

The Antarctic Sun

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Glad hands



A Spryte-load of general assistants waves to a passerby. Each year people from a wide range of backgrounds become GAs. The job entails a broad spectrum of work, from shoveling snow and dirt to entering data and cleaning equipment. See related story on page 12. Photo by Beth Minneci.

Quote of the week

"Normal is something you set your dryer on."

- Veteran McMurdoite on weather in Antarctica

Winging it

Snow petrels visit island

By Kristan Hutchison Sabbatini
Sun staff

"Pretty bird, pretty bird," Andy Klein shouted down to his fellow scientists, digging soil samples from a hillside on Bratina Island on the other side of the McMurdo Ice Shelf.



A snow petrel in flight

Dianna Alsup looked up and saw a white bird flying ten feet away, wings curved like scimitars glinting in the sun. The snow petrel swooped past, then soared up the hill.

"I don't know why the dove's the symbol see Petrels on page 5

water life and death in the valleys



A seal, dead in the Dry Valleys.

By Beth Minneci
Sun staff

For just a few weeks in the Dry Valleys each year, glaciologist Thomas Nylen can hear a steady trickle of water flowing past the dome tent in which he sleeps.

The rest of the year water is frozen, silent.

In Taylor Valley, one of three in the area, the largest of the valley's science camps is nestled among gigantic ice sheets plunging over cocoa

peaks. On the ground, tents and research huts look toy-sized next to an 80-foot ice wall – the cliff face of Canada Glacier, and the subject of Nylen's intense scrutiny.

This afternoon, on soft, pebbly sand at the glacier's edge, water streams gently past Nylen's boots, feeding Lake Hoare. He points with a pole to ice blocks that have split from the edge, piled like rocks fallen off a mountain. It's called

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Old practice, new problem

By Josh Landis
Sun staff

McMurdo Station's history of local trash disposal surfaced this week when excavation for the new waste treatment plant uncovered a forgotten landfill. A bulldozer dug into the ground near the blasting site by Winter Quarters Bay on Wednesday, exposing an old pile of discarded food.

A skua landed to investigate some of the 1960s-era sausages, but even it didn't find them appetizing. They were in remarkable condition considering their age. They've most likely been frozen solid ever since they were thrown away.

The garbage must now be disposed of again.

"We're going to dig out what we can see and send it out as food waste," said Tom Vinson, McMurdo's waste management supervisor. His team will put the old food into boxes and keep it frozen so it won't spoil. After it returns to the U.S. by ship it will be burned at an incinerator in Washington.

In the early days of the program, the slope that leads down to the bay was used as a dumping ground for varying types of refuse. After remediation efforts by the National Science



This week a bulldozer unearthed sausages and other food estimated to be more than 30 years old. The garbage will be shipped off the continent with the rest of McMurdo's food waste. Photos by Josh Landis.

Foundation in the 1980s and 1990s however, the area looks virtually clean.

From time to time, however, pockets of old trash turn up. In this case the amount of food waste was small enough to be contained in 18 large, cardboard boxes and shipped off-continent. ■



Home improvement

Paul Zahradka attaches a cone to his gingerbread house with icing Monday night. A dozen gingerbread houses were decorated this week by dining attendants and volunteers in preparation for Christmas. Photo by Kristan Hutchison Sabbatini.

Take your best shot!



*The Sun's Photo Festival
is only two weeks away!*

*Share your vision of
Antarctica with the world*

One entry per person

Submit via e-mail to AntSun@polar.org
Deadline: Saturday, January 6

Public judging will decide
winners in three categories:
Scenic, Wildlife and Other

News In BRIEF

Helicopter ready to fly again

A helicopter stuck on the edge of the sea ice since Dec. 16 will be flown home as soon as the weather clears, said Jack Hawkins, project manager for Petroleum Helicopters Inc.

The AS 350, or A-Star, was shifting a 1,500-pound (680 kilogram) gondola when the clamp holding a cable failed. The cable snapped up and hit the main rotor, nicking one of the blades. The pilot safely lowered the helicopter from about 60 feet off the ground, Hawkins said.

One inspection is left, but maintenance crews determined the helicopter is safe to fly once the rotor blade was replaced. PHI keeps spare rotor blades on station.

Operation a success

An experiment on Pegasus runway with a wheeled plane went well last weekend, station operations manager Bill Haals said. An LC130 landed on skis, then moved across the snow on wheels. The test is part of an effort to build a summer snow pack sturdy enough for Pegasus runway to one day take over as a wheeled-plane landing site once the sea ice runway closes each December. The runway is closed mid-November to late January.

Almost all of the compacted snow held up, with the wheels breaking through in just a few places, Haals said. More tests are planned this season.

corrections

The Sun would like to clarify some statistics on USAP waste management: The program reuses 34 percent of all waste, 29 percent of solid waste and 55 percent of hazardous waste (in the form of oil and fuel). Last season a truck-load of paint and glue that was shipped to Latvia, not soap. Two buildings burn waste oil.

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LETTERS to the editors

First and foremost, a special Christmas greeting to wish you the love, joy and peace that the Christ child brought to the world: may it be yours personally and extend to your family, friends and our community.

There is a simplicity about Christmas that shines through the tinsel, social demands and commercialism that can permeate the season. Somehow our hearts are touched by the humble Bethlehem setting with the baby, the stable, shepherds, animals and above all Mary and Joseph who were forced to be away from home and family at this special time to satisfy a census demanded by a foreign power – the Romans.

For those of us who come to the crib with faith, a whole new world opens up because we believe that here lies the child of God's promise. This child that would come to be known as the Messiah, Son of David, Son of God, Savior of His people and the

world. We live in a world of new technology, global communication and interaction. We think we are very smart and sophisticated. The truth is, it is nothing compared to the wonder that we celebrate at Christmas.

I've not been here at this time of the year before. Now as I enter the chapel each morning and look at the simple crib in front of the altar, then look out the window at the Antarctic mountains, I'm somehow deeply touched by the contrast of the little crib of 'our creation' and the wonder of God's creation that surrounds us.

My prayer is this: that the Spirit of Christmas will live in our hearts and touch our daily lives in the years ahead. May we learn some truths from a reflection on the Bethlehem scene that 'speaks' to us of humility, simplicity, joy, peace and love: my wish for you and all of us at Christmas and always.

- Father John Coleman

the week in weather

around Antarctica

McMurdo Station

High: 36F/2C
Low: -14F/-10C
Windchill: -9F/-23C
Wind: 31 mph/50 kph

Palmer Station (Saturday)

High: 51F/11C
Low: 30F/-1C
Avg. temp: 35F/1C
Wind: 28 mph/44 kph

South Pole Station

High: -16F/-27C
Low: -23F/-31C
Avg. temp: -19F/-28C
Wind: 21 mph/34 kph

around the world

Saturday's numbers

Iqaluit, Canada

High: 34F/1C
Low: 22F/-6C

Singapore, Singapore

High: 86F/30C
Low: 75F/24C

Bergen, Norway

High: 38F/3C
Low: 32F/0C

Bergen, NY

High: 26F/3C
Low: 17F/-8C

Dwight, Ill.

High: 22F/6C
Low: 10F/-12C

Springfield, Tenn.

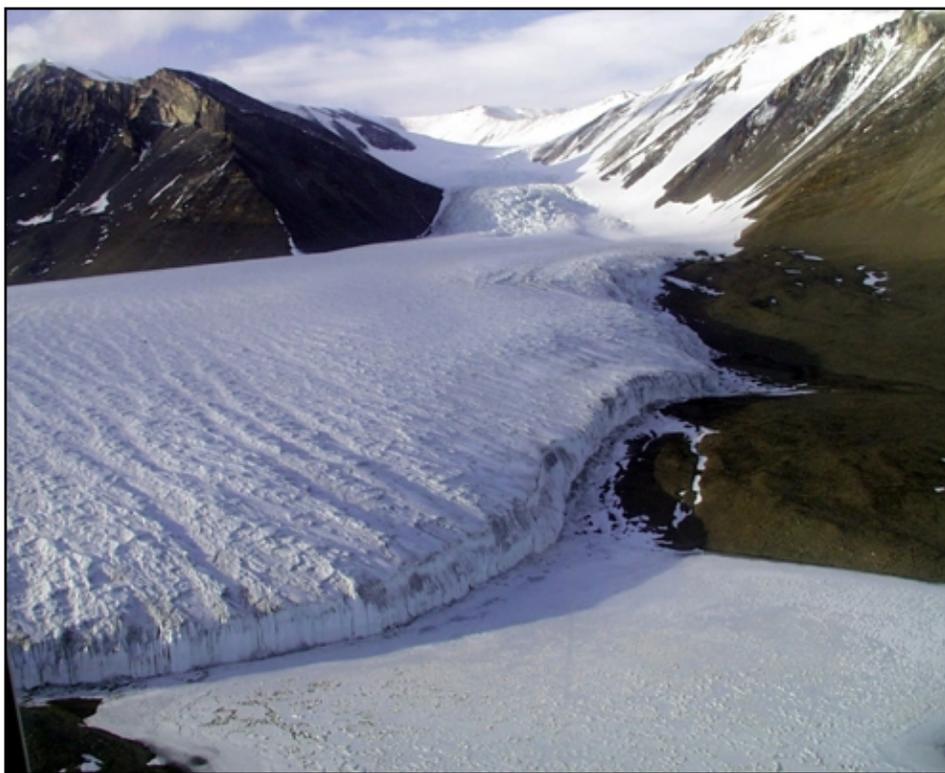
High: 35F/2C
Low: 24F/-4C

web sites of the week

Dreaming of an ICE Christmas

- <http://www.riv.co.nz/rnza/tales/antarctica.htm>
A New Zealand artillery gunner's tale of Christmas on the Ice
- <http://hum.amu.edu.pl/~zbzw/ph/xmas/pcpra.htm>
Polish Christmas celebrations in the Polar regions
- <http://www.christmas.net.au/>
It's not December 25, but you can go on holiday here

Valleys from page 1



Top: Canada Glacier from the air. Above left: Even a little bit of dust drives big changes on the glacier's surface. Right: Thomas Nylen makes his way down a mountain along Canada Glacier's edge.

calving, one way glaciers shrink. Evaporation and melting are two more. Understanding the rate at which the glacier melts and evaporates is fundamental to studying the valley's ecosystem, Nylen says.

As part of a collaborative effort, the Long Term Ecological Research Network, Nylen monitors three lakes and four of Taylor Valley's glaciers. Since 1993, about 40 scientists have examined the major features of the Dry Valleys' ecosystem - the glaciers, streams, soils, and lakes. Encoded in the chemistry of the lakes, the layers in the rocks, the properties of the ice are messages telling tales of thousands of years of climate change.

To measure the seasonal mass lost from each lake and glacier, each summer he com-

pares the surfaces against bamboo poles he planted earlier in the season, and he gathers information from meteorological stations.

Today, heading for the top of the Canada Glacier, Nylen is looking for local signs of glacial melting. Carrying two ski poles for balance, he works his way up a mountain, along the water flowing from the glacier's edge. At 300 feet, water roars over big rocks and boulders. He hikes higher, where the flow is slow and trickling again, under a thin layer of ice. Even higher, about a mile from camp, the rapid is frozen - slick, bumpy and solid.

Water is the source of life and lakes in the area. In this desert, glaciers are the primary source of water, not snow. Some scientists believe that during a cooler, dryer time 1,300

years ago, when the glaciers were much smaller, the streams and lakes were dry.

"Somehow the climate has changed since then so you have more water coming into this system," Nylen says.

Canada Glacier is thinning four or five inches a year as it advances several feet. Unknown is how much is due to recent or

"In this desert glaciers are a very important part of this ecosystem."

- Thomas Nylen,
glaciologist

long ago weather events, says Andrew Fountain, the lead scientist in this project and professor of geology at Portland State University in Oregon. Fountain is not in Antarctica this year.

"This is where it gets difficult," Fountain says on a telephone in Portland. He offers a metaphor for his science, comparing the 1,000-year reaction lag of a glacier to the time it takes a person playing tug of war to fall after a rope snaps. "It takes time for the wave to reach the person at the end of the rope. It takes a while for the wave to be expressed at the end of the glacier."

Maybe 1,000 years. Perhaps a human lifetime.

In the valleys, while surrounded by numerous glaciers, each with a smooth, streaming presence, it is difficult to believe that this is a desert. But here, only a few inches of snow fall each year. Almost all of it turns to water vapor before melting, leaving precipitation in the valleys less than that in the Sahara.

"Here's roadside attraction number two," Nylen says, aiming his poles at a dead, dried seal on rocks piled at the edge of the glacier. The seal probably became disoriented here, 7 1/2 miles (12 kilometers) from the ocean. Many petrified seals are scattered across the valleys. "This is a testament to how dry the valleys are."

With air temperatures below freezing, most of the summer glacial melt is due to dust and rocks blown onto the ice. Even small amounts increase absorption of sunlight, which raises the surface temperature. Wind throws dust on the ice. Dust absorbs heat and melts into the surface, creating a pool. Several pools meet and create a chan-

see Valleys on next page

Petrels from page 1

of peace," Alsup said. "It should be the snow petrel. That's the purest white bird I've ever seen. The way it flew you could see its wing carve a hole in the sky."

Snow petrels, *Pagodroma nivea*, are one of the three most common seabirds in the Antarctic, along with Adelie penguins and Antarctic petrels, said David Ainley, a marine ecologist specializing in birds. The white bird has dark eyes, a small black bill and bluish gray feet. Its wings spread about 32 inches (80 cm).

This year the snow petrels have been spotted regularly flying around Observation Hill next to McMurdo. Vilmar Tavares saw a pair of the birds as he hiked up the backside Nov. 29.

"Winding my way around, this streak of white flashed through my peripheral vision. Being careful not to lose my balance I turned as quickly as I could and saw this white bird I'd never seen before," he wrote in his journal. "I observed a second bird doing lazy circles in the sky. By the time I got my camera out (numb fingers) they'd wandered over towards Scott Base."

Seeing snow petrels is not unusual, said Ainley, who had three sightings in one day this year, including a flock of 24.

"This is the time of year that they're around here," Ainley said.

Petrels winter at the outer edge of the



A petrel on its mountaintop nest.

pack ice, where there's still some light and food, then follow it in. As snow leaves the slopes in early December the petrels head to the hills to nest, Ainley said. The seabirds nest on bare peaks, sheltered from skuas by large blocks of rock. The closest known nesting sites are 350 miles (563 km) away, at Cape Hallett, and 500 miles (805 km) away in the Fosdick Mountains. Petrels may be nesting much closer though, Ainley said. "Probably most of their nesting spots are unknown," Ainley said.

The petrels other defense is to squirt a

waxy, yellowish stomach fluid at predators. The fluid is a musky oil, called mumijo, which petrels quickly render from their food. The smoky scented oil is used to feed their chicks, but it also breaks down the insulation of feathers if it gets on a skua.

"That's the purest white bird I've ever seen."

- Dianna Alsup

"It would be like getting oiled in an oil spill," Ainley said.

Layers of mumijo surround petrel nests, some of it dating back 10,000 years. Ainley hopes to study the layers, which could provide another record of changes in snow cover and environment.

The petrels around McMurdo are not currently being studied, so it is not known if the soaring number of sightings is this year is because more of the birds are here, or if people are just noticing them more.

"It's easy to miss them until you really know to look," said biologist Grant Ballard. "You have to look up."

But look quickly. By early January the petrels are usually gone. ■

Valleys from pervious page

nel. Water flows through the channel, carrying rocks and dust. Melting starts again.

In some areas, the result is a masterpiece: sculpted ice formations - caverns and swirling features that resemble the water and wind-carved canyons of the Utah desert.

In the gut of one of Canada Glacier's channels, Nylen rests on what looks like a six-foot organ pipe of ice. "This is my favorite spot," he says, plopping down his ski poles.

The channel is a piece of work, and is evidence of small particles

having large, immediate impacts, Fountain says. As for calculating the glacier's slow reactions to climate, Fountain and Nylen are looking at their weather records and next year will examine ice cores.

The Dry Valleys is an ideal place for studies because of its simplicity. With little but cold and dry snow, ecosystems are uncomplicated by interactions such as rain found in temperate areas in the United States and Europe, Nylen says.

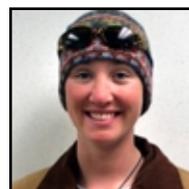
"Glaciers in other places don't play as big a role," Nylen says. "In this desert they're a very important part of the ecosystem." ■

Highway One

What has been your best Antarctic experience?



"Getting to see all the pretty scenery. Everybody down here's nice, everybody."
Michael Hammond
Electrical



"Climbing up icebergs at two in the morning."
Bryn Clark
Crary Lab Materials



"Pretty much everything. I like the people. I like going outside. I like the boondoggles. I like everything but I don't like being a janitor."
Michelle Waknitz
Janitor

beautiful



Mike Cameron and Shawn Dahle get ready to tag an adult Weddell. The tagging system provides a continuous record of the animals in the area that goes back to the 1960s.

The mysterious world of the Weddell seal

& brutal

By Josh Landis
Sun staff

"These animals get beat to hell. They tear each other up, they're vicious."

- Dan MacNulty
seal researcher

Turk's Head is an eerie place. Even under the glare of a midday sun, the rocky outcrop on Ross Island sounds haunted. The moans and bleats of Weddell seals echo off the stone promontory as skuas hover menacingly overhead.

Researcher Mike Cameron steps around a lounging female and her pup, looking for brightly colored plastic tags attached to their flippers. He's checking every seal in sight. He and his teammates will get the ones that aren't tagged twice.

"Here's one," Cameron calls out to Shawn Dahle. The two of them approach the animal, ready for a struggle.

"For an 800-pound carnivore, they're amazingly docile," he said.

But that doesn't mean they're non-resistant.

Tagging seals can be a difficult, smelly and even dangerous task. It involves one person throwing a hood over the animal's head and jumping on its back to keep the hood in place while another tags each of the rear flippers. Each seal responds differ-

see next page

from previous page

ently to the imposition. The more resistant ones can throw the scientists off several times before the job is done.

But the exercise is essential to a body of work that dates back to the early 1960s. That's when research on the population of Weddell seals in the McMurdo Sound area began. Animals tagged then are still swimming these waters, teaching scientists more about these mysterious mammals each year.

Nobody knows, for example, exactly how long the seals live or how many reproductive cycles they can have. Some females that were tagged as pups in the early 1970s are still giving birth and show no signs of slowing with age.

The violent turf battles that take place between males underwater are also largely a mystery. Researchers know the fights are brutal by the severity of scars and wounds they see on the seals, but can only imagine what takes place out of sight.

"There's some conflict on the surface, but the vast majority takes place underwater," said researcher Dan MacNulty. "The combat these males sustain is really remarkable."

The outcome of fights like these determines the reproductive success of the Weddell males, which is also something that is little-known. In more than 30 years of research, only one picture has ever been taken of two Weddells breeding.

The research team at Big Razorback Island, working under veteran scientist Don Siniff, has been trying to change that.

Inside an orange, sunbathed shack next to the snow-covered island, they monitor a television set connected to an underwater video camera. Kolene Krysl, a member of the Teachers Experiencing Antarctica program and research assistant, mans the camera with a small keyboard. She points it at a shaft of sunlight streaming through an open crack in the ice. Seals swim out of the inky darkness, bob to the surface and disappear out of view.

The camera is there to capture the underwater world most researchers rarely get to see, with a focus.

"The idea is to study the interaction between males," said Dan MacNulty. "These animals get beat to hell. They tear each other up. They're vicious."

The camera is the only way to get a good view of the fights, and learn more about the territorial ways of the Weddells.

"One of the big things we're looking at is male-to-male interaction as the big ones come back to claim their territory," said Krysl.

Most large mammals, such as bears, usually presage their confrontations with bluffs, and often avoid dangerous battle.



Top: A female seal rears up as researchers walk in the distance. All seals in the study area are tagged. Above right: Kolene Krysl and Dan MacNulty watch seals swim by an underwater camera. Left: A mother and pup lounge on the sea ice next to Turk's Head. Numerous cracks in the area make it easy for the seals to leave the water here. Photos by Josh Landis

Not the Weddells. The more researchers learn, the more they realize how violent these animals are.

An estimated 80 percent of the 1,400 Weddells in the study area are part of a continuous record. Each one's age, sex, location and date of birth is recorded. By tagging newborn pups and recording which female they're with, researchers can follow the maternity line back as many generations as are tagged.

"We can find a pup and tell you who it's great, great grandmother was," said Cameron.

Establishing which males become fathers isn't so easy. Until recently, determining which male sired which female was impossible, since the breeding takes place underwater and the males aren't involved with the rearing of their offspring.

Modern technology is changing that. Now, all the adult males that turn up at Big Razorback Island are targeted for a new

monitoring project: DNA testing. By taking tissue samples from the males and comparing them to tissue samples from pups, scientists can determine which seals reproduce, and which ones get left out of the mating game.

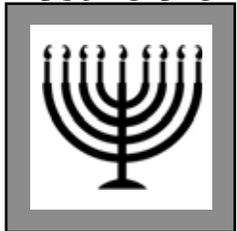
They already suspect a smaller number of males do a larger portion of the breeding.

"Most males don't get any females," said Cameron. He estimates the ones that do get to reproduce could sire as many as seven offspring in one polygamous breeding season.

Also in the group's arsenal of scientific equipment are cameras and sensors that Katsufumi Sato, a Japanese researcher working with the team, has been attaching to the backs of the seals. The instruments record the depth and direction of the seals' dives as the cameras take hundreds of pictures, looking for more information on the underwater habits of the common, yet mysterious, Weddell seals. ■

our Antarctic week

24
 Church services,
 11:30 p.m.
 Christmas service
 leading to midnight
 mass, Chapel



24
 X-mas Rave,
 8 p.m., MEC

24
 Movie "It's a
 Wonderful Life,"
 8:30 p.m.,
 Coffee Shop

25
 Christmas services,
 9:30 a.m. mass and
 11 a.m. Protestant
 service, Chapel

26
 Kiwi Trivia, 8 p.m.
 shuttle to Scott Base

28 Movie "Who's
 counting?
 Marilyn Wearing on
 Sex, Lies and Global
 Economics," 8 p.m.,
 Coffee shop

29
 Ballroom dance
 gala, 7:30 p.m.,
 gym



COLD HARD FACTS

The top ten states listed as mailing addresses by Raytheon workers on the Ice:

- Colorado - 211
- Washington - 75
- Alaska - 62
- California - 44
- Minnesota - 43
- Idaho - 40
- Montana - 35
- Wyoming - 27
- Texas - 23
- Oregon - 17

Ross Island Chronicles

By Chico

Well, it looks like
 another Christmas
 spent in Antarctica
 and the middle of
 nowhere.



Yeah, not even
 Santa Claus comes
 this far south.



Personally, I could
 care less about
 Christmas. Besides,
 probably no one
 remembers we're out
 here.



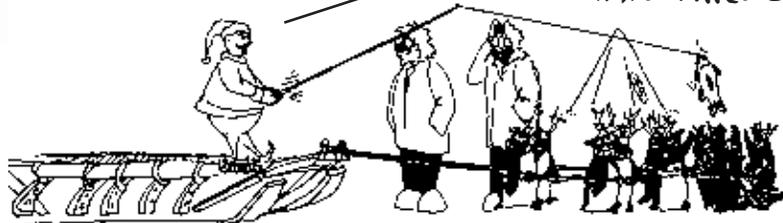
No kidding. The only
 one visiting tonight
 is the cold air.



Hey look! There's
 someone coming.



Merry Christmas, gentlemen. I'm on
 my way to
 Who-ville. Care to come along?



We Are FAMILY



While most people leave their families far behind to come to Antarctica, a few families come together.

The Schernthanner sisters at the South Pole.

By Beth Minneci
Sun staff

In a teenager's perfect universe, most would live planets apart from their parents. But at 19, Jessica Lovato traveled halfway around the world to bunk in a dorm room with her mom in Antarctica.

"My first year, I didn't know anybody here, so there was a comfort level," said Lovato, now 22.

While most people leave their families far behind to come to Antarctica, a few families come together.

The Schernthanners, the Lavatos, the Wades. The Ravers – all six of them.

"I didn't see them much in the states," said Shelley Raver, who works with four family members in the galley. "But I see them a lot here." Two Ravers work in the heavy shop.

On Sundays, sometimes Shelley and brother Jason go to mom and dad's dorm to play board games. Tomorrow, they'll open Christmas presents together.

For families on the Ice, feuds sometimes flare up, like when a fistfight erupted between two brothers last week. But largely, the people with the same last names get along fine. Having family in Antarctica means companionship, and instant hiking partners.

The Schernthanners of Antarctica are three thirty-something sisters from Idaho who worked together two summers ago at the South Pole.

"My sisters are my best friends," says Liesl Schernthanner, who is back at Amundsen-Scott South Pole Station with sister Heidi while Monika sits out a season.

"I am not only lucky," Schernthanner said, "but delighted to be able to spend time with my sisters."

Ivy and Dan Wade, a married couple from Seattle, are at McMurdo Station for the first time. Leaving

Washington for a cramped compound in Antarctica was tearing away from their comfort zone, home. This was shocking and uncomfortable at first.

"We come out of the solid middle class," Dan Wade said. The Wades are in their early 50s. "We're home-owners with our yard and our garage."

The first several weeks were rocky, but Ivy diligently transformed their dorm room into a living room where they can take their shoes off and swap stories at the end of the day. He is a firefighter. Ivy drives a shuttle.

"We have different jobs but have been going through the same experiences," Ivy Wade said. "It's like having a live-in psychologist."

Families on the Ice almost always migrate in the same pattern: one tests the Ice alone in a sort of reconnaissance season, then if positive signals are sent home, others might follow.

But a small margin digresses from the norm.

For the Wades, Antarctica was his idea. He'd been reading books about the Heroic Age for years. Approaching retirement, the Seattle Fire Department granted him a leave of absence. Ivy knew immediately that she would go, too.

"I said, 'You can have your mid-life crisis, but I'm coming along to supervise,'" she said.

The Wades are undecided about coming back.

This year, Jessica Lovato, now in her third season, recruited her cousin, Karen McCoy, a secretary at the Chalet. Back in Idaho, the Schernthanner' youngest sister Britta is graduating from college and has yet to make plans.

"Maybe there will be four of us around next season," Liesl Schernthanner said.

For the six-person Raver representation: "This is about it," Shelley Raver said, "except for my grandparents. I'd love it if my grandparents came. ... " ■



The Other Poles

By Glenn Grant
Special to *The Sun*

The South Pole gets all the glory.

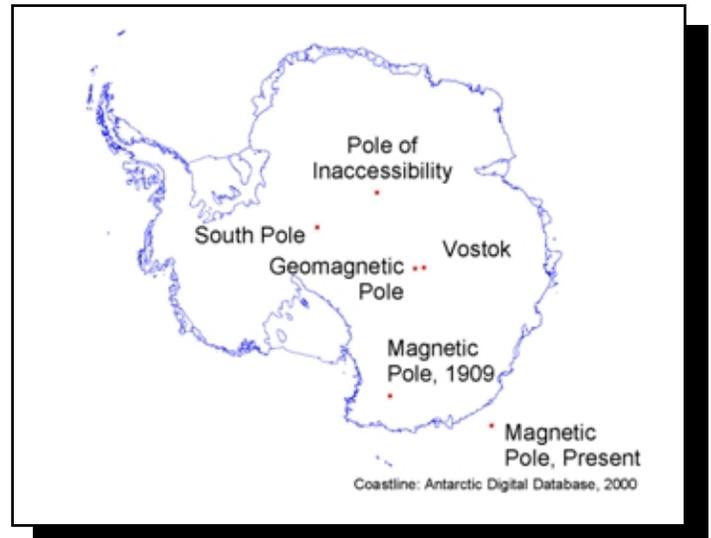
It is the rotational axis of the Earth and the ultimate end-of-the-road experience. Tourists pay \$25,000 to set foot there, take pictures of the ceremonial chrome ball, admire the dome, shiver in the galley for a few minutes clutching a cup of cocoa and then fly away. Some do so without even noticing the small, brass marker and commemorative sign planted nearby at the official Geographical South Pole and almost none of them will ever see Antarctica's other poles.

For most purposes, the North and South Geographic Poles are considered stationary. The Earth rotates around the polar axis once each day, wobbling just a little, but the average rotation point doesn't change. If you were at either pole, however, with an accurate global positioning system (GPS), it would appear that the pole is moving away from you. In reality it is not the pole that is moving, but the ice on which you are standing. Every January a new South Pole marker is hammered into the snow at the precise location, which is almost immediately wrong because the ice sheet underneath it is grinding along at a rate of roughly 10 meters (30 feet) each year, or about an inch every day. The sea ice at the North Pole may move 10 meters or more in a minute, and you would have to walk northward continuously just to stay at the Pole.

A compass will work near the South Pole. It may be alarmingly inaccurate, but it'll still work. The compass was probably known in China more than a 1,000 years ago, but it wasn't until about the 15th century when someone figured out that the Earth's magnetic poles were not located at the same position as the geographical poles. While the North and South Magnetic Poles generally stick to their respective polar regions (maybe flip-flopping every few hundred thousand years or so), in most areas of the world compasses do not point to true north. A compass needle always aligns itself with the local magnetic field, but that doesn't mean it's pointing at anything in particular. While the magnetic poles are a big attraction for a compass needle, belt buckles, ferrous mountains and the occasional continent can all distort the magnetic field.

As you approach the magnetic poles, however, a compass will stop working entirely, preferring instead to jam itself vertically in its case. This is actually one method of determining the location of a magnetic pole, using a kind of vertical compass called a "dip magnetometer." When the dip needle is straight up and down, you're there. Another method to find the magnetic poles is by measuring the direction of the Earth's magnetic field at observatories around the world, and then computing the pole locations mathematically. In theory, this should be very accurate because it's based on a lot of measurements. In reality, the two methods disagree with each other so the positions of the magnetic poles may differ greatly depending on how you go about finding them.

To further complicate things, the magnetic poles wander around with their own agenda. From a geological standpoint, they move great distances in extremely short amounts of time. When Douglas Mawson, Edgeworth David and Alistair Mackay sledged to the South Magnetic Pole in 1909 it was in Victoria Land. Since



that time it has migrated out to sea and is now swimming somewhere off the Adelie Coast. Solar activity, like the recent solar storms, can also distort the Earth's magnetic field and temporarily displace the magnetic poles several kilometers in a single day. Cartographers hate wandering landmarks like these, but for some reason they still feel obliged to put X's on polar maps where they think a magnetic pole might live, even though the locations are almost certainly wrong.

The upshot of all this magnetic meandering is that when you're using a compass in polar regions you should be aware of the local declination – that being the amount by which it "declines" to point to true north. In the case of McMurdo, the declination is about 148 degrees eastward. So if you trust a compass to point you north out of Mactown and back to Christchurch, you would in fact be heading almost due south. In lower latitudes the declination error is not so significant, but long-distance navigators (such as airplane pilots) still have to take it into account, otherwise a flight bound for, say, New York's JFK airport could land at Newark instead, which would not necessarily be a bad thing.

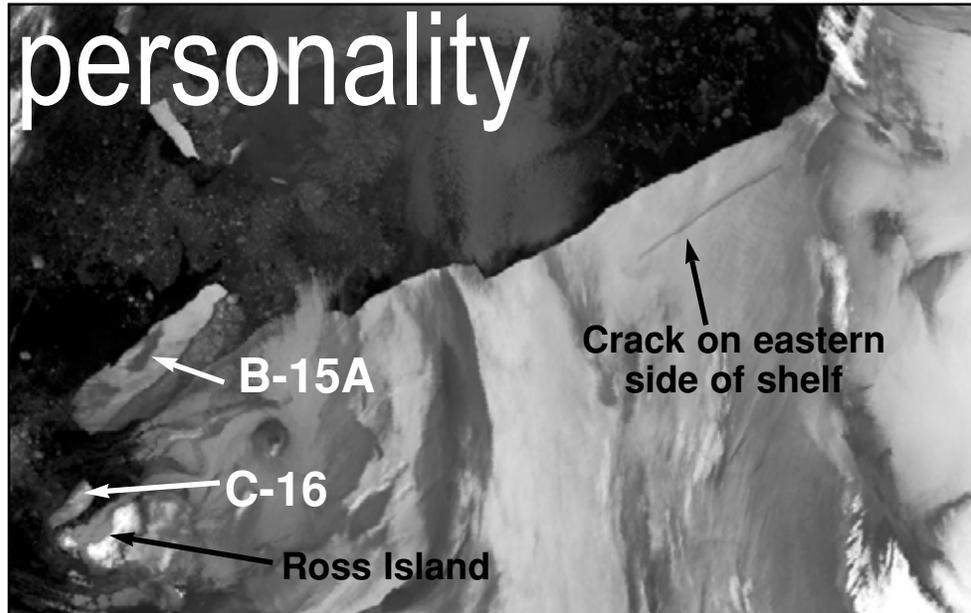
Because of all the headaches with compasses near the poles, many travelers in polar regions simply rely on GPS technology instead. A hyper-accurate GPS reference station can render precise locations down to millimeters, and a small handheld unit can safely guide you across featureless terrain or through a zero-visibility whiteout. At least until the batteries go dead.

The whole argument over the location of the magnetic poles tends to aggravate geophysicists. From their point of view, the best way to picture the magnetic field of the Earth is to imagine a large bar magnet in the metallic center of the planet. The spinning molten core is the primary source of the magnetism, and if you draw a line outward along its rotational axis you'll find the geo-

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The Ross Ice Shelf's split personality

A satellite image of The Ross Ice Shelf shows B-15A and C-16 near Ross Island (lower left). A large crack is visible on the opposite side of the shelf, the possible site of a large, future iceberg formation. Photo courtesy of the Antarctic Meteorological Research Center at the University of Wisconsin-Madison.



By Josh Landis
Sun staff

Two large pieces of the B-15 iceberg that calved off the Ross Ice Shelf in March are still hanging around Ross Island. Both B-15A and C-16 appear to be grounded northeast of capes Bird and Crozier. They've rotated slightly in recent weeks, but don't seem to be going anywhere in a hurry.

Scientists watching the bergs' movement say there isn't much chance they'll enter McMurdo's shipping lanes this season. But they don't rule out the possibility that could happen in the future.

B-15 drew a lot of attention when it first formed simply because of its sheer size. Before it broke apart, it was the largest floating object ever observed. But while the state-sized chunk of ice awed many people, its birth was a long time in the making, and in many ways, expected.

According to Ted Scambos, of the National Snow and Ice Data Center, The Ross Ice Shelf "grows" almost one kilometer (3,280 feet) each year. When it extends far enough to the north, a combination of tides, currents and wind break off pieces that become icebergs. At roughly 40 kilometers (25 miles) wide, B-15 represented about 40 years of ice shelf growth, and a natural shedding process.

B-15 update

But now there's a new twist. The shelf's western edge, by Ross Island, is farther north than it's ever been seen before and it hasn't formed the icebergs that would be expected.

"We've seen about 80 years of ice growth without significant shedding," said Scambos. "It would stand to reason something would happen soon, but who knows when?"

At the same time, the shelf's eastern edge, by Roosevelt Island, has developed a long crack that's more than half a mile wide and farther south than the shelf has ever calved before. The crack has been there for as long as 15 years, but it's grown recently and "it is one of the sites where the next giant berg to calve off the ice shelf is likely to come from," according to Scambos.

If that happens, another four decades' worth of ice will be loosed into the Ross Sea, and the shelf will have retreated farther south than ever seen before.

Scambos wouldn't speculate on whether another giant iceberg would form, but said it looks like the crack is evolving faster than the recent history of the ice shelf would suggest. Contrasted with the stability of the western edge of the shelf, that poses a lot of intriguing questions for ice-watchers.

"I'm unsure why we've got this sort of split personality on the Ross Ice Shelf these days," Scambos said. ■

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magnetic poles. Using this technique, the North Geomagnetic Pole is where the line intersects the Earth's surface near Thule, Greenland, and the South Geomagnetic Pole is at Vostok Station, Antarctica. If you've ever wondered why Vostok was built in such an awful place, this is it.

The last type of "pole" in Antarctica is the so-called Pole of Inaccessibility. This is more of a clever invention than a physical phenomenon, but it still has a bit of novelty about it. By definition, it is the location that is the farthest from any coastline, and thus the place on the Antarctic continent that is, theoretically, the

most difficult to reach. It's also where the Soviet Union built a station called Polus Nedostupnosti, although at an altitude of 3,718 meters (12,198 feet) it's not clear what anybody expected to find there except shortness of breath. Like Gertrude Stein said about Oakland, there is no there there, just a desperately desolate spot on the Polar Plateau. But if you're finding South Pole Station too crowded and you want to go someplace to get away from it all, the Pole of Inaccessibility may be the place you're looking for. ■

Glenn Grant is McMurdo Station's science technician.

warm bodies Warmhearts



A DAY WITH McMURDO'S GAS

"If you're going to work your butt off for not very much money, why not do it here."

- Sally Lyon
foreman

By Jeff Inglis
Special to The Sun

It's early morning. Most folks are struggling to get to work with coffee in hand. But several bright-eyed, low-paid men and women are bouncing off the walls in the GA shack next to the carpenters' shop at McMurdo.

Led by former general assistant Sally Lyon, this season's operations GAs are ready to work. Lyon doles out

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From left to right above are operations general assistants Lynn Keating, Stephanie Koetzle, Shawna DeWitt, Heather Reider, foreman Sally Lyon, Gifford Wong, Devin Duffy, Brian Granbery and Eric Bullen. Photo by Beth Minneci.

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the day's tasks.

"Heather, you'll go to waste. Lynn, you'll go to the galley, but it's just for the morning," Lyon says. She also sends two GAs in a Spryte to replenish the Penguin Ranch fuel supply. The remaining two head out to Williams Field to re-flag a route on the ice shelf.

These operations GAs are not the only ones in town. But the work of several other GA's assigned is with designated departments in town, such as facilities maintenance and fuels department, is bit more specialized. The nine operation GAs are the ones out shoveling snow, moving boxes, entering data and generally helping out all around McMurdo Station.

It doesn't take a lot of training to be a GA, though they do go to happy camper and sea ice schools early in the season. But it does take a certain type of person.

Lyon picks her crew carefully from a pool of applicants that by far outnumber the number of positions available. They're all seeking a job with adventure.

"The variety is what attracts most people," Lyon said.

Most of the people she picks, Lyon said, are flexible and have a sense of humor as well as



a broad range of life experiences. This year's GAs include a former Peace Corps volunteer, a former tour director with the Ringling Bros. and Barnum & Bailey Circus, and a person who worked with delinquent youth.

But there is one characteristic that pervades all else in the application process, Lyon said: "Somehow they've made it clear that they will do anything to get here."

"People are starting to recognize that there's an incredible amount of talent in this group."

*- Sally Lyon
foreman*

This means Lyons doesn't have to sell the job; she even tries to discourage applicants. She starts an interview by telling them about the worst parts of the job. If they still sound positive, she tells them the good parts.

As the season progresses, work varies a bit, but not always enough. Sometimes GAs end up doing the same thing for several days. Though from the beginning they were told that this would almost certainly happen, it is still sometimes difficult.

When the job does change every day, on the other hand, there's different challenge.

"You don't see the big picture," said GA Lynn Keating. A day-long task for a GA may be part of a month's worth of effort for everyone else; having a sense of closure about a project is rare.

Lyon tries to mix up the tasks among the group a bit, to keep them interested in what's going on, and to keep them learning about how the station operates.

"My goal is that they're as excited to work on January 20 as October 20," Lyon said.

She reminds them to be aware of where they are and how amazing it is.

"When you're shoveling, don't forget to look up," Lyon said.

In addition to becoming well-rounded in operations, being a GA is a good way to make a good impression on people who will be hiring for next season.

"It's a great springboard," Lyon said.

All of last year's McMurdo GAs came back for another season, whether for winter at Palmer or in town this season. Many more ex-GAs work all over town and throughout the Antarctic program.

"Everywhere you go, there's former GAs," said GA Heather Reider.

From those former GAs and the quality of work of each year's crew, the word is spread-



Above: Heather Reider clears a path broken up by a jack hammer.

Top left: Devin Duffy hooks the fuel sled to a Spryte for a trip to refuel the Penguin Ranch. Photo by Jeff Inglis. Below: Eric Bullen snips faded flags off poles pulled from the sea ice.

ing that GA labor is valuable, Lyon said.

"People are starting to recognize that there's an incredible amount of talent in this group," Lyon said.

Lyon's combination of practicality and motivation works out well for her and for the GAs. Most of them are active most days, and they are able to work without much supervision.

"They exceed my expectations," Lyon said.

And even outside of work the GAs stick together as a team.

"A roomful of strangers become the best of friends in four months," Lyon said.

In the morning, they trade jokes and stories, as well as tips and thoughts about previous work or that day's upcoming projects. At lunch, they rally around each other, asking, "How's your day going?" and exchanging reports of how life and work are in different departments.

The bottom line for most of the GAs is that they're here on the Ice and experiencing a range of ways to work and live.

"If you're going to work your butt off for not very much money, why not do it here?" Lyon said. ■



Profile World

Wilbert's



Carpenter cartoonist creates MacTown "Far Side" in 3-D

By Kristan Hutchison Sabbatini
Sun staff

If Gary Larson worked with wood instead of a pen he might have created scenes like Ken Wilbert's in the carpentry shop.

Finger-tall figures, cartoonish in their oversized red parkas and white boots, ride missiles, jump off diving boards, play ping-pong with penguins. Two inch-high penguins peel off in a Spryte, dragging a parka-clad body on a sled behind.

"I don't know why I got started," said Wilbert, who created the first three-dimensional cartoon two years ago, during his second Antarctic summer. He had never made anything of the sort before.

Wilbert thought about how he got started a moment longer, clasp and unclasp his large hands.

"It would probably be the same motivation I have now, which is to make people look at themselves. I think it makes people laugh to look at it; it makes people smile. That's a good tonic for our community."

The first scene he made was of a figure in a red parka and white boots, crossing on a tightrope from a lush island of palm trees and chimpanzees to a white island built up with metal structures.

"It was an evolutionary thing. Humans begin in Africa and here we are today," Wilbert said. "At the other end of the tightrope is the Antarctic continent littered with steel and things that aren't so pretty."

He displayed that scene in the Ross Island Art Show and got a great response.

"People tend to laugh and I think that's good," said Wilbert, who made five more scenes the next year and one so far this season.

In his work, Wilbert tries to use scraps that would otherwise be thrown away, going through dumpsters and picking trash off the ground for his materials. He stitched the orange bags carried by some of the figures from ripped up trail flags. Burnt out bulbs form heads. The wooden penguins were made with scraps from the carpentry shop, where Wilbert stays late to create the scenes.

Since he started, Wilbert has spent 200 to 300 hours after work building the scenes there.

"I do enjoy making the things," Wilbert said. "It gives me a lot of joy,"

The process is painstaking. He visualizes the scene first, then sketches it on paper, working out the details in advance.

"Making everything is the easy part. It's thinking up the idea that's hard," Wilbert said.

Like the first, some of the later scenes have deeper messages. One of the parka-clad figures is mid-jump on a trampoline with binoculars held to his eyes.

"I saw that as a scientist trying to get a better view," Wilbert said.

Other scenes are just for fun, like the penguins playing ping pong.

"There's no deeper message there," Wilbert said.

But there's an underlying message to all the scenes. Though Wilbert calls his display "Beaker Art," he said the figures

portray all of us.

"Whether you're working on some big science experiment at the lab or digging ditches as a GA, we're all doing the same thing," Wilbert said. "We're all four inches high, we all have a lightbulb for a head, we all wear red jackets and we all do the same thing."

Wilbert would like the scenes to stay on the Ice, where people understand the humor, but he hasn't tried to find them a permanent home. After the annual art show he just packs the pieces away in a cardboard box and stores it on a back shelf in the carpentry shop.

"I really haven't thought that the day would come when I'd be boxing that up and shipping it home," Wilbert said.

Home is Denali, Alaska, where he's lived and played music for 25 years. For four years now he's been hopping between the Arctic and Antarctic summers.

"I haven't had a winter in a long time," he said.

It may be a long time more. For now, he plans to keep coming back each summer. The carpentry shop is a great place to work, Wilbert said.

"It's a good work center. It's a great place. That's one of the reasons I come down here," Wilbert said.

As long as he keeps returning, the display will continue to grow. Wilbert said he has too many ideas to mention.

"The more we laugh at ourselves the better off we all are," Wilbert said. "Not all, but too many people take themselves way too seriously." ■