



January 5, 2003

New way to date old stone

By Kristan Hutchison
Sun staff

Particles showering the Earth could tell geologists how long particular rocks have been on the surface.

Trees show their age in rings, ice in layers, people in wrinkles, but stones are a bit trickier. Geologist Paul Renne collected rock samples from the Dry Valleys last month, hoping they will help him crack the code of argon-38, an arcane isotope created as certain atoms are bombarded by particles from tiny nuclear reactions in the atmosphere. Isotopes are atoms of a chemical element with differing mass numbers and physical properties.

Renne is attempting to determine the rate at which argon-38 is created. Then geologists could measure argon-38 in rock samples to establish their ages.

"If we knew somehow that the rate of this incoming radiation was constant or predictable, then we could tell how long those layers have been exposed," said Renne, who has a three-year research grant from the National Science Foundation.

This could become a new and important tool for geologists.

See Rock on page 18

Self-portrait from a kite



First place other

Photo by Eric Muhs, TEA at the South Pole

Unique views of Antarctica prevailed in the Antarctic Photo and Writing Contest, like the above photo, which takes the standard "hero shot" at the South Pole ceremonial marker to an unexpected level. Photography judge Joan Myers, a fine-arts photographer and National Science Foundation artist grantee, said of the photo she chose for first in the "other" category, "What an odd view of the South Pole marker...Somebody went to a lot of work here. They probably had a lot of images that didn't work and I'm sure the photographer's hands were getting very, very cold." Other winning photos and writing start on page 11, or go to www.polar.org/antsun to see the photos as they're meant to be, in color.

Photo, Poetry and Prose Festival

QUOTE OF THE WEEK

"That's a Darwin Award waiting to happen."

— South Pole scientist referring to two men trying to traverse the continent on kite-pulled sleds

INSIDE

Lost skua finds Pole

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Celebrating year's end,
Pole style

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www.polar.org/antsun

Marking a wandering Pole

By Mark Sabbatini
Sun staff

The annual ceremony at Amundsen-Scott South Pole Station of placing a marker at the exact bottom of the world isn't the place one normally finds unexpected guests.

But this year four skiers appeared as final preparations were underway. The visitors arrived to cheers 10 minutes before the event that traditionally greets the New Year, getting as much of a surprise as the Pole dwellers who spotted the group.

"To be honest, it was a bit overwhelming," said Paul Landry, a guide who led the

46-day private expedition. "We're together for 46 days and then there's like 30 or 35 people there asking us questions."

It may be the first time surprise visitors have appeared at the ceremony, said Jerry Marty, the National Science Foundation representative for the station. The skiers said they were simply finishing a final 30-hour push to reach the Pole, with no idea the ceremony was occurring that day.

At 10 a.m. Dec. 29 - timed for the station workers' day off instead of New Year's Day - a new pole with a specially designed marker for 2003 was placed at

See Marker on page 9

Ross Island Chronicles

By Chico

<p>So these are the Dry Valleys everyone keeps talking about. I don't see what the big deal is. There's nothing here but rocks ...not even snow!</p> 	<p>Look there's a microarthropod, an Antarctic springtail. They are the largest terrestrial creatures on the continent and only grow to 2 millimeters in length.</p> 
<p>WHAT?! AND WHAT ARE WE, TOURISTS?!</p> 	<p>Maybe I ought to swallow it to show it who really is the king around here.</p> 
<p>There's a good chance your stomach will keep it alive for some time. I'm sure there's plenty for it to eat in there.</p> 	<p>If you put your finger in your mouth deep enough like you taught me, you can upchuck him out and then ask for forgiveness.</p> 

Cold, hard facts

Erebus

Number of active volcanoes in Antarctica: **3**

Southernmost volcano: **Mt. Erebus**

Discovered: **In 1841 by James Ross**

Named: **For one of his two ships, a Greek name for the ring of darkness the dead had to pass through**

Height of Mt. Erebus: **12,280 feet (3,794 meters) above sea level**

Area covered by Mt. Erebus: **about 400 square miles (1,035 sq. km)**

Average temperature on the volcano's slopes: **-20F (-29C) in summer; -60F (-51C) winter**

Temperature in the lava lake: **about 1,652F to 2,066F (900C to 1,130C)**

Age of Erebus: **> 1 million years**

Age of the summit: **< 100,000 years**

Frequency of eruptions: **Strombolian (lava bombs) – several times a day; Ash-infrequent**

First time a lava flow was observed: **2000-2001 season**

Sources: Mt. Erebus Volcano Observatory, NSF and New Mexico Tech

The Antarctic Sun is funded by the National Science Foundation as part of the United States Antarctic Program. Its primary audience is U.S. Antarctic Program participants, their families, and their friends. NSF reviews and approves material before publication, but opinions and conclusions expressed in the *Sun* are not necessarily those of the Foundation.

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Web address: www.polar.org/antsun

Katabatic Crosswords: Countries with bases in Antarctica

Tip: Most clues list a base or station of a country

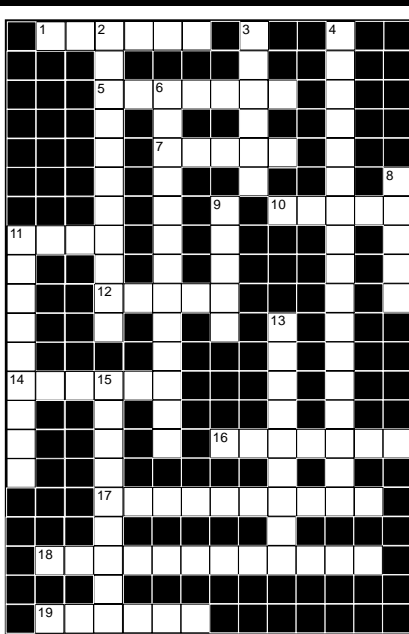
Across

- Vostok
- Artigas
- Maitri
- Great Wall
- The committee the bases operate under (acryn.)
- Escudero
- Arctowski
- Vernadsky
- Scott
- Palmer
- Dumont d'Urville

Down

- Marion Island
- Comandante Ferraz
- Bases are assigned a number based on this
- Rothera
- Syowa
- King Sejong
- Where all points converge
- Mawson
- Esperanza

Solution on page 19



Squares too small? No pencil to erase your mistakes? Try our interactive online puzzle at www.polar.org/antsun

Non-human life form seen at Pole

By Mark Sabbatini
Sun staff

The conspiracy theorists have it right: Every so often residents at the South Pole experience the shock of seeing a life form that absolutely is not human.

It happened again last week, as a skua that apparently strayed hundreds of miles from its natural habitat was spotted in the vicinity of the Amundsen-Scott South Pole Station. The birds are common along the shores of Antarctica – at least 800 miles (1,280 km.) away – where there is plenty of food for them, but it is the first sighting in two seasons at the Pole.

There are no bird experts at the Pole – hardly a surprise, since winged creatures aren't supposed to be there – but the collective opinion is wind or other weather factors help push the occasional skua way off its intended course. Tracy Sheeley, the station's communications supervisor, said a bird's chances of making the long return journey without food are generally poor.

"It's nice to see a non-human life form for a change," said Sheeley, a resident of Talkeetna, Alaska, who is working her fifth season at the Pole. "People are always excited, but that poor little guy is doomed."

The good news is the skua spotted Dec. 29 was still able to fly and was relatively plump, indicators it was in better health than some previous birds, according to several people who have spent multiple seasons at the station.

A number of people said they spotted the bird late in the morning or early in the afternoon before it flew off toward field camp sites a few miles away. There were no sightings mentioned after Sunday evening.

"Compared to the other ones I've seen down here, that one looked good," said Scott Smith, a plumber who recalled four skua sightings during the eight seasons he has worked at the station.

But the skua was hardly finding life easy: Smith said it was trying to eat one of the orange flags along the station's ice runway when he saw the bird.

Ruth Ofstedal said she and three co-workers went looking for the skua after Smith told them about it. She said they found the bird resting on a snow berm along the ice runway before it eventually flew off toward the new elevated station being constructed.

"Some people want to keep it as a pet," she said. "Of course they're fantasizing."

The Antarctic Treaty forbids disturbing native wildlife, so well-intentioned thoughts of assistance are not possible.

Skuas, closely related to the gull family, typically have a wingspan of about four feet and weigh two to four pounds. They are known as scavengers who eat sea life, steal penguin eggs and clean up carrion for nourishment.

On a very rare occasion they may find food scraps at a settlement – an incident at

McMurdo Station years ago where it "rained" chicken bones dropped by raiding skuas is local legend – but the chance of a stray morsel from the South Pole's tightly closed outdoor waste bins is essentially zero. A few workers suggested the skua spotted at the Pole might fare better under the South Pole dome, where some food waste is temporarily stored in large open boxes, but doubted the bird would find its way there.

Late October to mid-December is typically the breeding season for skuas, with eggs hatching in late December to late January. The estimated lifespan of the birds is about 11 years.

There are two species of skuas found in the Southern Ocean, the Antarctic (also known as the brown) and the south polar. The latter breed is more commonly found in Antarctica, although they are often seen following ships at sea and have been sighted as far north as Greenland and the Aleutian Islands in Alaska. Deneb Karentz, the National Science Foundation's science representative at McMurdo, said she spotted one a few years ago during a boat trip near San Francisco.

By early Sunday evening the skua spotted at the Pole had made its way toward the SPRE-SO camp about five miles away, landing near a goose windsock being used at the ice drilling site. A few miles away, Paolo Rapex, an electronics engineer from the University of Rome, said he also spotted the bird about 328 feet (100 meters) from his research camp at about 6 p.m., thinking at first it was a rock until it moved.

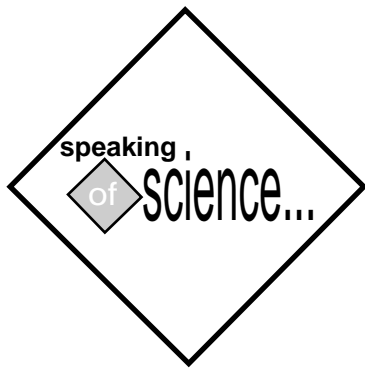
"I stopped the skidoo and it was a very big bird," he said. "It circled us and followed the road. It was an incredible sight because we didn't expect it."



[The creature] was trying to eat one of the orange flags.

A skua flies near one of the runway markers at Amundsen-Scott South Pole Station on Dec. 29. Stray birds find the Pole about once every other year on average, straying hundreds of miles from their native habitat.

Photo by Scott Smith/Special to The Antarctic Sun



Monitoring whales along the west Antarctic Peninsula

By Ana Sirovic

Antarctic whales were heavily harvested during the first half of the 20th century. More than two million of them, mostly baleen whales, were caught in the southern hemisphere during this time, reducing populations to fractions of their original sizes. Baleen whales are toothless, with modified keratinous (same material that your nails are made of) plates that make up their filtering apparatus, baleen. They are huge, and feed on much smaller marine organisms such as krill or copepods. Most of them undergo long annual migrations from their low-latitude breeding areas to the high-latitude feeding grounds.

During the whaling period the whales were caught mostly for their blubber (which is the most important site of fat, which was used as fuel oil), but meat and bones were also exploited. Extreme depletion of many populations of various species (especially the largest one – the blue whale), along with development of alternate, cheaper ways of producing products previously made from whale parts, led to a decrease in commercial whaling and eventually to its end in 1984.

Current low sighting rates of certain species of whales (e.g. blues and fins) make obtaining reliable estimates of their population numbers using traditional, visual survey techniques difficult. We are taking advantage of the recent developments in computer technology to use a relatively new method to study whales: acoustics. Baleen whales, such as blue, fin, humpback, right whales, etc., are known to produce low frequency, species-specific calls. By making continuous acoustic recordings, it is possible to obtain long-term records of the abundance of calling animals in an area, and also to observe their seasonality and distribution patterns.

We have developed autonomous recording packages that are moored to the seafloor and record low-frequency sounds (up to 250 Hz; this is sufficient for monitoring blue and fin whale calls, as well as parts of minke, humpback and some seal

calls). An autonomous recording package consists of a hydrophone, a data logging system, 36 gigabytes of hard disk space, an acoustic release, ballast weights, flotation and lots of batteries. These instruments can currently be deployed and make recordings for 400 days, providing a relatively cheap and efficient way to monitor baleen whales. This method is particularly useful in regions like the Antarctic, which are not easily accessible and have extreme environmental conditions during long periods of time.



Photo courtesy of Ana Sirovic

Three humpback whales swim in front of the Nathaniel B. Palmer in the Gerlache Straits.

We can supplement our long-term recordings with real-time recordings from sonobuoys deployed from an underway ship. Sonobuoys are expendable listening devices that transmit real-time audio records of underwater sounds to the ship via a radio signal. These data can be used in conjunction with visual observations for verification and calibration of the long-term seafloor data.

Our project is part of the U.S. Southern Ocean GLOBEC (Global Ocean Ecosystem Dynamics) program. The main goal of the SO GLOBEC program is “to understand the physical and biological factors that contribute to enhanced Antarctic krill growth, reproduction, recruitment and survivorship throughout the year.” And no such study would be complete without an understanding of the role of krill’s predators: penguins, seals and whales.

Our group collaborates with the

International Whaling Commission on this project. The International Whaling Commission has been conducting visual surveys of whales around the Antarctic continent for many years, and recently have been trying to expand their surveys and tie the distribution of whales to ecological parameters. By using both the more traditional methods (visual surveys, as well as photo-identification studies and tissue sample analysis) in conjunction with the novel methods (acoustics), we are able to obtain a more complete picture of the whale distributions in the west Antarctic Peninsula region.

We have participated in five SO GLOBEC cruises in the west Antarctic Peninsula region over the past two years. During this period we have made some exciting discoveries. Most notably, blue whales appear to remain in the west Antarctic Peninsula throughout the year and do not all undergo seasonal migration. Fin whales, on the other hand, seem to follow the more typical pattern of migration from the higher-latitude areas in the winter. This finding could have an impact on our understanding of the effect of foraging of whales on krill during the winter months. In the future we hope to investigate this impact further, and also to gain a better understanding of the interactions between the whales and their environment.

This year we will be doing a final recovery of our eight instruments that have spent the past two years recording along the continental shelf in the west Antarctic Peninsula. There are endeavors underway, however, to deploy autonomous recording packages at other locations around the Antarctic in collaboration with other countries’ Antarctic programs, including the British Antarctic Survey and the Australian Antarctic Division.

Ana Sirovic is a Ph.D. student at Scripps Institution of Oceanography, in La Jolla, Calif.

around the continent

SOUTH POLE

A rush for the holidays

By Anne Lewis

Pole correspondent

Christmas came to the Quiet Sector Science on Dec. 26, 2002, out at SPRESO Camp (89 55'41.32"S-144 26'30.06"W). The Ice Coring Drilling Services drillers — B. Bergeron, D. Braun, M. Pender and T. Gacke — reached a new record depth of 203.4 meters for a continuous core sample from the South Pole Region. The previous record was 202.4 meters taken in 1982. The drillers will continue using the same 4-inch electromechanical drill to achieve a final depth of over 300 meters.

The South Pole's brisk Christmas morning kicked off with the Race Around the World. Festive runners, dome-head walkers, sofa sitters, snowboard-skiers and Pisten Bully riders all gathered to join in on the 2.3-mile course looping the ceremonial Pole. Allister Knox of the Jeffries Science Group was the top male winner with a time of 17.57 minutes. Leisl Schernthanner was the top female runner with a time of 26.34 minutes.

South Pole's New Year's party was a rockin' good time. The evening got off to a great start with DJ Joe Speidel spinnin' the tunes. The dance floor was already groovin' by the time the first band, NPQ, hit the stage, moving the crowd with a varied set including songs by Third Eye Blind, Jimi Hendrix, Robert Earl Keen and Green Day. All were duly impressed by the set's close. Next up was Clear and Copious, who rocked the house with songs by Queen, Social Distortion, the Ramones and Black Sabbath. Now that's Rock & Roll. Later came South Pole's official Boy Band — Minus 98 Degrees! The squeal and swoons of the audience were evidence of the group's overwhelming cuteness and lip-sync ability. If given the chance, they could probably even sing. Another dose of

NPQ and Clear and Copious sealed the deal — along with the "Near Year's" countdown long about 12:30 a.m. Close enough for Dec. 29 by the Pole's standards.

The ITASE (International Trans Antarctic Scientific Expedition) traverse arrived at the SPRESO Field Camp (five miles out from Pole) at 1:17 p.m. on Jan. 2. The aim is to describe and understand environmental change in Antarctica over the last 200 years. Team members are taking ice cores at 100 km intervals, collect-



Photo by Jon Emanuel/Special to The Antarctic Sun

At the South Pole station 'Near Year' Party.

ing surface snow and ice samples, meteorological readings and collecting radar profiles of the ice sheet. The multi-year traverse started at Byrd Surface Camp, extended to old Siple Station and has now completed this season's final leg to the South Pole.

PALMER

Glacier Search & Rescue

By Tom Cohenour

Palmer correspondent

Most people try to avoid crevasses but the Glacier Search and Rescue (GSAR) team at Palmer Station actually tries to find them. By knowing where the crevasses are and which way they run, the GSAR team can flag a safe route to keep people from falling in.

Crevasses are fissures or clefts in glacial ice, ranging in width from a few

inches to several feet. The depth can reach over a hundred feet (33 meters).

Glaciers look like rivers of ice. Some move quicker than others but in doing so, they ride up and down according to contours of the Earth. The rise and fall causes cracks, or crevasses. As the glacier moves, the cracks open and close.

"Think of a Snickers bar," said GSAR team leader Jim Waters when describing how crevasses form. "Slowly push up in the center and down on the two ends. If you do that, you'll see the chocolate crack in a few places." That's how a glacier cracks. As it slowly moves over a ridge on the contours of the Earth, it extends until the sheer weight of the ice causes the glacier to crack and form a crevasse.

Waters studied at the American Alpine Institute and was an Outward Bound instructor for two summers in Oregon and a member of the ski patrol in Jackson, Wyo. He's traveled on glaciers in California, Washington, Oregon, Canada and in the mountains of Ecuador.

GSAR training began several weeks ago for eight new members recruited from the summer personnel arrivals, of which many have previous mountaineering experience. Orientation included rope use, knot tying and equipment issue to team members. Training exercises are now being conducted on the glacier behind Palmer Station and in crevasses.

For the uninitiated, some of the gear issued to team members might sound foreign: crampons, ice screws, carabineers, prussic rope, figure 8 and picket. Not only does the team need to know how to use the gear, but they also need to know when, under what circumstances, and what the acceptable safety limitations are for their use. Someone's life could depend on it.

The ropes and various knots used by the GSAR team are an art unto themselves. Names like double-fisherman's, figure-eight-on-a-bite, follow-thru and water-knot only begin to describe the amazing array of twists, loops and curls. And each knot has its purpose. "Ideally, each team member will be able to tie each knot perfectly while standing in a cold shower with their eyes closed," said Waters.

the week in weather

McMurdo Station

High: 44F/7C Low: 20F/-7C
Wind: 42 mph/68 kph
Windchill: -13F/-25C

Palmer Station

High: 46F / 8C Low: 32F / 0C
Wind: 43 mph / 69 kph
Melted precipitation: 1.6 mm
Snowfall: none

South Pole Station

High: -5F / -20C Low: -22F / -30C
Wind: 15 mph / 24 kph

Two ways to cross the continent

Science circumnavigates by balloon...



Photo by Joan Myers/Special to The Antarctic Sun

The ATIC payload was successfully launched at 6 p.m. Dec. 29 and as of Friday was traveling at an altitude of 124,000 feet at 20 knots. It's position was latitude 73°49.20 S and longitude: 66°20.40 E. The Boomerang payload will be launched at the next calm weather opportunity, possibly as early as today. Observers are asked to stay outside of the launch pad perimeter. The balloon flights can be followed in real-time at <http://192.149.107.13/ice0203.htm>. Officials at the long-duration balloon facility are requesting people not call for flight updates since personnel are occupied with launch plans.

Others try kite...



Photo by Mark Sabbatini/The Antarctic Sun

An independent adventurer struggles to get a kite-powered buggy moving at Amundsen-Scott South Pole Station on Dec. 29. He and his colleague hoped to revolutionize Antarctic travel by making a 650-mile journey across the continent in 10 days on the buggies. Such a trip normally takes two months on cross-country skis. However, the men abandoned their attempt after only a few days, saying unusually calm wind made it impossible for them to travel.

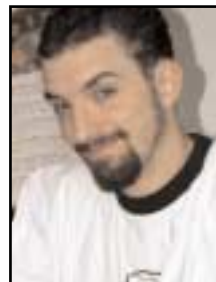
Continental Drift

What is the dumbest question you've ever been asked about Antarctica?



“Probably ‘Is it cold down there?’”

Robert Schwarz,
South Pole
AMANDA
researcher from
Munich, Germany



“What is the elevation at Palmer Station? (while viewing a photo of the dock)”

Chris Vitry
Palmer network administrator
from Denver, Colo.



“Somebody asked if we could see the Trans-Alaskan Pipeline.”

Dave Weimer
McMurdo power plant operator from Palm Harbor, Fla.

NOT REALLY THE NEW YEAR AT THE BOTTOM OF THE WORLD

By Mark Sabbatini

Sun staff

Being at the South Pole means being able to toast the New Year 24 times – once for each time zone – since they all merge at the bottom of the world.

Make it 25 if you go to the “official” party.

Extraordinary as such things might seem by normal standards, for some Pole dwellers it’s as cliché as being able to walk “around the world” in only a second or two. For many researchers and support staff the biggest thrills of the New Year come from more ordinary thrills in an extraordinary setting.

Most anyone willing to go on stage can be a rock star. Partyers may go through rummage bins for fancy clothes or show up for the dance in snow boots. The “beaker juice” gets nearly as many comments for its fresh fruit chunks as its other ingredients. And a few souls may venture into the frigid outdoors and visit the South Pole marker wearing less than their standard expedition gear.

“It’s always neat when you’re working down here because of the lack of facilities,” said Frederick McDougall, an electrician working his ninth season in Antarctica and sixth at the Pole. “You have to do with facilities like (throwing the station party in) the heavy shop.”

McDougall was the singer and violinist for one of three bands that played in the station’s “Near Year’s” party on Dec. 28, held in the workshop where heavy equipment work normally takes place. It’s the only place large enough to hold the station’s 220 summer residents. Also, since the population puts in a six-day workweek with Sundays off, a premature weekend party is generally the preferred alternative to asking most people to work after only a few hours of sleep in the middle of the week.

But just getting ready here is a different experience. Heavy shop workers spent two days getting their work area cleared, including steam-cleaning the walls. Trouble is, there are no drains on the floor, so it’s an eight-hour task to collect all of the water and haul it away for proper disposal.

“The reason we like to do it is because it gives us an opportunity to clean this area good,” said Dave Anderson, a heavy shop foreman from Meridian, Idaho, who is working his first season at the Pole and

third in Antarctica.

For many who are thousands of miles from home, traditions go out the window. Cameron Lewis, a communications operator working her first season at the Pole, said her typical New Year’s celebration is a large bonfire with friends.

“Everybody gets together and throws their Christmas trees on,” she said.

With no trees anywhere near the Pole and no fires – one of the biggest hazards in Antarctica – Lewis spent part of the afternoon helping decorate the heavy shop for the party before showing up with the crowd a few hours later.

Still, plenty of patterns from the outside world are recognizable here. People leave work a bit early to get ready for the night ahead. The party, scheduled to begin around 8:30 p.m., doesn’t really get going until a couple of hours later as everyone is still getting dressed up (or down) and arrives fashionably late for the celebration. There are a few gripes as hot water runs out in some dorms as numerous people take showers (limited by station rules to two minutes twice a week) and do laundry.

In rooms near the shop, band members make sure their instruments and oversized wigs are ready for the stage. It will be the first performance of the season for all of the groups.

“It’s the first time I’ve ever been in a band,” said Michael Boyce, a carpenter from Denali Park, Alaska, who is working his fourth season at the South Pole. But the rhythm guitar player got premier equipment for his debut gig: an expensive model, designed for cold weather, made of graphite and epoxy-injected wood left by professional musician Henry Kaiser. He visited the Pole last year and played in what some call the best gig ever.

Boyce is playing in the band “NPQ,” short for “not physically qualified,” a term applied to those who don’t meet the necessary medical standards for deployment to Antarctica. A second band, “Clear and Copious,” is a common reference to the extremely dry air of the station and the need to constantly drink fluids. A third “rumored” group, known as the “Boy Band – Minus 98 Degrees” will show up

See Near Year on page 8



Photo by Mark Sabbatini/The Antarctic Sun
Dave Anderson, center, sprays water on the floor of the heavy shop at the Amundsen-Scott South Pole Station Dec. 28 in preparation for a “Near Year’s Eve” party that evening.

Near Year From page 7

just before midnight and do its best impression of a lip-synched 80's teeny-bopper band as a hoard of the station's women encourages them on.

Outside the station is silent – an unusual sensation since construction on a new station building and related work typically go on 24 hours a day. Some residents are scattered throughout some other buildings as midnight nears, playing cards in the smoking lounge or watching movies in the recreation room. And an unlucky few have to work, keeping watch at the radio communications center or getting ready for the midnight meal served to employees who work the overnight shift.

A sign in the dining hall asks residents to wash their own dishes, since only one person is on overnight “midrats” duty, instead of the usual four. The cook is Mark Lehman, a Yellowstone Park resident working his fifth season at the Pole, who is preparing assemble-it-yourself fajitas for the larger than normal crowd that may – or may not – appear.

“It’s one of those nights where everybody shows up or nobody shows up,” he said.

Still, Lehman is able to get away long enough to play trumpet for one song in the heavy shop. As midnight nears the growing crowd pays less attention to the chips and pickled eggs and more to the dance floor, but when the midnight hour strikes there is no pause whatsoever to observe it.



Mark Lehman, the night shift cook at the South Pole, takes a short break to play trumpet during a song at the station's "Near Year's Eve" party.

Photo by Robert Schwarz/
Special to The Antarctic Sun

“This is a ‘Near Year’s’ party. We don’t do a countdown,” said “Cookie” Jon Emanuel, head of food service at the station and lead singer and bassist of “Clear and Copious.”

At 12:30 a.m., an impromptu countdown finally happens. The party continues for a few more hours, with the “NPQ” drummer Doug “Dog” Forsythe filling in for both bands after his “Clear and

Copious” counterpart Solan Jensen injured his hand while playing.

Many are up by 10 a.m. that day for one of the big events of the season: the annual dedication of a marker that signifies exactly where the geographic South Pole is. A new marker has to be placed each year because the ice shifts at a rate of about 39 feet per year.

Talk of another party surfaces as the real New Year’s Eve approaches Tuesday, but on a much more informal scale. B.K. Grant, the station’s area director, said a large number of people typically stay up to bring in the real New Year, but tend to disappear from whatever gathering they’re at fairly quickly to get a bit of sleep before the day shift begins.

“Six a.m. comes pretty early,” she said.

South Pole employees Tony Black, right, and Zephyr McConnell hit the dance floor during the station's "Near Year's Eve Party."

Photo by Robert Schwarz/
Special to The Antarctic Sun



happy
NEAR
YEAR!

Marker From page 1

exactly 90 degrees south, the geographic South Pole. A new marker is placed each year because the bedrock at the South Pole is covered by a glacial ice sheet nearly two miles thick that is sliding downhill toward the Weddell Sea at the rate of roughly an inch a day. It moved 32 feet 8.4 inches during the past year.

"Happy New Year, South Pole," said B.K. Grant, area manager for the station, ending a ceremony that lasted only a few minutes. The workers and skiers cheered, then began taking pictures of themselves and others at the new Pole and the marker attached to it.

The annual markers traditionally are designed and made by staff who worked the previous winter at the station. The 2003 design features a copper and aluminum Yin Yang pattern, with a depiction of a moonrise over the South Pole dome on one part and the new elevated station on the other. It was designed by Eric Hansen and constructed by Michael Whitehead, both employees who worked the winter of 2002 at the Pole.

"This is a beautiful one," Grant said during the ceremony. "They did an incredible job. This is something that's going to stay with us forever."

The marker was attached to a support pole by Angie Rutherford, a first-year general assistant from Whitefish, Mont. Station officials typically select a person whose work they consider to be exceptional to perform the task.

"I feel really honored to be a part of this," Rutherford said.

A sign identifying the marker as the geographical South Pole and featuring famous quotes by historic explorers Roald Amundsen and Robert Falcon Scott was moved by surveyors Jack Giacalone and Kurt Skoog, who performed some of the preparatory work, including digging the holes for the sign the day before the ceremony.

An ever-increasing line of poles from previous years stretches out several hundred yards on the plateau. If they are undisturbed and continue traveling at their present rate the poles could fall into the ocean, about 840 miles away, in roughly 140,000 years.

The markers left on the poles in past years are being collected and will be displayed in the new elevated station when it opens. Part of the reason is to provide a long-term location where they can be easily viewed, but it will also protect against possible theft.

"There's been a couple stolen," said Larry Hothem, project leader for geodetic science for the United States Antarctic Program. "I know the 1994 marker is missing."

Hothem is also one of the U.S. Geological Survey officials who spent about an hour just before Christmas taking precise Global Positioning System (GPS) measurements to determine, relative to the continuous operating GPS observatory at the South Pole, where the current marker would be placed.

The measurements include corrections for ionospheric effects and can pinpoint the location within a few centimeters. GPS receivers deployed at stations of an international net-

Marker a work of winter art

This year's geographic South Pole marker was made by Michael Whitehead, a production engineer at Honeywell in Minnesota who spent the winter of 2002 at the Amundsen-Scott South Pole Station as a CARA/MAPO machinist engineer. The following is his account of how he created the marker:

The Pole marker is traditionally designed by a winter resident the prior season, so we were responsible for the 2003 marker. Those interested submitted artwork and then voted to select the final Pole marker artwork. Eric Hansen's artwork was chosen. I was the CARA/MAPO machinist/engineer and the person in that position is typically responsible for making the marker.

I made the Pole marker in the lab out at MAPO. They have a nice machine shop, including Bridgeport mill and gear head engine lathe. The marker I made consists of 12 pieces made of brass, aluminum and copper. The "jewel mount" that holds it is aluminum. Pole markers are typically just a brass puck engraved with the artwork. I have always been impressed with the pride and workmanship of those at the Pole and decided to use my skills as an accomplished tool and die maker and mechanical designer to capture that spirit.

I ended up working a double shift the last couple months of the season—one shift for my job and another shift working on the marker. The tooling at MAPO was limited and the marker was rather complex, so I ended up spending about three hours making tooling and fixtures for every hour of work on the marker.

I really enjoyed working with Eric's yin-yang theme and the artwork in general. His artwork had challenges in itself due to being submitted at about a 2.2X scale. It was very detailed and graphic and many of the lines defining the old and new stations were less than 0.01 inches apart when reduced to fit the 4-inch diameter material at hand. I wanted to capture all of the detail of the artwork, so I needed to make a special fixture to grind the engraving cutter to a 0.002 inch point.

I inlaid aluminum and copper into the brass to accentuate the yin-yang theme of the artwork and provide some color. The copper should oxidize to a nice dark rust color and the aluminum should stay rather bright and shiny.

I wanted the characters to stand out and compliment the aluminum part of the symbol, so I engraved the characters through the brass top ring and backed them up with an aluminum ring to give them the appearance of inlaid silver. The aluminum ring around the yin-yang symbol helps isolate them and cases the letters in conjunction with the first aluminum ring around the periphery of the outer edge of the marker. I also included a copper ring to tie in the copper of the symbol and an additional aluminum ring below for balance.

To create sleek lines and a light impression, I machined a 6-inch radius on the top and bottom halves. I did not want fasteners to clutter the design, so I made the top and bottom halves screw together and capture the accent rings in between.

I would like to thank Jon Berry, Kathy Rawlins and Vince Bollinger for their suggestions and help.



Photo by Mark Sabbatini/The Antarctic Sun
The 2003 South Pole Marker



Photo by Mark Sabbatini/The Antarctic Sun

“Visitors pay more attention to the ceremonial Pole because of the barber pole and all the flags.... People at the station who are in the know pay more attention to the geographic Pole.”
 — Kurt Skoog, surveyor

Surveyors Jack Giacalone and Kurt Skoog move the sign that identifies the geographic South Pole to its new location for 2003. Every year a new Pole, seen in the right of the picture, must be established to account for the movement of shifting ice covering the bedrock nearly two miles below.

Marker From page 9

work, including locations in Antarctica such as McMurdo and Palmer stations, provide reference measurements that allow accurate calculations.

Last-minute checks are later performed to make sure the measurements at the Pole are accurate and nobody has moved the temporary marker indicating where the new and official marker will be placed. As it turns out the temporary marker was moved slightly this year, but officials were able to correct it quickly.

The results from the GPS measurements are much more accurate than previous methods, but since the ice is shifting at the same rate and in the same direction each year it is possible to use a simple procedure for determining where the marker is placed, Hothem said.

"The motion of the ice is a constant, so we could - if you wanted to - make it trivial," he said. "You could go off and measure the distance along the line of motion relative to the previous markers, which we could know the position of within centimeters."

A person watching the Earth's rotation at high speed would see the South Pole marker wobble slightly, said Michael Holstine, science technician for the CUSP research lab at the station.

"We're marking the geographic South Pole, not the axis of the Earth," he said.

As for direction of the shift, anything

moving away from the South Pole is going north. In more navigational terms, the ice is moving along the 40-degree west longitude line.

The South Pole dome is expected to pass near - but not over - the geographic Pole in 10 to 15 years. But nobody seems worried the marker might have to be placed under the dome where nobody can reach. Among other factors: the dome is scheduled to be replaced by 2007.

"I think by the time it (the marker) gets that far the dome will be out of here anyway," Skoog said.

There are three "official" South Poles, plus one major ceremonial one. The geographic Pole - the one at Amundsen-Scott South Pole Station that is relocated every



Photo courtesy of Karen Feather

A group of workers and scientists at the South Pole makes a New Year's toast for peace at the geographical pole marker.

year - marks the bottom of the world at 90 degrees south. A short walk away is the ceremonial mirror-topped barbershop South Pole surrounded by flags of Antarctic Treaty nations.

Second is the magnetic South Pole, where a compass needle able to move vertically as well as horizontally would point straight up. At the moment, the magnetic South Pole is located off the Adelie Coast at about 65 degrees south, nearly 2,000 miles from the geographic South Pole. This Pole moves northwesterly 10 to 15 kilometers a year. It exists and moves because of Earth's iron-rich molten core.

The third is the geomagnetic South Pole, the center of the auroral oval. It owes its existence to the solar wind. It is in East Antarctica and is the most dynamic of the three, changing location with variations in the solar wind.

For visitors and residents, a "hero shot" at the South Pole seems nearly mandatory. Most people end up with pictures of themselves at both the real and the ceremonial geographic poles.

"I think visitors pay more attention to the ceremonial Pole because of the barber pole and all the flags," Skoog said. "I think people at the station who are in the know pay more attention to the geographic Pole."

Revolt

Fiction first place
by Rebecca Glover

Penguins! With Uzis! The noted Principle Investigator raised his head from his knees and risked a glance at the sentry standing next to the orange mesh fence. With an angry squawk, the penguin leveled his weapon in their direction and opened fire. Bullets drilled a line of holes across the Jamesway above the humans' heads, showering them with wood chips. The noise was deafening, but when it ended, the PI heard something even worse: the nasty, high-pitched cackle of penguin laughter. The PI buried his head in the huddle of red-coated humans. Someone sobbed in fear. Probably the camp cook, Kelly. The sound brought another blast of gunfire, another shower of splinters.

Don't call attention to yourself! That had become his mantra. MacOps would send someone to check on them, eventually. Their radio check was hours overdue. Through his fingers, the PI watched their leader hand his Uzi to a subordinate and waddle toward him. A small foot landed a heavy blow on his shoulder, spinning him onto his back. Their leader stared down at him with glittering penguin eyes—cold eyes. He had never noticed how cold their eyes were. He clamped his hands tightly over his own eyes to blot out those cold, dark eyes.

Suddenly, a blade of a beak thrust into his mouth. He felt a rasped tongue slide over his own smooth tongue, then a lumpy mass of warm liquid filled his mouth. *Vomit! Penguin vomit!* The PI twisted to one side and retched the pink liquid onto the sea ice while their leader threw his head back, brayed and pumped his wings in the classic ecstatic display.

Screw the graduate students! Every man for himself! The PI scrambled to his feet and ran for the fence. He almost made it.

The judge said, "I liked this story primarily for the humor, but also because something actually happened in 300 words! It was a fun twist on the "look at the cute penguins" theme."

Rebecca Glover is a second-year computer hardware technician at McMurdo Station. She was an English major at Vanderbilt University and is currently working on a master's degree in writing popular fiction at Seton Hill University in Greensburg, Penn.



Tom and skua silhouette with Mt. Williams Photo by Laura Hamilton, painter apprentice

The judge said, "You have this human as big as the mountain and a large bird. It's a strange sense of proportion.... It makes an interesting photo."

The Urn-maker's Son

Fiction second place by Karen Joyce

I was born in Etrusca where my father was an urn-maker. My family was not well off, but we always had enough millet to last the winter. Except, of course, for the Insect Year, when all the villages starved. I especially remember one afternoon that summer. We were playing down by the river when my friend Abda spotted a fish caught in an eddy.

"Idyah!" he cried. "It is mine!" We all splashed into the water together, grabbing at the fish and pulling each other down. The fish sparkled in the sunlight before disappearing into a hole. We dove after it and as we gave chase, it led us to an underwater tunnel. Swimming along, we soon came to a cavern where djinis in odd stockings were working at anvils. We ducked behind a rock, but they spotted us nevertheless.

"Come out, boys!" they shouted. "Do not be afraid! We will grant each of you one wish!"

Abda stood up first, his voice shaking. "Ndotis, if you please, I would like our village urns to be filled with millet!"

"Granted!" cried the djinis.

Urguk went next. "Ndotis, my family would be grateful for a herd of fat sheep!"

"Granted!" cried the djinis.

Then it was my turn. "Ndotis, I would beg to become a Dining Room Attendant at McMurdo Station, Antarctica!"

"Granted!" they cried again.

And so, my friend, this is how I came to find myself here, scrubbing at the sides of these pans with yourself. But now I must also ask from what place is your origin? Ah, Denvercolorado! I do not know it, but to judge by your belly it must be a magnificent village, urns overflowing with millet! Oh, with Arbeez, you say? Well, I am sure it is most delicious!

The judge said "Again, the humor in this story was appealing. I liked the use of the old-fashioned fable format. The author was able to tell a complete story — beginning, middle and end — with 300 words. The imaginary element made the story vibrant."

Karen Joyce's bio is on page 16.



Swirling snow
Second place scenic

The judge said, "It looks like a science fiction set....It's strange, unearthly, Mars-like or something. It was taken under very strange lighting circumstances."

Photo by Zee Evans,
PM shop forewoman,
McMurdo Station



Moon over the Royal Society Range
Third place scenic

Photo by Bill Servais,
dentist, McMurdo Station

Fiction judge:

Lucy Jane Bledsoe judged the fiction entries. She was an NSF writer grantee in 1999. She has published children's novels, literary essays and short stories, including one based at McMurdo Station called "The Breath of Seals" which can be read on the Web at <http://www.bliethe.com/bhq6.2/6.2.04.html>

She wrote:

"I want to congratulate all the Antarctic writers who were brave enough to submit a story for the fiction contest. Writing a good 300-word short story is considerably more difficult than writing a 10-page one. I looked for stories that were complete, i.e. moved a character from one state of being to another, and stories that elicited a genuine response in me the reader, like humor or sorrow."

The judge said "The sorrow in this story really stuck with me after my first reading. I liked the impressionistic style, and also the dramatic use of the ice cloud mirroring the emotional truth of the story."

Joe Mastroianni lives in California where he's hoping his abandoned career as a Silicon Valley executive doesn't interfere with his screenwriting and publication of his novel about Antarctic adventure.

Ice Cloud

Fiction third place
by Joe Mastroianni

"Mac Ops on Mt. Aurora."

The cold subsided. Pressure lifted from his chest. His hands and feet stopped hurting. There was only the lump of dead hand warmers in his gloves and boots.

Gail would get the car. He saw it in her eyes when he left her in the airport, and he could read between the lines in her messages. She wasn't asking for the lawyer's address to send him the papers, she was negotiating for the car.

D--n. That was Robert's car.

If only he could find the radio. He would call Mac Ops and tell them to stop g----- Gail.

"... Mt. Aurora."

Before he left the hut they told him walk west and he'd be okay, around the nose of the glacier.

Then the glacier disappeared into a cloud. The landscape was gone. The wind stuck its fingers through gaps in his ECWs.

He thought about Gail while he walked, her green eyes. How many times had she said she loved him? Lots of years. Lots of time. Not anymore.

He pulled his zippers as high as they would go, tightened the hood until he could only see a circle of light, and kept going.

Until the wind got so strong it was hard to move. Then he hid behind the boulders.

He should drink or eat. Move. Anything to get warm. But he wasn't cold anymore.

"J.T."

The radio kept going off. He felt for it. His hand moved in his mind, but when he looked down, it lay still like a part of the landscape. Gone.

Not that the radio would make any difference. Nobody could find him in this storm.

The cloud that ate the mountain was upon him. He felt sharp particles of ice against his cheeks.

Then that was gone too.

Ice Blinks

Non-fiction first place
by Susan Monroe

Diane died. I ran. South for the winter, where it is actually summer – an Austral Summer, a Polar Summer - one long summer day in Antarctica.

Stepping off the C-141 plane onto the ice runway, I waddle, overstuffed in the downy insulation, neck craning to take it all in. Everything is new, everything is different. That's the point, isn't it? I've left behind a husband of 33 years, grown sons, my life in suburbia.

I think about Diane. Is this all she would have needed to save herself? Detective Boatright chronicled the books in Diane's backpack the day she died: *Scared Life*, *The Reluctant Shaman*, *Life on the Path*. She was striving, as I am. We lived remarkably parallel lives.

A passage in Worsley's *Endurance* describes how early Antarctic sailors searched the clouds for iceblinks. Glaring white reflections on the underside of clouds indicated pack ice. Darker lanes pointed to open water and a way out. Diane desperately needed an iceblink, a way to chart a course out of the pack ice of her past.

She possessed an innate ability to see motives not readily apparent to others. This sort of ability in mid-life can cripple. She sensed being overlooked, dismissed. Accomplishments shrouded in the cloak of middle age.

Two shots were fired in the house at chest level – as if she were aiming at something or someone. The third shot was fired in the yard. A shot-gun blast to her chest. Gun held an arm length away.

This place where the sun runs seamless circuits above the horizon, where unseen forces trick the eye with inverted images and splash sun dogs on the horizon...this place of myth and heroic acts ...this place of isolation and refuge...this place could have saved you, Diane. It's going to save me.



Hot Day on Torgy
Adelle penguin chicks on Torgersen Island
First place wildlife

Photo by Cara Sucher,
lab supervisor,
Palmer Station

The judge said, "They are just so cute. They are really hard to resist."

Non-fiction judge:
Gretchen Legler, PhD, judged the non-fiction entries. She is an associate professor of creative writing in the Department of Humanities at the University of Maine at Farmington. She was a NSF writer grantee in 1997. She has published one book, *All The Powerful Invisible Things: A Sportswoman's Notebook*, and numerous essays, stories and articles.

The judge said, "In addition to having all the elements of a powerful piece of nonfiction writing, the prose here is clear and careful, strong, and full of detail. A beautiful, sad, and moving piece of writing."

Susan MacGregor Monroe, PhD, is senior analytical chemist at McMurdo Station in her first season on the Ice. Her only previous writing experience involved scientific journal articles and/or technical papers.



Reverie
A blue-eyed shag
Second place wildlife

Photo by Joe Pettit,
station manager,
Palmer Station

The judge said, "This one is just really very elegant."



Penguins porpoising
Third place wildlife

Photo by Laura Hamilton,
Painter apprentice,
Palmer Station

The judge said, "This is really about penguin life. We forget that they spend all their time in the water."

Morning, Lake Hoare, Summer 2002

Non-fiction third place
by Joe Mastroianni

Light flickers through the skylight, the airborne turbine whining, downdraft thumps against the walls of the hut. In the air, the scent of toasted muffins and melted butter. A couple breakfast plates are piled beside the sink.

In the corner the radio barks, busting the temporary silence into shards of day like ice. The glaciologists are off to Commonwealth, then the Canada.

There's a creak in the heavy door when it opens, reverse refrigerator. It's a sound that becomes part of you, so you don't hear it anymore. You just know what it means. Someone walks in, tosses a hat onto the table, checks to see if there's any hot water left and, finding none, sets some on for tea.

In front of you, granola in a melmac bowl, the kind your grandmother had. Coffee mug of orange juice. Formica table and folding chairs straight from the last church bazaar.

Someone grumbles about the helo schedule. A joke about the rocket toilet.

The judge said: "The power of this short piece comes from the wonderful sensory detail about smells and sounds, and also the turn in the middle, where the narrator makes the connection between his/her life in Antarctica and his/her childhood through the melmac bowl full of granola....A wonderful piece of writing."

Clear the sleep out of your throat to laugh.

Have you been drinking enough water? How many days will you wear these socks? Is the sun still rising over the house you lived in as a child?

Did you ever think you'd look up one day to see the glacier face, the mass of blue ice that groans and shatters like an upturned china cabinet?

You say, "In your life did you ever think..."

She answers, "What?" first word she's said today.

Say it's science. Say it's work. Say it's a pain.

Outside it's not wintertime Chicago, or a blustery Boston afternoon, or Paris, or Stockholm, or even Ulan Bator.

When the door opens and the sun tears in on a Paleolithic blast of air, look around. So little of the universe is inhabitable.

And here you are.
Antarctica.

The longest night

Non-fiction second place
by Judy Spanberger

The sun set March 20th. We watched out the windows of the new station as the giant yolk, sitting on its vast white, sank lower and lower - a radioactive egg glowing sunny-side up. The clouds were pink around the edges as they nestled in the darkening blue, like a Georgia O'Keeffe painting. A month later it's as though we've never seen the sun at all.

It's much colder - minus 80 or below. Breathing is like sucking in baby bee stings. Everything fogs up and I find it easiest to get around without glasses or goggles. I pull my hat low and my neck gaiter up to my eyes, leaving a slit to see. I fall down from time to time, but since I never know it's coming I don't tense up and seem to bounce. Wearing 50 pounds of clothing helps.

Sometimes this life seems so incredibly difficult and I want to shake my fist at the Gods. And it all snowballs into bigger questions of life and pain and hunger in the world, and children born into unloving situations and mean people and, and, and...

And what could I possibly do about it all from here? Then I sit on my knees and weep, tears freezing to my lashes.

More often I walk to the storage berms or milvans and wonder how lucky I am to be here. We see auras now almost daily - sometimes a broad sweep of God's paintbrush or curling up like the smoke off a giant cigar and shimmering high in the heavens. Other times they drip down like animated chandelier crystals. They seem to dip low enough to reach up and grab one. If I could grasp one would I touch the face of this southern God who challenges me so?

The judge said "The strengths of this second-place winner include: beautifully descriptive figurative language....Compelling and beautiful writing."

Judy Spanberger's 2002 winter at the South Pole as the construction cargo senior was her second winter and her 10th season since starting with the program in 1988. Last summer she served as South Pole correspondent for *The Antarctic Sun*.



Halloween sunlight
First place people

The judge said, "You see this sort of photo a lot, but this one is really successful. Something real fortuitous happened here."

Photo by Zac Willette,
general assistant,
McMurdo Station

The white of morning

Poetry first place
by Stefan Pashov

The white of the morning
opens it's empty hand,
and everywhere I go,
I am just in the center
of the world.

*The judge chose this poem
"for its elegant expression of
a complex thought in decep-
tively simple terms."*

Stefan Pashov is in his second McMurdo season, working in supply. He left Bulgaria in 1986, where he had degrees in world literature, linguistics, history, theory of culture and philosophy. He teaches poetry writing and has put together a book of about 700 short meditations.

Poetry judge: Bill Fox was a NSF writer grantee in 2001. His coming book on "envisioning Antarctica: history and nature of antarctic images" will be his fifth non-fiction book on how people transform land into landscape.



Launching XBT's from the LM Gould Photo by Graham Tilbury,
Second place people Palmer Station

The judge said, "It really gives you a sense of the volume and power of water in the ocean and how vulnerable we are to it."



Retiring Old Glory Photo by Doug
Honorable mention Ruuska,
people met tech
Onset D camp



Trash Truck 2002 or 1962?

Third place people

The judge said, "This is just such a classic-style photograph."

Photo by Mark Furnish,
waste operations manager,
McMurdo Station

Ob Hill

Poetry third place
by Ron Smith

Lucullan vista
crowns the height of that hill,
severed by a sword
of one word,
secret of an only sky,
commands the sun
to fall,
falter in flattened sheen
against glacial waves,
rigid ice-islands
on a blue plate,

Snow mountains teethe
through clouds
white as light,
crystal rivers empty
slowing time,
as if sea
became land,
and formed one soul,
one life,
uttering it's lone word,
within an eternal howl
of winter —
Be.

The judge said, "It deals precisely with what the landscape demands as a human response."

I refuse to go jogging with penguins

Poetry second place
by Karen Joyce

I refuse to go jogging with penguins.
They insist upon changing directions.
All that sprinting and stopping
And preening and flopping
We'll never get anywhere, hopping.

And then there's the Antarctic Treaty.
Yes I know that this isn't Tahiti.
Our species must never
Disturb or endeavor
To jog with the locals. A pity.

No, penguins make poor running mates.
When choosing a partner, a penguin equates
To picking a man with a soccerball belly
Stubby little legs and a body like jelly.
If I could find no one else, I suppose they would do
But where would I find them a good Nike shoe?

The judge said: "It's funny, which is difficult to do in an Antarctic poem without lapsing into bad imitations of Robert Service, and compact in expression."

Karen Joyce writes "In my 12 years on the ice, I've weathered more regime changes than an Albanian peasant. During the day, I coordinate computer support for the Crary Lab. But my best work is done at night: committing occupational suicide by writing comedy novels about life in McMurdo."

Ron Smith is the Air National Guard Liaison for the NSF Office of Polar Programs and previously came to the Antarctic with the 109th Airlift Wing. He is seeking to publish his first book of poetry, with previous publication in obscure magazines.



untitled
Honorable mention
people

Photo by Geoff Gilbert,
environmental remediation,
McMurdo Station



Flags on the Castle Rock Trail
Second place other

Photo by Robbie Liben,
 senior computer technician, McMurdo Station

The judge said about her selections for the other category, "These are three totally different images....The reason I picked them is that here, we can see ordinary things in a different way."



Bar ice
Third place other

Photo by Cara Sucher,
 Lab supervisor,
 Palmer Station

Haiku judge: Andrew McCarter, currently a curriculum and assessment specialist, worked in the waste barn of McMurdo last season. Last year he was a double winner in the writing contest.

James Battaglia is a first-season electrician's apprentice at McMurdo Station. He writes haiku, anecdotes about his experiences and some short stories.

Zac Willette, a first-season general assistant at McMurdo, loves being from Blue Earth Minnesota. He grooves on language, digs visuals and misses teaching.

Bunny Boot Haiku

Haiku first place by Zac Willette

I am Bunny Boots.
 You mock me because you love
 How I make you sweat.

The judge said "1! 2! 3! Bunny counts out the competition with three confident declarations."

Spring sun

Haiku second place by James Battaglia

Spring sun warms snow
 Slumbering stream awakens
 Two wood ducks dance

The judge said "This poem, like spring itself, slowly comes to life."

Wind strums McMurdo

Haiku third place by Karen Joyce

Wind strums McMurdo
 Volcano island music
 Phone wires are singing

The judge said "the lines of this poem are themselves like three taut, parallel wires of a tiny musical instrument."

“Hello, natural laboratory.... We’re using the best possible place to get the best possible data on our production rates.”

— *Kim Knight,*
geology student



Photo courtesy of Paul Renne

Kim Knight collects rock samples in the McMurdo Dry Valleys to test for cosmogenic argon-38, which could become a new way to gauge the age of stones.

Rock From page 1

“It could be quite significant,” said Warren Sharp, another researcher at the Berkeley Geochronology Center. “Determining the ages of surfaces is of interest in many areas of geology, for instance, glaciology and related paleoclimate work.”

Bombarded by particles

Cosmic rays strike the Earth’s atmosphere from all directions, setting off nuclear reactions that spray out ions and subatomic particles such as neutrons.

“It’s basically this constant rain of particles on the Earth,” Renne said.

As they strike the ground, the particles sometimes blast elements in the top few centimeters, splitting off pieces and transforming them into other isotopes. Many such reactions are known to produce helium-3, for example, and an atom of calcium or potassium could be hit by a particle and turned into argon.

The particles hit people and animals, too, but normally we aren’t around long enough for the barrage to have any long-range effects, Renne said. Rocks, on the other hand, lie around like targets for thousands or even millions of years, long enough for the particles to leave their mark. Often these marks fade, since the cosmogenic, or cosmically-caused, isotopes produced are radioactive and decay away.

The trick is to find isotopes that are sta-

ble or have a long half-life that can be easily read. So far, stable helium-3 is the best tool geologists have for studying ancient rock surfaces. Geologists have established that helium-3 is created in many minerals at a rate of about 100 atoms per gram per year when cosmic rays blast apart heavier atoms. With that knowledge they can measure the number of atoms of helium-3 in a particular rock and know how long that rock has been exposed.

“Right now the major techniques that get used for this are isotopes that require very, very expensive instrumentation, which really limits what you can do,” said Ken Farley, a geologist at the California Institute of Technology.

Argon would be better than helium-3 because it is not prone to leaking out of minerals, as helium does, “which means we can use this isotope to study rock far, far back in geologic time,” Renne said. Argon and helium are both noble gases, a rare group of gases exhibiting great stability and low reaction rates.

“Argon is really the lightest noble gas that gets stuck,” Renne said.

Argon could also be tested for with smaller rock samples than the tens of grams needed for two other commonly studied cosmogenic isotopes – beryllium-10 and aluminum-26, Renne said. The application of both beryllium-10 and aluminum-26 is limited by their radioactivity.

Before geologists can use argon as a

measuring stick to date rock, Renne needs to calibrate it. To do that, he needed a number of rock samples likely to contain cosmogenic argon.

Several years ago, Farley used helium-3 to measure the rate of uplift in the Dry Valleys and gave Renne some of the mineral samples. In them, Renne found argon-38, an isotope he’d previously measured on moon rocks.

Argon-38 is more common in moon rocks, because the moon is exposed to higher levels of cosmic radiation than can make it through the Earth’s protective atmosphere. The moon’s surface is also very stable, like the Dry Valleys. Other scientists have measured argon-38 in lunar rocks and meteorites for about 30 years, but Renne’s team was the first to detect it on Earth.

“Where you’re really going to see it is places with really, really low erosion rates, like the moon or Antarctica,” Renne said. “The Dry Valleys are without question the slowest eroding place on Earth.”

Indeed, a Swiss study five years ago found a boulder on Mt. Feather in the Dry Valleys that had been exposed to the surface for at least 10 million years, based on their measurements of helium-3. Much of the Transantarctic range has been exposed from 1 million to 5 million years. In other areas of the world, it’s more typical to find rocks that have been exposed for 1,000 to

Rock From page 18

100,000 years.

“More than a million years is very unusual,” Renne said.

Antarctica also receives twice as much cosmic radiation as lower latitudes because the Earth’s magnetic field is especially steep here, which means the deflection of incoming protons is minimized. Renne knew the best samples would be found someplace with nearly flat or gently rounded mesas and no glacial erosion.

The Dry Valleys were ideal.

“Hello, natural laboratory,” said Kim Knight, a graduate student at the University of California at Berkeley, who is working with Renne. “We’re using the best possible place to get the best possible data on our production rates.”

Lab work

Renne and Knight collected 20 rock samples from Salmon Hill, Schist Peak, Beacon Valley, Table Mountain and Mount Fleming. They’ve taken the samples back to the Berkeley Geochronology Center in Berkeley, Calif, where Renne was the founding director and currently is a geochronologist.

They will grind the rocks coarsely to separate out the minerals they are most interested in – those rich in calcium and potassium – which show up as shiny specks in the rock. They’ll test the samples for the starting minerals by irradiating them in a nuclear reactor and measuring how much argon-37 and argon-39 are created from calcium and potassium respectively. Then the samples are gradually heated to determine how much argon already existed in the rock and how much came from cosmic radiation.

“The atoms don’t have cosmogenic and non-cosmogenic written on them,” Renne said.

About 20 milligrams of the crystal, like a pinch of salt, is put in a near vacuum and slowly heated with a laser. After the sample reaches about 600C it begins to release argon. The first argon released comes from the atmosphere. About 0.8 percent of the Earth’s atmosphere is argon and of that, 0.06 percent is argon-38.

“It’s only when you start to really heat these crystals up and the chemical bonds start breaking that you get the cosmogenic argon,” Renne said.

Young rocks won’t have any cosmogenic argon, but old rocks like those found in the Dry Valleys will.

At 900C, the powdered rock glows orange. At 1,100C it’s iridescent, like a lava lake. Eventually it becomes white hot. After it



Photo courtesy of Paul Renne

Paul Renne uses helicopters to find likely sites for the kind of rock samples he needed, usually flat or slightly rounded mesas without glacial erosion, where the stones would have been exposed for a long time.

cools all that is left is a radioactive bead of black or green glass and hopefully a new understanding of the rate at which cosmogenic argon develops in rocks. That knowledge will have a number of applications, including studying the erosion history of land masses and the uplift of major mountains.

“We can look at the balance between processes that uplift mountains and processes that erode mountains,” Knight said.

Potentially argon-38 and helium-3 could be used together to learn about the elevation of the Earth’s surface as a function of time, Farley said. If that works, they might help determine when the Tibetan plateau became elevated, an “incredibly important Earth science problem that nobody’s been able to solve,” Farley said. “The Tibetan plateau controls a tremendous amount of global climate.”



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Profile

Big duties come with leading smallest U.S. Antarctic station

By Kristan Hutchison
Sun staff

Getting to Antarctica was Bob Farrell's boyhood dream. Being there has become his career.

Farrell had wanted to go to Antarctica since he read Admiral Byrd's book *Alone* when he was 12. As soon as Farrell finished college he began asking around about jobs there. He was teaching English in Japan when he finally landed a job as a general assistant at the South Pole, flying all the way to Denver to interview.

Since then, Farrell has spent a decade in the Antarctic program. He worked his way up to area director for Palmer Station. A neck injury kept him from deploying to Palmer this season, where he was supposed to put in his fourth season as station manager. The winter station manager, Joe Pettit, who has been there since March, had to continue in that position for a full year.

"It's his first time as a station manager and he's done an exceptional job," Farrell wrote from Denver.

In Palmer, Farrell is remembered as a movie buff with a sense of humor.

"He likes to laugh, tell jokes and is very sociable," said Tom Cohenour, who worked with Farrell in past years.

A fan of the Austin Powers movies, Farrell dressed as Dr. Evil last Halloween in Palmer and often quoted lines from the series: "Why must I be surrounded by idiots!" or "I will not tolerate your insolence!" He sometimes even broadcast soundclips from the movies over the all-call system, Cohenour said, "All done in humor, of course."

The humor is balanced with work.

"He's an approachable, concerned leader, who can focus on the big issues, lay down the law when he has to, but still manage to have a lot of fun," said Barb Watson, an instrument technician at Palmer Station who worked with Farrell last year.

Stuck back in Denver this season, Farrell can see all the movies he wants, but misses Palmer.

Palmer is the smallest of the three U.S. research stations in Antarctica, with a support staff of 24. That's exactly what Farrell likes about it.

"I like the community aspect," Farrell said. "That's the best thing about Palmer, that it's a small and interdependent community."

The same types of tasks need to be done as at a larger station. But with fewer people to share the responsibility, every-

one has to have a broad range of abilities, such as the mechanic who takes care of all the vehicles and the power plant, or the station doctor who also takes air samples.

"The downside of it being small is you have very, very little private space," Farrell said.

Fifteen people often share one bathroom.



Photo by Kristin van Konyneburg/Special to The Antarctic Sun
Bob Farrell near Palmer Station last season.

There is no space to go for a run, since Palmer is on a small patch of bare ground surrounded by water and a glacier. To get away from it, Farrell walks up on the glacier when the weather is good or goes out in a zodiac, the small boats they use.

"Just to get out to the backyard or out in a boat clears your head, gives you a better perspective."

One time he was out in a zodiac and saw some whales. They cut the engines to watch and soon three humpback whales were surfacing within a few feet of the boat.

Those good weather chances don't come very often, though.

"We have this reputation of being the Club Med or the Banana Belt," Farrell said. "But a lot of times it's rainy and gray. You can't get out. You can't see the beautiful mountains."

Even when the weather is nice station manager Farrell is often stuck in his office. He's dealt with some difficult situations from there.

"There are times I felt we just had a guardian angel watching over us," Farrell said.

One of those was in the winter of 2000, when a man at Palmer had a heart attack and needed to be medevaced. The question was whether to send the station's only doctor out with the patient.

Both ships, the *Nathaniel B. Palmer*

and the *Laurence M. Gould*, were at the dock meant for only one ship. In Palmer Station's normally windy weather it would have been disastrous, with the wind and waves knocking the ships into each other and the dock. But for a full day and night the wind and waves stayed calm, just long enough to stabilize the patient and send him out without the doctor.

"When it works out well it's a relief and you learn a lot of lessons from it," Farrell said.

On another occasion, Palmer Station was able to help out one of its neighbors, Rothera Station. The British ship *James Clark Ross*, carrying 16 passengers and cargo for Rothera, couldn't make it to the British station because of ice. Instead, it pulled up alongside the *Gould*, which was at dock that day. The cargo was transferred across the ships to the dock, then the community pitched in to haul it up the hill to the glacier, where four British Twin Otters landed and shuttled the people and gear to the station.

"It was one of these great Antarctic experiences – international cooperation, community spirit, everyone just working so hard," Farrell said.

Farrell is also the official station greeter when tour boats come. Though Palmer is the smallest of the U.S. Antarctic stations, it gets the most visitors because it is on the well-traveled cruise route along the Antarctic Peninsula. Only a dozen tour boats are allowed to disembark passengers at Palmer each year.

"It's a balance, because it's a huge impact when they come ashore," Farrell said. "But it's also energizing because you get these people who are so thrilled by things we take for granted."

Last season a larger cruise ship came to Palmer for the first time, Holland America's 1,266-passenger *Ryndam*. The ship dwarfed the station and carried too many passengers to let them come ashore, but Farrell and others went aboard to give a talk.

"That was surreal. We got onto the ship and it was like this four-star hotel," Farrell said.

Posh as it was, Farrell was happy to return to his more modest accommodations at Palmer Station.

"It's a magical place at times, where you just stop and you're awestruck by what's around you," Farrell said. "All of Antarctica is."