



Dig It

Researchers read
Antarctic history
through rocks

By Emily Stone
Sun staff

Think of it as CSI: Antarctica.

A group of savvy crime scene investigators go to the Transantarctic Mountains to search for clues to identify the violent forces that have left their mark all over the continent. In this episode, the clues are rocks.

OK, maybe it's not quite a made-for-TV drama. But as geologist John Goodge describes it, a geologist's job is similar to that of a police officer who shows up at a car crash.

"You have the wreck and you have to figure out how it happened," says Goodge of the University of Minnesota Duluth.

Goodge and co-principal investigator Kathy Licht hope to solve some mysteries by gathering roughly one thousand kilograms of rocks from the edge of two powerful glaciers pushing through the mountains. The rocks should help them piece together parts of the continent's history.

They will do entirely different research on the rocks once they get home. Goodge wants to see what the rocks show about Antarctica's origin

See THEORY on page 10

Quote of the Week

"I love the name tags on our jackets."

— Woman relieved that she has help in remembering a thousand different names.

Inside

DePew returns to rugby
Page 12

Former editor goes bi-polar
Page 4



Artists and writers coming to the continent look at life on the Ice a little differently than the rest of us. We revisit a few of the recent program participants, beginning on page 7.

BENEATH THE SURFACE

Photo by Norbert Wu / Special to The Antarctic Sun

ON THE MOVE: Balloon buildings equipped with skis for mobility

By Steven Profaizer

Sun staff

Construction crews working to complete NASA's new long-duration balloon facility have a longer drive to work. The six buildings, which were built downhill from McMurdo Station during the winter, have been moved to their new home eight kilometers away at Williams Field.

Each of the buildings is on large skis designed to make them mobile. Starting in late September, the buildings were pulled one-by-one behind D-8 Caterpillar tractors in a slow parade to the airfield. The last one was put into place Oct. 14.

"This is a huge improvement to [the facilities] the program had," said Linda Waterhouse, project manager. "The buildings were old, and these are nice, new and bigger. It's exciting for [the scientists] because it means they can fly bigger payloads, and that's what it's all about for them — the science."

The buildings were constructed near McMurdo and relocated to Williams Field because of the advantages associated with conducting the large-scale project close to

station. But they were originally designed to be mobile to save money and resources after the facility is in use.

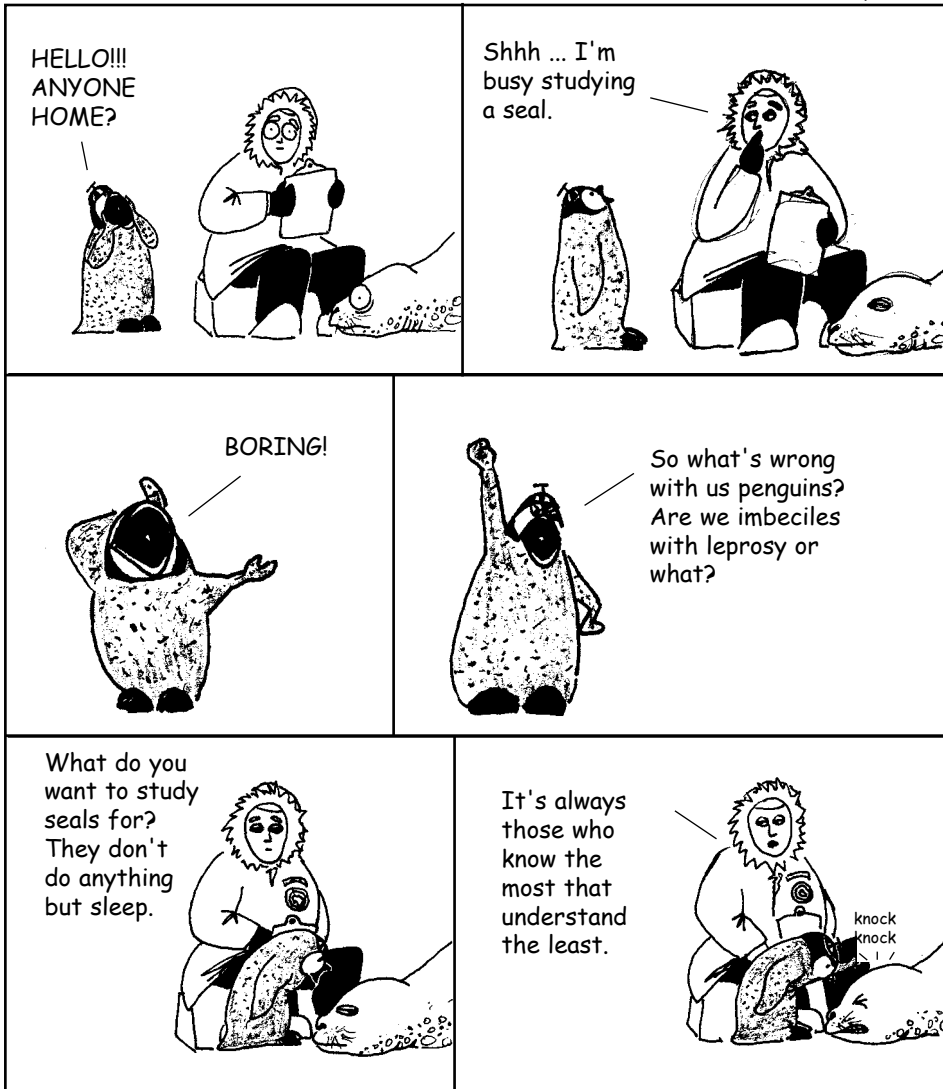
"Historically, these buildings had to be dug out every year," Waterhouse said. "It took several weeks, a lot of people and a

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Jeff Scanniello helps line up one of the largest buildings of NASA's new long-duration balloon facility Oct. 13.

Photo by Steven Profaizer / The Antarctic Sun



Cold, hard facts

Skuas

Wingspan: 1.2 meters

Weight: 1 to 1.8 kilograms

Expected lifespan: 11 years

Variety of skuas in Antarctica: **south polar skua, brown skua**

Diet: **krill, squid, fish, penguin chicks and carrion**

Odd habit: In search of food, skuas sometimes display a behavior called **kleptoparasitism**, which is when an animal obtains meals by chasing smaller birds until they regurgitate their last meal or drop their fresh catch.

Worst thing the skua does for its reputation: **kills and eats penguin chicks**

Sources: Antarctic Birds: Ecological and Behavioral Approaches by David Freeland Parmelee; www.antarcticconnection.com

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Photo by Steven Profaizer / The Antarctic Sun

Workers pull the two largest buildings of NASA's new long-duration balloon facility to Williams Field on Oct. 13. The buildings were constructed near Scott Base and then dragged about eight kilometers by D-8 Caterpillar tractors to the airfield.

Cold weather did not freeze construction

From page 1

lot of money every year to dig them out.”

At the end of the summer season, workers will be able to free the buildings from the locations where they are currently anchored and move them onto snow berms, where they will be re-anchored for storage. This will eliminate the need to excavate the buildings at the end of every winter.

Creating movable buildings by affixing them to permanent skis is not a new concept; airfields and research camps have used them for years. But the two largest buildings, at 12 meters high by 18 meters long, are in an entirely different weight class than structures typically moved by this method.

“We had a lot of people question whether we could move buildings this large, but we had done all the engineering analyses and felt we could do it,” Waterhouse said. “We’d never moved anything that large before, but we had a lot of information to go on ... We drew on a lot of good historical information.”

A reoccurring problem Waterhouse found in that history is that the skis will often freeze to the snow after sitting still

“We had a lot of people question whether we could move buildings this large, but we had done all the engineering analyses and felt we could do it.”

— *Linda Waterhouse,*
project manager

and immobilize the building.

“People have used a lot of different methods to free the skis from the ice,” Waterhouse said. “Most of them are pretty harsh and have a possibility of damaging the building, such as banging the building or putting explosives under the skis to break the bond.”

Waterhouse said she wanted to come up with a less destructive and more effective way to free the buildings. Her answer was

to create heated skis.

When it’s time to move the buildings, the skis are warmed to melt the ice cementing the buildings in place. This frees them in a gentler way than many past methods afforded.

Frozen skis were not the only obstacle the team had to overcome. These buildings were largely constructed during the winter months, when weather is always a force with which to contend.

This winter was not the worst on record in McMurdo, but it was not an easy one, Waterhouse said. The buildings were erected outside, where the workers had to face months of dark winter days with temperatures dipping into the negative 70s Celsius.

“The largest challenge was probably constructing these buildings in the extreme weather conditions encountered during the winter,” said Bill Marshall, construction coordinator for the project through the relocation of the buildings. “On average, the temperatures were [significantly colder than on station] and we got a lot of blowing snow. Most of the people were beat by [August]. Moving the buildings was probably the easiest part.”



Perspectives Perspectives

A new kind of Ice life

By Kristan Hutchison
Special to the Sun

Through the plane window, white ice extends to a horizon of blue-hued peaks. I reach for the hood of my red parka, ready to cocoon myself within for the long flight. But the flight attendant interrupts, offering tea or coffee. The Greenlandic words sound soft, as if spoken through a mouthful of feathers.

For the first time in five years, I'm not flying to Antarctica, not following the sun as it slips south. Instead, this plane noses down at the edge of Greenland's ice sheet, landing in a town settled before Captain Cook discovered the southern *terra incognita*, before Scott or Amundsen were born. After years wondering what Antarctica's native culture might have been if it had one, I've come to find it on the opposite end of the world.

Antarctica is the only continent without a people of its own, unpopulated until research stations took hold 50 years ago. In my Antarctic wanderings I imagined a native Icepeople dressed in sealskin leggings, the dry snow sliding off their penguin parkas. I could see these hypothetical natives sneaking up on snoozing Weddell seals, slicing the blubber off with stone blades, skua always waiting a few paces away for the scraps. Through the long, dark months the Icepeople would tell their tales, the ones that explained how wind carved the world and a trickster skua steals the sun each year.



Photo courtesy of Kristan Hutchison / Special to The Antarctic Sun

Kristan Hutchison on a ferry in Greenland earlier this year. She's exploring Arctic ice this year instead of returning to McMurdo.

The Greenlanders do wear sealskin, cut into fashionable coats. Originally these Inuits were hunters, moving between summer fish camps and winter hunting camps. They still eat seal, but no longer build their homes from the local stone, turf and blocks of ice. Now they paint their houses bright red, yellow, green and blue, bringing color to the landscape of ice and rock.

A sculpture gallery of icebergs floats in the harbor. Flying over the middle, Greenland's ice sheet appeared to go on forever, but here at the edge it's apparent that the ice is shrinking. The villagers all say the same thing:

"This harbor used to ice over and we'd cross it with sled dogs. For the last five years it's open, so we fish all winter."

The sled dogs stay staked in the field, barking and pulling on chains when a person walks by. They are eager to run again.

If Antarctica had a native people, the grandfathers might be telling tales of change, too. How in the old days they used to ski across the Larsen B iceshelf. How it was harder to find lichen before the glaciers receded. How they built castles of ice that never melted, not like the shelters of today that drip and disappear in the summer. Ah, the old days — always harder but somehow better, flavored with memory.

We *are* the Icepeople, the ones who will tell those tales. Like the Inuit, we are semi-nomadic, following the work as they followed the hunt. Dressed in our traditional garb — red parkas, white boots, Carhartts — we speak a language difficult to decipher:

"I was checking LTER cargo for my PI and heard some freshies are expected on the next Herc."

Yes, we have a culture, but it's hard to put down roots on the Ice. Like Inuit elders voluntarily disappearing into the storm when they were no longer useful, Antarcticans leave for another world when we've done enough Ice time.

I've officially joined the good old boys' club, the association of Old Antarctic Explorers. We are expatriates from a homeland that doesn't exist, a diaspora from the Ice. Now I, too, can wax nostalgic. Antarctica has mythical proportions and people back home want that myth



Photo by Yann Arthus-Bertrand / Special to The Antarctic Sun

Kristan Hutchison on assignment last summer for The Antarctic Sun. She's staying home in Alaska this year.

retained. They don't want to hear about days spent staring at a computer screen, eating cafeteria food and playing Scrabble in the evening.

I'm culling through my stories for ones that lend themselves to exaggeration, so I can tell grandkids someday how I dangled from a plane over the South Pole, snapping photos in temperatures that would freeze a polar bear's fur. Forget that there were safety harnesses involved. Would Inuit children keep listening if their hero/hunter, Kiviuk, had not been escaping cannibals, capturing a goose-woman as a bride, and riding on the back of a large fish to find his way home?

But how do I tell the important stories, the ones that show what it really takes to survive on a harsh continent? The Greenland Inuit know the secret. I see it in their broad smiles, their quick jokes, their easy laughs. It's not the parkas that protect us. It's something much warmer, woven in strands that run from person to person — the cloth of community. On the Ice, we had to recreate it every season. On the Ice, we had another chance every year to make it better.

Landing again on the damp soil of home, a place where roots take hold and trees grow tall, I'm trying to remember. In the midst of the forest, with the distractions of life, it can be difficult to see what is obvious when there is nothing but rock, ice and people. The truth about Antarctica is it's a place, just like everywhere else. And like everywhere else, like wherever you are right now, it's what you make of it.

After five seasons working for The Antarctic Sun, Kristan Hutchison is staying home in Juneau, Alaska, working as a freelance writer. E-mail her at kristanhutchison@yahoo.com.


 around the continent

SOUTH POLE
Projects gear up

By Mike Mulvihill

South Pole correspondent

It's official. The South Pole Station has begun the 2005-2006 summer season.

If you take a walk around the station and listen to the buzz of activity, you can already tell that it's going to be a busy one: There's heavy equipment moving in every direction, and the all-call is sounding over the intercom.

The New York Air National Guard is doing a great job of getting the LC-130 flights in and out on a timely basis; the cargo crew is off-loading supplies as fast as they come in; and the entire station is shifting into high gear to get the job done.

The temperatures have been hovering around negative 50 degrees Celsius and the physiological elevation has been as high as 3,349 meters. The summer population is steadily increasing, currently at 202, and the winter folks are on their way home for some well-deserved rest.

There are many projects slated for this summer. It's an exciting time to be a Polie. Installation of the exterior siding of the new elevated station is scheduled to begin, and will give the building a fresh new look. The old buildings under the Dome are scheduled to be demolished, and the move from the Dome and into the new station continues.

The IceCube scientists are getting ready to install this year's string of photo-multiplier tubes for the elementary particle detector array. IceCube is an international collaboration to build a neutrino telescope and promises to be a very exciting project.

While some science is just beginning, other projects are coming to their end. The AST/RO project, Antarctic Sub-millimeter Telescope and Remote

Sci-fi nights become South Pole tradition

By Tom Lohr

South Pole correspondent

A flying saucer touched down at the South Pole Station on Nov. 1 at 7 p.m. The alien inside sought not to harm the station crew, but to entertain a group of Polies gathered in the station's old library under the Dome for the inaugural screening of Science Fiction Film Tuesdays.

The weekly event is the brainchild of Ethan Dicks, a self-proclaimed sci-fi buff. This year's first screening featured the 1951 cult classic "The Day the Earth Stood Still."

The old-time science fiction film was a fitting launch for the popular event, as the Dome bears an eerie resemblance to the film's silvery saucer.

The hallmark Dome is scheduled for dismantling in the near future as Pole's operations shift to the new elevated station. The Dome, like the movie, has stood the test of time, and both have etched an impression on those who have viewed them.

Dicks is a scientist with the IceCube project concerned with collecting bits of interstellar matter. IceCube, designed to study neutrinos, is beginning to gear up for even bigger operations and will be a mainstay at the South Pole for many years to come.

And as long as IceCube remains, it's likely Dicks will as well, and the South Pole's weekly visits from outer space will continue.

Observatory, has performed 10 years of valuable research and is ending this season. Nick Tothill of the Smithsonian Astrophysical Observatory gave an informative lecture last month that over-viewed the past decade of sub-millimeter telescope science at the South Pole and where it may go in the future.

Our beloved executive chef, Jon Emanuel, a.k.a "Cookie Jon," is leaving his dining hall post this season. He is being replaced by Wendy Beeler. The whole station wishes Jon the best of luck in his new endeavors.

Even with a six-day workweek and 24-hour shifts, there is still some time for recreation. There are movies, yoga classes, science fiction nights, a quiet reading library, science lectures and two saunas.

With many new beginnings and a few chapters closing, the South Pole station is steaming ahead into a promising future. There is still much work to be done, and little doubt who the hard-working people that come to the South Pole each season are up to the task.

PALMER
Science open house

By Kerry Kells

Palmer correspondent

Palmer Station had a busy couple of weeks with the arrival of our resupply and research vessel, the *Laurence M. Gould*, for a one-night port call. We also had a science open house for the community and a medical evacuation from station with assistance from our neighbors to the south, the British at Rothera Station.

Our science support team members held a "Science Happy Hour" with a variety of hands-on displays, microscope observations and participant experiments. This annual event at Palmer preceded the arrival of our summer grantees and principal investigators.

The *LMG* first stopped at the

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the week in weather: Oct. 28-Nov. 3
McMurdo Station

High: 24F / -4C

Low: 3F / -16C

Max. sustained wind: 46mph / 74kph

Windchill: -40F / -40C

Palmer Station

High: 45F / 7C

Low: 23F / -5C

Max. sustained wind: 44mph / 70kph

Precipitation: 9mm

South Pole Station

High: -50F / -46C

Low: -60F / -51C

Peak wind: 17mph / 27kph

Max. Physio-altitude: 3,349m

Continent From page 5

Copacabana field camp. After calm weather and a speedy set-up of the camp, the *Gould* proceeded to Palmer Station and arrived on the evening of Oct. 27.

The ship brought principal investigators from the Long Term Ecological Research group: Hugh Ducklow, Patricia Matrai, Langdon Quetin and Maria Vernet. Other members of the LTER group arrived, as well as researchers from Bill Fraser's seabird research and Tad Day and Chris Ruhland's terrestrial ecosystem research groups. We welcomed the new members to Palmer and said goodbye to eight others, six of whom had spent the winter on station, including our winter station manager, James Slaughter.

The new arrivals also included our two International Monitoring System (IMS) installation engineers, Erik Swanberg and Bouvard Hosticka. They will install equipment to automatically sample particulates in the air and look for radioactive particles that emit gamma rays. Measuring the energy coming off the gamma rays can determine what type of radioactive particles they are and what produced them. This is one of the many world-wide installations that are part of the Comprehensive Test Ban Treaty monitoring system.

Also in October, one of our community members had a medical emergency and the station came together to prepare for an evacuation. With no time to wait for a vessel to transport the patient, the request was made to the National Science Foundation for air transport. The NSF then asked the British Antarctic Survey for assistance. Palmer Station coordinated with Rothera Station, about 320 kilometers away on Adelaide Island,

to arrange for a Twin Otter to fly to Palmer and take the patient to Punta Arenas, Chile.

Members of our Glacier Search and Rescue and Ocean Search and Rescue teams prepared a landing area and coordinated the safe transport of the patient to the aircraft. The Twin Otter landed on the top of the Marr Ice Piedmont glacier, which is easily accessible behind our station. Our winter physician accompanied our friend in the Twin Otter for transport to Punta Arenas. On the way, the Twin Otter landed at Marsh/Frei Base on King George Island for refueling and continued on to Punta Arenas.

The operation was a great success and the patient has recovered and is doing well. Thanks go to everyone on station for their assistance and to the excellent support from Rothera Station, the NSF and AGUNSA, our contractor in Chile.

Strong sustained winds over the weekend blew the fast ice out with some bands of ice still remaining near station. Hopefully, in the next few days, our new arrivals can begin boating and sampling.

SHIPS

LMG

Compiled from reports by T.J. Hurlburt
Marine Projects coordinator

The *Laurence M. Gould* arrived safely at Palmer Station on Oct. 27 after passing through the Gerlache Straits and Neumeyer Channel under cloudy skies. The next day the *LMG* unloaded and loaded cargo before leaving port Oct. 29.

With one engine down, the ship expected a slow ride through the Drake Passage. The weather started fairly good but later turned foul, continuing to slow the ship's northbound progress.

NBP

Compiled from reports by Alice Doyle
Marine Projects coordinator

The crew tested equipment on Oct. 28, including the Conductivity, Temperature and Depth (CTD) casting gear. It was nice to have the first gear deployed with such ease and success. Hopefully the rest will follow in the same fashion. The ship continued south towards the Ross Sea polynya, which is an area of open water in the pack ice.

Building seas the next day made the first CTD cast interesting. The cast was part of a plan to collect water both north and south of the circumpolar current. Winds continued to increase the following day as the barometer dropped slightly as we steamed towards a low pressure system. We stopped briefly in the early afternoon to conduct a test of the free-fall CTD before continuing south.

Afternoon operations on the 31st were cancelled as winds and seas increased dramatically throughout the day. The waves were impressive, keeping the main deck full of deep water. One especially big wave reached the helo deck.

We continued with our morning CTD cast the next day. This cast was particularly important, as it was the first cast south of the polar front. We finally reached sea ice in the late morning.

The current ice images show the Ross Sea polynya is slowly opening up to the north of the Ross Ice Shelf. We have calculated that we will have to transit through approximately 1,100 kilometers of sea ice before reaching our study area.

Antarctic Photo Contest

Deadline is Dec. 11. Send photos to sunsubmissions@usap.gov.

Continental Drift Why did you come to Antarctica?



"I have always been fascinated with Antarctica and finally had the opportunity."

James Ramseier,
Palmer physician from
Las Vegas, Nev.,
first season



"To see something that is truly beautiful and to go someplace where no one I know had been."

Mike Mulvihill,
South Pole light vehicle
mechanic from Orlando,
Fla., first season



"The people and the unique experience. To be a small part of something that makes history."

Dennis Carey,
McMurdo air traffic controller from Pensacola,
Fla., sixth season

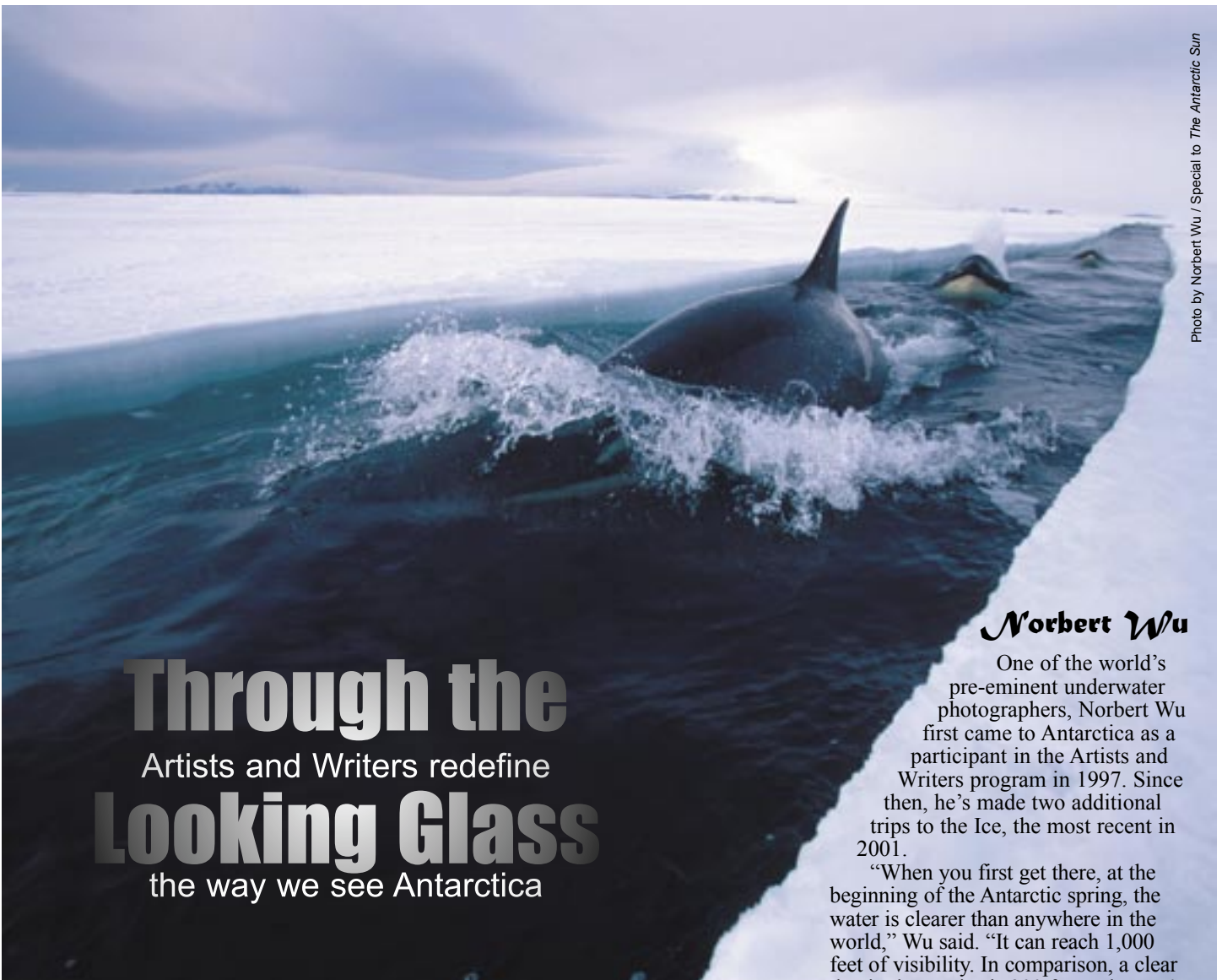


Photo by Norbert Wu / Special to The Antarctic Sun

Through the Artists and Writers redefine Looking Glass the way we see Antarctica

Norbert Wu

One of the world's pre-eminent underwater photographers, Norbert Wu first came to Antarctica as a participant in the Artists and Writers program in 1997. Since then, he's made two additional trips to the Ice, the most recent in 2001.

"When you first get there, at the beginning of the Antarctic spring, the water is clearer than anywhere in the world," Wu said. "It can reach 1,000 feet of visibility. In comparison, a clear day in the tropics is 200 feet at best. It's the last really untouched place on earth, and that is what has drawn me back."

Wu produced a prodigious amount of work during those trips. Photographs from his three seasons at McMurdo were published last year as a large-format book, "Under Antarctic Ice," from the University of California Press. Another major project during more recent visits involved the filming of a high-definition documentary on Antarctica's underwater world. The PBS documentary aired in 2003 as part of the Nature series. Wu said the film's use of high-definition TV technology, or HDTV, was a landmark production.

"The film is already seen as a ground-breaking effort because of the technology and the subject matter, and will therefore be seen and reviewed in more venues than the initial PBS broadcast," he said.

Story and Layout
by Peter Rejcek

Science through the lens of the camera, through the fine tip of a paintbrush, through words inspired by a world found upside down on the globe. These are some of the media by which artists and writers attempt to render the ineffable beauty and biology of Antarctica into tangible form.

That's the poetry behind the National Science Foundation's Antarctic Artists and Writers Program. It's intended to show the American public what goes on through the eyes of people who are generally not scientists but excel in expressing their experiences in creative ways, according to Kim Silverman, NSF program officer.

The NSF received 330 applications for the program between 1992 and 2004, Silverman said. During that time 66 proposals were selected by peer

panels from various fields in the arts, science and technology, she added. The selection process is "similar to that of the scientists," she said, with the two main criteria being the proposal's intellectual merit and the breadth of its intended impact.

"It's a highly competitive program," Silverman noted. Indeed, the NSF averages 22 proposals a year, with the number of applications nearly doubling that average over the last two years. About six projects receive grants each year.

"The program is just growing," Silverman said.

On the following three pages the *Sun* revisits five past participants of the Antarctic Artists and Writers Program to see what works they produced and how their experiences have impacted their outlook in other ways.

William Fox

Writer Bill Fox found himself in a place familiar to many who have visited Antarctica for the first time — he had the irresistible urge to do it again.

“Obviously being on the Ice for almost three months generated a huge amount of writing, leaps forward in thinking about how human cognition encounters space and transforms it into place — and the all-too-predictable desire to return and do more,” he said.

Fox’s book “Terra Antarctica” from Trinity University Press is scheduled to hit bookshelves this fall. The book delves into the history of the artistic, cartographic and scientific images of the continent. That work led to a similar project with NASA on Devon Island, where the NASA-Haughton Crater Project is practicing for Mars.

“I mean, where else to go once you’ve been on the Ice?” Fox wondered.

An excerpt from an essay that was published in Orion magazine in 2004 is reprinted here, and will appear in a book of essays he hopes to finish next year, “Climbing Mount Limbo: Essays on the Edge of Land and Language.” Several other essays are also finished or in the works, he said.

In fact, the longer Fox has been away, the stronger his ties to the continent seem to become. He was a curator for an exhibition in Los Angeles for the Center for Land Use Interpretation about “Antarctic One,” the road from McMurdo to Scott Base.

“All this has led to being in contact with a constantly expanding circle of Antarctic writers, artists and scholars from Germany, France, England, New Zealand, Australia and around the U.S.,” said Fox, who came to the continent in 2001.

Through the Artists and Writers redefine Looking Glass the way we see Antarctica

The following is an excerpt from an essay written by Fox and published in Orion magazine last year. It’s also set to appear in a book of Fox’s collected essays in 2006:

I’ve been here for almost three months, working as a visiting writer both in the Cray library and out in the field, and this is my last night in the Antarctic. I’m heartbroken to be flying out in two hours on a National Guard cargo plane to Christchurch. It does that to everyone, leaving here. I’ve never met anyone who has worked in the Antarctic who didn’t want to go back.

Just offshore a red-and-white U.S. Coast Guard icebreaker churns a circle in the sea ice, keeping open the channel it’s made for the annual delivery of food and supplies that will soon arrive on a freighter. Across the sound the mountains stand fourteen-thousand-feet high. I’ve spent much of the last three months looking at them, either while out on the sea ice or from the top floor of the lab. Every time I’d take a break from writing on my laptop, I’d go prop my elbows on the deep window casements to stare out at the peaks and glaciers. Most mornings, when the air had warmed enough above the sea ice, a Fata Morgana would appear; impossible cliffs would flicker into existence for an hour or two, slowly changing shape as the thermal discontinuity between surface and air shifted slightly.

The Antarctic is like that, throwing up extravagant promises before you and then melting them away. The Bridge of Sighs between the lab and Building 155 is a pun on the Bridge of Sighs in Italy, and tonight both wind and emotion cut through me, singing a duet of loss, which is what the poem we’re carving on the bridge is all about.

Connie Samaras

To capture the dynamics between extreme environments and built space, Connie Samaras decided to go to the end of the Earth.

Samaras spent three weeks at Pole last November on a photographic mission to study the contrast between extreme environment and living space.

“It took me the better part of my stay to be able to finally see and image the strange juxtapositions of scale between landscape and built environments,” recalled Samaras, a professor in the Department of Studio Art at the University of California, Irvine.

The images are still fresh in her mind, she said: “The sea-like nature of the desert ice plateau and the divisions of day and night one can see on the horizon under 24-hour daylight; the fragile linear markings of the antennae fields against the ice; the things that will soon no longer be, the Dome, its interiors, the skinless plywood surfaces of the new station.”

Samaras shot about 500 pictures during her stay at Pole. She culled about a dozen, blown up mural-sized, for several upcom-



A closeup image of the space beneath the new elevated station at South Pole. “It looked like an upside down landing strip or highway to me,” photographer Connie Samaras said.

Photo by Connie Samaras / Special to *The Antarctic Sun*

ing exhibitions. It was difficult, she said, not to focus on the Antarctic vistas and instead capture what she called the “fragments” that people normally see.

“Using close-up lenses, standing in the outside and looking back on the built environment of the inside was a disturbing

experience,” she explained. “Perhaps it was the harshness of the weather — I was there early in the season — but in the end, I think it was more the result of turning my back to the idea of the panorama since it is through panoramic images that people are most used to seeing faraway spaces represented.”



Photo by Joan Myers / Special to *The Antarctic Sun*

In some areas of the Dry Valleys, like Beacon Valley, the ground has not been saturated by rainfall in at least 10 million years. Between nine and 30 meters across, these dark polygons of soil were formed by the cracking of an ancient glacier hidden beneath the surface.

Lucy Jane Bledsoe

A book on armchair travel to Antarctica for youngsters, "How to Survive in Antarctica," is one of three books author Lucy Jane Bledsoe has written based on her two trips to Antarctica in 1999-2000 and 2003-04.

"The most difficult thing in writing about Antarctica is to express the place without overwriting. The place is so grand and beautiful, it seems to defy good writing," she said. "My hope has been to let that expansiveness and beauty infuse all my work without addressing it directly. That's why I like to write fiction, or narrative nonfiction ... as opposed to exposition."

"How to Survive in Antarctica," which should be out before the end of the year, afforded Bledsoe an opportunity to take a different tact from other kids' books about Antarctic history and science. A cross between travelogue and survival guide, the book contains facts about people, Antarctic challenges and her own first-person accounts. It's unique because "there is very little written for children about contemporary life on the Ice," she said.

Other works include a novel, "The Antarctic Scoop," about a young girl who uncovers a plot to ruin the continent, and a non-fiction collection of stories, "The Breath of Seals: Adventures in Fear and Grace."

"This book explores my relationship to the wild, the meaning of fear, and the experience of grace," Bledsoe said of the last book. "The opportunity to experience a place so extreme, and therefore to feel so intimately what it means to be human, can only be a good thing for a writer."

Joan Myers

Joan Myers has been busy preparing her photographs for a traveling exhibit, as well as putting together a book of Antarctic images. "Wondrous Cold: An Antarctic Journey," is scheduled to premiere at the Smithsonian National Museum of Natural History in Washington, D.C. in May 2006.

Returning to work behind the lens hasn't been easy since her visit to Antarctica in the summer of 2002-03.

"It's been hard to photograph after Antarctica," she said. "The place is so powerful and the experience of photographing there so all-involving that everything else has seemed unimportant by comparison."

Myers said she originally wanted to come to Antarctica because she's always been interested in how humans live on the planet, "especially on the fringes. You can't get any further on the edge than Antarctica."

In her online journal Myers asked this question to herself: Why does Antarctica matter? Her photographs try to answer that question on two levels.

"On one hand, Antarctica matters because it's the most unspoiled pristine landscape we have left on the planet ... and it's awe-invoking because it invokes what preceded human life and what will eventually succeed it," she explained. "On the other hand, the science is important, and I loved meeting scientists and photographing everything from astronomy at Pole to [microscopic algae] under the sea ice."

**Through the
Artists and Writers redefine
Looking Glass
the way we see Antarctica**

not freezing to death. If you're modest, you have a fourth problem: Nothing shields the bucket from view of other people and the penguins.

Here's what you do. First, find a few rocks and set them next to the bucket. As you strip off your layers, place them under the rocks so they don't blow away. Use the bucket fast. Get dressed very fast. To not get dangerously cold, you need to do all this in ten seconds or less. Good luck.

Think you're finished? Not so fast. All human waste is flown back to the United States so that the continent does not get contaminated. So before retreating to the warmth of your tent, you have to carry the bucket over to a big barrel and empty it. It's best to wait for a moment when the wind isn't gusting.

The following is an excerpt from the kids' book, "How to Survive in Antarctica":

Antarctic Challenge: How to Use the Bucket

The bathroom facilities in most field camps are quite primitive. At Cape Royds, there's a bucket. Yep, just a bucket sitting in the open air.

So there you are with the wind howling at 30 miles an hour bringing a wind chill of - 20° F. You're wearing five layers of clothing: long underwear, a fleece jumpsuit, a fleece sweater, wind pants with suspenders, and a down parka. You have at least three big problems. One, getting all those layers of clothes off (the jumpsuit and suspenders are major obstacles). Two, making sure your clothes don't blow away in that wind. Three,

Theory: North America once neighbored Antarctica

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and its last billion years of history. Licht is interested in the tale the rocks can tell about ancient ice streams, especially how changes in their flow may have affected the stability and behavior of the West Antarctic Ice Sheet over the past 20,000 years. The two teamed up because they want rocks from the same place. They are currently at McMurdo Station taking day trips into the field.

When the glaciers of East Antarctica hit the massive wall of the Transantarctic Mountains, the bottom layer of ice and rock gets trapped and is slowly pushed up to the top. The group looks for “dirty spots” in the glaciers as a sign of where rock and mud have been carried up to the surface.

“It’s just like a little present,” said Licht, of Indiana University Purdue University-Indianapolis. The group is focusing this year on the edge of the Byrd and Nimrod glaciers, which push through the mountains onto the Ross Ice Shelf.

Ancient History

Antarctica is larger than the continental United States. Yet we have little idea what it actually looks like under all that ice.

“In terms of Earth geology, Antarctica beneath the ice really is the final frontier,” Goodge said, “because we can’t get to it.”

However, there are ways to hypothesize what’s down there short of drilling through the ice, which is a costly enterprise that yields samples from only one specific spot. Earlier research has shown that East Antarctica — the large swath of the continent east of the Transantarctic Mountains — is the oldest part of the continent. It’s actually the original crust, or shield, of Antarctica. There are two spots near the Nimrod Glacier where 3.2-billion-year-old rocks have been discovered.

“That represents a little window through the ice into the old shield of Antarctica,” Goodge said. He hopes to gather more of these rocks from nearby glacial deposits this year to further study the continent’s origin.

There are plenty of theories about Antarctica’s past that Goodge would like to shed more light on.

There’s the question of what used to be attached to East Antarctica along the Transantarctic Mountains before West Antarctica showed up. The western part of the continent didn’t begin forming until about 300 million years ago, and the bulk of it is much younger.

One theory is that a billion years ago, North America was Antarctica’s western neighbor. There are pieces of geological evidence that tie East Antarctica to the western United States. Rocks discovered here resemble rocks of a similar age found in the Mojave Desert region. And a band of unique



Photo courtesy of John Goodge / Special to *The Antarctic Sun*

Devon Brecke, a graduate student with the University of Minnesota Duluth, picks rocks out of a one-meter-by-one-meter square in a spot on the Transantarctic Mountains. The rocks should help scientists recreate a picture of how ancient ice streams moved across the continent during the last glacial maximum about 15,000 years ago — the time when the ice extended farthest out from the continent. Understanding this will help glaciologists predict what role ice streams may have in future climate change.

igneous rocks running in a line from the Mojave through New York may have been the source for some Antarctic sediment.

While it’s easy to find rocks of the same age around the world and rocks of similar composition, Goodge said it’s rare to find rocks that are both the same age and composition. As a result, geologists often conclude that two such sets of rocks are related.

Not everyone agrees with the North America hypothesis, Goodge said. Some think that North America and Australia were connected, although it’s generally agreed that Australia and Antarctica were long-time neighbors.

“What almost everyone does agree is that at one time there was another continent there,” he said of the edge of East Antarctica.

Then, about 700 million years ago, Antarctica and whatever was next door ripped apart, leaving a large rift zone that filled with sediment carrying particles from eroded rocks similar to those found in the United States.

About 200 million years later, an oceanic plate moved in. It shoved against East Antarctica and was wedged beneath the continent through a process called subduc-

tion. This created an ancient mountain range, which forms the base of the present-day Transantarctics.

The modern Transantarctic Mountains appear to have been created not by a collision of tectonic plates, but by their ripping apart. For the last 50 or so million years, Antarctica has been trying to split along its ancient border, Goodge explained. The crust thins as the two pieces move apart, and the warm mantle below rises up buoyantly and creates the large mountains that loom in front of McMurdo Station and across the continent.

Goodge’s previous fieldwork here focused on rock that’s still attached to the Earth, known as bedrock. While working on those projects, he saw rubble and sediment that had been pushed around and deposited near his field sites. But he ignored it. This year, that’s the stuff he’s looking for.

When someone in the group finds a new type of rock or a type of rock in a place where it previously hasn’t been spotted, they know they’ve got a new clue about the history of the Earth buried deep under the ice.

Ice Streams

Kathy Licht is concerned with how these
See ROCKS on page 11

How rocks ride ice streams may help predict future change

From page 10

rocks get pushed around by the ice.

She's hoping to help recreate a picture of how ancient ice streams moved across the continent during the last glacial maximum — the time when the ice extended farthest out from the continent — which occurred about 15,000 years ago. Understanding this will help glaciologists predict what role ice streams may have in future climate change.

Ice streams are essentially fast-flowing glaciers within ice sheets whose sides are heavily crevassed where fast and slow ice meet, as opposed to glaciers that run through mountain valleys and flow along rock. Ice streams are extremely powerful, moving up to 500 meters of ice forward a year.

Licht's project started while she was trying to understand what role the West Antarctic Ice Sheet had in creating the glacial maximum. The ice of that period extended as much as 1,000 kilometers farther into the Ross Sea than it does today, Licht said. There are five troughs in the ocean floor there. One theory holds that those troughs correspond to the five current ice streams in West Antarctica, meaning West Antarctica was the primary mover of ice during that era.

About six years ago, Licht started looking at some ocean floor sediment cores that she'd collected for a previous project. She wanted to see what they could tell her about this theory since no one had previously tested it. She analyzed rocks and sediment found in the cores that could be clearly linked back to either eastern or western Antarctica. It appeared that half of the Ross Sea was imprinted by East Antarctica and half by West Antarctica, disproving the five-ice-stream theory.

The idea that East Antarctica and West Antarctica's ice was equally powerful doesn't hold with today's reality. East Antarctica's glaciers have to squeeze through the Transantarctic Mountains before meeting the West Antarctic ice streams on the Ross Ice Shelf,



Photo courtesy of Kathy Licht / Special to *The Antarctic Sun*

A Twin Otter sits at the edge of a glacier in the Transantarctic Mountains, where Kathy Licht and John Goodge will collect rocks for their research projects.

and thus they lose much of their power. These days, the western ice is a bully that pushes around its eastern counterpart.

"The ice streams must have reorganized in the past," Licht said, or some of them were absent.

Licht didn't have many samples from East Antarctica to correlate with the seafloor sediment studies. So she's back in Antarctica to gather more rocks. Her group lays out a grid of one-meter squares at each of its sampling sites, and takes 100 golfball- to baseball-sized rocks from each square, as well as scooping up some mud and sand.

Next year they will return and sample from another part of the mountains.

"We'll have a much better data set," than what they had several years ago, she said.

She's also interested in tracking how rocks are pushed by glaciers. She wants to know how far the different bits can travel, which will help her understand how long it might have taken for ice to transport those rocks up to 1,000 kilometers.

The information she learns will help scientists understand the role of ice streams in climate change. Was it ice streams alone that pushed the ice so far off the edge of the continent? And were the ice streams again responsible for retracting that ice when the global temperatures warmed and sea levels rose?

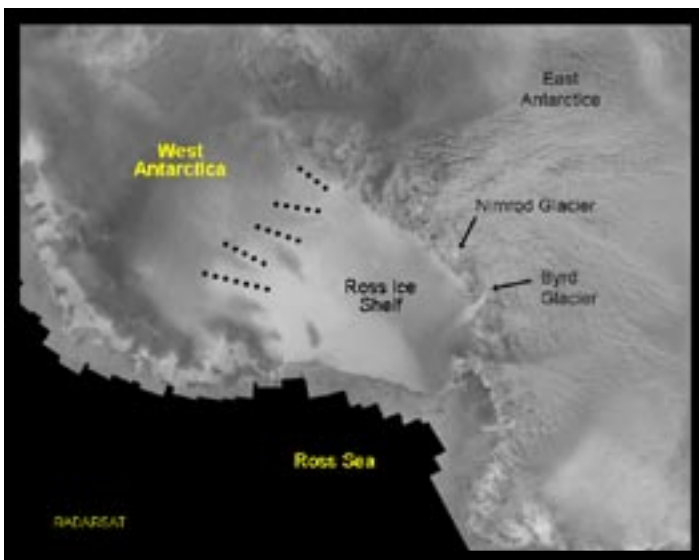
To get a better sense of this, Licht will feed her data to James Fastook at the University of Maine. Fastook, a computer science professor, will compare the data to a computer model he maintains of the movement of Antarctic ice sheets. He uses geologists' research from across the continent to make sense of the past and present movement of the ice. Hopefully Licht's newest findings will mesh with his model.

"I will look at the simulated flow lines that come out of the model for the time when the ice stood out at that point [in the Ross Sea] and hopefully it will agree," he said. "If it doesn't, I have more work to do."

The models predict the behavior of huge areas of the continent over tens of thousands of years. Fastook does this by using information from the small percentage of space that has been studied directly to make assumptions about the vast regions that have never been touched. But the model would be nothing without field work like Licht's, he said.

"Without people like her," Fastook said, "the stuff I do is useless."

NSF-funded research in this story: Kathy Licht, Indiana University Purdue University-Indianapolis; John Goodge, University of Minnesota Duluth.



Graphic courtesy of Kathy Licht / Special to *The Antarctic Sun*

The Transantarctic Mountains create the boundary between East Antarctica and West Antarctica. Kathy Licht is looking at how the two halves contributed to the continent's last glacial maximum.

Profile

Bringing rugby to the Ice

By Peter Rejcek
Sun staff

Keith DePew discovered a passion for rugby at an early age in an unlikely place — Kuwait.

“From the first time I saw it, I thought it was the coolest sport ever — just a bunch of guys going out and beating the snot out of each other,” said DePew, remarkably fit with youthful good looks at age 32.

Since his first summer at McMurdo in 1999, DePew has been captain and coach of the Mount Terror rugby team. He missed a couple seasons while wintering here as a firefighter. But once again he’s working on turning a mostly green team of players — weaned on American football and baseball — into a competitive rugby squad for the annual game with the New Zealanders at nearby Scott Base.

“What I like to do is introduce as many people as I can to the game,” he said to a roomful of rugby hopefuls in the dining hall last month. “I’m really psyched to have so many people out.”

DePew first witnessed the game thanks to a British ex-pat who worked for his father while the DePew family was living in Kuwait. The memory remained strong after he returned to the States and entered high school, where he tried to generate interest in the sport on his campus. But the science and technology magnet school wasn’t an ideal place to recruit rugby players, he said.

It wasn’t until his freshman year at Virginia Tech that DePew and a high school buddy got the opportunity to play. The friends had to endure the usual rites of passage that older students inflict on the frosh, or first-year students.

“I probably would have quit if it hadn’t been for him,” DePew said of his buddy. “They abused us like you wouldn’t believe.”

Despite the rough beginning, he stuck with the team, which repeatedly won state, and went to the nationals during DePew’s final year in 1996. He continued playing after college in the Washington, D.C. area and then in Denver.

An avid rock climber, he had gone to Colorado to visit a friend to climb with and decided to stay. DePew worked at a recreation center and for a construction engineering company. He also worked on-call for the fire department in Golden, a Denver suburb.

DePew’s first deployment here was as a firefighter in 1999, though he’s worked in several different departments over the years. Recently, he took a full-time job with Raytheon Polar Services Co. and works at McMurdo as the science cargo assistant supervisor.



Photos courtesy of Keith DePew / Special to *The Antarctic Sun*

During that first year on the Ice, he wanted to return rugby to the recreation calendar. The sport has been played here sporadically since the 1970s, he said.

“When I came down, there was nobody, as far as I knew, running the team,” he said, adding humbly that his role is really just organizing the team and bringing the rugby balls to practice each week.

“I really couldn’t get the whole thing done without all the people who commit their time to it,” he said. “Everyone else makes the team work.”

On a recent Sunday practice in the open quad between several dorms, DePew’s coaching style was immediately apparent. He methodically ran drills, patiently repeating instructions or demonstrations of certain skills. He gently pulled aside a couple of players who were having problems doing a spin pass, an awkward-looking throw requiring more finesse than strength, and worked with them individually.

“He’s really patient,” said Helen Paul, one of the few experienced Mount Terror rugby team members this year. Paul, who works at the power plant, practiced with the team last year, and played eight years on a Division II women’s rugby team in Virginia.

“He’s the driving force behind the team,” Paul said of DePew.

Back home, DePew also coaches a high school team, sticking by the motto that it’s not if you win or lose, but how you play the game.

“I generally like working with the kids ... who just want to learn how to play,” he said of his stateside commitment.

The community gets behind DePew and the team. The recreation department sup-



Keith DePew, third from left above and at left, is the captain and coach of the McMurdo rugby team, which he resurrected when he started working here in 1999.

ports the effort with some gear; transport is provided by the vehicles and the shuttles departments; and the station dentist, Dr. Allena Burge, is creating custom-made mouth guards for the team.

“We traditionally have the biggest fan base of any sport on station,” DePew said. “It’s a big deal. It’s a lot of fun.”

Rachel Murray, the McMurdo recreation supervisor, said volunteers like DePew make big events like the rugby game possible.

“That’s pretty much how all of our events are run, by people like Keith,” she said.

There’s also a special bond that forms between the American and New Zealand teams on game day. Despite some confusion about the rules by the Mount Terror club each year, the Kiwis are always eager for the game.

“We quite enjoy giving you guys a ham-merin’,” said New Zealander Keith Roberts from Scott Base. “It’s all good fun.”

In fact, the after-game party between the two teams is one of the highlights of the entire affair, according to DePew. Stories are swapped and strategies (also known as creative cheating) revealed. It’s a camaraderie that doesn’t happen in other sports, he noted.

“You finish the game, you guys are long-lost brothers,” DePew said.