



Scientists seek to label whale species

By Steven Profaizer
Sun staff

Patches of pure white splashed on an inky black body. Two-meter-tall dorsal fin slicing through the water's surface. An attraction at SeaWorld. A pack hunter with cunning intelligence and stunning power.

The killer whale, or orca, is one of the most universally known animals in the world. They are also one of the most widespread mammals, second only to humans, and inhabit all of the world's oceans.

Yet scientists are still working to determine how many species of killer whales exist. Only one species is currently recognized, but many people, including researcher Robert Pitman, believe there may be two additional species among the estimated 20,000 to 80,000 killer whales that inhabit Antarctic waters. Pitman is far from the first to believe this: Soviet Union whalers in the early 1980s first observed the killer whales' differences in diet, preferred habitat and coloring. He does, however, hope to be part of the team that finally solves the mystery.

Pitman, of the National Oceanic and Atmospheric Administration, led a team to Antarctica last year on a two-week mission that used sophisticated technology to hopefully gather enough information to finally solve the killer whale controversy. They used several methods, including

See DNA page 17

Quote of the Week

"Don't laugh. It's McMurdo Christmas shopping."

— *Man at the store with a basketful of soda and snacks chosen as gifts for local friends.*

INSIDE

Monitoring mountains

Page 3

Polie couture

Page 7



Deep Freeze turns 50

By Emily Stone
Sun staff

Al Hisey spent one of his first nights at McMurdo Station by accident.

It was 1955, and he was ferrying supplies by tractor from Navy ships across the sea ice of McMurdo Sound to the spot on Ross Island where the station was being built. During one of the first trips, there was a major break in the ice between the fledgling station and the ships. The 10 or so men on shore had to hunker down for a few days while the ship repositioned itself, Hisey said.

They needed extra food. So the men walked into Robert F. Scott's hut nearby to look for supplies. Hisey, then 22, remembers that the Cadbury chocolate was still good.

"When we went up to the hut, we knew we were the first ones to be there in a long time," he said.

It has been a similarly long time since Hisey and his fellow Navy men were here. In fact, Scott's trip to the South Pole was a less distant memory to those men than their trip to McMurdo is to us today.

This month marks the 50th anniversary of Operation Deep Freeze's arrival in Antarctica. Deep Freeze I, which is how the

See NAVY on page 8

See related stories inside:

Little America V is constructed, then abandoned, page 9

The IGY spurs modern Antarctic program, page 11

Time line of events since Deep Freeze, page 8



Performing with a purpose

Jena Ferrarese plays the bassoon at the 10th annual Women's Soiree at McMurdo Station. This year, the event raised more than \$3,200 for Breast Cancer Support Services of the Caterbury/West Coast Division of the Cancer Society of New Zealand.



Rachel Murray / Special to The Antarctic Sun

Cold, hard facts

USAP ships

Lawrence M. Gould (LMG) **Nathaniel B. Palmer (NBP)**

Type : Research & supply Research & icebreaker

Builder: North American Shipbuilding

Made: 1997 1992

Length: 70 m 94 m

Breadth: 14 m 18 m

LMG installed power: 4,575 horse-power from two Caterpillar 3606 diesels

NBP installed power: 12,720 horse-power from four Caterpillar diesels

The *NBP* circulates a water-anti-freeze mixture under working decks to prevent freezing and ice build-up.

Source: Raytheon Polar Services Co.

The Antarctic Sun is funded by the National Science Foundation as part of the United States Antarctic Program (OPP-000373). Its primary audience is U.S. Antarctic Program participants, their families, and their friends. NSF reviews and approves material before publication,

but opinions and conclusions expressed in *The Sun* are not necessarily those of the Foundation.

Use: Reproduction and distribution are encouraged with acknowledgment of source and author.

Senior Editor: Emily Stone

Editors: Steven Profzaizer, Peter Rejcek

Copy Editors: Rob Ford, Bill Jirsa, Rob Jones, Traci Macnamara, Melanie Miller, Hilary Oliver, Erin Popelka

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



TAMDEF data may redefine ice models

By Peter Rejcek
Sun staff

In Mike Willis' world, the earth below the Antarctic ice sheet is positively dynamic, pulling apart and rising up at tremendous speed.

Of course, Willis measures geological movement in millimeters along a stretch of the Transantarctic Mountains. At four millimeters a year, the uplifting of the ground, mostly caused by the recession of the ice sheet, might not seem like a lot. But watching the earth literally bounce back into shape as the weight of the ice decreases could help researchers better predict how future sea levels may rise.

"Sea level is rising faster than we understand it should be," explained Willis, a graduate student at Ohio State University's Byrd Polar Research Center. "Where is that water coming from? As yet, that's a mystery."

To unlock that mystery, scientists in a project called Transantarctic Mountain DEformation, or TAMDEF, are using a network of Global Positioning System (GPS) receivers to track the vertical (uplifting) and horizontal (rifting) movement of the continent.

Over the last decade, they've installed high-quality geodetic rock pins into exposed bedrock across a quarter of a million square kilometers of the mountains and on several islands to the east, in the vicinity of McMurdo Sound and the Ross Sea. The pins mark the spots where the GPS antennae are placed each field season. The receivers are left on site for up to 90 days, continually recording the points' positions. The data is compared to previous years to detect the amount and direction of movement.

About 10,000 years ago, there was a lot more ice on top of Antarctica during what's referred to as the last glacial maxim. In West Antarctica, including the McMurdo Sound area, the ice surface was about 700 meters higher than at present, according to Willis. Far more static, East Antarctica has lost less than 100 meters over the last 10 millennia, Willis said.

Scientists generally focus on "the problem child" of West Antarctica, where icebergs are calving. But Willis said East Antarctica is also losing ice mass. Though the loss is smaller, it can't be ignored due to the area's sheer size, he explained. In fact, based on TAMDEF's data, it's likely that it was only 5,000 years ago when ice started to disappear from the larger area east of the Transantarctic Mountains.

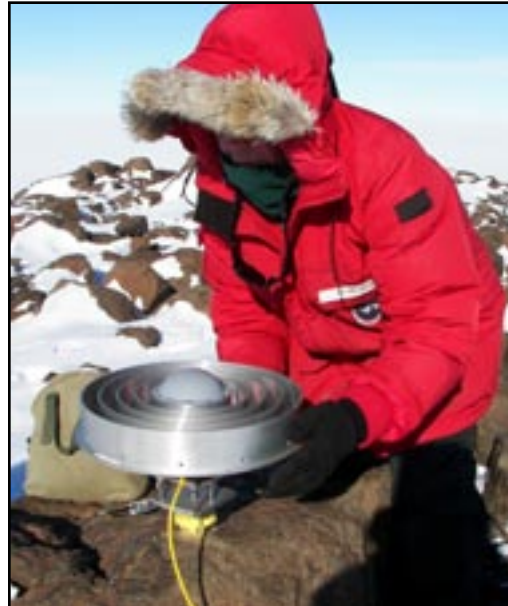
"It does look like there was a more recent ice withdrawal from East Antarctica than most people suspected," he said.

This is the last year of TAMDEF's second field campaign. Between 1996 and 2000, researchers made their initial forays into the mountains as well as onto islands like Beaufort and Franklin in the Ross Sea. Over the last three years, they've gone much farther south and now have equipment occupying about 35 sites. There are also several continuously running observation points, which they can monitor from the states throughout the year.

The team spent the first part of this season making helicopter trips to their sites to set up equipment. Thanks to advances in technology since the first TAMDEF campaign, the GPS receivers can operate with less power but collect far more data. That means they can run unattended for much of the austral summer. The TAMDEF team will return in January to recover their equipment. They will then spend the next 18 months crunching the data.

Willis said he expects his group — led by Principal Investigator Terry Wilson, also of Ohio State University — will publish some groundbreaking conclusions.

Topping the list: TAMDEF scientists are certain that the Antarctic plate is rifting, contrary to other theories.



Kathleen M. Heideman / Special to *The Antarctic Sun*

Geoff Linnell repositions a chock-ring waveguide antennae on Deverall Island Nov. 15. A network of Global Positioning System receivers in the Transantarctic Mountains is providing important data to scientists studying the horizontal and vertical movement of the continent.

"It is pulling itself apart," Willis said. "It's really, really obvious. ... What's surprising is that half of the rifting is on land and half offshore."

A rift is a place where the Earth's crust and lithosphere, which consists of the crust and upper mantle, are being pulled apart. This horizontal movement is much easier for researchers to measure compared to the vertical rebound, according to Willis.

The main reason why the vertical change is so difficult to measure is the orbit of the GPS satellites, Willis said. For horizontal movement, you get measurements from all directions (360 degrees around the point you are measuring from).

"For vertical measurements, the Earth blocks half of that circle, so you only get measurements from the hemisphere above the ground — an arc of 180 degrees," Willis explained. "In Antarctica, you don't even get that because the satellites skirt so low across the sky, only achieving a maximum elevation of 65 degrees from the horizon."

"Therefore it is harder to get a vertical solution as you're only getting about half the data to work with."

Another challenge is that the horizontal movement has definite points to measure against, versus the vertical movement where the point of reference is not so obvious.

"Where is zero? Is it at the Earth's core?" Willis said about trying to determine a baseline against which to measure how far the continent is rising.

While the vertical question of glacial rebound is harder to answer, it is more vital in terms of sea level rise. What the TAMDEF group is finding is that traditional models of what the Antarctic ice sheet looked like 10,000 years ago do not sync with its data. For example, where the ice sheet was believed to be thicker, the data supports a thinner slice of ice based on the amount of glacial rebound.

"We're actually testing these models as we go along," he said.

The ice models are used to predict sea level change. If the models change, then those predictions will change as well, Willis noted. How changing the ice models will affect sea level rise predictions is uncertain right now. But Willis said he's not ready to invest in oceanfront property in Florida any time soon.

NSF-funded research in this story: Terry Wilson, Ohio State University, <http://www.geology.ohio-state.edu/TAMDEF/>



Perspectives Perspectives

Missing the scent of the season

By Rich Jeong

Special to the Sun

I've been on the Ice for a little more than two months, and it's time to stop and smell the roses. That can be pretty complicated here in Antarctica, as it has been a long time since any summer worker has smelled a rose. This is the first time in my life I've been so deprived of smell.

I started thinking about smells after hearing Lonnie Clayton's talk about his experiences at McMurdo 50 years ago with Operation Deep Freeze. He referenced a memory he had of sailing across the sea and being able to smell life as he got near the coast of New Zealand. The thought of being able to smell life has stuck with me as I keep catching whiffs of smells I miss from home, like lavender, sage, and especially pine.

If we were at home in the States during the Christmas season, we'd be walking in and out of stores or houses where wreaths and pine trees would abound. In McMurdo, we've got decorations going up, like fake Christmas trees with great ornaments and fake wreaths with garland and decorations.

There's definitely something missing when you don't have a log burning in the fireplace, a Christmas tree aglow in lights and candles, and Christmas dinner in the oven.

Of course the chefs here prepare a brilliant meal for the holidays, and even day to day we are treated to the pleasant smells put out by the hard-working people in the kitchen. This is probably our olfactory savior. It is always interesting to walk next to Building 155 and get a sense of what the next meal might contain. At night, you can get the smell of freshly baked bread and sometimes you can tell when night shift workers are having fried chicken. The kitchen gives us life in food and triggers memories of the world beyond this beautiful landscape.

But it is the holiday season, and we exist without smells like pine.



Photos by Steven Profaizer / The Antarctic Sun

Rich Jeong sniffs the fake Christmas tree in the galley, searching for the scent of pine. The holiday season has reminded him of all the many scents missing from Antarctica.

But it is the holiday season, and we exist without smells like pine. No trees grow here. We have no dogs; we have no grass. There is nothing alive but humans, some plants in the greenhouse, a few skuas, and undoubtedly lots of bacteria that like the cold.

Sure it's the windiest, driest, coldest and most lifeless continent on Earth, but it never dawned on me when I signed on to come to McMurdo that I wouldn't smell much of anything pleasant for about 130 days.

We take smells for granted in the civilized world, where on any given day your nose could try on a thousand different smells. McMurdoites, on the other hand,

just get things like cleansers, sweat, deodorant, dirty coats, stale offices and cigarettes.

What Mactown misses is the basic scent of life. We have to resort to our memories of things like the smell of a dog, a blade of grass, a blooming tree, a garden, or rich, warm soil. It's a tough gig when you've missed it for so many weeks.

Antarctica is a desert of snow, ice, and lava rock — where the dry air saps everything of water, and the cold and six months of darkness inhibit most life. The smells that we bring with us in bottles, cans, food and air fresheners, along with that of snow and wind, are what are possible here.

Sure we might get smells of the sea when the ice breaks up, but for now, when we smell sage, red pepper, lavender, or even someone who's put a bit of cologne on, it's a shock to the system. It's a bright spot in this smell-deprived bubble we live in on this harsh island.

around the continent



SOUTH POLE

Summer brings changes

By Mike Mulvihill

South Pole Correspondent

The end of the calendar year is fast approaching, and it's hard to believe that the summer season has already past the halfway point.

Seeing the transformation of the station from the beginning of the season to what it looks like now is quite remarkable, and it's obvious that all the hard work that happens around here is paying off. There are some major changes happening to the station's landscape, and walking outside each day offers a different view than the night before.

Enormous piles of snow get moved around from place to place by the heavy equipment operators as part of a plan to allow for buildings to be moved and construction to continue. Where there once was a pile of snow, now there is a smooth, raised pad and a great new home on higher ground for the Cryo facility, cargo offices and their do-not-freeze storage. The place where the buildings were is now filled in. Instead of a valley, there is a smooth transition into the surrounding areas.

Looking out toward the dome is probably where one of the most noticeable changes is occurring. Like a giant silver submarine, the bio-med arch is slowly making its way out of the frozen tomb that has encased it for so long. Each day we get to see a little more of its curved shape emerge. The mountains of snow that get pulled away from it and moved around allow us to view the dome entrance and the connecting arches as they were when they were fully above ground.

Continuing to pan around the landscape, we see quite a few large snow boulders hanging around summer camp. These boulders are just waiting for an artist to come and sculpt new life into them, as an



Tom Lohr / Special to *The Antarctic Sun*

Jodi Dobson rolls out some cookie dough Dec. 21 in the dining hall of the South Pole Station. Program participants at all three stations have filled their weeks with holiday activities.

outlet for Polie creativity.

With the warmer temperatures, outdoor recreation has picked up and Polies are getting outside more often. McMurdo instructors have come to Pole for the past three weekends and given folks an opportunity to get off station and learn how to camp and survive in extreme environments. The hearty souls who took the class learned valuable skills that will surely be remembered, like erecting a Scott tent and building a snow shelter.

There is also a freshly groomed ski loop to venture out on, football games being played — both American and Kiwi style — and a general desire to be outside and enjoying the polar sunshine.

The other obvious event that comes at year's end is Christmas. It is a pretty big event at Pole, and it promises to be an enjoyable weekend. People are baking pies and exchanging gifts in an effort to

bring the holiday cheer to a place far from home.

There will be a traditional dinner on Christmas Eve split up over three seatings to accommodate the entire population, and many departmental gatherings have happened all over station. On Christmas morning, there is the much anticipated Race Around The World, a three-kilometer long, three-lap race around the Pole that is sure to be the highlight of the weekend. Participants will join in on foot, skis, snowmobiles or any other mode of transportation they can get their hands on. A nice weekend of festivities and fun will get Polies ready to head into the second half of their season rested and ready to finish the projects ahead.

PALMER

Greetings from space

By Kerry Kells

Palmer Correspondent

The past week we contacted another group working on science at an isolated station.

Our satellite communications technician, Chuck Kimball, contacted the International Space Station via ham radio on Dec. 17. Expedition 12, as the current U.S. Space Station crew is known, is run by American Commander William McArthur, a retired army colonel, and Russian Flight Engineer and Sovuz commander Valery Tokarev, a Russian Air Force colonel.

Expedition 12 launched on Sept. 30. The mission is set to run for six months, and the NASA website mentions that Expedition 12 will focus on preparations for space station assembly, maintenance, education and science in microgravity, Earth observation and other scientific experiments.

Chuck made an attempt at 3:34 p.m. local time to contact them by VHF ham radio. The first attempt was unsuccessful.

See CONTINENT on page 6

the week in weather :

McMurdo Station

Max Temp: 37F / 3C

Min Temp: 20F / -7C

Min Wind Chill: -15F / -26C

Max Sustained Wind: 37 mph / 59 kph

Palmer Station

High: 41F / 5C

Low: 25F / -4C

Max. sustained wind: 14 mph / 22 kph

Precipitation: 0mm

South Pole Station

High: -1F / -18C

Low: -15F / -26C

Peak wind: 19 mph / 31 kph

Max. Physio-altitude: 3,162m

Continent From page 5

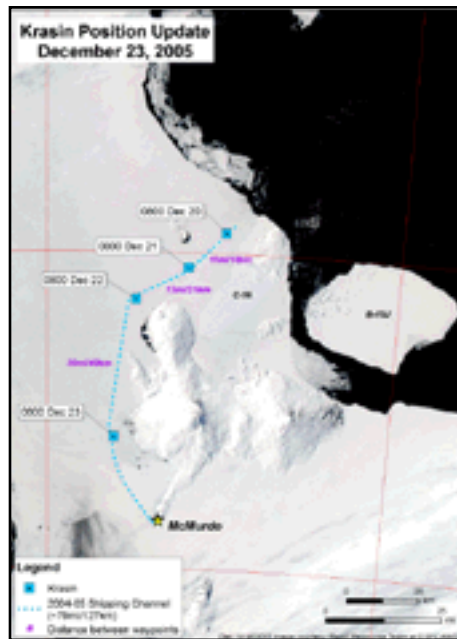
At 5:08 p.m., we made our second and final attempt for the day, and Palmer Station successfully contacted the International Space Station. We spoke with McArthur for about five minutes. He is a frequent user of the space station's ham radio equipment and is attempting to gain a ham radio certificate for working ham stations on all seven continents.

He spoke about their supply ship (and the oxygen supplies on board), the science under way and also acknowledged the commonality of a "hostile environment" in both Antarctica and space. Due to the space station's orbit, Palmer Station is the only U.S. Antarctic station far enough north to "see" the station for ham radio contact.

Our Wednesday night science lecture was presented by John Dacey, with the Woods Hole Oceanographic Institution in Massachusetts. Dacey is at Palmer studying the volatile sulfur gas, dimethylsulfide (DMS), which makes up about half of the total non-anthropogenic sulfur flux to the atmosphere. DMS is also oxidized into compounds that tend to form aerosol particles. By doing so, they may reflect incoming sunlight and cool the Earth. Ninety percent of the global DMS flux is emitted from the ocean.

Dacey also spoke about his experience on the *Polarstern* in the western Weddell Sea. The 11-week cruise last summer had three main research components centered on the melting and spring breakup of sea ice.

We have also seen the return of the sea ice around station. This has hindered science in the field. Science in the labs continued with available samples. Rounding out our week were holiday preparations. Next week we will see the return and departure of the *Laurence M. Gould*.



This map shows the progress and current location of this year's icebreaker, the Krasin, as it rounds Ross Island. The ship should make it here on or before Dec. 28. After the Krasin leaves, the tanker should arrive on Jan. 15 and will be followed by the arrival of the freighter on Jan. 24.

SHIPS

LMG

Compiled from reports
by Stephanie Suhr
Marine Projects coordinator

We recovered the 10-meter Multiple Opening/Closing Net and Environmental Sampling System (MOCNESS or MOC-10) on Dec. 12, followed by two conductivity, temperature and depth (CTD) casts and pumping for trace metal samples.

Operations had to be suspended overnight Dec. 14 due to repairs on the turbo on one of the engines, which went down around 10 p.m.

The great news of the day came with the reception of the most recent RADARSAT image of the area: it looks as if our first and biggest iceberg, A-52, is now free of Clarence Island, on which it seemed to be stranded early into the cruise.

We decided to head back to A-52 the next evening.

Both engines were back up in the wee hours of Dec. 15.

The day started with deployment of the CTD with the dreaded hose for deep trace metal sampling, followed by deployment of the remotely operated vehicle (ROV) late in the morning.

The ROV carried an improvised net mounted to the front of its frame to scrape underwater organisms off the iceberg, which was successful.

Close to midnight on Dec. 17, we deployed the Biosonics sonar to try to image the subsurface area of the iceberg with mixed results.

We kept the Biosonics sonar deployed overnight. After more CTD casts, a successful deployment of the ROV was completed in the morning, followed by another tow with the MOC-10 with the towfish in the water simultaneously. The day ended with deep (1500 meter) CTD casts in the evening.

NBP

Compiled from reports
by Harold 'Skip' Owen
Marine Projects coordinator

We departed Lyttelton, NZ, on Dec. 18, one day behind schedule. The delay was agreed upon with the chief scientist to ensure all inbound cargo was received and all scientists were able to fully set up and check out systems prior to departure.

Continental Drift Who's your favorite Antarctic hero or explorer and why?



"Amundsen, because he rarely gets the credit he deserves for having made it to the South Pole first."

Chuck Kimball,
Palmer satellite communications technician
from Glenwood Springs,
Colo., seventh season



"Douglas Mawson. Anybody who can put his feet back together and keep on going — that's hardcore."

Josh Roney,
McMurdo firefighter
from Espanola, N.M.,
first season



"Zorac of Mars. It's his UFO at the South Pole. He is the galaxy's most underrated explorer."

Tom Lohr,
South Pole HR/Finance
specialist from
Jane Lew, W. Va.,
first season

Whassat On Your Head

Polies don't put a cap on their self-expression

By Tom Lohr
South Pole correspondent



Beaver Cohen



Dehlia Sprague



Martin Lewis

Choices for personal expression are rather limited at the South Pole.

Clothing, the venue for personality propagation in much of the United States, becomes problematic in the Antarctic climate. A pair of brightly colored Keds high-tops will broadcast much about your inner being, but does little to keep the piggies warm. Your favorite team's sport jacket won't block the biting sub-zero wind. Jeans that look like they've been run over with a lawn mower may be hip, but are too ventilated for our icy world.

In the brutal chill, one wears either a red or green parka. An occasional smattering of Carhartt brown adds some flavor.

Exacerbating the blandness is the unchanging polar landscape — flat and white for as far as the eye can see. In an environment that is 90 percent red, green, brown and white, how does one become distinguishable from your average Antarctic explorer? For many, the solution is to exhibit a little cranium creativity.

If you ask materials handler Dehlia Sprague what she has sitting on her head, she'll tell you without hesitation: a "possum." Using critter fur to keep warm and comfy is a centuries-old technique, but never has such an ugly marsupial looked so dashing as it does perched atop Sprague. And it's as close as one will come to having a pet at the Pole.

Working in a construction area at the elevated station necessitates head protection. Brian Taylor, one of the Pole's many carpenters, prefers to protect his noggin with a rock climbing helmet. "It's a California thing," Taylor explained.

A self-described "ski beanie" keeps Todd Nemnich's top toasty. Also a carpenter, Nemnich is an Antarctic veteran and knows the tradeoff between comfort and warmth. The hat, strictly for indoor use, is a signal that Nemnich is near.

That's no rag on Randi Gryting's head. A vibrant bandana keeps her coiffeur in fine form while working

as a dining room attendant. Her job is to keep the polar population supplied in sparkling and hygienic dinnerware. Accessorizing is the key to keeping Gryting in style: her white gloves gracefully complement the colorful kerchief that makes her the fashion envy of the kitchen crew.

It is a little known fact that scientific brains must be kept at optimal operating temperature to process the endless streams of data and formulas that make the Pole a goldmine of scientific information.

IceCube researcher P.J. Charpentier ensures that his gray matter keeps humming along by donning his infamous "mad bomber" cap. The cap gives Charpentier a very Roald Admundsen-like look that says, "I just stepped off of the dog sled." In fact, Charpentier's mad bomber cover may rival Amundsen for time on the Ice. Bought in 1999, the hat has kept Charpentier's noodle warm for multiple winters. Scuffed but tough, it's been repaired with dental floss to keep it in operation.

Alaskan-turned-Antarctic, Adam Rein sports a homemade knit hat to stand out from the crowd. A birthday present on a previous trip to the Pole, the carpenter's knit cap also contains a strand of historical significance that he has been sworn to secrecy not to share.

Some Polies do fancy issued extreme cold weather (ECW) gear. Technical Support Manager Martin Lewis is never without his Yazoo cap, which looks like an Elmer Fudd hunting cap. "It's practical, versatile and keeps me warm," he reasoned. "Plus it has earflaps."

Chef Boyardee would be envious not only of Beaver Cohen's skill in the kitchen, but also of his trademark chef's hat. Not only does it keep the heat from escaping Beaver's smooth scalp, but he uses the flat top as a model when he forgets how to make pancakes.

Besides serving as an outlet of originality, personalized headgear at the South Pole also is very useful for identification. From ten meters, a Polie bundled up in traditional ECW gear might be Rein, Lewis or Robert F. Scott.



Adam Rein



Brian Taylor



P.J. Charpentier



Randi Gryting

TIME LINE

U.S. Antarctic moments from Deep Freeze to the present

1953

The oldest tractor still operating at McMurdo is built by Caterpillar, Inc.

1955

The U.S. Navy's Operation Deep Freeze begins. Its goal is to build seven U.S. scientific stations on the continent in two years.

Dec. 18: Deep Freeze ships arrive at McMurdo Sound.

1956

Feb. 19: McMurdo Air Operating Facility renamed Williams Air Operating Facility after Richard Williams, who died in a tractor accident a month before.

Oct. 25: First cargo air-dropped at the South Pole.

Oct. 31: Gus Shinn lands first plane at the South Pole.

Nov. 20: First construction crew arrives at the Pole.

1957

First International Geophysical Year begins and runs 18 months. Scientists from 67 countries conduct research at 65 stations.

Navy comes to build first bases



Dave Grisez / Special to *The Antarctic Sun*



U.S. Navy photo / Special to *The Antarctic Sun*



Dave Grisez / Special to *The Antarctic Sun*

Top, the Seabees established a base camp in 1955, known as "Tent City," to live in while building McMurdo's permanent structures. Middle, sled dogs were used during Operation Deep Freeze. Lieutenant Junior Grade Jack Tuck drives a sled in 1956. Bottom, Seabees erect a Clement's Hut at McMurdo. The prefabricated huts snapped together quickly, enabling the crew to build an entire town in a few weeks. Some of the seabees practiced erecting the huts at an Army cold weather room in Detroit.

From page 1

operation's first year is known, brought 1,800 men here to start building the modern era's scientific stations on a continent that was still largely unexplored. The mission was to have seven stations ready for the International Geophysical Year, which began in 1957.

The first wave of construction started in 1955 at McMurdo Station and Little America V. McMurdo was not originally intended to be a major scientific base in its own right. It was primarily an airfield for the planes that would fly to the South Pole to establish a base there the following year. Little America V would be the country's primary scientific station, as well as the staging area for the crew building Byrd Station farther inland.

It wasn't until December 1959, when Little America was closed, that McMurdo evolved into the main U.S. station.

The Navy's construction goals and the scientists' research plans might have been lofty, but the men who came here to work that first year saw the task primarily as just another job. It might have been an adventurous one that took them to a remote place, but they didn't see themselves as pioneers or explorers.

"I've never looked at it as anything heroic," said Dave Grisez, who was at McMurdo as a 20-year-old machinery repairman. "It was just part of being in the Navy."

That doesn't mean the men didn't enjoy the job. They worked hard, but they had their fun, whether it was playing poker and pinochle, staging a reenactment of the marriage of Grace Kelly, complete with gowns and bridesmaids, or enjoying perhaps a bit too much "whiteout punch."

Even 50 years later, many of the men say they never worked with a closer group of people than the Deep Freeze crew and still consider them their best friends.

"There was some cold weather, but we had a good time," said Grisez, who gets together regularly with Hisey in Indiana, where both men live. "I got home safe. I've got a lot of good memories."

See SEABEES on page 13

1957 cont.

March 11: Adm. Richard Byrd dies at the age of 66

Oct. 15: First commercial plane lands at McMurdo. The Pan Am jet was chartered by the Navy for deploying Seabees and VIPs. Female flight attendants onboard become first women to visit McMurdo.

1959

National Science Foundation takes over the Antarctic program from the National Academy of Sciences.

First permanent laboratory, the predecessor to what is now the Crary Science and Engineering Center, is built at McMurdo.

U.S. turns over Wilkes Station to Australia and Ellsworth station to Argentina.

The 12 leading member nations of the IGY sign the Antarctic Treaty, which pledges that the continent "shall continue forever to be used exclusively for peaceful purposes."

Dec. 31: Little America V is closed.

1960

Twelve C-130s, equipped with both skis and wheels, start flying Antarctic missions.

Little America to be primary station

By Emily Stone

Sun staff

Traveling to Antarctica was an adventure in an unknown land for most of the men in Operation Deep Freeze. For Rear Adm. Richard Byrd, it was a homecoming.

Byrd had been to Antarctica four times already. In 1929, he completed the first flight over the South Pole. He returned three more times to lead scientific expeditions. During each visit, he established a base on the Ross Ice Shelf, which he named Little America I through Little America IV.

It followed, then, that in December 1955 he would return to the same spot to establish Little America V. About 725 kilometers away, another Deep Freeze contingent was building McMurdo Station.

Despite the fact that McMurdo was on solid ground while Little America V sat on an ice shelf moving steadily toward the ocean, Byrd decided that Little America V would be the primary U.S. scientific station for the upcoming International Geophysical Year. Little America was also the staging area for the crew building Byrd Station, 1,000 kilometers inland.

The station served its purpose. It was closed at the end of 1959, and McMurdo became the main U.S. Antarctic station. Today, Little America no longer exists. It has fallen into the ocean, joining the previous Little Americas that calved off the edge of the ice shelf.

"We disappeared," said Ed Ehrlich, the doctor at Little America that first year. "There's no remnant to really maintain any kind of memory of what we did."

Building starts

Byrd intended to build Little America V next door to his previous camps at the Bay of Whales, the same spot where Roald Amundsen launched his trip to the South Pole.

But when the Deep Freeze ships arrived, they found that iceberg calving had ruined the bay. The group traveled about another 50 kilometers to Kainan Bay, where they found a suitable spot.

The men started transporting cargo several kilometers from the ships to the station, which required bridging two large crevasses. Some of the crews slept in unheated buildings instead of returning to the ship at night to save time.

Byrd formally commissioned the station, which



Jim Waldron / Special to *The Antarctic Sun*

Men stand outside the operations building at Little America V in 1957, with the Air Traffic Control tower in the background. Little America was built to be the main U.S. Antarctic science station during the IGY. Adm. Richard Byrd chose the site, which was near the four previous stations he had built on the continent, named Little America I through Little America IV.

was a jumble of bright orange, prefabricated buildings, on Jan. 4, 1956. The next major goal was to establish a route to Byrd Station.

First attempt at Byrd

A seven-man reconnaissance party set out in mid-January to find a safe route through crevasse fields, leaving bamboo poles every half a kilometer to mark the trail. They traveled about two weeks, calling in for air support each time they reached an impasse so they could reconnoiter by plane. On Feb. 3, after blazing 600 kilometers of trail, they decided they'd gone as far as they could at that point.

A small plane picked up part of the group. But it never returned to station. There was no backup plane, so an icebreaker came from McMurdo with a plane and helicopter to help with the search.

"We didn't know whether we were going to be able to find them," said Ehrlich, who went out in the helicopter to search for the men.

The mostly intact plane was found on the crest of a mountain and the helicopter crew followed footprints until they found the men in remarkably good shape six days after the crash. They had decided to start walking back to Little America.

"Of course, there was a great celebration," said

See WINTER on page 10

"There's no remnant to really maintain any kind of memory of what we did."

— Ed Ehrlich, the doctor at Little America V, on the station's closing

1961

Construction begins on a new Byrd Station, 10 kilometers from the old site.

First winter medical evacuation completed when a scientist is flown out of Byrd Station with an undetermined stomach ailment.

McMurdo bowling alley opens.

1962

Nuclear power plant built at McMurdo. It is decommissioned 10 years later.

The first dedicated research vessel, *Eltanin*, joins program.

Jan. 12: Williams Air Operating Facility is officially renamed McMurdo Station.

Feb. 13: The second Byrd Station is dedicated.

1963

New Zealand instructors hired to teach the outdoor survival training program at McMurdo.

Anvers Island selected as site for Palmer Station.

Dec: South Pole residents find out that President Kennedy was killed 20 days after the fact, due to problems with communications equipment.

Winter crew of 73 hunker down

From page 9

Ehrlich, now 77 and living in Wisconsin.

The station wasn't as lucky the following month. Another tractor train set out to leave fuel caches along the reconnaissance party's route to prepare for the trip the following summer. On March 5, a tractor fell into a crevasse, crushing and killing driver Max Kiel.

"That was devastating," said Bill Stroup, chief construction electrician at the base. Stroup said Kiel had taught him how to drive a tractor when the ship was being unloaded, and Stroup learned that Kiel's father had been killed in an equipment accident.

Winter

The 73 men who spent the winter at Little America continued with the station construction. They also organized the cargo for Byrd Station, and kept their winter supplies within easy access. Temperatures dipped down to negative 61 degrees Celsius.

Ehrlich said he had few doctoring duties, though he did perform what he believes was the first appendectomy in Antarctica.

"Basically, we were dealing with a healthy group of people," he said. So he helped out with whatever was needed.

One of those jobs was handling the liquor rations. Ehrlich was supplied with about 20,000 tiny bottles of brandy and some other "medicinal" alcohol. One officer suggested that they refuse to give the men the drinks. Ehrlich argued that the men should get them.

"I said, 'you better do it, or we're going to have a mutiny,'" he said. The decision was against regulations, but there were no consequences. The men could also buy beer. The cases — enough for about 50 per man — ran out after six months, he said.

Little America's chaplain didn't organize entertainment the same way McMurdo's chaplain did, so the men were left to find their own fun. They played poker and ping-pong, watched movies, talked and read during the long winter, and had parties with the doctor's doled out supply of liquor. They managed to keep



Photos by Jim Waldron / Special to *The Antarctic Sun*



Above, a group of tracked vehicles prepares to depart Little America V for a trip on the Ross Ice Shelf in 1957.

Left, an aerial view of Little America V in 1957. The station was built on the Ross Ice Shelf, and therefore had to be abandoned after only a few seasons because the moving ice shelf was burying the station under snow, and would eventually send the station out to sea.

themselves busy until late October, when the first plane carrying precious mail arrived.

Stroup, who at 28 was one of the older men on station that winter, said the average age of the enlisted men was about 21. The young crew did great.

"They met the challenge," he said. "We had some [challenges] and we had some personality clashes. But nothing ever interfered with the job."

Traversal to Byrd

With summer underway, a second reconnaissance party set out to find a suitable route to the location for Byrd Station.

They radioed back on Dec. 4 that they'd found a good path, and the 19-person tractor traverse team set out. The United States wanted to build a station there because scientists believed the spot was

See DANGEROUS on page 12

1964

Original Palmer Station opens in the summer.

March 6: Fire destroys a science building at Cape Hallett Station. This marks the last winter use of station. Summer U.S. penguin studies continue there.

Sept. 30: First winter airdrop, with mail and freshies, made at Pole.

1965

Nov. 17: First commercial flight over Pole.

1966

Construction of McMurdo's largest building, Building 155, begins.

U.S. Air Force begins C-141 flights to McMurdo.

Feb. 14: First fatality at South Pole when Andrew Burl Moulder is crushed between a cargo sled and airplane.

1967

June 18: First winter flight to McMurdo.

Sept. 2: First "winfly" flight to McMurdo. A third, short season between winter and summer, known as winfly, is added to the calendar.

1968

The *Hero* research vessel launches.

Nations build stations for '57-8 IGY

By Emily Stone

Sun staff

The modern age of Antarctic research was only supposed to last 18 months. Fifty years later, we're still here.

The era began with the declaration of the first International Geophysical Year, slated to coincide with peak sunspot activities from July 1957 through the end of 1958. The IGY was an outgrowth of two previous International Polar Years in 1882-83 and 1932-33. While the IPYs focused exclusively on research at the poles (primarily in the Arctic), the IGY included researchers across the globe.

The United States built seven Antarctic stations between 1955 and 1957 in preparation for the IGY. The most ambitious was at the South Pole.

Organizers had wavered on whether a station at the Pole was logistically desirable. Once they heard that the Soviet Union was interested in establishing a station there, the Americans decided they were up to the task. The Soviets ended up at the magnetic South Pole, where the Russian Vostok Station still operates.

In total, 67 nations conducted scientific research in Antarctica during the IGY at 65 stations built by 12 of the participating countries.

The U.S. Navy undertook Operation Deep Freeze to build the American stations. The first year it built Little America V on the Ross Ice Shelf, which was to be the main scientific center, and a station on McMurdo Sound whose primary purpose was to provide a runway for planes that would fly to the Pole.

President Eisenhower became alarmed at the ballooning cost associated with the increasingly ambitious plans for Antarctic exploration. In 1956, he reminded the IGY organizers that they were only funded to stay for 18 months.

Two years later, Congress was convinced to continue the program. The IGY scientists made major breakthroughs in understanding the upper atmosphere and weather forecasting. They had measured



Jess Walker / Special to *The Antarctic Sun*

The United States built seven Antarctic stations for the International Geophysical Year. U.S. Navy Seabees built McMurdo and Little America V in 1955-56. The rest were constructed the following year. Of the original stations, only McMurdo and South Pole are still used by the U.S. Antarctic Program. The other stations were either closed or turned over to other countries.

the thickness of Antarctica's ice and learned that the weight of the ice pushed the bedrock in parts of Antarctica below sea level. Fossil tree trunks were found in the Horlick Mountains about 500 kilometers from the Pole.

Scientists had studied penguins and seals, as well as human's reaction to the extreme cold and isolation. During the 1955-56 summer season alone, pilots had flown over more than 1.6 million square kilometers of the continent that had never before been seen.

After an appeal by the National Science Foundation in 1958, Congress agreed to keep the stations open so that scientific research could continue uninterrupted, as it does today.



The reddish-orange structures on the left are the first buildings that went up in early 1956 at what is now McMurdo Station. The rest of the objects are construction supplies.

Dave Grisez / Special to *The Antarctic Sun*

1969

Four women from Ohio State University come to McMurdo in the summer as the first U.S. Antarctic Program women scientists on the continent. The four, plus a woman from New Zealand and a journalist, visit the South Pole, becoming the first women at that station.

McMurdo, Byrd and South Pole stations change from U.S. time to New Zealand time.

Extra fuel storage tanks at McMurdo make this the first year only one fuel tanker needs to come to station.

1970

New Palmer Station opens.

Blasting accident sends boulder through the roof of a Palmer Jamesway building, injuring Lt. Harry Anderson.

Jan. 30: The first meal is served in Building 155 dining hall.

Oct. 8: C-121J "Pegasus" airplane crashes at McMurdo, but no one is injured.

1971

Chicago Tribune reporter Louise Hutchinson becomes first woman to spend the night at the South Pole due to flight delays.

Dangerous tractor traverse a success

From page 10

crucial in understanding weather patterns in Antarctica and much of the Southern Hemisphere.

Chief Petty Officer Stroup was part of the traverse team. Now 78 and living in Mississippi, Stroup remembers spending much of the ride helping the cook and keeping snow melted for water.

Ingenuity was key on the trip, he said, as it was at the stations.

Like the time when a push rod on a tractor broke. Bad weather at Little America meant no plane could fly in with a replacement part for a few days. A mechanic with the group noticed that the stove, which was the type used on ships, had a rod on it to keep the pots from falling off. It looked an awful lot like a push rod.

"It was a perfect fit," Stroup said. The party continued on its way.

On Dec. 23, the traverse stopped, and the surveyor checked his measurements.

"He said, 'it looks like this is about where we're going to be,'" Stroup remembers.

The group started assembling the camp's four buildings. It only took a few weeks, helped in large part by the practice they'd had putting up buildings at Little America.

"We didn't reinvent the wheel," Stroup said.

Ehrlich points out that while the group sent from McMurdo to build the South Pole station went by plane, the Byrd team had to traverse heavy machinery by land through dangerous crevasse fields.

"Their effort, I think, was at least the equivalent of what was involved in building the Pole base," he said. "And very few people acknowledge that."

At home

The Deep Freeze II crew were at Little America when the men returned from Byrd, and the original men were soon on their way home.

Ehrlich said he gets great satisfaction from his time in Antarctica. But it was not a style of doctoring he wanted to repeat.

The uncertainty of having to treat possibly serious trauma that was beyond the scope of his training



Jim Waldron / Special to *The Antarctic Sun*

On Dec. 4, 1956, a traverse party departed Little America V for Marie Byrd Land. Their mission was to find a safe route through the crevasse area where the Ross Ice Shelf meets the Rockefeller Plateau. The group arrived at the location where Byrd Station was soon built on Dec. 23.

as a young doctor was a constant issue. He went on to become a specialist in endocrinology and is now professor emeritus at the University of Wisconsin. The McMurdo doctor at that time, Isaac "Ike" Taylor, went into academia as well, becoming the dean of the medical school at the University of North Carolina. (Taylor was also the father of singer James Taylor.)

Stroup returned home in February 1957 and met

his 14-month-old daughter for the first time. He stayed in the Navy until 1976, when he retired with the rank of chief warrant officer, W4, after 30 years of service.

He notes that many of the Deep Freeze I

"I don't remember anyone ever saying it was a lousy tour."

— Bill Stroup, now 78, on his time at Little America V as a chief petty officer



men made the Navy their career, earning substantial promotions along the way.

"If they could work under those conditions, they had no problems meeting the challenge of other (conditions)," Stroup said of the training and skills the men got at Little America.

He wasn't surprised to learn that the station had been closed and eventually disappeared.

"We knew that some day Little America V would go out to sea," he said. Still, it was worth it to be part of the station's history.

"I don't remember anyone ever saying it was a lousy tour," he said.

1972

Feb. 19: Second Byrd Station closes.

1973

New Zealand makes first McMurdo winter airdrop.

First McMurdo ice wharf is built.

Nov. 9: Armed Forces Radio and Television TV broadcasts begin at McMurdo.

1974

Mary Alice McWhinnie and Mary Odile Cahoon at McMurdo become the first American women to spend the winter on the continent.

First women hired by contractor to work at McMurdo.

Navy turns South Pole Station over to civilian management.

1975

Jan. 9: New domed South Pole Station is dedicated.

Feb. 3: Lights turned off for good at old Pole station, which was already buried under eight meters of snow.

1976

Nov. 16: First official survey marker placed at geographical South Pole.

1978

First videocassettes arrive at Pole.



Preparations begin in late 1955 to off-load cargo from Navy vessels and transport it over sea ice to what would become McMurdo Station.

Dave Grisez / Special to The Antarctic Sun

Seabees chosen for Deep Freeze

From page 8

How it started

In March 1955, President Eisenhower announced that America would participate in the International Geophysical Year, from July 1957 through the end of 1958.

Unlike two previous International Polar Years, IGY scientists would study the entire Earth. Eisenhower appointed the Navy, with its experienced Mobile Construction Battalions (known as CBs or "Seabees") to lead the project in Antarctica, which was named Operation Deep Freeze.

Eisenhower chose retired Rear Adm. Richard Byrd, the most famous American Antarctic explorer of the time, to serve as the officer in charge of Deep Freeze. Rear Adm. George Dufek, who had been to Antarctica with Byrd twice before, postponed retirement to become task force commander.

The IGY, Byrd wrote in a 1956 *National Geographic* article, "is perhaps the most important cooperative effort of scientists in the history of man. From it we are going to learn a great deal about this old world we've crawled around on for so long."

The Navy had about six months to organize the massive effort in order to reach Antarctica by the next austral summer. It sent out a call for Deep Freeze volunteers.

Grisez was aboard an aircraft carrier in the Mediterranean when he spotted the notice on a bulletin board.

"I hadn't been there, so I volunteered," he said. "That's why most of us volunteered. It was someplace we hadn't been."

Grisez and about 300 other men gathered at the Seabee base in Davisville, R.I. to start training. Most were Seabees, but the group also included men from throughout the military and some civilians. About half those men would spend 14 months on the ice, working two summers and a winter before being replaced.

"They said 'you're going to winter-over,'" Grisez remembers. "I said, 'what's that?'"

The men spent the next few months assembling all

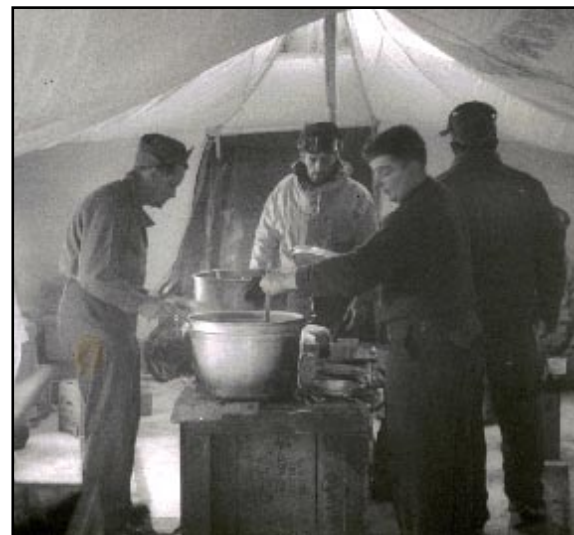
the construction equipment, materials and supplies needed for McMurdo, Little America, South Pole and Byrd stations. Some of the men went to an Army cold weather room in Detroit to practice putting buildings together in negative 54 degrees Celsius.

"It was a very hectic time," remembers Dick Bowers, who was a 27-year-old junior lieutenant.

In November, the Deep Freeze fleet of three icebreakers, three cargo ships, a gasoline tanker and two gasoline barges set off for New Zealand loaded with tractors, forklifts, cargo sleds, jeeps, Sno-Cats, 1,800 men, 30 huskies and 1,100 kilograms of mail for collectors eager for an Antarctic postmark. Fifteen airplanes from the Air Development Squadron VX-6 also gathered in New Zealand.

After a brief stay in Lyttleton, New Zealand, where the men said they were treated like kings, the ships set off for Antarctica. The state-of-the-art ice

See SEA on page 14



Dave Grisez / Special to The Antarctic Sun

The chow line in the mess tent at McMurdo Station in the summer of 1955-56. A permanent building was built for the kitchen that summer, allowing the men to eat free from the wind and cold.

1978 cont.

Aug. 22: Fire destroys McMurdo Chapel of the Snows.

1979

Dr. Michele Raney becomes first wintering female at Pole.

1981

Dec. 1: Malfunctioning electric toilet causes major fire at McMurdo vehicle repair shop.

1985

Polar Duke replaces the *Hero*.

1986

109th Air National Guard makes first Antarctic deployment to McMurdo.

1988

First tourists arrive at Pole in Twin Otters from Patriot Hills.

1992

Nathaniel B. Palmer research vessel joins the program.

Phone calls to the States possible from McMurdo. Previously, people could make calls from Scott Base, patched through New Zealand to the States.

1996

Last routine mid-winter McMurdo airdrop takes place.

1997

First ATM is installed at McMurdo.

Sea ice causes problems, takes a life

From page 13

breaker, the *Glacier*, was the first ship to pull into McMurdo Sound, arriving on Dec. 18, 1955.

First summer

"It's beautiful, but you never saw so much nothing."

That's Patrick "Rediron" McCormick's stock answer when people ask what Antarctica was like.

McCormick earned his nickname after spending many hours doing the thankless job of nailing corrugated steel sheets onto the frames of the Quonset Hut buildings. He hit his thumb and index finger often enough so they resembled "a swollen glob of hamburger." The other guys began calling him Rediron — and still do — after the metal channels where the nails went, which were painted red.

All the buildings at McMurdo were pre-fabricated structures. The men lived in "Tent City" while the buildings were being assembled.

McCormick, who recently wrote an account of his time on the Ice at his family's request, remembers the cooks preparing their first meal in the mess building instead of a tent in February, allowing the men to eat shielded from the wind and cold.

"All of the food stores were canned, dehydrated or frozen, absolutely nothing fresh but the cooks were industrious and creative and managed to keep most of us well nourished and happy," wrote McCormick, now 70 and living in Rhode Island. Of all the advancements that he's heard about at McMurdo in the last 50 years, he said he's most struck by how much the kitchen and food supply has improved.

After many weeks of hard work, Grisez said the men were treated to their first movie. About three minutes in, the sound went out. Chaplain John Condit got up and said he'd seen the film and would narrate for the disappointed crowd. A few minutes later, a young cook stood up and said he'd seen the movie, too, and would take over the dialogue. It became a much bawdier film after that, Grisez said.

The sea ice caused problems for the men. Sixty-five kilometers of it kept the ships far from the spot on Ross Island where they wanted to build the station. The ice breakers did their best, but for a while it seemed like the station would have to be built farther north at Cape Evans. Finally, the *Glacier* was able to get within about 15 kilometers of Hut Point, where Scott's 1902 Discovery hut stands, and the station was built on its current site.

The ice also claimed lives. Six men died at McMurdo during those first 14 months. The first was Richard Williams, who was driving a D-8 tractor across the sea ice when it fell into a crack. The doors were wired open, but Williams couldn't escape.



Courtesy of Dave Grisez / Special to *The Antarctic Sun*



Elaine Hood / *The Antarctic Sun*

Above, Dave Grisez, a Navy machinery repairman, stands next to a D-8 Caterpillar tractor in 1956. Grisez said the assignment in Antarctica was better than being stuck on a cramped ship. Like many of the men, Grisez didn't consider himself to be a pioneer by building the stations. It was just another job.

Left, Grisez, at the 50th anniversary celebration of Deep Freeze in May in Biloxi, Miss.

The base was temporarily renamed Williams Air Operating Facility. One of the station's current runways, Williams Field, still bears his name.

The long hours spent off-loading the ships and erecting buildings continued through the summer. Bowers remembers being puzzled from time to time when men or supplies from a certain project turned up missing. He eventually figured out that Chaplain Condit was pilfering parts and people to build a chapel. Bowers knew not to complain too loud, since the chaplain was well loved and the project was a morale boost to the men.

Meanwhile, the VX-6 aircraft flew across large swaths of the continent that had never before been seen. Between Jan. 3 and 14 alone, 1.3 million square kilometers of new ground were covered.

In all, 84 buildings were constructed at McMurdo. All this was geared toward the station's real purpose of establishing a 9,700-meter runway on the McMurdo Sound sea ice — a job that would happen over the winter.

The winter

The ships left McMurdo Sound in March 1956, leaving 93 men at McMurdo Station for the winter. The winter crew celebrated their impending isolation with a party. Then they got back to work.

They had to slaughter seals as food for the sled dogs, which were there to help with search and rescue operations. They repaired machinery and continued putting buildings together. Others organized the South Pole cargo to ready it for airdrops in the summer.

Men did whatever tasks were needed, often those that would normally be considered beneath their rank.

See MEN on page 15

Men build ice runway in winter

1997 cont.

Oct. 18: First issue of *The Antarctic Sun* is printed, replacing the Navy's *Antarctic Sun Times*.

1998

The *Laurence M. Gould* joins the program.

1999

The last Navy contingent at McMurdo departs when the pilots with the VXE-6 Squadron fly back to New Zealand for the last time.

2000

Construction begins on new elevated South Pole Station.

2002

C-17 airplanes begin routine flights between McMurdo and New Zealand, phasing out the C-141s

First winter residents move into new South Pole Station.

2005

Feb. 4: Last C-141 flies from McMurdo to New Zealand.

Sources: *Bill Spindler, Billy-Ace Baker, Elaine Hood, Val Carroll, "Reader's Digest: Antarctica," NSF, Robin Burns, Colin Bull, Al Sutherland, Rae Spain, Susan Lee, Alan Schoenwald, Gerald Crist.*

From page 14

"You did what you had to do," said Jim Bergstrom, who was a lieutenant in charge of setting up the airfield's ground-controlled approach equipment. He helped out in the mess tent.

The runway builders first needed to pick a spot as far south as possible so the ice would last well into the summer. The planes that had previously flown to the station were much smaller and lighter than the ones coming the following summer. Those new planes would airdrop cargo at Pole and then deliver the men to build the station. They needed a full runway.

It took more than 100,000 man hours to clear 16 kilometers of snow from the ice and then smooth out and maintain the runway, according to a *National Geographic* article from 1957. A huge floodlight on top of Observation Hill guided the men back into town during winter days spent working on the sea ice.

The men's only contact with the outside world during those eight months was occasional ham radio calls that were patched through to their families. Otherwise, they were on their own.

McCormick describes how each of the berthing huts had a small area with a table and chairs. "We used the open area to play cards, drink our beer, shoot the breeze, solve world problems and otherwise entertain ourselves."

They watched all their movies so many times that they started running them backward, just to shake things up.

Chaplain Condit organized a lot of the entertain-

ment, including a re-enactment of Grace Kelly's marriage to Prince Rainier.

"I was a bridesmaid," said Bergstrom, now a retired Navy captain living in Virginia. "I was wearing a Swedish flag on me as my gown. ... That was what we did on Saturday night — had fun."

Condit came through for the men again on June 21, mid-winter's day. He had bolts of cloth with him and fashioned gingham curtains and table cloths for the mess hall. The men dined by candlelight on spaghetti, meatballs, pizza and wine. This was followed by a movie and party, with the obligatory whiteout punch, a combination of grain alcohol and fruit juice mixed by the station's doctor, Isaac "Ike" Taylor.

Grisez wrote in his diary: "A few fights, but I had fun singing."

Many of the men suffered from a winter affliction that the group called "big eye." They'd wake up in

the middle of the night unable to sleep, wander into the mess hall and find half the station there with the same problem.

By early September, despite temperatures as low as negative 50 degrees Celsius, the men had basically completed the runway — just in time for a huge storm to blow through town and trash their work. The entire project had to be redone in a month. The men came through, and the runway was completed and ready when the ships and planes returned in October.

"They turned out to be a group of very, very talented people and very dedicated," Bowers said of the crew. "They just worked relentlessly."

See DEEP on page 16

"They just worked relentlessly."

— *Dick Bowers, a junior lieutenant at McMurdo, of the Seabees who built the station and runway.*



Elaine Hood / Special to *The Antarctic Sun*

Above, Jim Bergstrom, a lieutenant at McMurdo, at the Operation Deep Freeze 50th anniversary celebration in Mississippi in May. Left, Chaplain John Condit organized a re-enactment of Grace Kelly's marriage to Prince Rainier. Bergstrom is the first bridesmaid on the left. Condit arranged for much of the station's entertainment.

Deep Freeze men remain close group

From page 15

Building the South Pole

The first flight of that second summer arrived on Oct. 16, 1956.

Adm. Dufek was onboard, but more importantly for the men, so were eight months of letters, care packages and hometown newspapers. McCormick remembers hearing his first Elvis Presley song, carried in on that plane.

The next day, disaster struck when a plane caught a wing in the snow and crashed. Three men died instantly and a fourth died in the sick bay.

But the Deep Freeze planes kept flying. Pilot Gus Shinn made history on Oct. 31 by landing the first plane at the South Pole. It stayed on the ground for 49 minutes, long enough for Dufek and his men to inspect the snow surface and record some atmospheric conditions. The stage was set to start building a station at Pole.

Twenty-four men from the McMurdo wintering crew, led by Bowers, were selected to go to Pole. Al Hisey was in the group. He remembers training every couple weeks during the winter by man-hauling sleds seven or eight kilometers, setting up a radio with a hand-crank generator, eating pemmican and sleeping in a tent.

Bowers and an advance party landed at the Pole on Nov. 20, and the rest of the crew followed shortly. Hisey remembers the first day that a scheduled plane didn't arrive because a runway problem in McMurdo kept it grounded. He thought of those many nights in a tent near McMurdo.

"That's when I think we came to the realization that maybe that training might come in handy," he said.

The men had learned a lot building McMurdo, and constructing the South Pole Station turned out to be an easier task, Bowers said. Construction was finished just after New Year's, and the crew returned to McMurdo. They turned the station over to Lt. Jack Tuck, and Paul Siple, the South Pole science leader who started his Antarctic career as a Boy Scout with Byrd on his 1929 expedition.

By the time the group returned to McMurdo, a new round of ships and men who were part of Deep Freeze II were taking over operations from the original crew. For most of those 93 men, their Antarctic adventure was over.

"We went down there and had good leadership. We did what we were supposed to do and had pretty comfortable quarters. I really didn't look at it as any hardship," said Grisez, who said the bunks beat anything he would have had on a cramped ship. "Nobody was shooting at us. ... It wasn't a bad deal, really."

Reminiscing

Hisey said he arrived at McMurdo as a "kid who didn't know much about anything except how to get from bar to bar."

He echoes many of the Deep Freeze men, when he says he left Antarctica with an understanding of how to get along with people, a sense of self-sufficiency, and lifelong friendships.

"I was probably closer to that one group than any group of people I've ever gone to school with or worked with or anything," he said. He retired from the Navy 21 years later as a lieutenant.

Many of the Deep Freeze veterans have remained close and gather for reunions every two years.

"We reminisce a lot," said Hisey, now 72, and tell "lots of lies."

The group had their 50th anniversary reunion earlier this year.

"That was fun," Bergstrom said, "also sad because a lot of our compatriots were just not around. They had passed on."

He's looking forward to the next reunion in 2007, which will be the 50th anniversary of the IGY, the event that spurred the modern Antarctic program. The year will also mark the celebration of



Courtesy of the Antarctic Photo Library



Photos by Elaine Hood / Special to *The Antarctic Sun*

Top, Dick Bowers, Al Hisey and Patrick "Rediron" McCormick at McMurdo Station during Deep Freeze I. The men remain close, and they all attended the Deep Freeze 50th anniversary celebration in May in Biloxi, Miss., as seen in the bottom photographs in the same order as above.

another International Polar Year.

"We were the guys who laid the foundation," Bergstrom said.

Grisez returned to McMurdo in 1995 for a chance to see what had been built on that foundation. He spent the summer working in the machine shop, this time with female co-workers, and modern communications, vehicles and buildings.

"It just blew my mind," he said.

He'd be working here again if his wife would agree to come, he said. When people ask why he wants to return, he tells them about the ice and mountains.

"There's a beauty to it," he said.

Which is how Adm. Byrd felt.

Deep Freeze I was Byrd's fifth and final trip to Antarctica. He died in 1957.

"People ask me why I keep going back to Antarctica again and again," he wrote in his 1956 *National Geographic* article. "Well, I like it there. I like the endless reaches of wind-rippled snow, the stark peaks, the awesome glaciers.

"I like the clatter of tractor trains, the whirl of helicopters, and shouts of men wrestling with vehicles and gear. ... I like the symbols of life's triumph in a lifeless land: the squawking skua gulls, the comical penguins, seals wheezing at their blowholes, the arching backs of whales.

"Most of all, I guess, I like the challenge of it, for Antarctica still plays for keeps. And I believe, as the scientists do, that the things we can learn there will have a profound effect upon the lives of us all."

DNA, photos used to count whale species

From page 1

taking aerial photographs that were fed into software that could determine the orca's size.

The team thought it would need two seasons to document 30 to 40 orcas using this method. But last year's effort proved so successful that they were able to sample 225 animals.

"I thought it was going to take two years to get any type of a workable sample size, but we essentially wrapped it all up last year," Pitman said. "We had to scramble to broaden our research, and I think we've got a pretty good program set up for [this season.] ... We are going to get a lot more out of this study than we anticipated."

The team has spent the last year coming up with the best and most effective methods to enhance its study, and they will return to Antarctica this season in early January with three new instruments in hand.

The first is a hydrophone. It will allow scientists to record the animal's underwater song of whistles and clicks. The sounds are used for communication and for echolocation. But the orcas' prey of choice can often dictate that behavior.

"In the North Pacific, mammal-eating killer whales are normally very quiet because the mammals they hunt all hear very well," Pitman said. "Fish-eaters tend to be a lot more noisy and social and talkative. I expect the [primarily fish-eating] killer whales around McMurdo are going to be chatting all the time."

The group will also use a laser device to measure the height and width of the animals' dorsal fins. The team will compare these figures to killer whales in other areas of the world and also between males and females in the Antarctic population.

The scientists are also bringing down 15 to 20 satellite tracking tags, which they plan to attach to the orcas' dorsal fins using a special pole. These tags are being funded through a \$30,000 grant from the National Geographic Society's Committee for Research and Exploration to help the team prove the existence of a separate species of killer whales in the Antarctic.

The tags will show when different types of orcas inhabit the Antarctic waters.

"It is not clear if these ice-inhabiting killer whales in Antarctica are resident year round or if they migrate to lower latitudes like the [main species of] killer whales do," Pitman said.

Pitman and his group divide Antarctic killer whales into three types.

Type A is the large, black-and-white version that is familiar to most of the world. This type can reach nine meters in length. It is present during the summer in Antarctic waters but does not venture



Donald LeRoi / Special to *The Antarctic Sun*

Killer whales swim in McMurdo Sound. The whales were photographed by scientists who use the photos to determine the size of the animals.

under the ice surrounding the continent. It travels in pods of 10 to 20 and feeds mostly on marine mammals like Antarctic minke whales.

Type B is significantly smaller than type A, growing to about six meters. It lives in the loose sea ice and feeds primarily on seals. It has distinctive coloring patterns, and yellowish markings instead of the white ones typical of most killer whales. This type is especially prevalent around the Antarctic Peninsula.

Type C lives mainly under the pack ice. It also grows to about six meters long but feeds on fish almost exclusively. Yellowish markings are found on this type as well, but its coloring patterns differentiate it from the other types. It has much smaller teeth than most killer whales. This form is especially prevalent around McMurdo.

Pitman said he hopes to be able to produce some concrete answers on the killer whale question sometime next year. He hopes the team's genetic work will help resolve this issue. Last season, the scientists took 15 pencil-eraser-sized tissue samples from different orcas around McMurdo.

Scientists are most skeptical about differentiating type B killer whales as a separate species from the other two.

"There is a lot of genetics work being done at the lab right now," Pitman said. "We are hoping this will resolve — to everyone's satisfaction — what is going on with Antarctic killer whales."

Proving variations large enough to sepa-

rate the animals into distinct species can be a difficult undertaking.

"They have to be distinct enough that they don't breed. That's usually the acid test," Pitman said.

The breeding test can sometimes be hard to observe, because potentially different species don't always overlap. This is where the group is fortunate in studying killer whales, he said. The animals live in the same vicinity but have different habitat preferences and appear to avoid each other during breeding. Pitman's group has never observed a mixed school or seen animals that look to be hybrids of the different types, despite the fact that they live near each other.

"It's looking good," Pitman said. "I'm convinced that the killer whales around McMurdo are a separate species."

While Pitman said he is very confident that type C killer whales, the Antarctic fish-eaters, are a distinct species, there is still work to be done before he can be as certain the type B killer whales, the Antarctic seal-eaters, are a separate species from type C.

"[Killer whales] are some of the most obvious and largest animals there are," Pitman said. "If it turns out we don't even know how many species there are, it gives us some idea of how little we know about what we have in our oceans."

*NSF-funded research in this story:
Robert Pitman, National Oceanic and Atmospheric Administration.*

Profile

FIRE & ICE: *Polie takes lead in station safety*

By Tom Lohr

South Pole correspondent

It takes a hearty soul and an ample dose of courage to face a wall of flames accelerating toward you at speeds normally reserved for automobiles. But that is what the protectors of North America's forests do regularly during the sweltering summer months.

As the fire crews pack up their gear for winter, many of these wilderness warriors face a seasonal dilemma: How does one replace the adrenaline rush of combating raging wildfires? For Dainella Nartker, a veteran with five seasons of beating back the flames, the answer lay south, way south.

Adventure and the lure of the unknown enticed Nartker to join the U. S. Antarctic Program. In 2004-2005, she spent the austral summer at the South Pole Station as a general assistant. This year, unable to shake the pull of the Antarctic, she is back for the full-meal deal and signed on to work a year at Pole.

"The first step down from the aircraft onto the ice was a feeling that will always be with me," she said. "Like the first step on the moon, I suspect, a soft sinking into a world devoid of life, yet unimaginably beautiful."

Nartker will assist in keeping the new elevated station juiced and the lights burning as an electrician's helper. She will also shoulder an additional responsibility as the station's fire brigade chief.

The bulk of the 2005-2006 winter crew met in Arvada, Colo. in September for a weeklong school to hone firefighting skills and gel into a team. The fire team is extremely important, because if the main station is lost to a fire, the Polies will find themselves in the bleak situation of having to live outdoors on the polar moonscape, where temperatures repeatedly plunge below negative 75 degrees Celsius.

As the firefighters went through their paces under the searing sun at the Red Rocks Fire Academy, one member seemed to stand out from the rest. Nartker excelled in fire knowledge, tenacity and skill, according to Liesl Scherthanner, the South Pole winter site manager.

"Dainella was pegged as fire brigade leader based on her experience in fighting fires, familiarity with the South Pole Station and its associated equipment, and unwavering dedication to field the most effective fire team possible," Scherthanner explained.

The firefighter-turned-electrician acquired a taste for working in the out-



Ethan Dicks / Special to The Antarctic Sun

Dainella Nartker, right, takes a break during firefighting school in Arvada, Colo., in September.

doors while living in her native Beaver Creek, Ore.

She started at the bottom of a wildland fire team, combating blazes as a digger between semesters at the University of Oregon (where she also managed the campus climbing wall). Nartker climbed the forest service hierarchy to finish as a squad leader.

After school, Nartker headed for adventure in her mother's native New Zealand, exploring the adventurous side of the South Island by climbing and kayaking. She later returned to the states to teach city dwellers the finer points of canoeing and kayaking in Virginia.

"It was amazing to watch someone learn a new ability that they never dreamed they would be able to master," she recalled of her times teaching watercraft skills in the Appalachians.

During her adventures in New Zealand, Nartker met a couple of other expatriate adventurers testing their limits: two Polies taking the long way home from Antarctica. Nartker credits the two with steering her to the Ice. By the following summer, she was at the bottom of the world.

Nartker said there's a big difference between her freshman season on the Ice and this return trip, which will last a full year.

"Coming here for the first time was one of the most nerve-racking decisions I have ever made," she said. "How different it is the second go-around. It felt perfectly natural to be coming here for a year, and, frankly, I'm quite content to stay



Dainella Nartker is working as an electrician's helper at the South Pole for a year, as well as leading the station's fire brigade.

in one place for more than six months for a change."

Overcoming a short turnover with the summer crew, a tough acclimation period and the demands of her full-time job, Nartker had turned the South Pole's firefighters into a cohesive team.

"Getting gear sorted and knowing exactly what we had as assets was an early challenge," she said of the beginning stages of team development. The role involves sorting out gear, organizing the team and procedures, and thoroughly familiarizing the crew with the station.

Tours of the station's nether regions have been integral in preparing the firefighters for a timely response, Nartker said. To this end, she takes the crew on frequent excursions to the lesser known areas. Training even includes spelunking through eerie utility ice tunnels, where the potential exists for incidents to turn nasty.

Training can also be problematic with team members that work three different shifts. "Coordinating training for the entire team can be a stumbling block," she explained. But the results attest to Nartker's skill at navigating fluid schedules.

Her leadership and efforts have given the station a fire brigade capable of dousing any fire that flares up, according to those who work closely with her.

"She's very intense and attuned to the needs of the fire brigade," said new team member Christopher Kieres. "Her enthusiasm and commitment to the team are obvious."

Though still nearly a year away from the time when she'll hang up her South Pole fire hat, Nartker is already planning her next great adventure. But what can she possibly do for an encore after experiencing the blistering heat of wildland fires and the brutal, bone-rattling cold of Antarctica?

Well, next up is a motorcycle tour of New Zealand's scenic South Island, with caving and backpacking planned along the way.