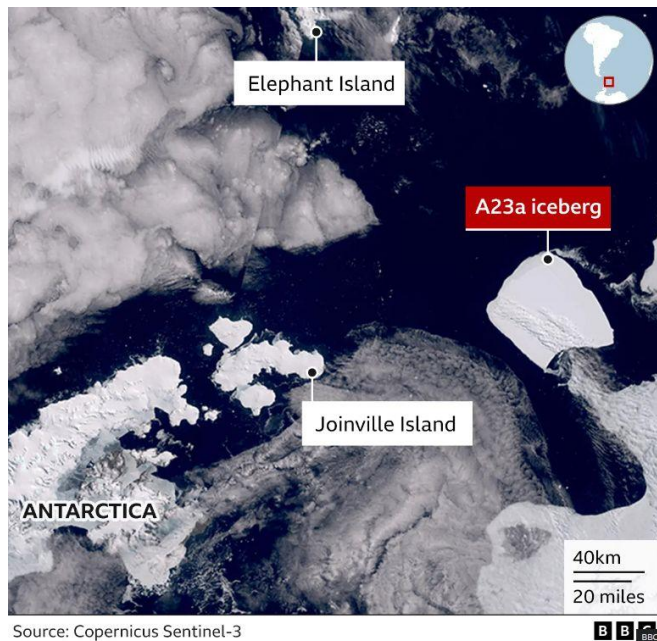
Global Times, Nov. 1, 2023

The 40th Chinese Antarctic research expedition set sail on Wednesday. Its key task is building a new station, planned to be finished by Feb. 2024.

The new base is located in the Ross Sea region and will cover 5,244 m², said Sun Bo, the Party head of Polar Research Institute of China. It will accommodate about 80 people in summer and 30 in winter. It will be China's fifth Antarctic station.

A23a, World's Largest Iceberg, Breaks Free

By Gloria Dickie, *Reuters*, Nov. 24, 2023



Source: Copernicus Sentinel-3

The world's largest iceberg is on the move for the first time in more than three decades, scientists said Friday.

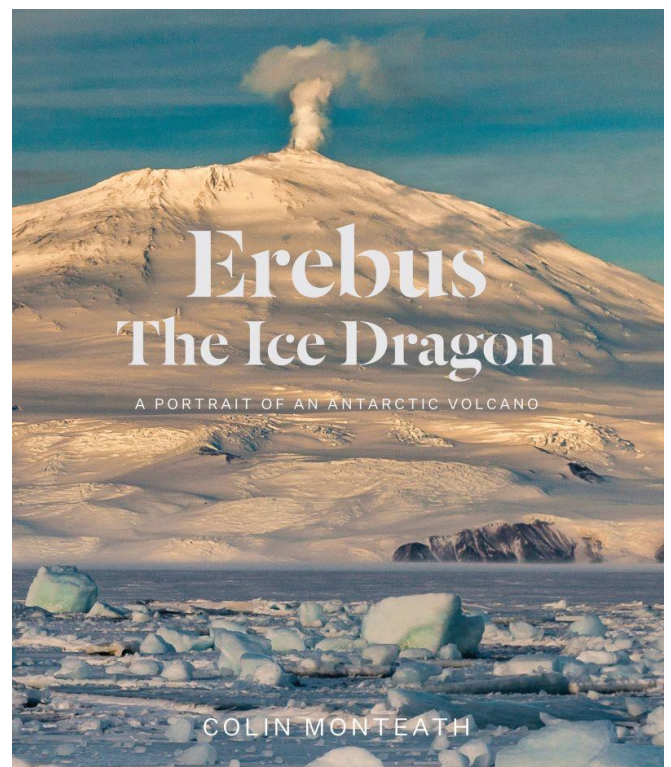
At almost 4,000 km², A23a is roughly three times the size of New York City.

Since calving off West Antarctica's Filchner-Ronne Ice Shelf in 1986, the iceberg — which once hosted a Soviet research station — has largely been stranded after its base became stuck on the floor of the Weddell Sea.

Not anymore. Recent satellite images reveal that the berg is now drifting quickly past the northern tip of the Antarctic Peninsula. A23a is also among the world's oldest icebergs.

Colin Monteath's New Book

Review by Jeff Rubin



Until not too long ago, a highlight of my year was the annual arrival of Colin Monteath's fantastic ANTARCTICA calendar (1984-2017, R.I.P.). Paul Dalrymple would order a box of them from New Zealand to save on postage, then redistribute them to interested Society members. I always looked forward to seeing the spectacular images that Colin chose — both his own and other photographers'. The calendar, sadly, is no longer produced.

Happily, Colin is also an author. His newest and 13th book, *Erebus the Ice Dragon: A Portrait of an Antarctic Volcano* (Massey University Press, 2023, 352pp, NZ\$65) may be his best yet. This book is that rare thing — a well-written, remarkably-illustrated volume that presents interesting data and anecdotes found nowhere else. Colin first considered writing about the volcano in early 1980s but put his manuscript aside and only resumed during the pandemic. So in a way, we have Covid-19 to thank for this wonderful book. The title comes from a poem he "scribbled" in a polar tent near the volcano's summit in 1975, his first time living on the mountain.

Colin worked in Antarctica for 32 summer seasons beginning in 1973 — and almost right away began his association with the southernmost active volcano in the world, which towers over NZ's Scott Base and McMurdo. Over ten seasons Colin served as Scott Base's field operations officer, helping coordinate logistics for NZ's science program. In 1978, during his 3rd expedition to Erebus, he made the first-ever descent deep into the active volcano — which erupts between 1-5 times *daily* — to test a rope and pulley system they had rigged up on the lip of the Inner Crater to allow scientist Werner Giggenschach to try to capture uncontaminated gases from a fumarole close to the lava lake. After an eruption blast stunned Giggenschach and spattered red-hot lava on his rope, burning through two of its three strands, as well as on his trousers (he quickly brushed it off with his leather glove), the effort was hastily abandoned.

Erebus gives us a comprehensive and exciting history from the volcano's discovery by James Clark Ross in 1841 right through to contemporary biology and volcanology in the 2020s. Included are the first ascent during Shackleton's *Nimrod* expedition, the second on Scott's *Terra Nova* expedition, early ascents in the 1960s by NZARP & USARP teams, major science expeditions from 1970s onwards, and a chapter on private expeditions, including Colin's own re-creation of the first ascent. We meet scientists including Phil Kyle, who worked on the volcano for an unbelievable 44 seasons and discovered Erebus' lava lake in 1972, one of very few anywhere in the

world; Nelia Dunbar and her partner Bill McIntosh, who between them worked there for 42 seasons; and Roger Mear, who made the first solo winter ascent in 1985.

Working on Erebus isn't easy. Not only is the volcano extremely active, with a constant threat of lava bombs, some the size of cars. (The sage advice of veteran French volcanologist Haroun Tazieff, who was known as 'Monsieur Catastrophe,' is to worry most about the lava bomb that appears to be motionless: "it will likely hit you. You need to move — fast!") Erebus' crater rim sits at 12,447 feet above sea level. Due to the flattening of Earth's atmospheres in the polar regions, however, the physiological altitude is 16,000 feet. Severe altitude sickness has required many evacuations down to sea level by helicopters. In early years, flights were complicated by under-powered helos that struggled to lift in the thin air.

But there are unique compensations to camp life on Erebus. A shallow pit dug in the hot volcanic sand can resemble a sauna, and in the early days before biosecurity rules forbid it, researchers sometimes made hāngī-style meals by wrapping meat in newspaper and foil and burying it to cook slowly for three days.

Sprinkled throughout, like the spectacular anorthoclase feldspar crystals that litter Erebus' crater rim, are intriguing facts. To cite only a couple of them, Colin reminds us that Tryggve Gran, the Norwegian with Scott, correctly prophesied the date of Amundsen's arrival at the Pole (p97). He also skied back from the tent where Scott and his companions died, leaving his own skis behind to form the memorial cross, while using Scott's pair so that the Briton's skis, at least, could complete the full journey (p98).

A necessary chapter covers the Air NZ crash near (but in fact not on) Mt Erebus in 1979 that killed all 257 people aboard. Colin helped coordinate the recovery operation. The chapter is sensitively written, with black-and-white photos and reminiscences by three others who joined in that heart-breaking work.

The final chapter, by Adele Jackson, who completed a PhD on the value of art in Antarctica, explores the 180-year history of writers', poets',

artists' and musicians' depictions of Erebus. Her survey is thorough, colorful and fascinating.

A word about the photos in *Erebus the Ice Dragon*: as you would guess, they are exceptional! A huge double-spread on pages 10-11 features an amazing (and terrifying) photo by scientist Harry Keys. It's a close-up of a fiery-orange lava bubble bursting inside the volcano's Inner Crater, sending molten lava flying 200 yards upwards. It alone is worth the price of the book. And it's no outlier. Nearly every page boasts a stunning image.

Valuable appendices include an Erebus chronology, a list of those killed on Flight 901, recipients of the NZ Special Service Medal (Erebus), a bibliography of scientific papers on the region, and even a roster of master's and doctoral dissertations on Erebus. The book's index, unfortunately so often omitted these days, is very good.

To sum up, this is one of the very finest Antarctic books to be published in recent years.

Colin gave the NZ Antarctic Society's Sir Holmes Miller Memorial Lecture about the book in Oct. 2023. Watch it at:

<https://www.youtube.com/watch?v=m5l6Xi0TVoM>

Steering U.S. Antarctic research

Review by Guy Guthridge

Future Directions for Southern Ocean and Antarctic Nearshore and Coastal Research (National Academies Press, 218 p., 2023) is a new “consensus study report” that describes priority science for the Southern Ocean and the Antarctic. The document also identifies needed resources and suggests “ways to address gaps between science drivers and the current portfolio of capabilities.”

Of the six chapters, three review the top science goals: the effect of the region on sea level, how the region impacts global heat and carbon budgets, and, looking in the opposite direction, how change is affecting the region. The other three chapters are an introduction, a description of the U.S. Antarctic Program, and “essential capabilities” like a research ship as well as tools and technology and how to get there from here.

The book underscores the Antarctic relevance to global populations and economies. Antarctica's ice sheets, with more sea-level rise potential than anywhere else, “may be approaching a dangerous tipping point toward major and potentially irreversible ice mass loss.” The stakes are high, and the uncertainties are large. Adapting just U.S. coasts is expected to cost over \$1 trillion by 2100. Imperiled low coastal zones worldwide generate about 14% of the global gross domestic product. Predicted sea level rise that's well documented amounts to 0.6 meter by 2100. But “assessments that include hypothetical and poorly understood grounding zone instabilities that may occur in Antarctica project from around 1.6 to 2.3 meters” by 2100, with more beyond.

The report suggests observing surface energy, heat transport, and ice mass balance to improve projections of sea level rise; investigating, remotely and in situ, ice shelf cavities, grounding zones, and ice fracture mechanics to pin down tipping points for irreversible ice loss; and observing and modeling geologic and geophysical processes including glacial isostatic rebound, geothermal heat flow, and examining the lithosphere-asthenosphere system (the rigid outer part of the planet and a deeper part with more plastic flow and convection).

The Antarctic region has an outsize effect on the global heat budget. Our weather is getting hotter, for sure, but a sobering fact is that so far, the global ocean has absorbed more than 90% of the excess heat from humanity's input of greenhouse gases to the atmosphere. Two-thirds of it happened in the Southern Ocean because that's where most deep waters rise to the surface and exchange heat and carbon with the atmosphere. The CO₂ budget also has an outsize role there: surface waters south of 35°S are only 20% of the world's surface ocean, but they account for 40-50% of the total removal of fossil fuel CO₂ emissions from the air.

The Southern Ocean is famous for its sparse observations; the chapter on heat budget and CO₂ prioritizes five science questions, ranging from what determines net uptake and release of CO₂ there to what processes will change the extent of sea ice.

The chapter on the impact of anthropogenic actions and change on the region's biota, unlike the

other two science chapters, doesn't really bring out the Southern Ocean's enormous economic and ecological significance or its response to change.

A fascinating pair of statistics for me is (a) 90% of all the whales ever taken anywhere came from the Southern Ocean and (b) the weight of Southern Ocean plankton that failed to develop because of the Antarctic ozone hole exceeds the weight of whales that were taken during peak whaling years. The chapter does say, correctly but somewhat bureaucratically, that the region has supported a range of ecosystem services, including fishing and tourism, and that, over the last several decades, "it has become clear that Antarctica's ecosystems have a finite capacity for meeting these varied needs."

The report advocates allocating resources to "explore and invest in the future of the most unobserved part of the planet, which is a unique, living laboratory for studying ecosystem structure, adaptation, and conservation."

Since 1949 the National Academy of Sciences has issued what has become a historical series of reports setting priorities for Antarctic research.

This one, like most of the earlier reports, is well referenced, well-illustrated, and came from a committee of scientists selected by the Academy. For this study, the committee numbered 13. Another 13 reviewed the draft report. Forty-four listed individuals "assisted the committee in creating this report." A workshop on Feb. 9-10, 2023 had 69 registered in-person attendees and 194 more registered virtual attendees, including 28 invited experts, most of whom gave presentations. Three additional open sessions were held, the last in May 2023.

This extended, open process gives the report validity if not gravitas for nearly anyone interested in scientific progress in the Antarctic. That's why this reviewer suggests that Antarctic Society members may want to give it some attention. Buy a prepublication printed copy for \$31.50 or download a high-quality PDF for free.

<https://nap.nationalacademies.org/catalog/27160/future-directions-for-southern-ocean-and-antarctic-nearshore-and-coastal-research>



The Antarctic Society

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August 11-14, 2024 Boulder, CO Gathering Registration

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_____ \$275.00 Full Registration per person. Increases to \$300.00 on June 1, 2024. 50% refund until June 1, 2024.

Full Registration includes the day programs, 2 lunches, Reception on Monday evening, Auction on Tuesday, and the Tour and Picnic on Wednesday.

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Proceed to page 2 if you wish to reserve a lodging unit on the Chautauqua campus.

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