



New picture at Pole operations

By Peter Rejcek
Sun staff

At 1 p.m. on Dec. 26, Neil Conant put himself out of a job when he announced that the transition of the operations center from under the South Pole Dome to the new elevated station was complete.

The veteran communications operator was temporarily brought to Antarctica to help operate the old ops center while the new one was brought online. Conant was philosophical about witnessing the end of an era.

"That's progress," he said. "Things change."

And how they've changed. The Station Operations Center (SOC) is the new ground zero

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Photos by Peter Rejcek / *The Antarctic Sun*

A look at the new South Pole Station Operations Center is inset into a photo of its high-tech audio/visual monitor, ringed with camera views of various areas of the station.

Ice claims many lives over time

By Steven Profaizer
Sun staff

"Today was the day I would give anything in this world to turn back."

So starts Charles Bevilacqua's Jan. 6, 1956 journal entry. That was the day he witnessed the death of a young Navy tractor driver, Richard Williams, during the first month of construction of McMurdo Station.

Throughout Antarctica's brief history with people, it has claimed many lives — about 60 of which occurred as part of the United States program in Antarctica over the last 50 years. Bevilacqua's journal is just one of many similar accounts that tell the tale

See DEATH on page 8

On the Prowl

Meteorite hunt attracts scientists from universities around the world

By Peter Rejcek
Sun staff

Mike Kelley studies asteroids so far out of reach that he needs a powerful telescope in Hawaii to observe them. For a chance to handle a meteorite — a tangible offspring from this celestial body — he's willing to spend six weeks in the outback of Antarctica.

"By using meteorites and asteroids together, you can begin to understand the early part of the solar system," explained Kelley, a researcher from Southern Georgia University. Detailed studies of meteorites can tell him about the history of the asteroid itself, revealing the ancient story of the solar system. "In some cases, you can find meteorites and asteroids that are a dead-on match, so you can then place that meteorite back to its original location in space."

Kelley is one of Ralph's Harvey's 12 so-called meteorite hunters, a band of geologists and mountaineers who scour the continent's

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Ralph Harvey / Special to *The Antarctic Sun*

One of the smallest meteorites found this field season measures less than one centimeter.

Quote of the Week

"Salad again?
What are we,
rabbits?"

— Person apparently oblivious to the preciousness of freshies.

Inside

Pier gets ship-shape
Page 3

Poet adds it all up
Page 12

Building a foundation

Workers continue construction of the facility for the new 10-meter telescope at the South Pole Station on Dec. 28. The telescope is designed to survey galaxy clusters and make fine angular scale measurements of the cosmic microwave background radiation. The ground shield for the telescope will be roughly the same size as the old South Pole Dome flipped upside down.



Carlton Walker / Special to *The Antarctic Sun*

Cold, hard facts

McMurdo's Central Building — Building 155

Beds: 249

Tables in the dining hall: 78

Public computers: 16

Offices: 9

Bathrooms: 8

Faucets at the automatic hand-washing station: 6

Viking helmets available for check out at Gear Issue: 3

ATM machines: 2

Barber shops, saunas, radio stations, mailboxes, stores, signed bowling shoes in a display case, Frosty Boy soft serve ice cream machines: 1

Source: McMurdo housing department, visual observations

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Senior Editor: Emily Stone

Editors: Steven Profaizer, Peter Rejcek

Copy Editors: Amanda Barnett, Andre Fleurette, Rob Ford, Bill Jirsa, Rob Jones, Hilary Oliver, Brian Spigel

Publisher: Valerie Carroll, Communications manager, RPSC

Contributions are welcome. Contact *The Sun* at AntSun@usap.gov. In McMurdo, visit our office in Building 155 or dial 2407.

Web address: AntarcticSun.usap.gov

Level 1 Comix

Matt Davidson



Unique ice pier provides harbor for ships

By Emily Stone
Sun staff

Every summer, an icebreaker, fuel tanker and resupply vessel arrive at McMurdo Station. They dock at what is essentially a huge, steel-cable reinforced, floating ice cube.

The ice pier is a one-of-a-kind creation. It was built for the first time at McMurdo in 1973 and has been perfected over the years so that it can last several seasons before having to be discarded.

Before 1973, ships either moored to the sea ice in McMurdo Sound and ferried cargo to land, or tied up along the fast ice — ice that's attached to land — along the shore of Winter Quarter's Bay. The first option was costly and dangerous and the second was wearing away at the fast ice. The ships' warm water discharge was melting the ice at a rate of up to three square kilometers of surface area a year.

So the Navy invented the floating pier as an alternative. Six piers have been built since then.

The process takes nearly a full year. It starts in early winter once the ice in the bay has become just over half a meter thick, making it strong enough to support equipment. The area is then surveyed and flagged, and depth gauges are placed. Then the surface is scraped free of snow.

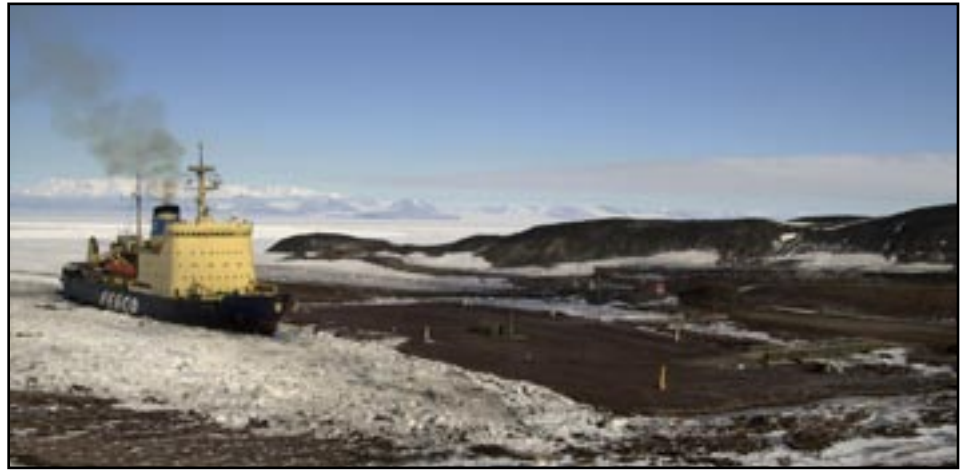
"Any amount of snow acts as insulation," explained Gerald Crist, supervisor of the station's fleet operations department, which builds the pier.

The problem with insulation is that it holds in the heat from the water during the winter. At just below zero degrees Celsius, that water might not sound so warm. But it's a relative hot tub compared to the air temperatures that can plunge to negative 30 or negative 40 degrees Celsius.

Fleet operations personnel use the cleared snow to build berms along the edge of what will become the pier. The berms are frozen to create a dam that will trap water on top of the pier as it is flooded and thickened.

The crew uses small pumps at first to flood the surface, Crist explained. Once the ice reaches a little more than a meter thick, fleet ops can install telephone poles along the pier. These poles carry the electrical wiring for the more sophisticated pumps. A cross brace between the poles supports the pumps, which hang into holes drilled through the ice.

Equipment operators squeegee the water to spread it around so it doesn't pool in any one area. This would be a problem because it would weigh down the pier around the pools and create unequal ice depth, making the pier potentially dangerous.



Emily Stone / The Antarctic Sun

The Krasin icebreaker pulls up to the McMurdo Station ice pier on Jan. 6.

The next major step comes when the ice reaches 2.7 meters thick. At this point, 2,500 meters of 2.5-centimeter-thick steel cable is crisscrossed on the surface to keep the sections together should cracks develop. Another layer of cable is set down after another meter or so of ice develops.

Divers periodically check the integrity of the pier to look for cracks and to make sure the pier hasn't gotten so deep that it will start hitting some of the higher parts along the bottom of the bay.

Once it's reached its full thickness for the season, the crew installs more steel cable as mooring lines to attach the pier to land. During the winter, the pier was held in place by the surrounding sea ice. But once the icebreaker arrives, the pier needs to be connected to land to keep it from floating away. A bridge is installed at this point so trucks and equipment can drive over the 15- to 18-meter wide moat. The moat is necessary to get the pier into deep enough water so the ships can dock there.

By this point, the pier needs to be insulated from the summer sun and temperatures as warm as 10 degrees Celsius. A layer of gravel is spread to keep the ice cold and to provide a wear-resistant surface for the trucks and heavy equipment used to load and unload the resupply vessel. Like the layers of water, the gravel must be spread evenly to make sure the pier stays balanced. In 1999, part of the pier that had cracked off the main section flipped over because it was weighted unevenly. There were no people or machines on it at the time and no one was injured.

A straight edge must be created along the outer edge of the pier so the ships can pull right up to the pier. On a first-year pier, this is done with explosives. Crist and his crew have come up with an alternate process for older piers. They now cut trenches along

the pier's edge and direct runoff water into them so there's a weak fault line running parallel to the edge. When the icebreaker comes in, it hits the pier and that section shears straight off along the even line.

"We're real tickled with that," Crist said, explaining that it was discovered "by trial and error, like most things down here." The method is less costly and more environmentally friendly, he added.

The final stages are putting up a warming hut and tower building, where operations headquarters are located. Then the ships arrive. Depending on the season, they can be here for a couple weeks or nearly a couple months.

Once they clear out, the National Science Foundation decides if the pier is strong enough to keep for another year. If it's deemed sound, winter maintenance is planned to improve and prepare the pier for the next season. If more depth is needed, the gravel will be scraped off and new water will be added over the winter. If the surface is uneven, it will be leveled by flooding low areas with fresh water.

If the pier has run its course, an icebreaker tows it out to sea. Cables are stitched through it with the help of divers and the ship hauls it out of the bay. In 1998, one chunk of the pier broke free and was loaded with so much gravel that it sank on the spot. The current pier, which dates back to 1999, had to be built in a slightly different spot because the water wasn't deep enough over the submerged chunk to build the pier above it, Crist said.

The current pier is very stable, Crist said. With the gravel on top, it extends more than seven meters below the water line, which is a safe two meters above the shallowest parts of the bay under it.

"We're ready," he said, a few days before the first ship was to arrive.



Perspectives Perspectives

Life on the other side of the snow berm

By Tom Lohr

South Pole correspondent

The tight-knit community at the South Pole has been described as a microcosm of society. Geographical influences range from Alaska to North Carolina. One would expect Antarctic abodes to match the variety in the polar population. But with the scarcity of building materials at the Pole, inhospitable weather, and logistical challenges, there's little middle ground. Dwellings largely boil down to two categories, in addition to the historical berthing rooms inside the old Dome station: the neo-cosmopolitan feel of the modern, contemporary elevated station, and the down-home, canvas-and-pine feel of the rustic collection of Jamesways, which emanate an aura of a 1890s mining camp.

I am fortunate enough to live in the luxurious architectural marvel known as El Station. Occasionally, I wander past the cargo berms that separate my world from the collection of Quonset-like Jamesways, which are long tent buildings, clustered near the far end of the station in an area known as summer camp. It is located at least 150 meters from my metropolitan marvel, and the hearty residents must slog through the cold three times a day when commuting to the new station for meals. That may seem brutal in sub-zero temperatures, but the wafting aromas from the baker's oven in El Station lure the summer campers into our building like caloric sirens.

Apart from the differences in the commute, amenities at the two living areas fall on both ends of the spectrum. In my private room in El Station, I can search the Internet for the latest news, read my favorite blog or make a phone call. Also, I can amble down the heated hallway and hone my vocabulary with a friendly game of Scrabble in our fully equipped game room. In the Jamesways at summer camp, entertainment is limited to watching movies in a dimly lit lounge that has a seedy Las Vegas feel to it, or slogging outside and pretending to pet a sundog. Granted, the Jamesways do sometimes have wireless Internet access.

Subtle differences in lifestyles also exist, sort of like the differences between



Bob Melville / Special to The Antarctic Sun

Tom Lohr is the South Pole human resources and finance specialist for the 2005-06 summer and winter. He brings a slightly different outlook to life at the new elevated station, which appears behind him.

Manhattan and Mayberry. In the haughty high-rise of the new station, we buy nifty new fleece pullovers that only a portrait of President Grant will procure. Could it be a coincidence that Antarctica's version of a thrift store, the Skua Shack, is on the outskirts of summer camp?

El Station has distinguished monikers for its residential spaces. There is the quiet reading room, the arts and crafts room, and the popular hydroponics growth chamber. On the other side of the berm, summer camp is next to places called the Cheese Palace and Graceland. In El Station, it is currently forbidden to smoke until the new smokers' lounge is finished, but our kin in the historic Jamesway district have an entire building dedicated for it.

Life in the Jamesways is not without redeeming qualities. Going to work or answering a call of nature during the middle of the night requires a trip outside. It is all too easy to be caught in a cyclic web of work, play and sleep in which an El Station resident never leaves the building, undermining one of the main reasons for working at the Pole: experiencing the polar landscape.

The provincial existence in summer camp also produces a greater sense of community than the plush digs of the elevated station. Just as in small-town America, those with less tend to bond together more

than those with endless distractions. That factor alone is a major reason many with enough Ice time, or seniority, prefer to live at summer camp than live in more lavish lodgings. Plus, living in the Jamesways puts distance between one and the ever-present, fresh-baked cookies laying about in the dining hall that jump into my mouth as I walk by.

Still, my polar palace is well lighted, fomenting a positive effect on its cheery inhabitants. Doors are well marked, a telephone is on every corner, and safety features abound. That's a stark contrast between the nearly pitch-black summer camp buildings that only a vampire could love. Even with a summer sun that never sets, it is eerily dark inside. Of course there's a flip side to all the bright lights in the big city: Most berthing rooms in the new station have windows that boast stunning views, but also allow in too much summer sunshine as one attempts to drift into a slumber.

While I hand it to the hearty souls who brave the dark depths of arduous summer camp life, I often think of those who devoted their lives to inventing the light bulb, the Internet, wall-to-wall carpeting and 21st century living. It would be a shame to waste such genius by not embracing the plush polar life — the life on my side of the berm.

around the continent



Cara Sucher / Special to *The Antarctic Sun*

Two Adélie penguin chicks poke their heads out from under their parent's stomach recently on Torgersen Island near Palmer Station.

SOUTH POLE

Station changing daily

By Katie Hess

South Pole correspondent

Now that the New Year has begun, the end of the summer season is fast approaching. The last flight is scheduled for mid-February, so operations at South Pole Station are truly cranked up to full tilt.

Outside, the daily appearance of the station is changing in big chunks. The cryogenics facilities are being constructed to form three large modules on a snow pad, raised up several meters from where they were last seated. The second of the three buildings to house liquid helium is nearly finished.

Steel for the main entrance stairway on the airfield side of the elevated station appeared overnight. The biomedical arch project to excavate and raise the structure to repair the bulkhead continues, with that entire area exposed and clear of most snow. Just across from the Dome entrance, looking up at the new station, the new gunmetal gray siding is spreading ever farther over the building. And out in the Dark Sector is one of the largest construction projects on station — the 10-meter telescope.

In the midst of it all, Polies still found time to enjoy the holidays in style and ring in the New Year. The celebration took place in the cleared and cleaned heavy shop for the last time because the party will be held in the new gym next year. Go-go dancers and Baby New Year made appearances, as three bands helped the community bring in 2006. There was dancing and delicious food catered by the dining hall staff.

The annual relocation of the Geographic South Pole marker (due to the 10-meter ice flow each year) took place at 7 p.m. on Jan. 1. (See story on page 6.)

Since then, the South Pole has been able to take full advantage of some great summer weather with ambitious flight

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PALMER

Hatching season begins

By Kerry Kells

Palmer correspondent

Palmer Station is surrounded by beautiful tabular icebergs and bergy bits, and we have had some brilliant days of sunshine followed by rain and winds that were more than 75 kph.

The Adélie penguin chicks on Torgersen Island and some of the other local islands have hatched and are about 10 days to two weeks old. The brown skua chicks have also begun hatching, but other local birds have not. The seabird research group keeps us informed on the new bird life around station as the season progresses.

Also this past week, we welcomed 114 visitors from the cruise ship *Corinthian II*. About a dozen more cruise ships are scheduled during the month of January,

the busiest time of year for visitors to the Antarctic Peninsula because of the abundance of wildlife and favorable weather. The *Rotterdam* of the Holland America lines stopped off at station later in the week, and several members of the community went on board for a presentation and question and answer session with the passengers. The *S/Y Sarah W. Vorwerk* yacht also paid a visit.

Palmer also celebrated Hanukkah, which began this year on Dec. 25 at sunset. Several members of the community volunteered to make traditional Hanukkah food. This included brisket, kugel (a noodle pudding), latkes (potato pancakes), and two desserts: ruggelah, which is like a turnover with apricot, raisins, jam, cinnamon and sugar, and mandelbrot, which is like biscotti. We even fashioned a homemade menorah out of wine bottles. We feasted on Friday and celebrated the New Year with our two-day weekend on Saturday and Sunday.

the week in weather

McMurdo Station

High: 41F / 5C
 Low: -16F / -9C
 Max. sustained wind: 26mph / 43kph
 Windchill: -18F / -28C

Palmer Station

High: 47F / 9C
 Low: 32F / 0C
 Max. sustained wind: 52mph / 84kph
 Precipitation: 13mm

South Pole Station

High: -9F / -23C
 Low: -20F / -29C
 Peak wind: 17mph / 28kph
 Max. physio-altitude: 3,192m

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schedules. Seven aircraft have been arriving at the station each day so far this week, and we hope to continue to receive as much fuel and cargo as possible before station closes. There is still a lot to accomplish before the last flight of the season leaves a much smaller winter crew for 2006.

SHIPS

NBP

Compiled from reports
by Harold "Skip" Owen

Marine Projects coordinator

We made good progress toward the IVARS mooring station number 12 in open water the day after Christmas.

IVARS stands for Interannual Variability in the Antarctic Ross Sea, a five-year project to learn more about year-to-year changes in the biology, physics and chemistry of the Ross Sea. The project involves two cruises per year through the Southern Ocean: one in December during the spring phytoplankton bloom, and one at the end of the growing season in February.

By comparing data from each cruise to that of "pre-bloom" water, IVARS researchers can calculate seasonal phytoplankton productivity and compare it to that of previous years, thereby revealing year-to-year changes.

After a morning of instrument deployments, we set out once again for the IVARS transect on the 26th. We started on the eastern end so that as we work west we'll be closer to McMurdo Station, where we may attempt to pick up some items needed by various science groups. We arrived at the IVARS transect station number 12 in the

wee hours of Dec. 27.

We started the morning with a full-size rosette cast on the first station of the 36-hour IVARS transect, working from east to west. The first of the two IVARS mooring arrays was deployed without a hitch. The remainder of the day was spent on conductivity, temperature and depth (CTD) casts, which continued through the night.

On Dec. 30, we completed the IVARS transect line, interspersed with casts for the Controls on Ross Sea Algal Community Structure, or CORSACS, project. CORSACS is a separate study to determine what controls phytoplankton dynamics.

After completing several more CORSACS stations on New Year's Eve, we entered the ice edge and found a broad area of fast ice to "park" overnight. Everyone was allowed to roam around a bit, stretch their legs and be touristy. Ice algae were collected in the broken area behind the ship. The New Year was rung in with dancing and ultimate Frisbee.

We started 2006 with several CTD casts, a trace metal Niskin bottle cast, and a trace metal rosette cast near the edge of the ice at the westernmost extreme of the first transect line. We'll work eastward along 76 degrees 30 minutes south latitude, then move north and track back westward as far as we can get. These two transect lines should take about eight days.

LMG

By Kerry Kells

Palmer correspondent

The *Laurence M. Gould* was expected back at Palmer Station on Jan. 5. The *Gould* brings more supplies for the summer season, freshies, mail and new arrivals. It then begins its month-long Long Term Ecological Research cruise. The ship will go south as far as Marguerite Bay near the British Rothera Station, about 325 kilometers south of Palmer.

Marker makes annual move

Tom Lohr

South Pole correspondent

The South Pole Station heralded in the New Year by performing a unique polar ceremony that can only be experienced at the bottom of the world — the relocation of the geographic South Pole marker.

The South Pole is covered by a three-kilometer-thick sheet of ice, which slides over the continent at a rate of about 10 meters a year, causing an increasing discrepancy between the marker and the actual location of 90 degrees south. Each year the marker is relocated on Jan. 1.

The design of the marker changes annually. It's made by the winter crew from the previous year, a source of pride for those who endure the harsh polar winter. This year's marker was designed by Stephen Parshley and depicts a raised model of the new elevated station. The 86 dimples on the marker's perimeter represents the members of 2005 winter crew. The marker was unveiled and put into place by the designer of the 2005 marker, Dehlia Sprague, who is a materials person.

About 50 people gathered for the event, which was preceded by short remarks from South Pole Area Director BK Grant, and National Science Foundation representative Jerry Marty. The ceremony was laden with historical significance, as 2006 represents the 50th year that the United States has maintained a permanent presence at the South Pole.



The 2006 South Pole marker

Continental Drift What's your favorite Antarctic movie or book?



"John Carpenter's 'The Thing' because this was the first intriguing story I had ever seen about a place I thought I would never go."

George Westby,
Palmer graduate student
from Owego, NY,
second season



"The 'Endurance.' Shackleton would so be my boyfriend"

Lynnette Harper,
South Pole materials
person from
Huntington, Ore.,
first season



"'Antarctica,' by Kim Stanley Robinson."

Genevieve Ellison,
McMurdo assistant
housing coordinator
from Portland, Maine,
second season

Comms goes high-tech at South Pole

From page 1

of operations, monitoring all communications and electronic activity. A suite of about a dozen flat-faced computer screens is spread around the state-of-the-art SOC. A large audio/visual screen hovers in the corner of the second-floor room of the B3 wing. In the center of the screen is a view of the IceCube science construction site from a rooftop camera on the elevated station. The large picture is ringed on the screen by numerous smaller views of the station's functional areas, like the power plant or fuel pump room. Outdoor light pours in through a half-dozen large windows.

"[It was] an interesting challenge to work out of two operation centers," said Tracy Sheeley, the South Pole communications supervisor. "This is it. Now we are based here, which we're looking forward to."

Sheeley's been living a schizophrenic existence this season, bouncing between the Dome comms room and SOC, a relatively short distance until you start climbing up and down the 90-plus stairs on the elevated station's shiny vertical tower. With Conant staffing the Dome, the job's been easier but still hectic, she said.

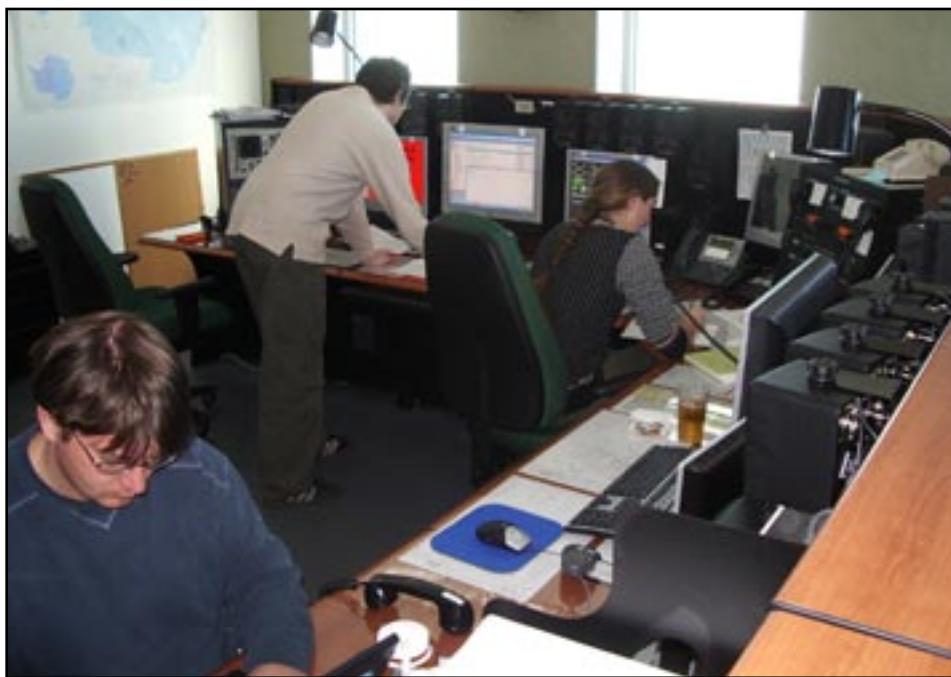
"I don't know how we would have done it without an extra person just because of the physical distance," she said. "It's definitely a challenge to transition while we are functioning at full speed ahead as usual in the summer."

Perhaps no one understands how difficult it's been besides Sheeley and Joe Tarnow, who works for the IT South Pole Station Modernization project. It's been his job to ensure the old and new communication systems worked in concert, cobbling together a bridge between the two.

"To get the two together to work and play nice has been a challenge," he said while taking a break from writing software to fix a glitch in the fire alarm announcement. Instead of a blaring siren, the new fire alarm system is a voice recorder that announces the emergency over the all-call system. The voice is having trouble enunciating, making the "a" sound like an "uh" — or what Tarnow calls the "James Brown alarm."

Change of culture

SOC will be even more of a hub of operations than the old comms, according to Sheeley. There's still the usual job of handling high-frequency radio calls with aircraft, local radio communications, and



Peter Rejcek / The Antarctic Sun

Personnel at the new South Pole Station Operations Center monitor station facilities 24 hours a day and can notify the appropriate staff of an emergency taking place in any part of the building.

fire alarms. In addition, the SOC will provide a 24-hour watch on the direct digital control system that monitors the various facilities, along with satellite and local area network systems.

"We have the capability for doing more than we could before," Sheeley said.

There are some new twists as well, like the installation of 23 cameras in and around the station. The rooftop camera, above the SOC, allows for a 360-degree view. Another camera is supposed to be installed on top of the A4 berthing wing, which is still under construction. A third will go on top of the dining facility. A fourth camera will be located near the MARISAT building, which houses a satellite communications radar, Tarnow said.

"That will give us a downwind view of the skiway," Tarnow said of the latter camera. "The plan with the cameras wasn't with any real specific purpose other than the thought that it could be helpful, and once they get around station, we might find better uses for them."

Added Sheeley of the new electronic eyes, "They have been helpful to see the flights."

These nuances are light years ahead of the old comms room under the Dome, which didn't even have a window. Of course, even if it did, it would have looked only a few meters away into the Dome's curved wall.

SOC will also operate differently in terms of social dynamics. The old comms room was downright homey, with couches and candy bowls, a place open to visitors.

With magnified capabilities and responsibilities, SOC will be strictly for business.

"They had to plan for a lot of scenarios that come through this room," Sheeley explained. "It's a different era, I think, starting with comms. ... It is a cultural change, which is truly station-wide."

Getting it done

While it's easy to see the transition as simply the flick of a switch, the brain transplant for South Pole operations was years in the making. During the winter, much of the new equipment for SOC was moved into the room, Sheeley said. She and the three communication coordinators have been getting hands-on training over the last month while Conant kept the lights burning under the Dome.

"Those of us who have been through [station modernization] all these years are looking forward to it being over," she said a few days before the turnover.

Relief over the completion of the project is a sentiment shared by many.

A key to making this summer's transition work was the installation of the HF antenna field near the MARISAT building, according to Carlton Walker, the South Pole facilities, engineering, maintenance and construction manager.

"That was a huge one to get behind us," Walker said, crediting McMurdo antenna rigger Jay Cairns and his crew with getting the difficult job done.

It took 10 weeks spread between last

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Death memorials honor the ultimate sacrifice

From page 1

of someone losing his life while supporting science and exploration on this continent.

According to Bevilacqua's account, seven men set out from McMurdo Station at about 7 a.m. toward Cape Evans on that fateful trip. About halfway there, the ice around Williams' D-8 tractor suddenly gave way, and both he and the tractor disappeared below the water's surface.

"Chief Wise and myself, who were standing only six feet away, were almost carried down ourselves as all the ice broke where we were standing," reads Bevilacqua's journal entry. "God, what a feeling to have that happen right before my eyes."

Williams was the first person to be killed near McMurdo Station during Operation Deep Freeze.

In 1956, what was then known as McMurdo Air Operating Facility was renamed Williams Air Operating Facility. In 1962, the facility became McMurdo Station and officials named the nearby airfield on the permanent ice shelf Williams Field to continue commemorating his sacrifice.

A memorial, Our Lady of the Snows Shrine, was also constructed for Williams. It still stands near Hut Point and consists of a Virgin Mary statue in a rock cairn. The structure was completed in time to dedicate the shrine on the one-year anniversary of his death.

"I hope to God nothing like that should happen again," Bevilacqua concluded in



Peter Rejcek / The Antarctic Sun

Lonnie Clayton, center, shares his memories of Petty Officer Richard T. Williams during a memorial service at Our Lady of the Snows Shrine Friday night. Williams died 50 years ago to the day when his D-8 tractor fell through the sea ice during Operation Deepfreeze I. Clayton is flanked by Chaplain Douglas Irmer, left, and Father Paul Duncan.

his entry. "But most of all, I thank him that my life was spared."

Another memorialized death is one of the last to happen here.

Chuck Gallagher was a U.S. Navy command master chief who spent four seasons on the Ice with the Navy between 1991 and 1995, when he retired and came back to

work as a civilian. He continued his work with the U.S. Antarctic Program until he died in McMurdo due to health complications on May 1, 1997. One of the two bars at McMurdo was renamed Gallagher's Pub in his honor immediately following his death.

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Antenna field key to getting SOC up and running

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summer and this one to install the 15 antenna towers, which included two 20-meter-high towers, according to Cairns.

"We worked pretty hard," he said.

It was cold work, as most of the job was completed outside, where wind chill one day dropped to negative 65 degrees Celsius, he said. The antenna towers are assembled outside on the snow. After holes are dug for the anchor footers, the towers are raised up using a crane. The riggers must then climb the towers to unfasten the crane.

"It's an ordeal," Cairns said. "It was nice to get it done."

Though the transition is over, the old Dome comms room will stay powered through the summer season as a backup. If all goes according to plan, the heat will be shut off this winter and it will be disassembled with the rest of the building, which houses offices, a poolroom and the old library.

"I think for me, it feels more matter of fact than I expected it to," said Sheeley about the transition of not just comms, but South Pole life from the Dome to the elevated station.

Shortly after the transition, in a follow-up e-mail, Sheeley said the move was not without a sense of nostalgia. "It did feel matter of fact up until that day, surreal throughout the actual transition, and terribly sad to walk into old comms that night to find the lights off and no one there."



Levi Littrell / Special to The Antarctic Sun

Antenna riggers Jay Cairns, Robert Zimmerman and Andrew Asher raise the curtain on the new high frequency (HF) antenna at South Pole Station on Nov. 21. The first HF digital transmission from the South Pole to McMurdo Station occurred a week later.



Peter Rejcek / The Antarctic Sun

A cross dedicated to the memory of Benjamin Miccou is silhouetted against the sunset behind the Chapel of the Snows. He, along with two other men, were killed in a helicopter crash on Oct. 31, 1992 near Cape Royds.



Steven Profaizer / The Antarctic Sun

A hardhat sits atop a memorial to Boatswain's Mate 1st Class Raymond Smith. Smith died after being knocked overboard while unloading the Southern Cross on Feb. 6, 1982.

Station pub named after former Navy chief

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Gallagher was well known for his distinctive presence, which he owed to his almost completely tattooed arms, gruff cigar-smoker's voice, completely bald head and ZZ Top-style beard.

"I remember him talking to us in the beginning of the year," said James VanMatre, who knew Gallagher for about two years and was on station when he died. "He said, 'I want us to have measurable goals down here. Mine is to fill these last four inches under my arm,'" referring to his tattooed arms.

Gallagher held several jobs while at McMurdo, his last one being recreation director.

"The day they flew out his body, we had a memorial service at the chapel, which he never would have gone to," VanMatre said. "Then we had a wake at what was then The Erebus Club. People shaved their heads, wore temporary tattoos and smoked cigars."

It was during that celebration of Gallagher's life that the group decided to rename the bar in his honor, and it has been known as "Gallagher's Pub" ever since. A small memorial is inside the bar and contains several photos and personal items of his in a glass case.

Gallagher, who was 50 at the time, died of heart failure after complications arising from pneumonia, dehydration and fluid build-up around his heart, according to a National Science Foundation press release.

"He loved it here; he'd been coming down for so long," VanMatre said. "I think that, if he had to go, he wouldn't have minded it happening down here."

Likely the most commemorated and well-known Antarctic death, however, happened well before the days of the U.S. Antarctic Program.

Capt. Robert F. Scott, of the British Royal Navy, led the ill-fated mission to race Roald Amundsen to the South Pole. After reaching the Pole in January 1912, about one month after Amundsen, he and the other four men in his group started the arduous journey back to the coast.

Bad weather and injuries slowed the team down, and none of

them survived. Scott, Edward Wilson and Henry Bowers died in their tent, just 18 kilometers from a food and fuel depot. Edgar Evans and Lawrence Oates died along the way before Scott.

Both the Amundsen-Scott South Pole Station and New Zealand's Scott Base pay homage to his efforts in Antarctic exploration. And a large wooden cross stands atop Observation Hill by McMurdo Station in memory of Scott and the lost members of his team.

The cross was erected by members of Scott's last expedition, who did not go with him to the Pole on Jan. 22, 1913. It took two days to move the cross up to the 230-meter summit of the hill.

Another of the most visible memorials at McMurdo Station is a second large wooden cross standing at the tip of Hut Point. This memorial is named Vince's Cross and was erected in 1902 to honor Seaman George T. Vince, a member of Scott's 1902 expedition and the first person to die in McMurdo Sound. Vince and eight of his companions were making their way back to their ship in a blizzard when he slipped down a slope, off a cliff and into the sound. His body was never recovered.

Near both Our Lady of the Snows Shrine and Vince's Cross also stands a marble monument topped with a bronze hard hat that is dedicated to the memory of Boatswain's Mate 1st Class Raymond Smith. Smith died Feb. 6, 1982 when he was knocked overboard while off-loading the U.S. Naval ship *Southern Cross*.

When Smith died, he joined the ranks of those who gave their lives to further the understanding of Antarctica and the world as a whole. Some of those men have specific memorials, others do not.

But it is with all those lost people in mind that Our Lady of the Snows Shrine, originally intended for Williams, was rededicated on the 40th anniversary of his death.

"We built the shrine just to Williams because we [didn't think] we were going to lose anybody else," Bevilacqua said recently by phone. "We rededicated that shrine, not only to Williams but to everyone else lost in Antarctica."



The meteorite hunters sweep an area near the Miller Range earlier this season looking for alien rocks. The eight-person team conducts

searches on snow mobiles, spread apart by about 10 meters to ensure not even the smallest meteorite is missed.

Ralph Harvey / Special to *The Antarctic Sun*

Meteorite hunting 'as alien as you can get'

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backcountry for pieces of stellar debris as small as a centimeter. This is the 29th field season for the Antarctic Search for Meteorites (ANSMET) project, and Harvey's 16th trip to the Ice.

"It doesn't matter how long you've been doing it, it never becomes passé," said Harvey, a geology professor at Case Western Reserve University in Cleveland, shortly before heading out to the field.

The thousands of Antarctic meteorites collected by Harvey and his group represent the world's most important supply of research meteorites, according to Tom Wagner, the National Science Foundation geology and geophysics program manager.

"Every year researchers eagerly await reports of the year's finds," Wagner said. "It's also unique in that the meteorites are available to scientists of all nations. Not all collections are as open."

The Antarctic meteorites include pieces of the moon and Mars, Wagner noted, including the meteorite that was purported to have fossil evidence of life, though that interpretation is hotly debated.

"Meteorites represent everything from the floor sweepings of the solar system's formation to chunks of broken up planets that didn't make the cut," he said.

Besides the project's obvious scientific value, it has wide appeal beyond the geological community. With its

romantic ties to pop culture science fiction — from "War of the Worlds" to Capt. Kirk of the starship *Enterprise* — it's the kind of science that captures the public imagination. Even the scientists themselves are not inured to the mythic appeal of their work.

"There are a lot of people in this crowd who are astronaut wannabes ... we all have dreams of being in the alien landscapes," Harvey said. "This is about as alien as you can get."

This year's mission

In their ongoing mission to discover strange, new rocks, the meteorite hunters use what Harvey calls "old school" techniques. Two groups are dropped by fixed-wing aircraft into the field. An eight-person team is doing a comprehensive search near the Miller Range, which extends south from the Nimrod Glacier for about 80 kilometers, in the Transantarctic Mountains. The team has made three previous trips to the area, dating back to a half-hour visit by Harvey's predecessor, William Cassidy, in 1985.

During the last trip there in 2003-04, a four-person team harvested about 90 rocks, including a rare Martian meteorite.

"From their finds and from the density of meteorites there — they found meteorites in every corner, nook and cranny they went — it was clear we wanted to send an eight-person team out there," Harvey said.

Gordon "Oz" Osinski, with the Canadian Space Agency, was a member of that season's field team, and returned to the Miller Range once again. "[I'm] looking forward to going back for six weeks to look for more," he said before leaving.

That team has a lot of ground to cover, about 130 square kilometers of mostly blue ice. Blue ice occurs when snow falls on a glacier, and then compresses as the glacier moves. During its travels, all of the air bubbles that are trapped in the ice are squeezed out, and the size of the ice crystals increases, making it appear clear blue when you look through it. For the hunters, the pristine surface makes it a perfect place to look for dark-colored rocks.

Veteran mountaineer Shaun Norman returns for his second season with the ANSMET group. While he's worked with a lot of Antarctic geology projects during his 18 summers and three winters, Norman said meteorite hunting is a unique experience.

The ANSMET expeditions make a point of going to remarkable places like the Miller Range, Norman said. "They're very special areas with this exposed blue ice."

The snow cover on the blue ice around the Miller Range may have increased since the last visit, Harvey observed, but there's still a lot of ice area to cover. "If we can get this whole thing cleared in one season, I'd be happy," he said.

The second group is on a snowmobile traverse west of the McMurdo Dry Valleys in Victoria Land. Except for an occasional re-supply flight by Twin Otter, the four-person team is on its own, hauling all its gear behind snowmobiles, Harvey said.

"They're just out there exploring in a caravan," he said.

First forays

For many on the team, it's a new enterprise, this expedition in the middle of nowhere.

Jani Radebaugh is a planetary scientist whose research focuses on volcanoes on distant moons that orbit Jupiter and Saturn. Like Kelley, also on the Ice for the first time, the chance for a firsthand experience is an invaluable opportunity, professionally and personally.

"It's an important tool in understanding the formation of the solar system, and that helps us understand the evolution of other bodies in the solar system," she said. "I think the bonus is that this [happens in] such an amazing place."

For his research work at the American Museum of Natural History, Joe Boesenberg handles meteorites as much as anyone in the field. The self-described "lab rat" specializes in the study of primitive meteorites that date back to the beginning of the solar system, about four-and-a-half billion years ago. But the research leaves out an important com-

See ANSMET on page 11

ANSMET's found 15,000 meteorites in 30 years

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ponent, he said.

"This is the first chance I get to do fieldwork," he explained.

Mike Wyatt is also familiar with handling meteorites, albeit thin slices under a microscope. His post-doctoral research involves work with NASA and the now-famous Mars rovers. The allure of Antarctica for Wyatt is in both the rocks themselves and the Mars-like environment where they're found.

"Just being able to see [the meteorites] in the field, is something I'm looking forward to," he said. "My interest in this is in understanding the Antarctic environment."

The Mars analogy is also a draw to Mary Sue Bell, whose "day job" is as a curator at the Johnson Space Center in Houston, where the ANSMET meteorites are initially processed. She wants to understand the techniques used to gather Antarctic meteorites and apply those methods to a future manned mission to Mars.

"Getting into the field and seeing how these samples are collected and curated ... all the way back to Johnson Space Center" is insightful, she explained. "It requires a lot of support — the kind of support you would need if you were in another alien environment."

We want you

Harvey said he receives as many as 70 applications a year from volunteers who want a chance to join the team in the field. He chooses candidates based on the strength of their academic interest in meteorites, though the meteorite science may not be their primary field of study. Instead, a volunteer may be a volcanologist interested in Earth deformation.

"We like to have a mix of veterans and new people," he said. "If it's somebody who is just getting a career started, and they do work on Antarctic meteorites again and again and again, that's an obvious person who can get a lot out of this.



Photos by Ralph Harvey / Special to *The Antarctic Sun*

The meteorite hunters remain in the field for weeks at a time in temporary camps like this one near the Miller Range. Principal Investigator Ralph Harvey is keen to point out that few science groups operate in this "old school" fashion by living and working so far afield.

"We realize how valuable that experience is," he added.

Harvey is also interested in volunteers who believe in teamwork and understand that meteorite hunting involves long hours, tedious routine and numbing cold. He said it's a job that requires fortitude.

For example, while he had never met graduate student Marie Keiding from the University of Iceland, she came highly recommended to him for her fieldwork ethic. The volcanologist said that while her research is differ-

ent, the techniques involved are similar. She's done field research in Greenland, working "in the middle of nowhere for a long time."

The big haul

All the time on the Ice here has paid big dividends for ANSMET, especially the last few seasons. In 2004-05, the team gathered more than 1,200 meteorites, including 170 kilograms of pallasite — rare rocks originally from the core-mantle boundary of a small planet or asteroid.

"They hit the goldmine in several places," Harvey said of the quantity of findings near the Beardmore Glacier in the middle of the Transantarctic Mountains. The exact nature of those nuggets is still under investigation.

"We've been bringing so many [meteorites] back, they're a year behind looking at what we've brought back," he said of researchers at the Johnson Space Center and the Smithsonian Institute.

Since the ANSMET team first went into the field some 30 years ago, it's brought back more than 15,000 specimens. What they'll find next is anybody's guess.

"These are samples of the great unknown," Harvey said.



Blue ice in what the meteorite hunters call the Hockey Cirque near the Miller Range makes it relatively easy to spot a meteorite.

NSF-funded research in this story: Ralph Harvey, Case Western Reserve University, <http://geology.cwru.edu/~ansmet/index.html>. NASA and the Smithsonian Institute collaborate with the NSF on this project.

Profile Taking a poetic look at science

By Bill Jirsa

Special to the Sun

When Kathleen Heideman explains that she is writing poetry about science in Antarctica, she's likely to encounter some skepticism about the subject she has chosen, especially from the researchers she is trying to observe.

"It's hard for them to believe that there's something poetic about the obscure thing they are studying," she said.

The things that one might expect to see in poetry make their appearances in her work: landscapes and the people in them, flora and fauna. But the central characters of her Antarctic poems are scientists at work. She uses them to tease out the common theme that unites science and poetry: curiosity.

Heideman spent about six weeks in and around McMurdo Station through the National Science Foundation's Antarctic Artists and Writers Program, gathering material for her project "Scientific Method: Poems of Antarctic Inquiry."

"There's a real core mission of inquiry here," she said. "That's what poets and scientists have in common. It's not necessarily what they're going to learn. It's how they're going to ask questions and how they're going to learn."

During her visit, she embedded herself with a variety of researchers to see firsthand how science gets done in Antarctica.

"I wanted to write about the particulars of science," she said. To prepare, she helped divers who gathered foraminifera from the bottom of McMurdo Sound, observed the careful sampling of freshwater lakes to study bacteria in the McMurdo Dry Valleys, and witnessed work on the IceCube project in its search for neutrinos.

For Heideman, each scientific question is an opportunity to craft a poetic offering toward our search for meaning in a universe full of weird and marvelous phenomena.

In "Foraminifera Studies (Explorers Cove, Antarctica)" for instance, she winks toward the notion of our evolution while singling out curiosity as our most salient trait: "Curiosity draws us down, — that old monkey tail curled to a hairy question mark, punctuating/the signpost of our humanity."

The poem offers a poetic perspective on the research being conducted at New Harbor, where divers retrieve sediment from the bottom of McMurdo Sound hoping to harvest the forams that live there. The poem simultaneously celebrates the wonder of the forams themselves (undifferentiated, single-celled life forms that nevertheless manage to arrange grains of sand into a beautiful



Bill Jirsa / Special to *The Antarctic Sun*

Poet Kathleen Heideman, shown here at Castle Rock, spent about six weeks in Antarctica working on poems about science.

protective coating — a "stained glass whorl of translucency"), while it also highlights our desire to understand the mysteries these small creatures invent.

"... every Answer plants a Doubting," she writes, "the mind's membrane of Certainty penetrated by question marks."

Heideman's fascination with science kicked in after her formal training as an artist. She laments the bifurcation she sees in our educational system that divides arts and sciences. "After a certain age, we just don't see what the others are learning."

Even after keeping up with physicists and biologists in the field, she is characteristically modest about her own knowledge of science.

"I'm totally unqualified in one sense," she says, "because I haven't had a science class since my junior year of high school."

Heideman grew up on a dairy farm in Wisconsin and now lives in Minneapolis. Her previous poetry shows an awareness of rural ways of life and the simpler rhythms of the language she found in her Midwestern home. She places herself in the tradition of plain-spoken poets like William Stafford and Robert Bly, who write about nature and rural life.

But nothing prepared her for the landscapes of Antarctica. She explores this difficulty of comprehending Antarctic geography in "Human considering the Polar Plateau."

The problem, she writes, is that what we see is limited by what we know: "each human eye contains a tiny yardstick marked with pencil: 'average pine tree. average crow' — /when we are uncertain, we lift that eye to the world."

The foreign scale and the lack of recognizable features, the poem asserts, leave us grappling for the familiar, and once again, the theme is our quest for comprehension in Antarctica:

"... the snow is different here, a noun with no verbish give, cement, glassine, or grains in spin-drifts. The cloud is waist-high. The horizon provides no scale for us to weigh this world upon, so we go on calculating, underestimating, yearning for what we know."

Out of the technical jumble and daily slog of research, Heideman has refined her own poetics, one that shares and celebrates the inquisitive mission of the human presence in Antarctica.

The Process of Extinction (MN Science Museum)

By Kathleen Heideman

In the end, they seated themselves at stools built for children, and rubbed their crayons over trilobite-studded stones: fernleaf, spiderfeet, ammonite, amore; all of it, heart and husk alike, gone hard. She perched beside him unknowing at the verge of extinction. They studied carbon-dates, a slice of forest floor, mating insects held in amber. She pressed against him by that fernslab wall, thinking— yes, but if it falls? Leave this flattened Oh! of dumb surprise to mark the spot where gravity reduced her to a greasemark, where a stone the miners undermined broke free and married her.