

The Antarctic Sun



Published during the austral summer at McMurdo Station, Antarctica, for the United States Antarctic Program

Breaking away



South Pole carpenter helper Teddy Anderson runs up the road from the ice pier last week while competing in the Scott's Hut Run. Anderson, who placed first in the women under 39 category, was flown from Pole to McMurdo as a reward for being the fastest woman in the Race Around the World on New Year's Day. Photo by Josh Landis.

Quote of the week

"Back slowly away from the monkey and put the football down."

- *McMurdoite yelling on Highway 1*

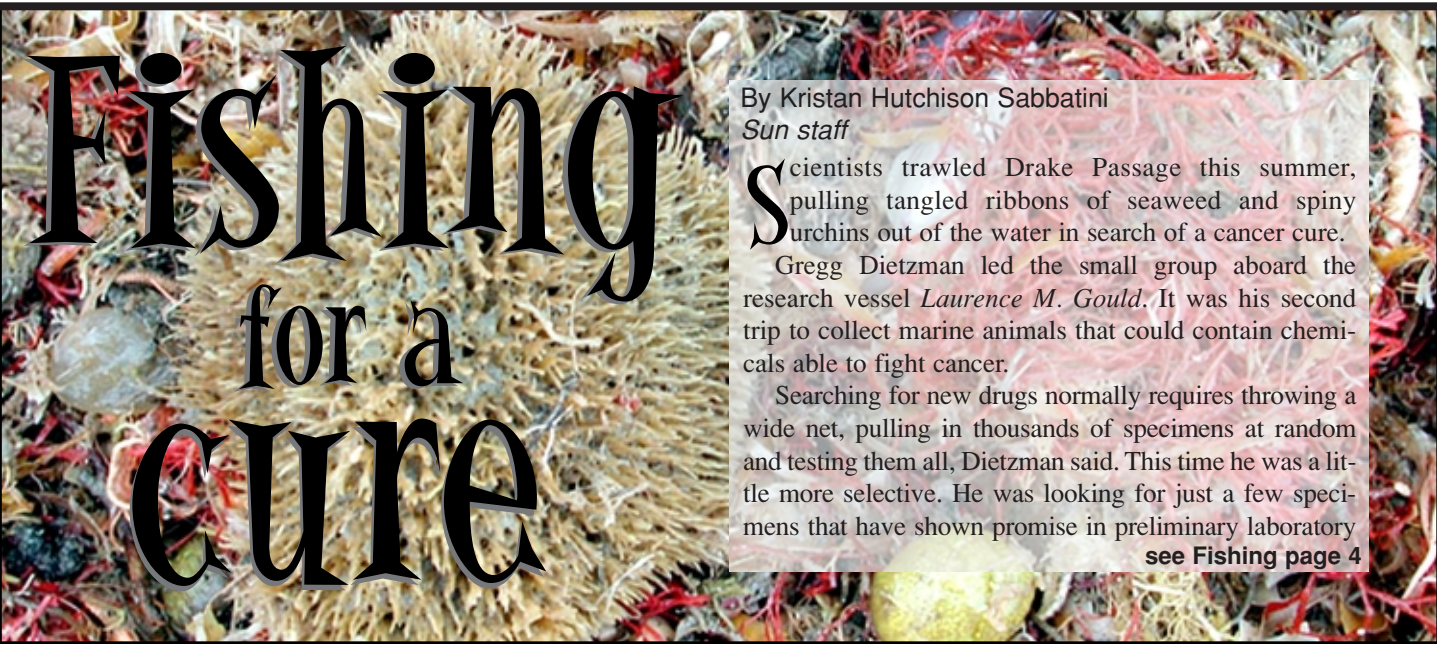
INSIDE

Natty B finds open water in the ice
page 5

On top of old smokey
page 6

Sheltering shelters
page 9

Spaced-out rocks
page 10



Fishing for a cure

By Kristan Hutchison Sabbatini
Sun staff

Scientists trawled Drake Passage this summer, pulling tangled ribbons of seaweed and spiny urchins out of the water in search of a cancer cure.

Gregg Dietzman led the small group aboard the research vessel *Laurence M. Gould*. It was his second trip to collect marine animals that could contain chemicals able to fight cancer.

Searching for new drugs normally requires throwing a wide net, pulling in thousands of specimens at random and testing them all, Dietzman said. This time he was a little more selective. He was looking for just a few specimens that have shown promise in preliminary laboratory

see **Fishing** page 4

Worth 1,000 words

The *Antarctic Sun's* Photo Festival attracted entries from all corners of the continent, depicting various landscapes, animals and views from the Ice. In all, there were 57 submissions, and selecting winners was difficult. The staff of the *Sun* narrowed the field down to three contenders in each category. Ernie Mastroianni, a visiting photojournalist from the *Milwaukee Journal Sentinel*, acted as the final judge in the competition. His comments appear with the top finishers. We urge you to visit the *Sun's* web site (www.polar.org/antsun) to view all nine finalists in color and full detail. ■



Other

First place: *Ice Cameo*, by Rick Londrie, air traffic controller, McMurdo
Ernie: "The composition, the color and the fact that it depicts an aspect of natural Antarctica," makes it first place.

Second place: *CUL8er, 91!*, by Glenn Gordon, information technologies, McMurdo

Third place: *Sundog*, by Rob Ricketson, carpenter, McMurdo

Wildlife

First place: *Weddell Dreams*, by Dave Carpenter, science cargo, McMurdo
Ernie: "I like the composition, the curves of the seal, the mountain and the clouds in the background."

Second place: *Fish and Chips*, by "Indiana" McLain, science mercenary, McMurdo

Third place: *Mr. Smiley*, by Jeff Bechtel, boating coordinator, Palmer

Scenic

First place: *Moon over Elephant Rocks*, by Cara Sucher, laboratory operations, Palmer
Ernie: "It's the shot I wish I could have gotten while I was here."

Second place: *Nacreous Clouds over Scott Hut*, by Clark Wallis, AGE department, McMurdo

Third place: *Helo pad*, by Jim Cook, electrician, McMurdo



Women on the way

Ann Bancroft and Liv Arnesen left the South Pole for McMurdo Station this week, continuing their attempt to become the first women to ski across Antarctica.

They began their journey at the edge of Queen Maud Land in November.

The team has about a month to complete the remaining 876-mile (1,402 kilometer) leg of the journey.

Corrections

- Last week the *Sun* ran a photo of Jessica Manuel rehearsing for a play and omitted her stage name. It is Marilyn Clavell.
- U.S. Coast Guard aviation technician Dani Keating has flown in helicopters hundreds of times, not with hundreds of pilots.
- The *Polar Sea* and *Polar Star* icebreakers go from forward to reverse by changing the propeller blade pitch in what is called its controllable pitch propeller system.

Learn how to save a life!

CPR

The McMurdo Station Fire Department is offering American Heart Association certification classes.

CPR courses 7 to 9 p.m.
Mondays at the firehouse.
Two-night course. Free.

Space is limited so call the firehouse to enroll, Ext. 2555

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Publisher: Valerie Carroll,
Communications manager, Raytheon Polar Services

Senior Editor: Josh Landis

Editors: Beth Minneci
Kristan Hutchison Sabbatini

Contributions are welcome. Contact the Sun at AntSun@polar.org. In McMurdo, visit our office in Bldg. 155 or dial 2407.

Web address: www.polar.org/antsun

The waiting...

Air National Guard members waited for a shuttle to Williams Field yesterday. All told, 81

Guard and Raytheon employees flew to Christchurch. By the end of the month, 205 will have left MacTown, 20 Raytheon employees for vacation before winter.

Next month flights will pick up even more when summer workers start leaving. The last flight out is scheduled Feb. 24.

"The next month, February, will be a very, very busy month," said Michelle Capron, an air services representative. Photo by Beth Minneci.



Scott's Hut Race results

The race last Sunday drew 134 competitors who ran the dirt course from Chapel of the Snows to Hut Point, to the travel lodge and back on the same route. The following are the top finishers by the race's age categories.

Women 39 and under

- 1 - Teddy Anderson 29:12
- 2 - Julie Aurand 30:18
- 3 - Reese Coffin 33:04

Men 39 and under

- 1 - Steffan Freeman 23:57
- 2 - Hiram Henry 25:1
- 3 - Steve Kupecz 25:14

Women 40 and over

- 1 - Karen Joyce 38:52
- 2 - Carmen Barber 40:54
- 3 - Peggy Malloy 41:5

Men 40 and over

- 1 - Jeff Rein 28:35
- 2 - Kevin Leech 29:28
- 3 - Ernie Mastroianni 30:09

the week in weather

around Antarctica

McMurdo Station

High: 35F/1C
Low: 14F/-10C
Windchill: -19F/-28C
Wind: 29 mph/25 kph

Palmer Station (Saturday)

High: 47F/8C
Low: 32F/0C
Avg. temp: 37F/3C
Wind: 33 mph/29 kph

South Pole Station

High: -11F/-24C
Low: -25F/-32C
Avg. temp: -19F/-28C
Wind: 25 mph/22 kph

around the world

Saturday's numbers

Magadan, Russia

High: -3F/-19C
Low: -9F/-23C

Montevideo, Uruguay

High: 79F/26C
Low: 51F/11C

Timbuktu, Mali

High: 86F/30C
Low: 51F/11C

Mars, Pa.

High: 27F/-3C
Low: 16F/-9C

Venus, Texas

High: 49F/9C
Low: 33F/1C

Jupiter, Fla.

High: 72F/22C
Low: 50F/10C



Gregg Dietzman and his crew sort through sea life hauled from the Antarctic sea floor aboard the research vessel *Laurence M.* earlier this season. Dietzman is testing Antarctic sea animals for possible pharmaceutical drugs. Photos courtesy of Gregg Dietzman.

Fishing from page 1

tests. About one out of every 20,000 specimens tested will actually lead to a useful drug.

"It's random, which means it's basically a numbers game," Dietzman said. "You have to have good luck."

In 1994 Dietzman collected 320 unique organisms and took them back to his office in Friday Harbor, Wash., to test. Of those, two showed potential for treating cancer. They were a plate-sized sea sponge he calls "Mr. Red" and a brown anemone he refers to as "the hand grenade," both named for their appearance.

"For us, common names are good to use because (at this early stage) it's the chemical constituents we're looking at," Dietzman said.

Ten other organisms have potential for treating tuberculosis. Dietzman came back this year to find Mr. Red and the hand grenade for further tests, and to pick up the other 10 organisms if he could.

With help from the crew of the *Gould*, he trawled the seafloor at a depth of 820 to 1,640 feet (250 to 500 meters) with a bag-shaped net. The ship made about 25 passes in the vicinity of King George Island off Palmer Peninsula.

Dietzman came away with pounds of the hand grenade anemone, but couldn't find Mr. Red the sponge. He hopes to return with a remote operated vehicle to look specifically for the sponge.

Of the other 10 specimens he was hunting he found seven. He brought all the specimens back to his lab to extract the active chemical constituents, the ones with potential for pharmaceutical use.

Extracting chemicals from the tissue samples is kind of like making coffee, Dietzman said.

Like coffee beans, the tissue sample is ground up.

"Then we steep the ground tissue in organic solvents," Dietzman said, "whereas with coffee you would use hot water as the solvent. What we end up with is an extract in the bottom of

our container much like you end up with a residue in the bottom of a coffee cup after the water evaporates."

The extract residue is applied to cancerous and non-cancerous cells in a laboratory at the Josephine Ford Cancer Center in Detroit to see how the cells react. Though the samples are random, the stakes are high. About half of all human medications and two thirds of all cancer drugs come from natural products, said Fred Valeriote, associate director of the cancer center.

"What we're interested in are compounds that are active against human solid tumors," Valeriote said. "We had found some activity in a couple of the Antarctic samples."

Drug researchers ignored cold water organisms for many

years because they thought there was more potential for natural drug products in the tropics. Of the 5,000 to 10,000 samples Valeriote tests each year, only about 50 come from Antarctica.

"There's not many people that are collecting in Antarctica for possible extracts or compounds that have anti-cancer activity," Valeriote said. "It's an interesting ecosystem, but it's a lot easier and nicer to collect in the Pacific Ocean or Hawaii."

The only other research group to bring Valeriote samples from Antarctica was Bill Baker and Jim McClintock. Baker has visited McMurdo four times and Palmer Station once, collecting hundreds of invertebrates. Invertebrates make a chemical compound to protect them from being eaten, infected or threatened. It's these compound that show pharmaceutical potential, Baker said.

Currently he has isolated one chemical that shows some promise, and he plans to return to Palmer in November for more.

"The Antarctic represents otherwise unstudied diversity, and drug discovery fundamentally depends on such diversity," Baker said. "Looking for a cure for cancer is like looking for a needle in a haystack, and the more straws you pick up, the greater likelihood one will be the needle." ■

"Looking for a cure for cancer is like looking for a needle in a haystack, and the more straws you pick up, the greater likelihood one will be the needle."

— *Bill Baker, cancer researcher*

Palmer plies the polynya

By Karl Newyear
Special to the Sun

Scientists aboard the *Nathaniel B. Palmer* have been testing the water of the Mertz Glacier Polynya, an open patch in the otherwise frozen sea off the Adelie and George V coasts.

Before setting sail Dec. 20, the *Palmer* crew completed a four-day port call in Hobart, Tasmania. This was the first time the *Palmer* has been to Australia in more than four years. Hobart, rather than Lyttelton, New Zealand, was chosen as the port of call because it is closer to the polynya region the scientists on board wanted to study.

A polynya is an area of perennially ice-free water where atmospheric conditions would normally cause freezing. The most common causes of polynyas are katabatic winds pushing ice offshore faster than it can freeze or the upwelling of relatively warm ocean water from below.

This time the focus of study was the Mertz Glacier Polynya, a box roughly bounded by 140 and 150 degrees east longitude, the Adelie and George V Coasts, and the line between 65 and 66 degrees south latitude. The Mertz Glacier is named after Xavier Mertz, a member of Sir Douglas Mawson's sledging party who died in a crevasse on the then-unexplored glacier.

The researchers measured electrical conductivity, temperature and depth throughout the area. These three variables completely determine the density of seawater and govern the convection and circulation of the ocean waters. A number of other instruments are connected to the main one,



The Nathaniel B. Palmer.
Photo by Christina Courcier

The purpose of this research cruise is to explore several topics that are not well understood about the oceanography of the Antarctic Ocean.

including equipment to measure dissolved oxygen, solar radiation and an acoustic doppler. Water samples are also being collected for analysis to measure nutrients, chlorophyll concentration, oxygen, and CFCs. The researchers used a fishing net to collect pteropods, salps, tunicates, and other assorted pelagics in the upper 262 feet (80 meters) of the water column.

The Chief Scientist, Stan Jacobs, along with the majority of the science party, is affiliated with the Lamont-Doherty Earth Observatory of Columbia University. However, among the 50 people on board there are nine nationalities represented, including four Australians.

Operations on the *Palmer* continue seven days a week, 24 hours a day and each Raytheon staffer works a 12-hour

shift with no weekends or holidays off. Recreational activities include reading and watching movies, and for those more motivated there is a gym and sauna available.

The *Palmer* is a dry ship, so the New Year's Eve party was missing the traditional champagne toast. However, ship-board life is not all work and no play; we see wildlife, icebergs, and large portions of the Antarctic coast that very few others do and the scenery changes every day. During this cruise we were within visual distance of the French station Dumont D'Urville and had an unexpected rendezvous with the private vessel "Sir Hubert Wilkins" in Commonwealth Bay.

Occasionally the ship will park for a few hours in fast or heavy pack ice and personnel can take "shore leave" for science operations such as ice coring, photography, or just a chance to be off the ship for a bit. We also operate two zodiac inflatable boats to access smaller ice floes or to conduct water sampling, such as for trace metals, well away from the steel hull of the *Palmer*.

One of the scientists on board is sending daily cruise updates to a shore-side web page at www.glacier.rice.edu. The *Palmer* will bypass McMurdo Station this year and continue on its westward circumnavigation of the continent. After our January port call in Hobart the ship will conduct a 59-day cruise ending in Capetown, South Africa before returning to Punta Arenas, Chile on a 17-day transit. ■

— *Karl Newyear is Marine Projects Coordinator on the Palmer.*

Highway ¹ ~~one~~

What will history remember about present-day McMurdo?



"Probably the vehicles. They'll have more computer parts and be more streamlined. And clothes. They'll be more waterproof and breathable."

Jen Teague
fleet operations



"The old communication equipment. That stuff is a dinosaur now, it'll be petrified by then."

Jim Hamlin
engineer



"That really ugly, bad, brown, long underwear."

Darlene Lim
Biology class graduate student



Stories and photos by Josh Landis
Sun Staff

When James Clark Ross sailed through the uncharted sea in 1841 that would later bear his name, he spied a tall, sloping mountain and called it Mt. Erebus. The smoldering peak must have made an impression, because he named it after the lead ship in his expedition. Little did he know that more than a century and a half later, the gold-spewing, bomb-throwing, shimmying and shaking mountain would be the focus of a different group of explorers.

In the world of volcano research, finding a cooperative subject is difficult. Active volcanoes can be inaccessible, temperamental, and even dangerous. Erebus is a rare find that's well-suited to study. Its location 20 minutes from McMurdo Station is the least of its unique points.

"It's a remarkable volcano," said Philip Kyle, an ex-Kiwi who's spent nearly three decades studying Erebus and now works through the New Mexico Institute of Mining and Technology. "The fact that it's in Antarctica is a red herring."

The most unique thing about it is the circulating lava lake in its crater.

"It's one of the few volcanoes in the world that doesn't plug itself up on a regular basis," said fellow researcher Rick Aster.

Most volcanoes erupt, then cool, offering scientists little glimpse of their inner workings. Erebus has a natural convection that continually brings new lava to the surface. This steady circulation provides not only a fresh supply of magma, but allows gases to escape, another attribute of the volcano that makes it ideal to study.

The characteristics of the exhaust, or plume, can reveal a lot about what's happening deep under the surface. Jean Wardell

"As long as it's convecting and degassing, it's going to stay happy."

— Jean Wardell, volcanologist

has been taking samples of the air over Erebus for several years, with a special focus on carbon dioxide.

Just like any liquid, magma is saturated with gases. Under the Earth's crust, at great depth and pressure, those gases are forced into solution. When the magma makes its way to the surface, the gasses escape much like carbon dioxide bubbles out of a bottle of soda when it's opened. Wardell is there to catch them.

"By examining the level of CO₂ escaping, I'm hoping to get a better picture of the hydro-geological system of the volcano," she said.

Erebus is perfectly situated to study trace gases in its plume because the air that streams past it is unpolluted. In areas closer to large populations, even the smallest amounts of pollution can throw off measurements.

Wardell attaches a tube to the tip of a helicopter's antenna, and has the pilot fly a precise grid pattern through the plume. GPS units record the position every second, and at her lab she can create a detailed, three-dimensional plot of her findings.

Wardell also takes air samples inside the more dramatic formations of the volcano: the towering ice fumaroles that dot the terrain and the labyrinth of caves carved out under the snow. Escaping heat and gases create both, and they are as beautiful as they are scientifically compelling. There are even tiny particles of gold in Erebus' exhaust, according to Aster.

see next page



Researcher Jean Wardell enters a snow cave on top of Erebus. Wardell samples the air inside the caverns, which are formed by heat and gases escaping from the volcano.

from previous page

In addition to gas measurements, Kyle's team is mapping the surface of Erebus with high-precision GPS units. Each time the volcano erupts, the mountain shudders. To see it through the eyes of a seismometer is, apparently, quite fascinating and, again, quite rare.

"This is the only volcano in the world that has this level of resonance," said Aster, referring to the subtle ways in which Erebus shimmies and shakes. One more piece of equipment rounds out the researcher's view. A video camera peers from the crater rim.

The camera keeps a constant eye on the lava lake, recording dramatic splashes and eruptions 24 hours a day. A live link in Crary Lab allows scientists to watch the action and compare it to the readings on their seismometers. Microphones also help them distinguish between movement on the mountain and earthquakes in other parts of the world. The recent earthquake in El

Salvador, for example, showed up on instruments here, but could be tuned out because its origin was known.

More extreme sampling methods include titanium instruments that are lowered from the active crater rim to measure the temperature of the lava, and "dog chain" sampling, where a chain is dropped into the lava and quickly pulled out with crystallized magma attached.

Common sense suggests that the gases spewing out the top of a volcano would be dangerous or even deadly, but Erebus' plume is mostly just an irritant.

It's about 95 percent water vapor, 4 to 5 percent carbon dioxide and less than one percent sulfur dioxide. That composition makes the plume noxious, but not life-threatening, which makes it possible for researchers to collect samples on the rim with little risk.

"Sometimes it gags us, makes us cough," said Wardell.

An eruption on Erebus can be a small pop, or as loud as a thunderclap. Regular eruptions toss "bombs" out of the crater onto the rim. These light, glassy bombs of varying sizes contain another rare feature of the volcano, crystals.

These crystals take years to form inside the molten stew of Erebus and are ejected inside the bombs. Over time, the more brittle parts of the rock wear away and only the crystals remain. There is only one other place in the world where such crystals can be found: The volcanic system at Mount Kilimanjaro, in Tanzania, Africa. On Erebus, they are especially abundant.

"It's just a gravel pit of crystals," said Wardell.

Eruptions in 1974 got violent enough to scare scientists away from the top of Erebus for several months. Kyle said bombs as large as refrigerators were tossed hundreds of feet out of the crater and landed near the research hut.

"Things got pretty interesting for a while," said Kyle.

But overall, the same qualities that make Erebus ideal for research keep it gentle enough not to pose a threat.

"As long as it's convecting and degassing, it's going to stay happy," said Wardell.

"It's the Old Faithful of volcanoes," added Aster. ■

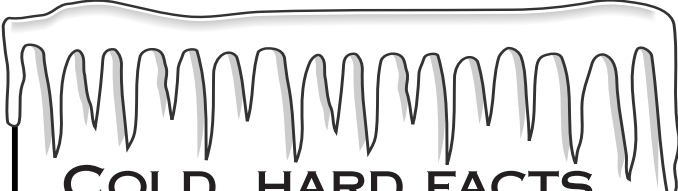
The summit of Erebus is more than 12,000 feet high. Scientists examine the plume, which is mostly water vapor, for gases that can give clues to the volcano's inner workings.



our Antarctic week

<p>21</p> <p><i>Antarctic Professional Golf Association driving contest, noon, Willy Field</i></p>	<p>21</p> <p><i>McMurdo Historical Society open house, 2-5 p.m., Coffee House</i></p>	<p>21</p> <p><i>Science Lecture "Stream flow and climate change in the Dry Valleys," Diane McKnight, 8:15 p.m., galley</i></p>
<p>22</p> <p><i>Slide show on Southeast Asia, Josh Landis, 8 p.m., galley</i></p>	<p>23</p> <p><i>Slide show on Bhutan, Tibet and a Sherpa wedding in Nepal, Janet Huddleston, 8 p.m., galley</i></p>	<p>24</p> <p><i>Lecture on the Comprehensive Test Ban Treaty, 8 p.m., galley</i></p>
<p>25</p> <p><i>Pottery Party, 7-9 p.m., ceramics room</i></p>	<p>25</p> <p><i>Discovery Hut tours, 7:30 and 8 p.m., sign up at recreation department</i></p>	<p>25</p> <p><i>Movie, "Strange and terrible tale of Sir Robert Scott," 8 p.m., Coffee House</i></p>

www.polar.org/antsun



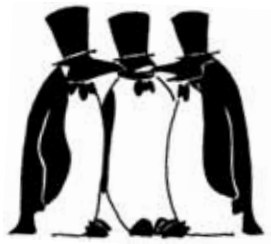
COLD, HARD FACTS Historic January

- 1773** (Jan. 17) – James Cook crosses the Antarctic Circle.
- 1820** (Jan. 16) – Thaddeus von Bellingshausen is the first to see the continent.
- 1895** (Jan. 24) – Carsten Borchgrevink lands at Cape Adare.
- 1912** (Jan. 17) – Robert Scott reaches the South Pole.
- 1915** (Jan. 19) – The Endurance trapped by pack ice of Weddell Sea. Ship sinks ten months later.
- 1922** (Jan. 5) – Ernest Shackleton dies on South Georgia Island.
- 1929** (Jan. 15) – Richard Byrd makes his first Antarctic flight.
- 1957** (Jan. 23) – International Geophysical Year South Pole station opened.
- 1975** (Jan. 9) – South Pole Dome dedicated.

Ross Island Chronicles

By Chico

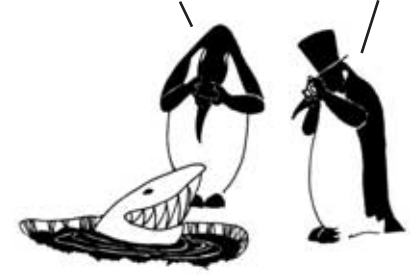
Hey, that famous underwater photographer, Norbert Wu, is back in town. Let's have some fun with him.



He wants some good pictures. We'll give him some he'll never forget.



This hero shot will make a great "Kodak moment." Say "Cheese!"



What the hell was that? I don't know, but I think it was a scared sea urchin that looked like Norbert Wu.



Preserving the huts



Robert Falcon Scott's hut, Cape Evans.
Photo by Jeff Inglis.



Scott's Discovery Hut, Hut Point, Ross Island.



Ernest Shackleton's hut, Cape Royds.
Photo by Douglas Quin.

PROTECTING THE HERITAGE

By Jeff Inglis
Special to the Sun

Almost exactly 99 years ago, construction began on the first building on Ross Island: Robert Scott's Discovery Hut. Now, researchers and fundraisers are stepping up the effort to preserve and restore the historic huts in the Ross Sea area.

Ross Island's three huts – Scott's on Hut Point and Cape Evans and Ernest Shackleton's on Cape Royds – are the primary targets for preservation, though there are over 30 historic sites in the region, including memorial crosses and supply depots left by the early Antarctic explorers.

"We have the responsibility for the practical management of Heroic Age sites in the Ross Sea area," said Nigel Watson, executive director of the Antarctic Heritage Trust, a New Zealand-based, non-profit organization.

To date, the AHT has hired conservators to come to the Antarctic to slow or halt the decline of metals, woods and fibers at historic sites. The trust also maintains a collection of artifacts in Christchurch, which are being worked on and will eventually, Watson said, be returned to their original locations.

But the trust's work so far has only slowed the rate of decay of rare historic artifacts.

"We really haven't halted the decline," Watson said. "As you look through the huts you can see the decay. Don't take it for granted, because one day it might not be there," he said, noting that one of the two buildings at Cape Adare is no longer standing.

Watson said the trust is now looking at different approaches to maintaining each historic hut site, ranging from a possible full restoration of the Discovery Hut to its original condition, to preserving a hut at Cape Evans or Cape Royds in something close to its current condition, though treating the materials to prevent future decay.

This could cost several million dollars, Watson said. The AHT relies on donations from the public for its operating budget. The money must fund responsible care for the huts, Watson said.

To that end, the conservation effort is backed up by

scientific research. Bob Blanchette of the University of Minnesota, and Roberta Farrell of the University of Waikato in New Zealand are conducting a joint effort, funded in part by the U.S. National Science Foundation, to study the decay and deterioration of wood in the historic huts.

The main source of damage to the wood is erosion. High winds sandblast the outer walls of the huts. This is visible, Blanchette said, particularly on the beams supporting the verandah of the Discovery Hut.

There is also chemical deterioration. The high salt content of the snow in the area, due both to the nearby seawater and to gas emissions from Mount Erebus, weakens the wood fiber.

Further, Blanchette said, fungi within the huts are attacking the materials that are sheltered from the storms to which the outer walls are subjected.

In addition, there seems to be a soil fungus attacking the wood foundations. It is not clear, Blanchette said, how this fungus arrived at the historic sites or how it retained its ability to attack wood in a wood-less environment.

"The fungi that we're finding are very unusual and appear to be unique to the Antarctic," he said.

Part of the research is also looking at the impact of visitors to the hut, who introduce dirt, heat and moisture into closed-up buildings. Blanchette's group has installed temperature and humidity monitors in the huts, and is trying to keep close track of the length of time visitors spend in the huts.

Blanchette and Watson are optimistic. Watson noted that the centenaries of the construction of each hut are coming up within the next decade. That provides a unique historical angle on fundraising, he said, which may have very positive results for the huts' preservation. Blanchette also believes that research and conservation can work hand in hand to restore and protect the huts before they disappear.

"It's not too late," Blanchette said. ■

– For more information about the Antarctic Heritage Trust or to donate money to the trust go to www.heritage-antarctica.org.

Antarctica is *the* place to find rocks from space



Top: Ice fields like this one are clear of debris, perfect backdrops for meteorite hunts. Looking at the frozen, blue fields is mesmerizing, like being absorbed by a rippling South Pacific sea. Above: Sara Russell searches through a pile of Earth rocks for meteorites. Photos courtesy of Larry Nitter. Right: A typical meteorite looks like this.



By Beth Minneci
Sun staff

Imagine living on Mars and one day picking up a meteorite that landed from Earth. Let's think locally and say it was a rock from Mt. Erebus.

Having never been to Earth, one might judge the whole planet by that one rock. That would be in error, of course. The Earth is made up of lots of types of rocks with varied histories, not just Erebus rocks from Ross Island in Antarctica.

"The same applies to meteorites found on Earth," said geologist John Schutt. "A lot of them are coming from different parent bodies with different histories."

Now think about how an Erebus rock is rare and considered special. So are some meteorites. In fact, only 35 of thousands found on Earth so far are from the Moon or Mars. The rest are mostly from what's called the asteroid belt, a suspended ring of debris and partially-formed planets that knock about in space. The ratio makes lunar and Martian rocks treasured finds.

For five weeks this season Schutt and five others traversed over hundreds of miles of exposed blue ice. Their mission was to bring home lots of meteorites.

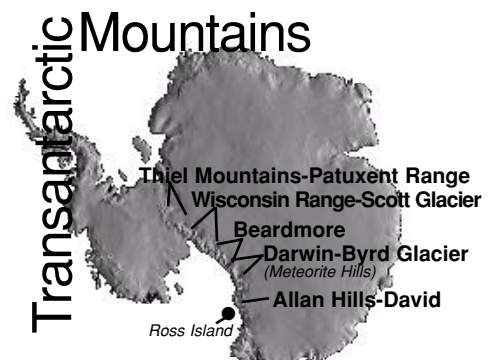
On snowmobiles about 100 feet apart they traveled in a series of parallel paths, scanning the ice while moving across it like a farmer plowing a field, back and forth, Schutt said.

"There's some big country out there," he said. "It requires a high level of concentration all day long."

The group worked at Meteorite Hills, an area in the Transantarctic Mountains near the Darwin-Byrd Glacier named for numerous meteorites found there in 1978. All told 750

Searching for meteorites on Earth is much less expensive than going to the moon or Mars.

see next page



from previous page

meteorites were taken this season, most of which are three to four centimeters in size.

"We pick up everything we find, including very small fragments," said Schutt.

Anything bigger than fist-sized is considered a large sample. The largest that U.S. scientists have found was in 1976, at about 300 pounds. This was part of an 840-pound meteorite broken into 40 scattered pieces.

An initial inspection of this year's catch revealed that nine meteorites appeared unusual. Further analysis at a lab in the States will tell more.

Though meteorites fall to Earth randomly, Antarctica is by far the best place to search for them, said Ben Bussey, who in December scouted new meteorite hunting fields with the meteorite project's lead scientist, Ralph Harvey.

There are several reasons for this.

The likelihood of finding one here is enhanced by the continent's white background. And the way glaciers move tends to concentrate meteorites on the surface at certain sites. Another is that meteorites found on ice sheets are less likely than those in temperate climates to be weathered away. And finally, in certain spots of Antarctica there is no other terrestrial debris with which to confuse an extraterrestrial rock.

Most of the group's searching was on blue ice that has not been near any Earth rock, Bussey said. But some areas were dense with terrestrial rocks. One way to tell the difference between Earth and extraterrestrial rocks is by their exterior. Meteorites have what is called a fusion crust, a glassy surface that developed as the rock came through the atmosphere, heated up and melted.

"You develop a pretty good eye for them after a while," said Schutt, who estimates that the team covered up to 1,200 miles on foot and snowmobile, and only examined one-third of the territory in Meteorite Hills.

All rocks flying through space are called meteors. They are usually made up of common rock forming minerals found on Earth.

When a meteor enters the atmosphere it glows and becomes a "shooting star." Much of a shooting star evaporates before reaching the Earth or is crushed to dust by pressure before it hits the planet.

"I've heard it can be 20 tons of meteorites and cosmic dust a year drifting down into the atmosphere," Schutt said. "It may even be more."

Every meteorite on Earth is a messenger with information about the history of other planets, asteroids and Earth's moon. Searching for meteorites on Earth is cheaper than, say, going to the moon or Mars to take samples. So each year researchers and volunteers scan Antarctic ice for meteorites, never knowing what might turn up.

"The more you collect, the better chance you have of finding something rare," said Schutt, who has been hunting meteorites in Antarctica since 1980.

Rare ones are prized, but even common extraterrestrial rocks are valued because they tell a more complete story about someplace in space.

The most abundant type of meteorite has chemistry that is similar to that of the sun. They are from the asteroid belt and are some of the solar system's oldest objects. Scientists study them to understand the conditions present at the start of the solar system, which is believed to have been between 4.5 and 4.6 billion years ago.

One of the rarest and most famous was found by Cray Lab supervisor Robbie Score in 1984. Known as



Top: Meteorite Hills was named 23 years ago after the nation's first meteorite hunt revealed an abundance of extraterrestrial rocks. At the Hills, red cliffs surround blue ice fields.

Right: The camp at Meteorite Hills from which six people searched for space rocks for five weeks. Photos courtesy of Larry Nitter.



Though meteorites fall to Earth randomly, Antarctica is by far the best place to find them.

ALH84001, Score found it in the Allan Hills area north of the Dry Valleys. Scientists said the meteorite contained fossilized Martian life. But other scientists have argued that the meteorite was contaminated by its contact with Earth.

"It is still inconclusive," said Schutt.

In Score's office is a 23-pound iron meteorite, the heaviest kind. It's about the size of a super-ball.

Since 1976 the National Science Foundation has funded Harvey's group in what is called the Antarctic Search for Meteorites program (ANSMET), which has collected specimens for study from many spots in the Transantarctic range. Including Japanese and European efforts, more than 20,000 have been recovered continent-wide.

The ANSMET group that hunts meteorites is actually part of a service from which scientists around the globe can borrow space rocks for research. Field party members examine the meteorites upon finding them in Antarctica, then send the rocks, still frozen, to the Antarctic Meteorite Curation Facility at the Johnson Space Center in Houston. At the center, the meteorites are freeze-dried to remove any snow and ice, then examined more. Findings are distributed to researchers around the world twice a year.

"It's very exciting to be finding extraterrestrial material," Schutt said, "especially if it turns out to be something unique." ■



Perspectives Perspectives

Living history

By Lee Gwin
Special to the Sun

One of the questions I get most often from friends back home when they hear I work in Antarctica is, "What do you do in your time off?" This season I found a very rewarding outlet for my after-work energy: I've been volunteering some of my time to the McMurdo Historical Society.

I was in the library one evening doing research for a paper I was writing on the Antarctic Treaty. Beaver, the volunteer librarian, said that he was going to a meeting of the McMurdo Historical Society (MHS) after his shift was over. I thought that might be an interesting group, and I might even be able to squeeze in a question about the Antarctic Treaty to help me with my paper. In a town as small as McMurdo, it was no surprise that several of those gathered at the coffeehouse that night were people I knew. I felt comfortable sitting in on the little meeting, and was able to get some idea of what the MHS was about, and where I might fit in. On the agenda was the problem of where to store the extensive inventory of artifacts the Society had saved from the retro yard, or the 'Construction Debris' bin. I learned that the MHS is concerned with the more recent history of the Antarctic. "Post Heroic Era" they called it.

Before my involvement with the MHS, my exposure to local history consisted of stories I heard from the 'old-timers' who were here before MacTown had an ice cream machine and cable TV in every room. I had heard talk of bits of McMurdo history, like the 'Nine-Pack', a collection of Jamesways up in the area of the new fuel tanks. I heard that you could keep your beer cold by simply keeping it on the floor in the days before every room had its own little fridge. I heard stories told of the dog teams at Scott Base, and the dump right in front of town. There are people here now who remember those things. It's equivalent to being in the states among people who remembered the times before air travel and telephone service. Being only a second-season Antarctic veteran, I can't swap stories with the guys who lived in the 'Nine Pack,' but if I hear someone is brand new this season, I'll tell them about the days when I was new, when the galley had an 'E-side' and an 'O-side', and by golly, we only had one scroll channel. Not like you spoiled kids today. I'm an aspiring old-timer.

Of course the 'old days' in the McMurdo time frame was practically any time before last year. I came to learn that McMurdo Station was substantially built in the International Geophysical Year (IGY) age of 1958-1959. That makes it only a little older than I am. If McMurdo were a car, it would be a classic, but not yet an antique.

I feel like I am in the middle of history being made when

Open House

Who: McMurdo Historical Society

What: Artifacts exhibit

When: 2 to 5 p.m.

Where: Coffee House



Photo courtesy of McMurdo Historical Society.

I'm here. People speak in hushed tones of the veterans who were here in the 1980s. Working with the MHS has reinforced my respect for the stories that are here, and the unique place we are in to preserve some of that heritage before those ice veterans stop coming back down, or go to the 'Nine Pack' in the sky.

In just the two months since my first meeting, a storage place has been secured in old Bldg. 63, above the bowling alley. There are plans in the works for a museum space next to the library in Bldg. 155, and even talk of someday creating a position for a town historian. It's gratifying to work on a project that shows some results right away, though there's a lot of work involved. Museums and archives don't get created overnight. I got the picture that these people were not just history buffs getting together in the Coffee House every Sunday night to pass around pictures of Navy days gone by. They are sincerely interested in preserving the historical heritage of this incredible place, and I get to be a part of it. ■