Return to Antarctic Photographs

October 13, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

This is the first installment of the 15 journal entries October 2002 through January 18, 2003

Go to: Journal 2

Select the Red Inset to See Map Detail and Facts about the Antarctic

October 13, 2002
McMurdo Base, Antarctica
-17degreesC (0 degrees F) Wind chill: -31.8°C (-25°F)

Journal

I go to bed in Santa Fe, wishing for a dream about my upcoming trip. Dream: I open the studio. It is dark and large and empty except for a giant black bull and a lion with an enormous mane in the center of the room. They watch me intently. I step into the room. The bull begins to paw the ground. The lion crouches. I know they will run for me if I enter further. I calculate the distance and hesitate. I am not especially afraid, just cautious. I want to come in.

C141 Flight to McMurdo

Christ Church. The early Antarctic explorers said that the hardest part of an expedition was the time before it starts. As I sat in the AZ airport waiting for the beginning of the 24 hours of flying that will take me from here to Dallas to Los Angeles to Auckland and finally Christ Church, I felt numb from the effort required to get to this point. Suddenly I had nothing left to do. It was a void. The last few weeks were long days of sorting camera gear, ordering new lenses, getting the right battery pack for the digital cameras and flash, only to find that I had forgotten to order the right cable. Without Bernie's help, I never would have made it. He worked full time running errands and solving gear problems the last few weeks. Every day I received emails and phone messages from Elaine Hood, my mother-hen organizer at Raytheon, concerning the need for permits (hard to get) for photography in specially protected areas, clothes to bring (avoid nylon underwear!). And the expenses—I finally gave up worrying and simply put what I needed on my Visa—hoping

that somehow in my absence it would take care of itself. After all this preparation, the actual arrival in McMurdo and photography should be, if not fun, at least, not full of constant stress.

This morning, after I said goodbye to Bernie in the airport, things began to go wrong. We both know I'm hopeless with mechanical objects. (Why did I ever take up photography?) He has saved my working situation over and over the years by fixing tripods that wouldn't extend properly, cameras that wouldn't open. This time we had no sooner kissed, cried, and I had gone through security at the airport, than the handle for my roll-on carryon stopped extending. This meant I had to drag it through long walks in Dallas, Los Angeles, and Auckland, getting hot, sweaty, and frazzled. I am such a klutz.

I've met a number of my fellow travelers. There were some 70 of us on the flight to Christ Church. A beautiful flight, clear skies, and a window seat so I got a great view of the rugged landscape of NZ, including the lovely snow-capped peaks of the northern part of S. Island. It reminded me a bit of Patagonia but it appears greener, a little less bleak. By good fortune I sat next to Dawn Crist on the flight to Auckland. When she told me her name, I suddenly remembered that the man I'm due to meet for the Marble Point Traverse is Gerald Crist. Turns out it's her father! We were both delighted by the connection. He has been coming down for 13 years. Her brother came down last year and wintered over. She decided to get a job South herself this year and see what he is always talking about and she's working as a General Assistant. That means she gets to work as a sort of temp, doing whatever is needed any particular day.

I haven't met any other PI's but I've met electricians, heavy equipment drivers, janitors, and kitchen staff. Dawn told me that the salaries aren't great, but then, there's nothing to spend it on so it's a way of saving some money. Most everyone is young. And, they all have an open look… one that I saw in pilgrims on the Camino de Santiago… a readiness to take whatever comes along and an excitement about life that one rarely sees when you go to the post office and say hello to your neighbor or go out to dinner with friends.

Several men on my shuttle van to the hotel were talking about being back down on the ice. One said, " you know, I think I keep coming down because that's where all my friends are…. I don't have much in common with people at home."

Christ Church is a pretty town, bright and clean today, the light so strong that I have to wear dark glasses in order not to squint. The trees are in flower; the shrubs a light Spring green. Spring is in full bloom here. It's a shock after the Fall gold and rust of the aspens and oaks and chamisa in Santa Fe. I've not only lost a day (going across the date line) but I feel I've lost a season.

Christ Church. After a good night's sleep, life looks lots better. I took it easy this morning, went shopping, and bought some earrings and a jade Maori pendant for good luck to wear South. Went over to the Antarctic Center about noon and went through the museum. There was something mind-boggling about a room chilled and full of snow where tourists can put on rubber slippers and Antarctic Center jackets and get a feel for Antarctica. Kids slid down an ice slide while their parents took their pictures. In another room, a sound system gave all the sounds of a polar blizzard and you could see a man in a snow vehicle talking about the storm roaring outside. Stuffed penguins and seals were a sad representation of the fecundity of polar wildlife, but the kids did seem to enjoy petting them. It is how we like our experience these days—safe, comfortable, and mediated by lots of wall captions. The information was excellent. The place was packed. Perhaps, it's better than sending everyone south and having to build Holiday Inns and McDonalds.

At 2 I walked over to the CDC(Clothing Distribution Center) for clothing issue. Marlene gave us a briefing on what we need to wear on the plane and how to pack our bags. The women headed to the right and the men to the left, and we all picked up our 2 bags of cold weather ECW issue. The goal was to try everything on and make sure it all fitted and then get organized so that when we are ready to depart, we will be able to drag our bags to the scales and have the necessities in our one carry-on bag. Sounds easy. It wasn't. For me, it was great preparation for Hell! I couldn't figure out how to put on some of the clothes, like the bib overalls (someone is going to have to show me how to fasten those clasps or I'm going to lose my pants the first time I wear them out in –20 degrees). Another mysterious but wonderful piece of clothing (which nobody else seemed to get) was a fleece cat suit that would have made Cat Lady jealous. Once I put that one on, I didn't want to take it off. It was warm and cozy. Other clothes included many pairs of gloves (most of which seemed inappropriate to photography since they were very stiff gloves or mittens), 6 pairs of gigantic wool socks, long underwear, several jackets, and insulated white rubber boots, called bunny boots. Many women tried everything on, repacked, and were out in half an hour. Two hours later I was still wondering how many pairs of gloves I really needed.

Onboard Military Aircraft

One question kept occurring to me. How will I pee out in the field? This is one of those questions that doesn't appear with a neat answer in the Polar Participants Manual. Guys, with their extendable parts, have it much easier. By the time I undo these strangely placed zippers in several layers of clothes, I'm not sure I will get enough removed to do the job without freezing sensitive parts. This will be an important experiment!

I had dinner with Ann who lives in Durango and works as a Forest Service wilderness ranger when she isn't down on the Ice. At McMurdo she runs the waste management division and drives fork lifts around. She has been coming down 7 seasons doing different jobs. We had a great vegetarian Indian meal and she told me about one season where she helped set up a field camp to study the movement of ice streams and another where she worked at Siple Dome. I found out later that she modestly omitted telling me that she was a member of the first all-woman expedition to ski to the S. Pole.

I won't be going South tomorrow. Three flights have been cancelled or boomeranged in the last few days. Scuttlebutt is that there are lots more boomerangs and turn-arounds for flights since the Navy left three years ago and turned the flight service over to the New York National Guard. These pilots are not experienced Antarctic fliers—they come down for only 2 weeks at a stretch, as opposed to the Navy pilots who lived down here for long stretches of time and did the run over and over. If the weather is better tomorrow, they will be able to take off and we will leave on Tuesday. That's fine with me. It's pleasant here in Christ Church—good food, spring flowers. In several more days, I will probably start to be anxious. At the moment I'm grateful for the day of rest.

McMurdo. I made it! I look out my Crary La office window to an incredible view. Below me is the sea ice runway where our C141 landed yesterday. A few small vehicles and huts are placed along the runway, but mainly the vista is of an unbroken white, flat expanse of ice rimmed on the far side by a spectacularly beautiful range of mountains. Mt Discovery is straight across from me with a slightly rounded top covered in snow. To the left is Black Island, where the antennas are located, and which I hope to photograph in a few weeks. Further yet, and just out of my view in this window is White Island. The sky is blue and perfectly clear.

McMurdo Station

I'm beginning to learn my way around. I've arrived at a good time, since people are just beginning to arrive for the summer season. Few of the scientists are here yet. It's mainly support folks—the electricians, heavy equipment drivers, supply folks that are here now. I still find myself at the wrong end of buildings when I exit them but I am at least beginning to have a sense when I exit that wrong door of where I want to go. It's a very small town here. It's impossible to get lost…but very possible to not know which building you want to go to.

I am very fortunate to have an office in Crary Lab, a gorgeous new science building. It has offices for all the scientists with field projects, as well as for support staff. It also has labs, loading docks, a lecture hall and library, and an aquarium for the strange fish that live under the sea ice (and they are doing continuing research on the way these fish manufacture glycoproteins that act as antifreeze so that they don't freeze in the below-freezing water under the ice). Crary Lab is very quiet. I met several guys from NASA who are here tracking satellites (they are leaving tomorrow) but otherwise, I've mainly met office staff. Everyone has been extraordinarily helpful, showing me the facilities and answering numerous questions.

View from my office

Looking South

I'm still pretty hung over from all the flying and lack of sleep. An hour or so after I was given a great Crary lab tour, I had to find my way back to the supplies room to get a pad of paper. I stumbled into the office next door (which I knew didn't look familiar). When I asked for a pad of paper, I got a blank look that told me I was in the wrong place… and then fortunately, I was rescued by Lisa who was passing by and sent in the right direction. My mind is still mush after; I seem unable to remember a name or a number longer than it takes me to say it.

My flight from Christ Church left on time at 9 AM. We had to report at 6 with all of our luggage. Back at the CDC, we put on our ECW gear (warm underwear, bib-coverall, bunny boots, gloves, and parka). We presented our passport, got a boarding tag to hang around our neck, and lifted out bags onto the scales. After lots of warnings about the consequences of being over 75 pounds in weight and the need to fit our carryon in the small box they showed to us, nothing dire happened to anyone. I know I was closer to 100 pounds myself… and the woman at the scales looked dubious for a moment… but I was waved through. Drug-sniffing dogs checked us out. By the time everyone had checked through and we watched a couple of safety videos, it was time to board the buses that took us out to the C141 aircraft that was to fly us to McMurdo. It is a long heavy-looking plane, a staple of the military's movement of personnel and cargo all over the world since the late 1950's. We climbed up a short flight of steep stairs and were fastened, one at a time, into webbed sling-like seats in two long rows. The men were loaded first, the women last, near the cockpit, since that's where the only (minimal) bathroom is located. There were nearly 100 of us along with tons of cargo in the rear. We sat touching the person on either side and with knees touching the person across from us. I didn't find it too uncomfortable since my parka cushioned the seat and I drowsed through much of the 5 _ hour flight.


From the Cockpit

What was below us? There are no windows on the plane, just dim yellow lights. Since I'm a photographer, however, the pilot invited me up into the cockpit as we began to fly over the continent of Antarctica on our way into McMurdo. The view below the plane was unreal—the tips of dark mountains draped with glaciers lining up and swirling over the white blankness of snow. What was most amazing to me was the size of it. It went on and on, as far as I could see. No roads, no structures, nothing but the continent itself in all its harsh beauty. How can I possibly photograph this awesome place? It's like being invited to Heaven or Hell (and, in this case, Antarctica is both) to photograph what's there. How can I capture this vastness in a picture frame?

It's very cold here. We were warned to put on our hats and gloves before deplaning. Wind-chill was –50 degrees F when we got off the plane. It reminds me of my childhood in Iowa where it would get to –20 degrees with a wind blowing (and they still hadn't invented wind-chill). It is so dry that you don't feel very cold as long as you have your parka on and keep moving. Anything exposed to the outside air and wind gets cold very fast. It's also very bright so I've been virtuous about wearing my UV-protection sunglasses. The ozone hole is centered here, so you can get burned very quickly if you are not careful.


Mt. Discovery and sea ice

A busy day. I finally got my computer completely hooked into the network and set up for email yesterday. I checked out my sleeping bag, tent, and most interestingly, the urinary funnel. Nevada swears by it and gave me a graphic demo with instructions on how to avoid leaks. It all looks quite complicated, and I fully expect to make a mess all over myself tomorrow if I have to use it in the Snow Survival course. The pee bottle is much easier…but problematic in very windy and cold situations where you don't want to bare your private areas to the elements. I'm going to practice tonight in the shower and see what happens.

The wind picked up this afternoon, changing a pleasant day to something considerably less tropical. By mid-afternoon, when I wanted to walk up to Gerald Crist's building to chat about the Marble Point Traverse, it was –7 degrees F with a wind chill of –65 degrees. My fingers were numbing inside 2 pairs of gloves and I couldn't make it up the hill. I retreated to my room, got a heavier pair of gloves, and tried again. This time I made it but I was nearly blown over backwards. I hope the wind dies down by tomorrow afternoon or it is going to be a challenging adventure to spend the night in the field.


Gusts in McMurdo

Well, I survived Happy Camper School…but not with a lot to spare. I have a new appreciation for what the polar explorers experienced, though of course they had hardships several levels of magnitude greater than mine… and they went through day after day of it for weeks and months at a time. I do not believe that you can convey in words what that feels like. The wind and cold here are so severe and so implacable that they are like striking a brick wall. You come away bruised and damaged and grateful to have survived.


Starting snow school

Our little group of 16 set off late morning from McMurdo after a brief discussion about hypothermia and frost bite. We drove by track vehicle over the hill behind Mac Town, as the locals call it, to the ice shelf to the south. The road goes past the New Zealand small base and then out on the ice shelf. Once you get over the hill you get an open view of Mt. Erebus, our local fire-breathing volcano at almost 13,000 feet. It doesn't look that high. When we got out to our campsite, it looked like you could walk over on the ice shelf and climb up it in a day hike. But, the air is so clear here, that distances are deceptive.

We stopped briefly in a small unheated metal hut, ate sandwiches and juice, and learned how to light the stoves. We then drove about a mile further to an empty flat area on the ice shelf and unloaded all our gear. The sun was bright, the snow crunchy beneath our feet. Eric and Allan, our instructors, showed us how to set up Scott tents (the same sort of tent that Scott used but of more modern materials and a bright yellow). Next we built a snow dome—covering all our gear with shoveled snow, packing it down, and then cutting an opening and taking the gear out, leaving an igloo like structure. Then we practiced making trenches and snow walls. You cut down a foot or so with a hand saw on two parallel sides and then cut cross ways and shovel out the block. It is firm dry snow that feels much like Styrofoam, and it makes a fine snow wall. Several of the guys really got into making walls and trenches and several of them slept in their constructions. I had been given a small dome tent, so I set that up, knowing that sleeping in a snow trench was not going to be my first choice.

Building a snow dome

Finally, we put our stove-lighting skills to the test and set several of them going to boil water for dinner. After all that work, freeze dried chicken and brown rice tasted as good as any fine meal I've ever had, and I finished it off with hot chocolate. We were given lots of encouragement to eat and drink a lot. Staying hydrated and eating enough calories are crucial for staying warm. Even after dinner, by around 7, it was bright as mid-day. I walked a short distance away and looked back. Our little camp was dwarfed by its magnificent surroundings, but the yellow Scott tents and red parkas made a bright splash on the ice. The sun slowly set about 9:30 but it never got fully dark (and in a couple of weeks it won't set at all.)

By this time, I was tired and ready for bed so I filled a water bottle with boiling water for the bottom of my sleeping bag and turned in. So far so good. If I put my parka over my head I could still breathe and not be too cold. I shivered a little and my feet were cool even with 3 pairs of socks and the hot water bottle. But, I did go to sleep, tossing and turning a bit but reasonably warm until about 3 AM. A sudden gust of wind rattled the untied guy wires on the tent (we had tied only 4 of them down with snow anchors the night before since it was perfectly calm). Then another gust came and another, stronger now. Pretty soon the whole tent was shaking. My tent mate Christine put on her parka and bunny boots and went to walk out to the outhouse. Very brave, I thought. I had to go but decided I would wait. An hour later when I finally couldn't wait, I opened the tent flap and saw that all our bags were covered in snow and the wind was howling. When I succeeded in getting my parka on and my boots on, I headed for the green flags that marked the path. I could barely see them, each about 30 feet apart. When I got ready to return, I found I couldn't see any flags. Everything was white, ground, air and sky. No horizon and no ground. I figured I might as well spend a little longer in that shed. When the gusts temporarily died down, I made it back, but I was frightened. Later when I got back to the computer I looked up the temperature and found that the low that night was –19 degrees F with a wind chill of –84 degrees F.

Snow school outhouse

How did the English do it in their cotton clothes? How did their bodies survive it? In the morning, it was so gusty that we didn't try and cook. The instructors came for us about 9 when we had camp broken down, and we retreated to the unheated metal shed for a lesson in radio. By this time, I was gobbling whatever food was still around—partially frozen sandwiches from the day before, candy bars, nuts and raisins. My fingers, even with glove liners and heavy gloves were cold. Several times I began to lose feeling in them when we went outside to do practice sessions. I swung the arms around and jogged a little and it was better, but I did get a touch of frostbite since today they feel burned on the ends. When we finally finished mid-afternoon, we drove back to McMurdo and I took a very long hot shower. Last night I slept 12 hours, and I am still exhausted. Clearly I would not make a polar explorer!

Sunset from my office window

Top of the Page

Return to Antarctic photographs

Previous Journal

Go to: Journal 3

October 20, 2002

Antarctica Journal

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-Joan Myers

Journal 2

October 15, 2002., 9:00 A.M.
McMurdo Base, Antarctica
6 deg F, -10 deg F wind chill

Unshoveling a crack in Sea Ice

It's been almost a week since I arrived and I'm beginning to feel comfortable in this strange place. Tonight I'm staying up late to photograph the sunset, one of the last before the sun remains above the horizon for the rest of the season. Sunsets take forever here. The sun has hovered at the horizon for an hour now, hesitating, reluctant. The sea ice has turned peachy, waiting. At this rate I may be here another hour. Probably not a good idea since whatever nasty bug I picked up at Happy Camper School has already taken my voice away and would probably like a chance to attack the lungs. I am determined, however, and have promised a sunset picture to Karen, who is in charge of computer support here at Crary and who has been very helpful to me in setting up my office.

Today was Sea Ice School. This class, I really enjoyed. We spent a little time in the classroom, examining all the forces that work on the sea ice—environmental ones like solar rays, currents, icebergs, and tides, geologic ones like shoals and shorelines, and human ones like vehicle traffic. Then we packed our lunch in a strange vehicle called a Hagglund and drove out on the ice runway and out towards the Erebus glacier tongue and Cape Evans. Once you leave McMurdo, you are in a whole different world. The town is built on black volcanic rock and has a shanty-like feel. Once you leave, you are in an absolutely clean white world.

Drilling a crack hole

We stopped several places looking at ice cracks. The sea ice is an organic affair, and all the forces that act on it cause it to ripple up in pressure ridges or crack apart. Most of the ice in McMurdo Sound right now is about 12 feet thick, but the large cracks that form often have weak thin places. The airplanes are landing on the sea ice right now, and they have to keep a close look out for ice movement. The rule of thumb for driving on the ice is that you can't cross any crack in a vehicle if part of the crack is less than 30" thick and that crack is more than 1/3 the diameter of the wheel treads of the vehicle. In order to find out how thick the ice is, you shovel off the snow and then use a large ice drill to find out how far down water is. Several of the cracks we saw, were slushy only a foot or so down, but none was very wide.

We also learned how to set up a tent on the ice, using the ice drill to cut opposing holes to run the guy wires through and using the ice as an anchor. It was cold and windy on the ice, but we didn't spend too long at a stretch outside, so it wasn't too unpleasant. The sight of the enormous bay of sea ice with the mountains in the background was worth it.

We then drove to Cape Evans, where Scott spent the winter before setting off for the S. Pole on his ill-fated expedition. The hut is now an historic monument and is administered by New Zealand. It's a place I hope to photograph in over the next couple of weeks, since much of the expedition's stores and furniture are still intact. We didn't have a key to go in on this trip and little time, but we did walk around the hut and climb the hill to the cross on top. I photographed the outside of the hut, the weather station up above it, and another strange wooden contraption, no doubt with some scientific purpose. The site is magical. It holds many ghosts.

Scott's hut at Cape Evan

Visually, it is more spectacular than the photographs I have seen, since it is dominated by Mt. Erebus, which towers 13,000 feet above it, and which smokes and coughs. The air is so clear that you think you could climb it and that it couldn't be that high… and you see the lava bombs that it has spit out all around the hut. I wonder if it is a female goddess that is the spirit of Erebus… if so, she is an icy one with a fiery core. Not at all like Pele in Hawaii who toys with humans. This goddess is totally above anything human.

Cape Evans with Mt. Erebus

Last night I went to a peace rally. More than 70 people showed up to be in a picture showing that even in the distant Antarctic there are folks who do not support America attacking Iraq. It reminds me of the old days in the 1960s in San Francisco with the big peace marches. It felt good to be able to do something… even though you know that it's mighty little. After some discussion about where to take the picture, we all put on our parkas and traipsed over to the Chalet in the bitter cold. A number of people were concerned about using the headquarters building for the NSF to promote a political point of view and were concerned about their jobs. A compromise was struck so that we used the back of the building without the NSF logo but with a fine view of the sea ice and distant mountains.

Strange castes and social strata organize the social life here at McMurdo. On one hand it is very egalitarian in that everyone is doing a job, working very hard, and respects the work that others do. But, some are more equal. The scientists are the highest caste and everyone else is there to support them. But you hear that "this place would be great if it weren't for the scientists." Then there are the upper level Raytheon employees who run the place. They are there to serve the scientists as well, but they have lots of power over the mechanics and food service workers. I hear gripes about that, since people are not terribly well paid. They also don't get to leave the station like I do. I spoke with the dentist at dinner last night. He said he had worked here for 3 years and hadn't left McMurdo yet. He is the only dentist on the whole continent! It would be dreary to work here month after month and see nothing of the beauty of the Ice or the wildlife. Mealtime is one place where the castes can mix (though they often do not). I have had meals with firemen, the chaplain, heavy equipment operators, radio operators, janitors, as well as most of the Raytheon staff. You can find just about anybody at dinner time in the galley and discuss problems or plans and network for the future. Last night I met the head of the newspaper, the Antarctic Sun, and we discussed ways we might help each other over the season.

Marble Point Traverse

Marble Point Traverse. We left McMurdo 16 October about 9:30 AM with two Deltas (a large red truck with giant balloon wheels…to get up to the cab I had to climb a small ladder) and a Challenger Caterpillar (that came along to retrieve a sled that malfunctioned on the last traverse to Marble Point a few weeks ago. Marble Point is about 50 miles from McMurdo, across the sea ice to the northwest. It is a tiny outpost used for staging supplies for research field stations in the Dry Valleys and as a fueling depots for helos (helicopters) that are the major form of transportation in the area. Several truck caravans are sent across the sea ice at the beginning of each season to supply the station. I was excited to be going on the journey. It was the moment I'd been waiting for, my first time off station where I would have an opportunity to photograph.

The day was gray with a slight wind. Minutes out of McMurdo, the town vanished. We could see red flags marking our path across the sea ice but little else. I rode in a large heated cab in one of the Deltas with Ralph, who has been coming down for seven years, first working on station but

Marble Point Traverse crew

gradually doing more and more trips like this that take him further away. After an hour or so, the weather settled down even further on us and snow began to blow across the track. We were following a track made by the previous traverse and marked every mile or two by a red flag. When the horizon disappeared, visibility dropped to a few feet just in front of the truck. Ralph had to hunch over the wheel to peer through the grayness and see the line of tire tracks ahead of us. With no horizon, it's hard to judge and organize space, and suddenly we lost the track completely. Ralph stopped, and the drivers converged.

"I'm sure we're off to the left of it," said one. "I think it's over that way," said another pointing off at a ninety degree angle from the first. "Good thing we've got GPS," said the third. They punched in figures, looked at their charts, and headed off into the featureless gray. To my relief (and theirs) we soon saw another red flag.

Mid-afternoon, the weather was still opaque. We broke out our sandwich lunches and juice and ate as we drove. We followed the track when we could and followed GPS readings when the red flags disappeared. The Deltas max out at about 17 mph and average about 10 mph on the traverse, so it was a leisurely pace. The sea ice is not smooth; it has lots of ridges and unexpected humps and dips that you can't see with these light conditions, so occasionally I was tossed a few inches off my seat. The previous traverse had smoothed the ice quite a bit, though, so it wasn't too bad. You get into a slow rhythm, not too different from being on a long road trip in the Southwest.

Marble Point station

We stopped briefly to say hello to a group of Kiwis (New Zealand has a small base, Scott Base, just a few miles from McMurdo, so we're neighbors on the Ice.). They were dragging several green huts, on their way to Granite Harbor to do some sort of geological research. A little later we came across the malfunctioned sled and loaded it up on the Challenger's trailer. Only in the Antarctic can you abandon a vehicle loaded with cargo and not worry about theft or vandalism until you get back in a couple of weeks to pick it up. About 4:30, we left the ice and started over the small spit of rocky land that is Marble Point over to the station.

Marble Point

Marble Point Station is luxury for a field camp. It has electricity from its own generator, adequate water, well insulated buildings, a telephone and dial-up Internet connection. The weather here is a little more benign than that at McMurdo—less windy and warmer in the summer months. A layer of snow covers the rocky ground now but it will melt soon. The camp consists of half a dozen small buildings. The main building is a large living hut with bath, kitchen, office, living/dining room, and two bedrooms. I sleep in a separate heated bunkhouse that has two rooms with two bunk beds in each; it has no windows but it has electricity, real sheets, and is toasty warm. In addition there is a repair/storage shed, a building for the generator, and a small hut for the camp manager.

Unloading supplies from traverse

Only 3 people work and live at Marble Point: the camp manager, a fuelie for the helos, and a cook. Sarah is the cook and weather person, When she isn't on the Ice down south, she works up in Greenland. She has cooked for all sorts of field camps, large and small. The Field Service provides her with meat, poultry, seafood, as well as dry goods, frozen veggies, pasta, and lots of condiments. Since these supplies weigh quite a bit for helo transport, out traverse has the job of bringing in several enormous cases of supplies for the station. Naturally everything in the cases is frozen solid, so no fresh veggies or salad materials come in this way ("freshies," like fresh fruit or vegetables are treasures here). Even at McMurdo, you get bananas for 3 days and then none for the next week.). Sarah loves to cook and bake. In the couple of days that I visited the camp, she offered us baklava, carrot cake, and several kinds of cookies. A typical dinner might be steak, roasted potatoes, pasta salad, homemade bread, and dessert. Another was chicken and shrimp and sausage gumbo. Her kitchen is stocked with real saffron and vanilla beans. She is an amazing cook who simply loves to make people happy by feeding them well.

Sarah Harvey, cook at Marble Point

There is running hot and cold water in the kitchen and bathroom sinks but no toilets. Here in the Dry Valley area, you are not allowed to pollute the ground with any kind of waste. All the water that goes down the kitchen drain is evaporated in a large black kettle outside. You can pee in a small waterless toilet inside (which is collected outside for eventual transport). The heavier stuff you do outside in a warmed hut into a plastic bag which is then put into a plastic barrel for transport. It's a strange added complexity to body functions that is intimidating at first, but not too onerous after I get the hang of it.

Everything comes down to water. In Antarctica, water has to come from snow melt (unless, like McMurdo, you have a desalination plant—very pricey!) Here at Marble Point, they have a large snow melt boiler and storage situation. Crunch (nickname for our camp manager) goes periodically with his little bulldozer scoop to the nearby Wilson Piedmont Glacier and scoops off

a layer of snow and dumps it in the large boiler. The water goes through several filters before being piped into the kitchen. However, since it gets warm here in the summer, the snow on the glacier melts and then they don't have as much to melt as other camps do. So, they are very frugal with water. A short shower can be taken once a week. The laundry is sent into McMurdo.


My bunkhouse

They have a brand new generator this year, Crunch tells me. Last year they had two old ones that kept malfunctioning. The electricity would shut down about 3 AM, and he'd have to go outside and repair the generator. Since it was –15 deg F this morning when I got up, I don't think that would be much fun.

The morning after I arrive, the traverse drivers head back to McMurdo with the Deltas. I head off with my camera gear for a short walk over the hill to the Bay of Sails. Here you can see stranded icebergs out in the sea ice with Erebus in the background. The other direction you look down on the station and off to the glacier behind it. There are not enough words in my vocabulary to do justice to this scenery, so I photograph it instead. I also photograph details of station life, interiors, and portraits.

It's hard work photographing in the cold. You wear a heavy parka and very heavy boots so walking any distance is more work than you're used to. If you exert enough to sweat, which you will do if you carry camera gear any distance, then you tend to get cold when you stop. I still haven't figured out the ideal combination of gloves to keep my hands warm and have enough dexterity to work the cameras. You have to wear a face mask and goggles against the incredible UV in the bright sunlight here, which make it hard to see. Forget changing film in the field—it's impossible to do with bare hands and you get frostbite if you take off all the gloves. I'm still learning.


Kitchen

I'm also trying to learn to stage gear so that I can manage most outings by myself. It's very hard working without an assistant here. There are lots of macho women at McMurdo. Many women run heavy equipment. It's an unusual unisex environment where women are expected to do the same work as men. I'm too old to be macho and I've already had one knee ACL repair. I do feel like a total wimp asking for help to carry all my gear but I have no choice. Fortunately, no one minds helping, but they always look surprised that I can't carry a large duffle, 2 camera bags, and a tripod by myself.

The good news is that I haven't had any problems with my gear. I keep my digital camera inside my parka and I haven't had a battery go dead yet. The Fujica 6x17 hasn't given me any problems yet either, though I haven't used it for long stretches. I consider all this to be a dry run exercise for the cold that I'll encounter at the South Pole when I go there in late November.

Breakfast quiche

My second day, it is again overcast so I can't get back via helo. Perhaps life is telling me I need a day of rest. The men move heavy cabinets all day and wisely spurned my offers of assistance. Sarah makes dill buns for our dinner of bacon and avocado burgers and refuses my offers of help, too. I write in my journal and read a K.C. Constantine mystery. In the evening we all curl up with blankets and watch "The X-Files Movie," a funny choice since it really does look like the Antarctic in the final snow scenes.

The next morning, the radio crackles. A helo is on its way to pick me up for return to McMurdo. I collect my gear and say good-bye. It's like leaving family. I'm very grateful for the welcome I received and the kindness shown to me during my stay. I wish I could go to Albertsons and get a package of blue corn chips and some red chile to send to Sarah, who would make something tasty with it. I, unfortunately, have little to give. I give hugs all around and climb in the helo.

The ride back to McMurdo is spectacular. We fly from Marble Point to Lake Hoare in the Dry Valleys and put down briefly to pick up one more passenger. The scenery reminds me of the foothills of the Himalayas. Lots of wind-blasted large rocks tossed across a snow-covered mountain landscape. A jumbled frozen waterfall coming off one of the glaciers. The camp is a puny-looking affair in the bottom of a great valley. I'm looking forward to photographing here in December.

Fueling helos at Marble Point

Stranded icebergs in Bay of Sails

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 4

October 27, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 3

October 27, 2002,
McMurdo Base, Antarctica
10:00 AM, 7 deg F, 7 deg F wind chill
1:40 PM, 5 deg F, -35 deg F wind chill.


McMurdo and Ross Island and Erebus

Went to a great lecture last night by Dr. Donal T. Manahan of USC on the importance of McMurdo to the great age of Antarctic exploration. We are here at an historic moment. It is the 100th anniversary this October of when Scott, Shackleton, and Wilson set off on their 1902 expedition to the South Pole. This was the first real attempt on the Pole, and although they didn't make it and had to turn back, all suffering from scurvy, it was the beginning of the race to the Pole that would be finally won by Amundsen a decade later. Dr. Manahan showed wonderful slides of images taken during that expedition of this area. Nothing of the station existed of course, but you could see the topography very clearly and think, "Oh, that's where my Crary lab building sits today."

The Discovery hut, which Scott brought from Australia, is still here at the edge of the sea ice. It was never designed to be permanent housing, since the men expected to sleep in their quarters on shipboard, and is neither well insulated nor well designed for such a cold environment. I walked down to see it a few nights ago. It was used primarily for storage and still has large carcasses of meat hanging in it that look like they might still be chopped up for a stew after 100 years. Well aged meat.

The men climbed Observation Hill, which is just behind the station, for exercise. So did I,

yesterday. How strange and wonderful to be walking around in their footsteps. When I have been in London, my favorite stop in the British Museum Library is to see Scott's final pencil-written journal, brought back after his death. From seeing it, I could almost imagine him writing his daily comments with half-frozen fingers in his small tent. Here at McMurdo, you can imagine the men alive, walking around, full of dreams and hopes.

Ponting's darkroom

One of the best parts of the lecture came at the end. Dr. Manahan showed about two minutes of a film that photographer Ponting took of Scott's party, Scott, Evans, Wilson, and Oats, harnessed together and practicing pulling a sled before they left on the 1902 journey. It was taken here at McMurdo. It gave a sense, better than anything else I've seen, of the labor of pulling a half-ton sled, of putting one foot in front of the other and slogging all day long, of falling, getting up, and pulling again. How determined we are as a species to do what has not been done before! How amazing some individuals are at doing what they believe they need to do despite all discomfort and pain.

Cape Evans kitchen

The heroic stories of the exploration period at the beginning of the century are the beginning of Ross Island history. This is a continent without a native history, without native peoples, so most of what we have is from the arrival of white European males in the twentieth century (except for a couple of earlier expeditions that sailed by or stayed without doing major exploration). Since white European males have also written the stories and the textbooks, their history is of course always suspect. The image of Antarctica has been forged on their anvils. It is one of struggle and endurance, heroism against all odds. I think about that a lot.

Another way of looking at Antarctica is to see it as a blank slate, without true long-term human history of occupation. Unlike other parts of the world, the early explorations here led to no colonization. The British explorers did do important scientific research here, which has continued to the present, but they couldn't live here with their families. Despite all efforts, this place is uninhabitable. You can then see it as a heroic place… or a hostile one… or as an impersonal place. More than any other place on the planet it simply reflects whatever we bring to it.

Camp Evans tools

This morning I got a snowmobile lesson. How to start your snowmobile and how to repair it when it doesn't work. The three other people in the class looked like they understood it all perfectly. All of them have already used snowmobiles, so I suppose that might have helped. I have no idea what a carburetor is (other than it makes a car go), so I am at a loss for how the fuel lines relate to it. When the instructor started taking the carburetor apart, I knew it was hopeless for me. I'm still not sure which gizmos I have to push and pull to start the thing, much less what to do once it was running. Hopefully, no body would be standing nearby. My inability to deal with mechanical objects is a great detriment down here where everyone seems to have some sort of mechanical knowledge. I have never driven such a snowmobile or anything like it, and I'm going to make damn sure that if I have to take one to get somewhere, I have a knowledgeable companion.

Today, the Antarctic is living up to its reputation. The whole Crary lab building is shaking with the force of the wind, now gusting to over 50 mph. I was supposed to helo out to Black Island today, but I could hear the wind before I ever got out of bed and knew I wasn't going anywhere. Tony Marchetti who manages Black Island sent me a note later in the morning that the wind was gusting to over 70 mph out there. Probably, it's even stronger now. From the top floor of the lab building the blowing snow looks like the billows of the sea.

McMurdo in a storm

"There's something about seeing the marks of man where none have a right to be," Denise Kusel about Cape Evans

8 deg F, -24 deg F wind chill. 7 PM. Yesterday, I got out to Black Island. It is an island, though not one surrounded by water. It's a 15-minute helo ride from McMurdo across the sea ice toward the south. Black Island is black because the winds off the glaciers that sweep down from the polar icecap blow it free of snow. It is a very windy place. It is also the control center for all the TV, satellite, and telephone communication systems for McMurdo. Because of its geography, McMurdo has trouble getting clear line of sight to all the satellites, so the signals are bounced off Black Island first.

Black Island kitchen

Inside the station, all is warm and friendly. Tony is the station manager, Karen is the cook, and Steve is the tech who minds all the communication equipment. Tony is quite a character. He's a sweetie—gruff, good-natured, and voluble. He loves to tell stories. The main living area is open and comfy with a kitchen with lots of storage and counter space, a big dining room table, and pleasant living room. The hallway to the bathroom is lined with shelves for a large pantry. A door at the end of the hall leads to the communications control center and then on to the inside of the microwave dome. It's a welcoming sort of place.

Black Island from the helicopter

Outside, it's a strange, fringy place. The hut is dwarfed by two giant microwave antennas, one for NASA, and the larger one for McMurdo. All the structures have a sense of impermanence and instability, as if they might be blown away in the next wind breath, despite the heavy cables that anchor them. When the wind blows, the panels on the microwave domes rattle like the top of a kettledrum. The landscape is austere with frozen ponds cradled in rocky hillsides. On one side is Erebus puffing away; on the other is Mt. Discovery, with a similar cone shape but now extinct. The landscape, though dramatic in scale, is not friendly.

I walked around for several hours, shooting both panoramas and digital. I couldn't get the strangeness into the picture frame. Genies are always elusive when you want to do their portrait. But, I did succeed in shooting a view of Ross Island with Erebus looming above it, as seen from the microwave dome of Black Island. It was the first moment that I really understood the geography of the place. From Mac Town, Erebus is invisible. From Black Island, it is enormous, and the town is a speck so tiny that you can't even see it. I shot a good bit of the camp, trying to show how it sits in the landscape. I also did some still lifes in the kitchen and a portrait of Tony.

When I got back, I attended a lecture by Dr. Donal Manahan from USC (the same man who did the wonderful history lecture on Sunday night). This lecture dealt with his research and was entitled "Growing up Cold and Hungry. Larval Biology in Antarctica." "Larval biology" sounds dry and technical, but the lecture was well-given and fascinating. According to Manahan, their research is showing that polar organisms have rate processes as fast as similar organisms in the tropics. The RNA synthesis of sea urchins here is as fast as in the tropics, and the rate of mRNA is four times faster.… These organisms are able to synthesize proteins at a phenomenal pace. The physiological processes are quite different from organisms that live in non-extreme environments. The eggs of some species can live up to a year and a half just waiting for the right conditions. It made me wonder what life might be like on another planet with very cold or very hot temperatures. We tend to assume that intelligent life can't exist in such places but after this lecture I think that's a bad assumption.

Today, I went out to one of the dive huts nearby. At the moment, some 14 divers are going down

on several different projects, including Donal Manahan's see urchin study. All of the divers I've met love their visits to this underworld and can hardly wait to go down the next day. Their clothes provide good insulation against the cold, so that they say they don't suffer. Today, I worked as dive tenders, which means that I helped the two divers fasten their tank straps and put on their tight-fitting gloves. It's a careful process to suit up for diving in this cold. When they finished getting all the layers on, only their lips were exposed to the cold water (the sea water underneath the twelve feet or so of ice is salty so that it doesn't freeze, even though it is below freezing temperature). They then sank slowly into the small hole that had been drilled in the ice inside the hut. A few bubbles marked where they had gone for a few seconds, and then just a blue hole. The dive time was about half an hour, during which I couldn't see any trace of activity in the hole. They told me later that they went down about 90 feet (130 feet is maximum), down a steep slope. When they came back up, they had a net of star fish, sea urchins, and other strange critters to take back to the lab. It's a beautiful place under the ice, clear blue, they said, and they saw a Weddell seal that swam gracefully up to them and then away.

Cape Evans supplies

Notes from Waste and Environmental Management briefing: 100% of all solid waste from Antarctica is removed and sent back to the US or Chile. 65% of it is recycled. That means a lot of work for many people… and lots of scratching of heads in front of the numerous bins that you have to choose from to sort your garbage.

Down here they make some very strange Mexican food. Burritos for breakfast with some odd egg-based tortilla and French fries to put in it and pickled jalapenos.

This afternoon I learned how to drive a Piston Bully (a macho-looking enclosed caterpillar truck on treads). People here on station are dying to drive these trucks. Several women I chatted with at breakfast looked totally envious and even offered to carry my camera gear for a chance to barrel out across the sea ice in a Piston Bully. Meanwhile, I am moaning to myself about the number of new skills I'm having to acquire—mechanical objects are my nemesis. I open milk bottles with a cleaver.


Fueling the Piston Bully

My new roommate is the coordinator for Fixed Wing operations. That means organizing all the airplane flights in and out of McMurdo. It's a nightmare of the first order and she hardly sleeps. She comes to bed after I'm asleep, gets pager calls often at midnight, and goes to work at 4 A.M. It's not a job I'd do no matter how well I was paid, but she seems to love it. Flights in and out of here are notoriously unpredictable. A couple of days ago, the first flights were to leave to open up the S.Pole station for the year. No flights have been in there since early spring. The first flight took off but then had mechanical problems (took a dive and made a number of folks, sick) and had to return to McMurdo. Today all flights were cancelled because of blizzard conditions at the Pole. Every day is full of new difficulties…we haven't had a mail delivery for a week, and lots of science cargo is backed up in Christ Church awaiting transport.

What a great day! Set off early AM with Eddie from the Berg Field Center. We got the Piston Bully going, loaded my gear, picked up lunches from the galley, and set off across the sea ice to Cape Evans. The Piston Bully is not a fast (nor efficient) vehicle. It took us over an hour to travel the 15 miles to Cape Evans (and used up 8.5 gallons of diesel fuel). Speed was not important, however. It was a good feeling to be leaving the town behind and heading out. Little wind, not too cold—wind chill –17 degrees, 7 deg. F.

Cape Evans hut

It's a thrill to unlock the door to the Cape Evans hut and peer into the darkness at all the objects left from the men who lived here almost a century ago. First was Scott on his ill-fated trip to the Pole, then Shackleton's Ross Sea party, preparing to lay depots for his equally ill-fated attempt to cross the continent. The big table in the center of the room made me think of the dinners they would have eaten in this space. You could still survive for a considerable period of time on the food remaining in this hut. The hut is crammed with food and small objects left behind. A hundred years ago, the British had a policy of leaving behind anything they did not need for the use of the next group that came along. It saved Shackleton's men, who lost all their supplies when their boat broke anchor and drifted out to sea without them.

You can see where each of the men bunked, Scott's little den with a dead penguin laid out on the table ready for dissection, the chemistry lab, the kitchen, and best of all for me, Ponting's darkroom. You can see his tripod, his developing trays, and left-over chemicals. His apron hangs on a hook on the open door. He could come back at any moment and develop more plates. Around to one side of the central living area are piles of seal blubber, perfectly preserved, and the pony stables (some of the pony tack is hanging over Oates's bunk, including a pony snowshoe).

To photograph this incredible site is another matter. First of all, it is very cold inside. There is no heat and no solar gain. Second of all, you are not allowed to touch or move anything so you can't make a still life more neat and tidy. Third, the only light for the entire large hut comes from a single long window over the chemistry table. That's why we see many beautiful images of glass tubes and beakers from Scott's hut! Everything else is in near pitch darkness. You cannot see the objects in the kitchen, much less frame them for a photograph. It is very hard to photograph what you cannot see.

Dining table and bunks

I did come somewhat prepared for this. I brought hand warmers to put inside my gloves (which really helped when my fingers began to get cold. I brought an external battery pack to run both camera and flash, so I didn't have to worry about batteries going dead. It was annoying to hook it all up and to wear the heavy battery under my parka, but it worked perfectly. Eddie helped me see what was stacked up in crates in the kitchen, in the corners of men's beds, and on shelves by shining a flashlight around. I couldn't see very well to frame a picture but the light provided enough to be able to focus and take the picture. I was often

surprised by what appeared on my digital monitor, since the camera clearly saw a lot more than I did. Many images won't work, but hopefully a few will. I've never had a more unpleasant working situation but it was worth it.


Seal-weighing camp at Big Razor

We gulped a quick lunch, I took some outside panoramas, and then by mid-afternoon we headed back. We stopped at the Big Razorback seal camp (where my tent mate from Happy Camper School, Cristine, works. This is a spectacular location, up next to the Razorback island and with a great view of Erebus. It's a good location for seals because there is a large open crack in the sea ice near the island so they have a place to get out of the water and up on to the ice. This field party was beginning to weigh the baby Weddell seals that have been born the last couple of days. The mothers are big, over 1000 pounds, but they are gentle and seem to tolerate a brief kidnapping. The babies make a bleating sound, a little like sheep but louder, and the mothers answer. Since they have no predators, they don't fear photographers (one of the worst predators!). I took some snapshots from about 10 feet away of the pups nursing. It was so much fun and so satisfying that wildlife photography looks more and more appealing. It was certainly more pleasant on this beautiful bright day than fumbling around in Scott's dark, cold hut, though I wouldn't have missed that somewhat challenging experience for anything.


Weddell pup nursing

Top of the Page


Weddell seal pup

Return to Photos

Previous Journal

Go to: Journal 5

October 30-November 3, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 4

October 30, 2002
4 deg F, 2 deg F wind chill 8 AM

Newall Glacier

Flew out Monday morning in an A-star helicopter (a small one that only holds 3 passengers plus the pilot) to Mt. Newell. I went with Geof and Sal from the environmental team here that does an audit every year to make sure that all the different field camps and sites comply with the Antarctic Conservation Act. Mt. Newell is a small repeater station and seismic transmitter station located on a high ridge between the Taylor and Wright valleys in the Dry Valleys. The flight there was up one of the glaciers and gave an amazing view of the ice cascading down into the valley floor, a jumbled jagged waterfall. The helicopter set down on the top of the ridge and shut down for a couple of hours while the men did their inventory and I photographed.

Mt. Newall

What a spectacular place! From the top of the mountain, you can see 360 degrees. The drop off must be a thousand feet to the valleys below and down to the sea ice. It would be a heck of a climb to get up here if you had to come up by foot. On top are the transmitters, a small hut, a wind generator for power, and a survival cache. Pretty minimal human activity but plenty to photograph. I could work a week up here doing pure landscapes. I thought of Gus Foster with his panorama camera —he would be in heaven here. The tips of the mountain stick out of the snow, but otherwise everything is covered in white.

They probably get a lot of wind up here but on this day it was calm and clear. Probably just above 0 degrees. I stayed toasty warm except for my fingers. I've learned now to put a hand warmer in at the first sign of cold fingers; after the frost nip that I got at Happy Campers all my fingers are still very cold sensitive. When you walk around, you mainly stay on top, but every so often you sink down six or seven inches. The snow makes sounds when you walk on it, sometimes a light airy crunch, other times pitched deeper, as if you are walking over something hollow. Since the helo stayed with us, I could keep whatever equipment I wasn't using inside it. The helo pilot just sat inside his cabin and read a book—lots of solar gain on a day like this!

Mt. Newall windmill

The next day, I was offered a trip on a Twin Otter. There are two of these planes that are being used by the US Antarctic Program, and they are flown by Canadians Sean and his wife Sandy. They are small prop planes on skis and they can land on the sea ice or snow (or water). It's fascinating to me that they are flown all the way down from Canada every year. They actually fly down the coast of S. America and then all the way across the continent. They are the only planes that cross the continent. With extra fuel on board they can go about 1200 nautical miles before they have to refuel. This was the plane that was used in the very ambitious and daring rescue of the doctor with a heart attack at the S. Pole in the middle of winter.

We flew north, out over the sea ice past the Dry Valleys, all the way out to Cape Reynolds at the edge of the Drygalski Ice Tongue, about a 50-minute flight. Below the plane were the icebergs stranded in the sea ice. Then, further out, I could see that the sea ice was beginning to crack and leads of water reached out like giant tentacles. Then, as we neared the landing site, the ice closed in and looked solid again. Although I was quite a bit north of McMurdo, there was no sign of open water. This flight carried 6 barrels of fuel for the helos. The pilot and his assistant circled an area that was just off the sea ice, part of a glacier as it was approaching the water, flat and open. He set the plane down on the ice, as gently as if he were on a groomed runway, but when we opened the door and hopped down, there wasn't a sign that anything human had ever visited this place before. Other than a shot of the guys rolling down the drums, I could find little to photograph. There was nothing but white ice as far away as the horizon. You forget when you're having lunch at the galley at McMurdo or walking around this crowded, busy town that it's a pin prick on the edge of an enormous and empty continent. When you leave the station and get 150 miles away, you leave

everything behind except for what you carry with you and have in the plane, and you realize how tenuous our hold on the continent really is.


Fuel drums at Cape Reynolds

"But, after all, it is not what we see that inspires awe, but the knowledge of what lies beyond our view. We see only a few miles of ruffled snow bounded by a vague wavy horizon but we know that beyond that horizon are hundreds and even thousands of miles which can offer no change to the weary eye, while on the vast expanse that one's mind conceives one knows there is…nothing but this terrible limitless expanse of snow…. Could anything be more terrible than this silent, wind-swept immensity when one thinks such thoughts?" Robert Scott, The Voyage of the Discovery, 1905

October 31, 2002. 3 deg F, -36 deg F wind chill. 7:30 AM One of my neighbors at the Crary office building, greeted me with, "Have you been to the galley yet?" "No," I said. "Why" "There are bananas and strawberries this morning." This is a major event. We haven't had any fresh fruit or vegetables for the last ten days. Freshies, as they're called down here, are treasures. Someone told me that if they dropped oranges and $5 bills from an airplane at the S. Pole, everyone would go for the oranges first. I believe it. It's hard when you don't get any fresh fruit and salads. It's not just the food value. You miss the smells and tastes. When I got to the galley, I put a couple of fresh strawberries on my hot cereal, and it smelled and tasted better than the fanciest of meals. All the senses are depressed here, and the fragrance of a single strawberry is heavenly.


Sea ice leads

Yesterday I photographed the Manahan group spawning sea urchins. For their research into larvae development, they need recently fertilized eggs. They inject the individual sea urchins with potassium chloride, which makes all their muscles relax, and they release either eggs or sperm, depending on their sex, into the beaker below them. The poor little creatures often die from the chemical, unfortunately, so they try not to inject more of them than what they need. I wasn't prepared for photographing small creatures in tiny beakers since I didn't bring a macro lens down with me. It never occurred to me I might be photographing very small objects. Needless to say, I also didn't have a proper setup for glassware still lifes. We propped up a black drawer behind a dark mouse pad and I used natural light. The result was not too bad, considering all.

Sled Pull

This place, with all its warmth and comforts, is also like the frontier. When you don't have something, you can't just go out and buy it, so you have to find a way to make do. In general, I'm feeling good about how all my gear is holding up. I've had no problems with dead batteries or cameras. The only difficulty I've had was unexpected—my tripod has a ball head and it freezes solid. Evidently, the ball contracts at a different and slower rate than the sleeve around it so it begins to stick at about 5 degrees and gets more and more solid the colder it gets. Several people heard about the difficulty and have tried to help out—we tried graphite, which did nothing, and I even had an offer to come to the machine shop and let them sand the ball down slightly. That seemed an iffy solution, though their shop here is famous for being able to make or repair anything required of them. I finally called Bernie, and he is arranging for a different head to be hand-delivered by a Raytheon employee who is coming in later this week. I am fortunate to be able to actually get a part in from the outside. If it were mailed to me, it would take a month to six weeks.

Last night I heard a lecture by Sridhar Anandakrishnan on "There is a Tide in the Affairs of Men… and Glaciers." Their group put several GPS poles on an ice stream last year to test whether the eruptions and seismic activity from Erebus affects the movement of the stream. All the ice sheets in McMurdo are moving. Snow falls on the polar plateau and then compresses and the ice moves slowly toward the edge of the continent where eventually it calves off into icebergs. It's like a wedding cake that has heated up and melted down over the edges. Ice streams are areas of glaciers that move much faster than the rest of the glacier, over a meter a day. Nobody is quite sure why, but they suspect it has to do with the underlying ground at the bottom, which is evidently more viscous under the ice streams. This group found that there was no particular correlation with Erebus activity, but to their surprise they found that the ice stream had daily spikes of greater movement and lesser movement and that these movements correlated with the daily tide in the Ross Sea under the floating ice sheet. Since the ice stream is enormous, a km thick, 50 km wide and more than 80 miles long, this was astonishing. The tides had a very measurable effect 80 miles away from the water. Even at that distance, the entire sheet of ice slowed down to half speed when the tide came up and slid out twice as fast when the tide went out.
Note: There are about 825 people at McMurdo right now.

November 2, 2002. 15 deg F, 14 mph winds, -15 deg F wind chill.

Power Plant

On Thursday, the weather was windy and cold so I walked down to the power plant. I had sat with Steve at lunch, who is the mechanic down there and he invited me to come down and take a look. I walked in and met Jordan Dickens, head of Power and Water, who kindly stopped his work and gave me a tour of both plants. Jordan has traveled all over the world and he has worked at all three U.S. research stations in Antarctica. He was the operation manager for one year at the Palmer Research Station on the Peninsula. He worked two years at the South Pole as the power plant mechanic and station electrician. He has

wintered six times and summered eight times on the Ice. His job is perhaps the most important on the station. Without power (running on diesel fuel) and water (a reversed-osmosis system pulling salt out of sea water), McMurdo would not exist.

Power plants are familiar territory after photographing quite a number of them for the Millennium Survey project a few years ago. This one was small and tidy, with six turbines. The power plant provides electrical power for all dorm buildings, the Crary Lab, and the work facilities at McMurdo. Jordan said they had a few other engines scattered around McMurdo in case of dire emergency, but these guys have been doing service for hundreds of thousands of hours. They have all logged more than 95,000 hours (if a car drove 45mph for 95,000 hours; it would have traveled over 4 million miles). That's pretty impressive for machinery in this harsh environment. What was unusual was that I was left to my own devices to photograph as I pleased… I guess the terrorist threat at McMurdo is minimal, as are liability concerns. I did a few shots of the machinery, the control panels, and the workers, and then moved on to the water plant.

The water plant was impressive. It is linked to the power plant since they use the waste heat from the power generation to heat the sea water. Since the temperature of sea water here is only 28 degrees F, below freezing, if they were to take the salt out without doing anything, the water would freeze and destroy the RO membranes. So they heat it up first. They also use the heated antifreeze coolant to heat the dorms and other buildings. It's an efficient system and when they eventually get new engines for the power plant, it will be even better, Jordan told me.

The system has worked very well for about 8 years, but it was in trouble the day I got there. All the filters had been clogging up. They drained one of the water tanks and found a layer of several inches of pteropods, a half-inch long critter. Evidently a swarm of them had come along and been swept into the sea water intake. Invasion of the Pteropods! They were busy changing out all the filters in the system, cleaning the tanks and the intake.


Cosmic Ray facility

Yesterday, I went out with Seth, the Science Tech here in Crary to the Cosmic Ray facility, CosRay, as it is called here. This is an old project that goes back to the IGY days of the 1950s, and the building looks a set for Dr. Who. Cosmic rays are atomic nuclei and electrons from outer space that travel near the speed of light and continuously bombard the earth. When they collide with nuclei of molecules in the upper atmosphere, they create a cascade of secondary particles that shower the earth. Neutron monitors like this one measure that shower of particles and help us understand plasma processes occurring on the sun and out in space. The actual detectors are only large tubes with a cover over them, set in a long lab building of old-fashioned, if not funky character. The computer is on one side; a vintage non-working Teletype machine is on the other with its paper tape hanging loosely to the floor. Previous scientists and techs have added many personal touches, such as murals on the walls. It was hard to believe that real science is occurring in this setting, but Seth assured me that he comes up every day to record data and check out the instruments.

Later in the day, I went out with another group of divers to Cinder Cone, a little hut on the back side of Inaccessible Island, on the way to Cape Evans. They are examining the effects of McMurdo's wastewater dumping over the years. McMurdo houses over 1,100 people during the summer season, and all sewage and wastewater is sent untreated into the ocean, about 135,000

liters a day. The NSF is installing a sewage treatment plant that will be online in 2003 and which will then reduce untreated sewage to a minimal amount. This group has set up several monitoring stations, including this one which is some distance away from the outfall.


Dive hut at Cindercone

These divers are going down because they need to protect their underwater site from the intrusions of starfish. Starfish are voracious scavengers here. I've seen them in the Crary aquarium tanks, a foot across, bright orange and very fat, devouring a piece of cod. It was a good outing, but unfortunately I couldn't photograph much of Cinder Cone, since the clouds were low and the wind was blowing. I couldn't stay out and photograph more than a couple of minutes before I could feel the fingers beginning to freeze up, even with several layers of gloves. The divers went down for about half an hour to weigh down the fence that they have used to enclose their site and to remove the starfish from inside. The hut was none too warm, and they shivered when they came up and changed into dry clothes.

Halloween

November 2, 2002
At McMurdo folks work hard and they play hard. Halloween is the biggest party of the season. It's held in the gym, a Quonset hut down by the helo pad, which is decorated for the occasion with black lights, cobwebs, and other decorations that are carefully kept from one year to the next in a big crate above the station. Beer is $1 a glass, the music is loud, and the costumes are great. Since nobody here has access to a major costume store, most of the costumes are homemade out of whatever odds and ends people can put together. I photographed a few folks early on in the evening before they went inside, but many of the most amazing costumes came later when I had given up working. One of the guys who works at Crary as a tech came as a beaker… one lady came as a dresser… another as a shower, complete with the curtain and hanging beads for water. She eventually won the prize for best costume. Parties here are let-your-hair-down affairs but

without pretense. People get bombed but for the most part, the atmosphere stays relaxed and comfortable.

Hut Point ceremony

November 3, 2002 9 deg F, -35 deg wind chill this morning at 11 AM Yesterday was the 100th Anniversary of Scott's 1902 departure from Hut Point on his first expedition to the S.Pole. NSF held a short ceremony out at the Discovery hut at Hut Point, a short walk from McMurdo to commemorate the occasion. The wind was blowing with a wind chill of about –20 F so it didn't last too long. Everyone huddled together while the short speeches were read. Also, an intrepid group of volunteers organized a man-hauling/woman-hauling sledge party in honor of the occasion. They pulled a Nansen sled the three miles from McMurdo around on the sea ice to the New Zealand Scott Base. Took them about 2 hours, and I arrived just at the end to photograph their arrival.

Here's a quote from Scott's diary (the 1905 book, The Voyage of the Discovery):
"We are off at last. By ten this morning the dogs were harnessed and all was ready for a start; the overcast sky was showing signs of a break in the south. Every soul was gathered on the floe to bid us farewell, and many were prepared to accompany us for the first few miles. A last look was given to our securings, the traces were finally cleared, and away we went amidst the wild cheers of our comrades."

The three men, Scott, Wilson, and Shackleton, eventually reached 82 degrees 17'S, more than 300 miles farther south than anyone before them and only about 480 miles from the Pole. They suffered greatly from scurvy and turned around on December 31. "We are as near spent as three persons can be," Scott wrote as they approached Hut Point again. They had been gone 93 days and covered 960 miles.

Footsteps

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 6

November 4-November 8, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 5

4 November 2002
11 deg F, -4 deg wind chill

Cape Royds

Yesterday was the first day that the temperature actually got above freezing. It was a summery 33 degrees yesterday late afternoon, and all over McMurdo you could see wet dirt underfoot. It didn't last long. Today is blustery, blowing snow, and cool. But, I could feel a change. It won't be long before most of the snow has melted from the town, leaving black volcanic dirt that will blow through the air. No longer will it look like Antarctica, so I need to get busy and do more shots of town before that happens.

Another first yesterday was the arrival of the skua population. These are large brown scavenger gulls that nest on several of the islands in the area and scrounge what they can get from the bins of sorted waste that are out in front of all the buildings and dorms here. They aren't pleasant birds; they will dive bomb you, swooping down with great force from above, if you come anywhere near their nests. Here, they aren't nesting so they are simply scavenging. It's great to see a bird swooping overhead out on the sea ice. We have no squirrels, no pigeons, no dogs or cats. We don't even have ants, flies, cockroaches, or other insects of any kind. You can leave food outdoors or inside and nothing will come to eat it. It's a sterile place, this white continent. Here at McMurdo, which is enclosed by over 70 miles of sea ice right now, we don't even have any penguins. An occasional Weddell seal hops out of a ice hole down by Hut Point, but for the most part, we see no animals or birds of any kind. So, it's great to see the first of the skuas arrive.

Yesterday, Brian Johnson (my sea ice instructor), Kelly Tyler, and a couple of other folks drove a Hagglunds (a strange tracked vehicle that will go anywhere, but slowly) out to Cape Royds to see

Shackleton's hut. The journey on land is short as the crow flies but it's impossible on foot. It goes over the base of the volcano, and the land is folded and crimped into an extremely rugged landscape full of crevasses. None of the expeditionary parties who stayed out at Evans or Royds succeeded in finding a land route. On the sea ice it takes a little over two hours to drive to Cape Royds, past the Erebus Ice Tongue, past Cape Evans to the Barne Glacier. This is an impressive glacier with a high wall of ice where it meets the sea ice. Because of the pressure down on the sea, the glacier causes major cracking of the sea ice, so the journey is a cautious one. I was glad to have Brian leading the way since he knows the cracks by name and location and keeps a watchful eye on all of them. At one point he saw a fresh crack and got out to do a fast drilling of it and a flag marking. The ice is still pretty thick, nearly 12 feet most places, but the cracks can be unpredictable. Near Cape Royds, there are lots of "proximity cracks" near the land, several of them quite wide. At one point as we were crossing on foot in preparation for walking over the cape to the other side where the hut is located, Brian fell up to his knees in one crack. He didn't hurt himself, but it did encourage me to watch carefully and do a wide step over the cracks.

McMurdo storage

Lake Bonney ice

Shackleton built a hut at Cape Royds in 1908 on the Nimrod expedition. Within a 33x19x8 foot space, 15 men slept, ate, worked, talked, and met all their social needs for a winter. They built it in 10 days and completed the insulating and furnishing in another 3 weeks. Shackleton had his own cubicle, two men shared each of the other seven. (Joyce and Wilde, David and Mawson had scientific equipment; Adams and Marshall had novels and gauze curtains.) The hut is not in as dramatic a setting as Cape Evans but it appears to be in a more sheltered. Certainly, the hut has a more comfortable feel. It feels less like a cold dark museum and more like the men could return from sledding at any moment to cook dinner.

Many objects remain from the expedition, as at Evans, and even more boxes of supplies both inside and outside the hut. I photographed biscuits, tins of tea, cod roe, curried rabbit, boiled mutton, veal and ham pate, bottled currants and gooseberries. Outdoors were tins of beans and tea that had opened up over time. Several of the reindeer sleeping bags lie out on the bunks awaiting their sleepers' return. Cooking utensils hang on the wall. A large teakettle sits on the stove. Shoes are neatly stowed under the bunks.

The setting is a low spit of volcanic land. The hut is sheltered in the far side so you have to walk over the hill to get to it. Just beyond the hut is an Adelie penguin colony. According to David Ainley (one of the penguin researchers here), the penguin colony at Cape Royds has been there for 1000 years. They have done paleo-penguin research, looking at sedimentary layers and carbon dating. The penguins are creatures of habit, returning to nest at the same place every year, so a penguin genealogist would have a great time here. We were not able to enter the colony itself since it is a protected area but we sat for a while and watched their antics. The Adelies have the most personality of all the penguins that I've seen. They bustle around, move rocks around to make their nests, talk up a storm, and are very curious. One of them left the colony and walked

over to where we were standing in front of the hut and paraded around in front of us, cocking its head, raising its flippers, and generally providing both entertainment and great photos.


Lake Bonney

It was a great day's outing…my only regret is that I seem to have lost the one pair of gloves that were keeping my hands warm, gloves that I just got a couple of days before from the Field Center. I constantly lose things. I put them in the enormous pockets of my parka and can't find them until I empty things out. The gloves, however, did not reappear when I got back. I seem unable to photograph and keep track of details at the same time. Crary Lab issued me a Green Brain, a little khaki notebook, but I can never remember which pocket I've put it in. Losing the gloves is a major loss; hopefully, they will reappear. So far, I've been fortunate in that everything I've lost here has eventually reappeared.

Last night, I did the Sunday night lecture in the galley. It's fun to do, because the audience is enthusiastic and large, filling almost all the available seats (and probably would have been even larger if it hadn't been for the Halloween party the night before). I showed some earlier work and then images from the Peninsula. It required effort to put it together in the midst of my schedule for the last few weeks, but I'm glad I did it. Lots of people have told me today that they enjoyed seeing what I was doing, and several folks have contacted me and suggested events that I might photograph.

November 7, 2002 7 degrees F, -25 degrees wind chill


Glacier from helicopter

On Tuesday I got a helo ride out to the Dry Valleys again—this time to Lake Bonney, the largest lake in the Taylor Valley. It takes a little over half an hour to fly out, first across the sea ice and then up the Canada Glacier to the valley. The helicopter has to climb a good bit to get up the glacier and over the ridge of mountains and then descends again rapidly to the floor of the valley and the frozen lake. No scientists are yet working at Lake Bonney, though they will be there soon working on climate research. I went with Vince, a mechanic, who went out to fix an ATV out at the camp. The helicopter dropped us off mid-morning and told us he would return about 3:30 P.M. So we had the enormous lake valley to ourselves for the day.

Jamesway at Lake Bonney

Vince started up the stove in the Jamesway—the Quonset hut style of building that has been used for years by the NSF here. They can be set up each year or in this case left up through the winter. They can be set up with as many compartments as are needed by the field party. Each has a stove running on diesel fuel to heat the building, as well as kitchen facilities, a table, and other comforts. This is a large camp so they even have a little outhouse in the back with the usual arrangement of funnels and bags (since all waste must be removed from the Dry Valleys). The day was not windy or cold, so it didn't take too long to get the space above freezing.

Dessicated seal bones

As I started to photograph, he turned the key in the ATV, which was parked out on the ice. It started right up and worked perfectly. Since he had nothing more to do, we decided to take it for a spin up and down the lake. At the far end, we found a great mummified seal up against a rock. I'm told that they are crabeater seals, rather than Weddells, and that some have been carbon-dated to 1200 years old.

Lake Bonney seal

Nobody knows how they got so far away from the edge of the Sound or what led them to make such an unpropitious journey. This guy was all there, with his teeth and all his bones in his flippers exposed. I hadn't realized that their flippers are not just a membrane of some sort. They are actually made up of quite a number of joints and finger-like bones that give them enormous flexibility.

We made hot water and mixed in dry soup and had hot soup and sandwiches for lunch. The huts are stocked with lots of canned goods, but the soups were all frozen solid. Only the items in the refrigerator were not frozen. This may be one of the few places on the planet where you put things like mayonnaise and mustard in the refrigerator to keep them from freezing. Vince told me that he works as a mountain guide and teacher outside of Lander, Wyoming, when he isn't down here. He's been coming here for 7 years, every winter. He even wintered over at least once. It's a change of pace, he said, and it's good money. His job as a mechanic takes him to camps all over the McMurdo/Dry Valleys area. Today, he was lucky and the job was easy!

Yesterday, I drove over to Scott Base, the New Zealand station that is only a couple of miles away from McMurdo on the far side of Observation Hill. Ma Peters, the head of Human Resources, greeted me warmly and treated me to a tour of the base. Kiwis are very different creatures from Americans, and their base reflects their considerably greater informality. It is also much smaller. They have beds for only 90 people on base, whereas McMurdo can house up to 1200. Their

support staff is about double the size of the science staff, as opposed to McMurdo which has a ratio more like 10 or 12 support for each scientist. That means that everyone at Scott Base, including the scientists, pitches in to do the station chores, whether it's tying flags to mark routes or washing dishes.

Scott Base

The station is laid out in a more orderly fashion than McMurdo, which looks like a nineteenth-century mining town spread higgledy-piggledy over the hills. Scott Base is a group of small buildings all painted a lime green and connected by passageways so that you don't have to go outside to go from galley to offices. Their field center is more integrated. Supply and drying rooms are connected to carpentry, electrical, and communications rooms. A greenhouse has hydroponics herbs, tomatoes, cucumbers, and beans. They have a hot tub in a separate building that looked wonderfully inviting—it had murals of trees and flowers painted on the walls. They look out onto the sea ice—a series of pressure ridges that have jumbled the ice up to waves and towers. The ground is more snow covered and the hills behind are also less bare volcanic rock than McMurdo. You have more of a feeling of being part of the continent and less of being on a volcanic outcropping.

They also have a considerably better lunch in their galley than we do! They had a great sandwich bar with a variety of cooked meats and cheeses. We haven't seen "freshies" for several days. They had lettuce, tomatoes, and cucumbers, as well as grapes, apples, and bananas. The buns for the sandwiches were home-baked. They also had several kinds of cheese for dessert, and a cappuccino machine for making your own coffee.

Cook at Scott Base

McMurdo has a high-fat diet. Usually, the galley has a vegetarian entrée, but even that is usually pasta or stuffed pastry. All the veggies are frozen and usually not very appetizing. Occasionally, we get a salad, but it's been a week now since there has been any fresh lettuce. Even the fruit is canned. Now, if you're into meat, you'll be real happy here. Last night there was steak, pork the night before. One night recently we had crab legs. I can see why there is such an emphasis on cholesterol in the medical process to check you out before accepting you to come down to McMurdo—the meals here are heavy in fatty meat, gravies, and biscuits and lacking in fresh veggies and fruits. If you didn't have a cholesterol problem before you came down, you will have one by the time you leave.

What are very lacking at their base are science facilities. The lab is primitive. It doesn't even have running water. They have to haul what they need from the building above. The couple of rooms are tiny and lacking in basic laboratory equipment. All the scientists there have to bring down their own lab equipment. What a contrast with Crary Lab here at McMurdo with its three levels of laboratory space with all sorts of modern equipment.

Gretchen Hofmann, a biologist from Arizona State University in Tempe, invited me to come out and watch their group set up their fish huts. This group is investigating how Antarctic fish respond

to a sudden elevation of temperature. Organisms elsewhere in the world have a heat-shock response that triggers previously inactive genes to synthesize heat-shock proteins, but there is some evidence that evolution at subzero temperatures has altered this response. Gretchen is well-loved by her deploying team of students and graduate students; she is organized, thoughtful and kind, and encourages their initiative. She has been coming down here for a number of years, and I heard later that her father was also a scientist on the Ice. She made me feel very welcome and provided a running commentary on the process of setting up the huts. First, a caravan of huts and drilling apparatus is towed out from McMurdo by a Challenger caterpillar to a predetermined location on the ice, a couple of miles off shore. A large bulldozer scrapes the top layer of snow off the sea ice. Then a four-foot hole is drilled with an enormous bit. The bit slowly drills down through the ice, bringing up first ice and then finally a swoosh of water. Finally, the hut itself is pushed into position over the hole, and snow is piled up around the sides to keep it in place. The huts are all set up with diesel stoves that just need to be turned on to make them operational.

Lake Bonney settlement

Drilling for fish hut

Completed hut for fish camp

Science projects: 80 at McMurdo, 23 at South Pole, 18 at Palmer, 19 on the icebreaker ships. Number of deploying scientists and team members at McMurdo: 270. Projects by discipline: Aeronomy and astrophysics, 30; biology, 40; geology and geophysics, 23; glaciology, 16; ocean and climate, 15; artists and writers, 6 (Photographers, just me). (from the Antarctic Sun)

Dorm room for a couple

“It has always been our ambition to get inside that white space and now we are there so the space can no longer be a blank,” Robert Falcon Scott, when they crossed the 80th parallel on November 25, 1902. “This compensates for a lot of trouble.”

Another Artists and Writers grantee, Bob Marstall, arrived a few days ago (he’s illustrating a children’s book on Weddell seals and is down here for several weeks). At the last moment, his writer on the project couldn’t PQ (physically qualify) and so he couldn’t come. What an awful disappointment! Bob is out for Happy Camper School today and tomorrow. It won’t be as cold as when I did it, but it won’t be a whole lot of fun with all this wind either. Writer Kelly

Tyler is also here for about six weeks. She is writing a book on Shackleton's Ross Sea party, the men who laid the depots for Shackleton's ill-fated attempt to cross the continent.

8 November 2002. 6:30 P.M. 12 deg F, 70 mph winds
-35 deg F wind chill


Snowy day

It's not too cold, but it's nasty outside. I could barely stand up walking from the galley to Crary after dinner. A high pressure system is pushing moist air towards us, the weather report said. This is not like any high pressure system I've ever seen before! Earlier, the afternoon was lovely with softly falling snow, a rarity here. I walked around and photographed the station, especially some of the storage crates that lay everywhere outside. After my lecture and getting to know so many people, I got calls from guys in trucks who passed me, "Hey, Photography Woman! How's it going?"


Scott Base greenhouse

Then I saw a little building that said, "Greenhouse," and so I pushed open the door. Inside were two small rooms of lettuce, tomatoes, cucumbers, and herbs. The lights were bright and the veggies were thriving. Who gets to eat this good stuff? Since I haven't had any salad for days, I began nibbling the lettuce leaves, which were delicious. Then I looked down at my camera to start photographing. My camera and tripod were covered with water. Dripping wet. The lens on the camera even had water in between the elements. The high humidity with all the hydroponics and plants condensed on the cold metal and glass… and that was that. I had to call it a day and come back and clean the equipment as best I could and leave the inside elements to dry.

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 7

November 11-November 16, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 6

November 11, 2002 18 deg F, no wind


Randy Davis locating a seal

Four of us went out to Randy Davis's seal camp, nicknamed Weddell World. Joe, who is the local installer of solar and wind power for field camps had a repair to do, so I went out with him for the day. More and more field camps are now being provided with solar and wind for their primary power (with a fuel-powered generator for back-up). Even out on the polar plateau in remote observatories, they are trying wind and solar since propane requires a delivery by large aircraft with three or four people required to plow a runway and unload. Wind is common on the plateau, even in the sunless winter.

Davis is a large camp with a nineteen-section Jamesway that serves as home, kitchen, living area, computer space, and laboratory for seven people. It is a temporary camp in that it is set up on the sea ice (and thus will be taken out when the ice begins to thin in December)… and it's not far from the Razorback camp that I visited a couple of weeks ago. They have one seal dive hole that is actually enclosed at the end of their hut and a seal that surfaces only there (since the hole is too far away for the seal to swim to another hole). Most of the seals with pups are a short snowmobile ride away; the pups are now about five times bigger than they were when I photographed pups at Razorback two weeks ago—their milk is 80% fat!

Randy Davis is looking at the foraging and roaming behavior of free-ranging Weddell seals. These seals dive deep in the ocean; they can descend several thousand feet. But, since they have to breathe every seven or eight minutes, they have to hold their breath under the sea ice and then come up at a breathing hole or crack. While they are under the water they have to eat… but nobody knew much about how they did all that until Randy started putting instruments and

cameras on them.

Photographer seal

I went out with Randy and several of his group while they located one of the seals, which had hauled out to rest on the ice. They captured it and put its head in a plastic bag with holes, and then replaced its video cartridge. Their seals have been fitted with a variety of monitoring equipment. Each is effectively a working lab and video cameraman. The monitoring lasts for only a couple of weeks, and then all of the machinery is removed, and the seal is no longer tracked. While she carries the monitors (and they are non-pregnant females), she provides amazing video footage of her eating and diving. I watched stretches of it on their video screens. You can see the seal's head out front and then the hole up above as she rises to breath, the fish that she gobbles, and other seals that pass by. I was not enthusiastic about subjecting seals to such an ordeal before I went. The Weddell seals are large docile creatures with no predators here, so they don't run away from humans. I did feel better after I saw how carefully the equipment had been attached and how little the seal seemed to mind carrying it. She makes no effort to roll over and get it off and she eats and dives normally.

What isn't great is that I trashed a lens somehow, my favorite 24-85 zoom. I didn't drop it or knock it. The zoom just stopped working. It will have to be sent to Nikon for repair. I've ordered another one to be sent down…and with several people along the way expediting that process (thanks, Bernie!), it should come in a week or so.

Sun dog

Several people have asked me what the social scene is like here in McMurdo. Do people who work here have families off the Ice? Isn't it strange to have so many folks without their usual familial relationships around them? First of all, McMurdo is a family of sorts, a giant one but no more or less dysfunctional than any other family. For some people here, that family is all they have that matters to them. They have close friends from coming here for many years. Since everyone here works very long hours, they get to know fellow workers better than they know friends off the Ice. Most people here do have families off the Ice. Many have wives and children. They come here because the pay is good, and they need the money, and work in Wyoming or Alaska isn't great in the winter. I know one man who has been coming down for 15 years; he has 4 kids and he and his wife have worked out an arrangement that works for them where he is there part of the year and gone to the Ice the rest of the time. Other folks have partners or spouses here with them. They fix up their dorm room with a couple of beds pushed together into a king-sized bed, find a chair and a couch, and make the place a home. They work different jobs during the day and find time to eat together and relax in the evening. A number of couples have wintered-over together. Many others are single… and the dating scene here is reportedly quite wild for those young at heart… but since I am neither single nor young, I can't report first-hand on that.

November 12, 2002. 12 deg. F, 15 mph winds, -18 deg F wind chill.


Servicing a Mat Track

I'm awaiting a flight to Terra Nova Bay, where there is a small Italian base. Yesterday, I waited around until after lunch to join a friend who was driving out to Windless Bight, a site on the south side of Ross Island. He was waiting on the vehicle's return, which didn't happen until early afternoon, and then it turned out they didn't have room for me since another mechanic had to go along. I worked at my computer, checked out the new arrivals in the aquarium, and generally futzed around, but by the time I was sure that after all I was not going, it was too late to plan anything else. One must always be flexible here. Flights here are often cancelled or delayed. Vehicles break down. Waiting is part of the Antarctic experience.

November 13, 2002, 8:30 A.M. 6 deg F, wind 24 mph, -34 deg F wind chill.

The flight to Terra Nova is very pretty. The pilot flew the Twin Otter, along the Ross Island coast line and then over the sea ice. His route over the base of Erebus provided a grand view of the volcano—until the katabatic winds coming down off the glaciers began to toss the plane around. The sea ice looks thinner than it did a couple of weeks ago; the leads of water are bigger. I got my first view of the Ross Ice Shelf edge, the Barrier as the early explorers called it. It is the place where the frozen, floating ice shelf meets the sea ice. It was a major obstacle for early arrivals by ship, since it is high and provides no easy access on to the polar plateau. As we approached the Antarctic coastline, the weather began to close down, and by the time we had landed on the ice runway, it was snowing.


Terra Nova

A visit to Terra Nova, the Italian base a couple hundred miles to the north of McMurdo, makes you realize how distinctive each of the bases on the Antarctic is. Terra Nova has style. The buildings are in a plan similar to the Kiwi Scott base, where all the main work and living spaces are connected, and they are all painted a spiffy blue and orange. The main complex houses galley and dining room, labs (much better equipped than the Kiwis), living quarters (4 bunks to a room with a bathroom down the hall), and a beautiful new command center on the top floor where they can manage both aircraft and vehicle activity. About 20 scientists work on their program, and the base can house up to 90 people. Unlike McMurdo, which is now about 40% women, the Italians have only 4 women on base. The Italian parkas and wind pants are slightly redder than the American issue and much more stylish. They are not clumping around in baggy clothes and giant bunny boots like we are. (The good news about the American issue is that the clothes do keep you warm…but theirs do that as well!) You wouldn't think of the Italians as being adept at cold-weather logistics and clothing, but evidently their program hired folks who had worked as mountaineers in the N. Italian mountains.


Lunch at Terra Nova

What is most distinctive about Terra Nova is its food. "Of course, the cook is from Naples," Giuseppe deRossi told me. I was there for lunch, which consisted of freshly-made pasta with grated Parmesan, a bean soup, homemade bread, tender veal piccata, green beans, fresh lettuce and tomatoes, with kiwis, good cheese, and chunks of chocolate for dessert. In the center of the long tables were a choice of red and white Italian wines and water, both natural and sparkling. Everything was delicious! After lunch, everyone walked next door to the coffee bar where they have a very large Italian espresso machine. Here at McMurdo, there is no liquor of any kind served with meals (you have to go to a separate building, Gallaghers or the Coffee House, and buy a drink there). McMurdo residents mention Terra Nova often. They would love to go there, and of course they cannot, and especially they talk longingly about the food.

Originally, I had been told that I would only have an hour on the ground to photograph at Terra Nova, but fortunately the pilots weren't in any more of a hurry than I was. After lunch, Giuseppe took me on a quick tour of the facilities and drove me up behind the station for a view of Terra Nova Bay. It was snowing so visibility was low. On a clear day, it must be dramatically beautiful. Mt. Melbourne, which I couldn't see at all, towers over everything, just as Erebus does here. Since they are several hundred miles further north, they have a more benign climate, slightly warmer and with more moisture, more like the Peninsula. The coastline is rocky, not the fine volcanic stone that McMurdo is built on, but large rounded granite boulders. Finally, the pilots radioed that they were getting ready. Giuseppe drove me out to yet one more beautiful viewpoint (unfortunately mainly invisible with the snow) and then down to the runway. We had managed a reasonably satisfying conversation with his bits of English and my Spanish and a lot of hand movements. I thanked him, we exchanged email addresses, and I left reluctantly for the flight back to McMurdo.


Itase traverse group

My office in Crary is next to offices for ITASE, a four-year project that is ambitiously traversing parts of the polar plateau. This year, the American group is going from Byrd Camp to the S.Pole, doing ice coring and other scientific observations. Their program is very ambitious. Their observations using penetrating radar, 3-inch ice cores, surface glaciology, chemical analysis, and atmospheric testing are designed to help understand the last couple hundred years of climate change. The Antarctic is the best place to study climate over time, paleo-climate. Far from being separated from the rest of the planet, the ice cores from here clearly record the Chernobyl disaster, major volcanic eruptions, and the subtle fluctuations of chemical changes, temperature, and moisture accumulation that have affected climate planet-wide.

Twelve Itase members, headed by Dr. Paul Mayewski, leave tomorrow to fly out to the polar plateau to Byrd and will arrive at Pole on Christmas Eve, if all goes well. I've become friends with Betsy, a teacher and former Olympic cross-country skier, who is thrilled that she gets to

accompany them. At the moment, they are discussing the difficulties of keeping ice cores uncontaminated, given the need to keep fingers warm at –50 degrees. You can't allow any nose drips to fall. You are supposed to use plastic gloves but they don't make any big enough to go over the layers of fleece that you need on your hands. And… how do you keep your wine from freezing? (Yes, they get wine because they provide it themselves!) Important questions. I was amused a few days ago to overhear them discussing how to pronounce "Itase." Since they aren't sure, I guess any pronunciation is OK. I did a portrait of the group and one of Paul.

Paul Mayewski

November 14, 2002. 9:00 A.M. 4 deg F, 25 mph winds, -43 deg F wind chill.

Trematomus bernachii

It's not too pleasant outside again this morning, so I've started photographing some of the Antarctic fish in the downstairs lab aquarium They are strangely primitive looking creatures, mostly between about 7 and 10 inches long. I have the greatest respect for anything that can survive in these waters. Gretchen Hofmann and several of her crew helped set me up with a small thin aquarium and to move the fish in and out. First attempts were a little soft, even with flash, but not too bad. Since I have little depth of field, and the fish are constantly moing, it's not easy. With bright lights and an underwater camera, it might be easier. I have nowhere to go for gels, backdrops, and similar props… and I have no intention of going in 28 degree water with them. (I really admire Norbert Wu's underwater images from down here, but I'm leaving that whole underwater territory to him!) At least with digital, I can put the images up on the computer immediately after taking them to see how it's working. I'd like to photograph the lovely little octopus with blue eyes that is down in the tank if I can figure out a way to do it.

November 16, 2002. 20 deg F, 12 deg F with wind chill.

Cape Evans in a blizzard

After several days of blowing wind and snow, the airplanes and helos are back to flying. It's pleasant not to have to put on quite so many layers. Last night I walked the couple of miles over the hill from McMurdo to Scott Base to meet an Australian friend who was in town briefly. It only takes about half an hour to do the walk but the wind was blowing at 30 mph, so I had to put on a balaclava, wind pants, and a hat, in addition to the usual layers of fleece, gloves, and parka. By the time I got there, I was huffing and puffing and very ready for dinner.

Windless Bight

The day before, Seth and I drove out to Windless Bight, about an hour's drive out on the Ross Ice Shelf on the back of Ross Island. This is the route followed by Apsley Cherry-Garrard, Wilson, and Bowers on their winter journey to collect Emperor penguin eggs (written up as the Worst Journey in the World, one of the classics of expedition literature). Of course, it was crazy to do any major expedition in the dead of polar winter when it is totally dark, day and night. They started off under a full moon, which helped them see during the crossing of the ice shelf, but after they got in a major storm and were delayed at Cape Crozier, they had to do the return journey in pitch darkness. As we drove along in our heated Mat Track (a pickup truck with treads instead of wheels), I could imagine them trudging along. They nearly lost their tent in the storm at Crozier, which would have been the end of them all, since there is no shelter along the route. I love the picture of the men before their journey and after their return, when they look like they have looked hell in the face and barely survived to tell the story.

Kitchen at Windless Bight

Today, at Windless Bight, there is an infrasound monitoring station for detecting nuclear blasts, one of eight stations that the US has agreed to install (sixty stations are planned globally). As the name indicates, wind velocities in the area are lower than elsewhere in the McMurdo support range, and windy conditions can interfere with detection of the desired signals. The station can detect small pressure waves carried from tens of thousands of kilometers away from large marine storms, explosions, volcanoes, and Space Shuttle launches, as well as atomic testing. It's not a whole lot to photograph—a pentagram of antennas and a small orange control building. Several of the techs had set up tents on the sea ice, so I photographed them and the inside of their small food tent. Just as I was packing up to leave, the sun came out briefly and lit the back of Erebus, which was impressively large from this side of the island.

We also took another trip out to Cape Evans. This time I got a few better shots of Ponting's darkroom with all his chemicals and a shot of the seal blubber in the outside hallway. The weather was unpleasantly windy when we were there, so strong that it was hard to keep a footing walking across the sea ice to the hut. We finally decided to leave a little early and head back before visibility closed down to zero and we couldn't see the flags along the route.

Next week should be challenging. I'm slated to go to the South Pole on Monday and to stay for four nights. I'm anxious about the photographs there. The altitude of 10,000 feet bothers many people. The cold is severe (it's been –50 below most of this last week), and I don't know how I and the gear will hold up. People say that every outdoor task takes six times as long at Pole as it does elsewhere.

“Out of whose womb came the ice?
And the hoary frost of Heaven, who hath gendered it?
The waters are hid as with a stone,
And the face of the deep is frozen.”
—lines from the Book of Job, carried by Shackleton. When he was forced to abandon ship, he tore out the flyleaf of the Bible, along with the handwritten inscription by Queen Victoria, and the page of Job with these lines.

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 8

November 18-November 22, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 7

8 P.M. 19 deg. F, -7 deg. Wind chill

South Pole. November 18, 2002.
-40 degrees, -65 degrees wind chill.

South Pole

I flew out with three other passengers and lots of cargo on a Hercules C130 this morning. Since one of the other passengers was Father Damien, the Catholic priest at McMurdo, I figured I was in good hands for the flight. The pilots invited me up to the cockpit shortly after take-off so I got a grand view of Black and White Islands and then a close-up of Minna Bluff, which you can see off in the distance from McMurdo. This is the route that many of the early explorers, such as Scott and Shackleton, took on their man-hauling attempts to reach the South Pole. After Minna Bluff are miles and miles of the Ross Ice Shelf, a floating extension of the polar plateau, easy going for the expeditions since it is flat. Unfortunately, at the edge of the continent, clouds appeared. By the time we crossed the Transantarctic Mountains up to the plateau, I caught only a brief glimpse of the mountains sticking up above the several miles of ice that cover their base.

Three hours after take-off, as we began to approach the Pole, the weather closed down further. We were flying in bright white clouds without any definition. The pilots began to descend slowly, following their readings. There is no tower at the Pole to guide the plane in, so line of sight for the landing field is necessary. As we got closer, the pilots peered out the windshield, rising out of their seats for a better look. Then suddenly, buildings appeared, and we set down seconds later. Less than a mile of visibility and you don't land here (and we would have had to return all the way to McMurdo); we had exactly one mile, they told me later.

Minna Bluff

It was a balmy –18 degrees here today when we arrived. I see polies walking around in their fleeces with no parka or hat. I even saw one guy in a t-shirt and jeans walking around under the dome. For me, it's cold, despite all the layers of fleece, balaclava, and heavy parka. By dinner time, it had cooled off considerably to the current –40.

When we got off the plane, we saw lots of buildings and construction equipment. Someone pointed us in the direction of the dome, the old station, but we were soon lost. We clambered around on snowdrifts around the side of the dome with all our bags. Father Damien, unfortunately, was as lost as the rest of us. Finally, someone pointed us in the right direction and we entered the tunnel that leads to the dome.

Arrival of freshies

This is an unusual structure, unlike anything I've ever walked into. All the tunnels and the dome itself are the temperature of the outside air, very cold, so they store all the food in there. Icicles hang from the ceiling. Layers of frost covers the inside walls and pipes. So are all the boxes of supplies that are stored under it. Fresh veggies, fruits, and beer that shouldn't freeze are stored in a giant freezer that is heated. Whenever a load of freshies comes it, a general call goes out on the radio and anyone who is nearby comes over to help unload it into the freezer. The galley is in a small metal building that was originally planned to serve 40 people and is now serving over 200 with all the construction crew, so people eat in shifts. Other buildings house staff offices, a library, rec rooms, and a medical facility. It is like being in a space ship. You are totally isolated from the world at large, self-contained and reasonably comfortable. Once you leave the dome, you go into the brilliant polar light that is just as bright at midnight as it is at noon.

Old Station dome

The South Pole Station is a very different place from McMurdo. It has the feeling of a small rural town where outsiders stick out and are carefully scrutinized. Those that winter-over here form a special bond. But, once I introduced myself, I met with smiles and questions.

The South Pole. A mythical place. A place that Scott and his companions suffered and died to reach. A place where the Ice Queen lives. The end of the earth. As far south as you can go. Santa's retreat when he finishes with Christmas? It doesn't appear on most globes because that's where the fastening pin attaches to the globe. (All of Antarctica is missing from many world maps.) Only a few thousand people have ever succeeded in reaching the South Pole in the history of the planet.

A place you can't ever reach. But, here I am.

November 19, 2002. –39 degrees, -68 degrees wind chill. Colder today. Al Baker met me after breakfast in a piston bully (one of two that just arrived on yesterday's flight from McMurdo). Surprisingly, the station is spread over a fairly large area. My living quarters are a five-minute walk from the dome. That may not seem like much until you think about it being –39 degrees with a breeze blowing. Much of the science is over a mile walk out. That's a nippy walk. More than the cold, the altitude bothers me. It is only a little over 9000 feet here, but the physio-altitude is 10,800 feet (because of the different atmospheric pressure here at the Pole). To me it feels more like 13,000-14,000 feet. I huff and puff as soon as I walk a short distance and find carrying a large bag to be all but impossible. With all my camera gear, I was fortunate enough to rate transportation and am very grateful for it.

Dasi telescope

We drove out to the Dark Sector, about a mile from the station, where telescopes and the neutrino detector (AMANDA) are located. It's called the Dark Sector because most of the telescopes function only during the six months of the polar night and need completely dark skies for best visibility. The science being done here is much more abstract than the biology and geology and climate research being done out of McMurdo. Several of the projects are looking at the Big Bang billions of years ago or remnants of supernovas (ACBAR, VULCAN, and DASI) or mapping galactic magnetic fields (SPARO). Reading descriptions of these projects before coming, I found it impossible to understand what they were about. The telescopes themselves are not conventional mirrors but rather a sort of hybrid between optical and electro-magnetic radiation detectors.

They are not much to see but they did at least give me a physical component to the science. What they are doing in the Dark Sector is greatly exciting astronomers all over the world.

Astronomical observatories

AMANDA and its new counterpart Ice Cube are especially difficult to comprehend. They are neutrino detectors. Neutrinos are subatomic particles so small that their mass is still not precisely measured, and only recently is their existence widely accepted. These particles pass through the solid mass of the earth as if it didn't exist. AMANDA is a group of some 40 detectors that have been sunk down in the ice to observe traces of these particles as they pass through the earth on their way back to outer space. Fortunately, the people who do these experiments are ordinary, if unusually bright, and very good company, so I didn't feel totally stupid in the questions I asked them.

In the afternoon, I tagged along with a group of Distinguished Visitors (called DVs here). We returned to the Dark Sector for a short visit and then out to the ARO sector where NOAH has a

climate monitoring facility. They are measuring carbon dioxide and greenhouse gasses here and at other locations around the world where the human presence is minimal. The detectors are so sensitive that we are not ordinarily able to enter this area at all. A single vehicle or human breathing can affect readings.

Doctor Will

Will, the station doctor, gave us a tour of his medical facility in the dome. He has enough equipment to handle some severe conditions but nowhere near what is available in even a small United States hospital. If you have a heart attack here, you are don't have 20 trained medical doctors and nurses jumping around you, hooking you up to complicated machines. The blood bank is walking around the station; since the match would not be perfect, a transfusion could be an iffy procedure here. I asked him what the attraction was for him to work under minimal conditions without great pay. "It's a great adventure," he said. "I can practice medicine as I always imagined and wanted it to be. There are no time clocks. I can visit patients and have time to listen to what they want to talk about. They have time to feel comfortable with me." It's not all positive. Sooner or later, he admitted, we will have a case where someone will die because we cannot provide the necessary care (indeed, a scientist did die last year). During the polar summer, a dentist flies in once a week from McMurdo; during the polar winter, the doctor has to do dentistry as well.

Tunnel worker

We then visited the new South Pole station, which is scheduled for completion in 2006. It is a funny-looking modular building perched on stilts above the dome. Several of the modules are nearing completion. The station is heated with waste heat from the power plant and has R70, foot-thick insulated walls, so it's very comfy to work in. They are expecting to be able to use the galley and some of the living quarters by January.

I photographed in the station, mainly shooting through the windows from the second story elevation. Inside it looks much like any other construction site in an Albuquerque office building, not too exciting. Work on the interior continues through the polar night, so they get everything external finished before the station closes down with no flights in or out until November. It was the easiest situation to work in that I've had since I arrived.

This afternoon, on the other hand, was an adventure. I had wanted to visit SPRESO in the Quiet Sector, where they listen via seismic equipment. They are keeping track of earthquakes, volcanoes, nuclear blasts and other explosive events. Seismology was the first science done at the South Pole, way back during the International Geophysical Year of 1957 and is the longest running observational science here. Along with other stations throughout the world, they are now mapping the earth's core. The South Pole is one of the quietest places on the planet. To make their instruments even quieter they are about to bore ice cores 1000 feet deep to sink their instruments into to get away from wind or any other ambient noise.

SPRESO is five-miles from the station, the farthest away of any project. Several technicians were going out to hook up the camp to the Internet and offered to take me along. Five miles isn't far, but it's still an adventure at –41 degrees in an open snowmobile. I climbed behind the driver, and we hooked on a sled with the techs and their equipment and set off. I don't know what the wind chill is at 25 mph, but it must be impressive. We all had on heavy parkas, but it was still cold after several miles. It was worth it, though, to get out on the polar plateau. The camp is down a slight dip from the station, so after about two miles, the station disappeared completely. As far as you could see in any direction was hard white flat snow and blue sky with the sun high overhead. This is what Scott saw as he trudged along with his heavy sled, dragging his feet, wondering if he would make it to the Pole before Amundsen. He saw this and only this for weeks on end, after he climbed the glacier in the Transantarctic Mountains to reach the plateau. An utterly featureless landscape, the same every day, unless a storm broke the monotony.

SPRESO tent camp

So what did I wear for this jaunt? Underwear, tights, two layers of fleece, three layers of capilene and fleece on top, a windbreaker overall. On top I zipped up my wonderful wind-proof issue red parka. On my feet: two layers of wool socks and bunny boots (heavy insulated rubber boots). On my head: a balaclava, hat, neck gaiter, and my parka hood (plus polarized goggles). On my hands: liners, fleece and bear paw mittens with hand warmers. That's a lot of clothes, probably 10-15 pounds worth. It's hard to keep track of everything. I'm always leaving something behind. Fortunately, the layers and wind stopping gear really works, and I was warm and comfortable.

The camp was not terribly interesting to photograph since the drilling has not yet begun, but I enjoyed meeting the women who do the drilling (they go all over the world doing ice drilling at high altitudes and cold places).

Kitchen chefs

When I got back to station, I found I had an appetite. The galley is the great social mixer. You never know whether you will be chatting with an electrician, a cargo loader, or an astrophysicist. The food is excellent, much better than McMurdo. Tonight we had great grilled lamb chops, couscous, asparagus, fresh rolls, a potato soup, and lots of dessert choices—cookies, baklava, cake, cranberry bread and more. The kitchen is open, and John, the cook, stands ready to accept compliments. Nobody ever criticizes the cook!

November 20, 2002. –42 degrees, -69 degrees wind chill.

Went out this morning with Bill, the winter station manager, and did portraits and additional telescope images at DASI, AMANDA, and ASTRO. Tony Stark, the principle scientist at ASTRO was in the middle of major equipment moving when I arrived and was slightly gruff at the request for a picture by a photographer who arrived unannounced in his lab. ASTRO has been his baby for 15 years, and he's very proud of it, so he soon started telling me about what they are doing. We

had a great lunch afterward.

Allan Day at DASI not only posed but also insisted I climb a very steep ladder and go into the telescope. I couldn't imagine photographing in the tiny space I saw from below, and it was a precarious climb to a tiny platform, so I did it more to please him than with any hope for a picture. When I stood up inside the telescope, the sight was worth the climb. The machinery is complex and elegant (as was the tiny device he later showed us for detecting polarization). It was a universe of its own—a great metaphor for a telescope that examines the early days of our universe.

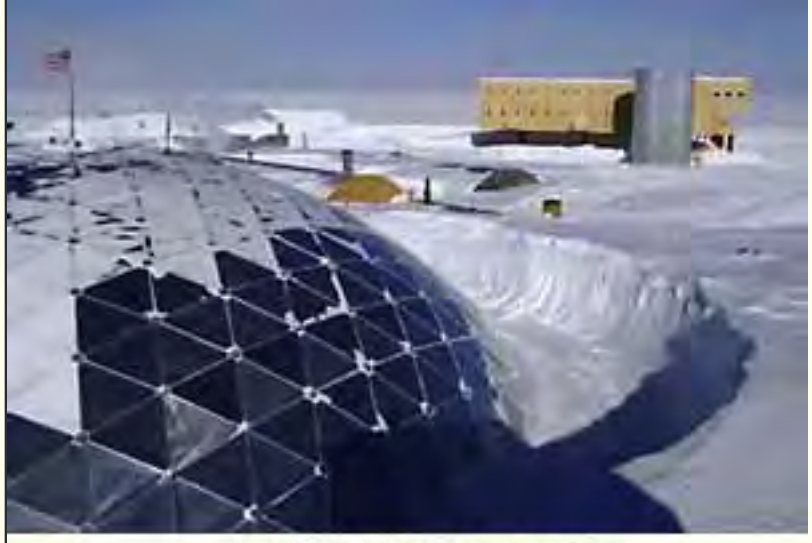
This afternoon I did panoramas, including several out at the end of the ice runway where a Hercules LC130 crashed years ago and now lies buried in the snow with only its tail showing. It's much harder to set up the panorama camera than shoot digital, since it requires a tripod, and my tripod freezes solid at these temperatures in about five minutes.

Being at the South Pole is like living in a space capsule or on another planet. You are totally dependent on fuel and other necessities for survival. You have communication with the outside world (they have satellite Internet connection here, but only for about 12 hours a day depending on the position of the satellites), but your world does not intersect with the outside world. You are totally separate. You feel like you are in a cocoon. You can't see the polar plateau from inside the dome. You are warm and well fed. But when you leave the dome, it is very cold and very bright. The sun circles around high in the sky and never sets. It doesn't feel or look familiar.

South Pole pool

My room is simple, about 6 x 8 feet with a couple of rough wood shelves, a metal wardrobe, and a bed. There is a large window, but I have to keep it mainly closed with a heavy Velcro covering since all the rooms share common overhead space. Since these eight rooms have workers who sleep days, the light from the open shade makes the whole dorm too bright. My room is warm enough and decently insulated and has a light for reading.

Going to the bathroom involves going through a double set of doors to a 100-foot passageway that is uninsulated and unheated. There is snow on the floor and frost on the inside walls. It is only slightly warmer than the outside –42 degrees. You don't linger here. You don't have bare feet or wear sandals. After a couple of turns you come to another pair of doors and the bath/shower room, one for men and one for women with laundry machines in between. You are allowed only two two-minute showers each week. All the water for this set of four dorms must be trucked in. I showered last night, and it was utterly delicious.



Looking toward new station

The new South Pole station has an ice well (called a Rod well)—an underground reservoir of warm water of some 500,000 gallons, made by a process of drilling hot water through the ice and letting it make its own underground chamber. One has already been drilled, and they are letting it enlarge its capacity until the station goes on line. At that time, they will have plenty of water. Since everyone here wears overalls and boots throughout the station, including the galley, nobody cares how you look. You shower when you can't stand yourself any longer.

November 22, 2002 -38 degrees, -58 degrees with wind chill.

I don't think it's possible to describe what this place feels like—its family-like culture, the dome that encloses it, or the blankness of the polar landscape that surrounds it. As soon as you get a mile away from the station you see how fragile it is in its uncompromising environment. Antarctica is the most hostile continent, and the South Pole is its center. It is so flat here that you can see the curvature of the earth 360 degrees around you. It's like standing in the center of a fish-eye lens. You can forget that when you're inside the galley eating a great meal.

Inside the dome

The old dome station would make a great set for a sci-fi flick. I'm told that when the last plane leaves for the polar winter, they play a video of "The Thing." You have the feeling that strange phenomena might happen here. Part of it is that the dome itself is gradually and inevitably sinking into the ice. That's why they are building the new station. Some day the dome will be totally buried and will eventually flow with the ice to the sea. If you look at doors in the dome, you can see they are already torqued out of shape. The light under the dome is dim which gives it a magical, if cold, look. Polies love the hometown community enclosed under the dome and complain they will lose it in the new station. As an outsider, it is a dim, icy place, fortunately punctuated by tiny outpost buildings that are warm and light. For someone like me, who is cold in New Mexico much of the year, this is like reaching Dante's ninth circle of hell that is ice. (Dante had it wrong, though; it's not dark.)

I wondered how –40 degrees would feel. It's different from when I arrived in McMurdo six weeks ago and it was –20 degrees. Then, I had an immediate flashback to where I grew up and thought to myself, "My goodness, I'm back in Iowa!" It's colder than that here. However, it is so dry that you remain warm as long as you put on enough layers. As soon as any clothes get damp, you're in trouble. You get cold immediately and risk frostbite. I've met several folks who got frostbite on their noses and cheeks from working outdoors and having their balaclavas get damp. People here say you adjust to the cold after several weeks and don't need so many layers, but I'm hoping I can leave before I find out whether they are right!

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 9

November 21-November 27, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 8

South Pole. November 21, 2002. –38 deg F, wind chill –59 deg F

Weather balloon

Took a long walk around the station last evening. I'm finally feeling pretty normal, and it was lovely to walk around and poke into new nooks and crannies. I ended up at the balloon hanger where twice a day a balloon is launched to measure wind speed/direction, temperatures, relative humidity, and pressure. The data sent to World Meteorological Organization (WHO) for incorporation in the southern hemisphere forecasting models. I photographed the launch and then some of the cargo berms with construction materials for the station. The place seemed a little less alien. If I keep moving, my fingers don't get cold and I'm quite comfortable. Most of the time I don't wear my parka hood and I'm actually a little too warm when I'm walking around.

One of the physiologists who is studying the effect of this place on the body here, told me that we increase our oxygen consumption by 20% within a couple weeks of arriving at McMurdo, increase caloric intake by 40% (without gaining weight), and our thyroid is so busy coping with the demands, that it doesn't produce enough hormone for the central nervous system. Thus, short-term memory loss is common. I can attest to that. I couldn't remember a single name when I arrived at McMurdo for several days; after that, I did much better. The same thing happened again when I arrived here at Pole. After about 5 days, I could begin to learn names. The physiologists are doing applied research, testing what thyroid additive might help.

One of the plumbers invited me to go down in the snow tunnels this morning. These tunnels were carved out of the ice last year to contain the pipes for water and sewage for the new station. The

Tunnel

plumbers are now connecting everything. They have offered before and I have politely resisted. It is –60 degrees down in the tunnels, and I couldn't see what the attraction was. Today, it was Janice (who has a plumbing company in Kanab, Utah, when she isn't down here) and she persuasively expanded on the beauty of the tunnels, so I agreed. We dressed in balaclavas but no goggles, plus the usual layers. I put the Nikon under my parka. You open a small door and set off. The tunnels aren't far underground so you don't have to climb down a ladder. All the pipes have heat tape around them so they don't freeze solid. They tunnels are about 8 feet tall and four feet wide and are lit by electric lights every so often. Their construction last year was an amazing engineering feat by a team headed by John Wright. The crew worked at –60 degrees with specially made ice-drilling equipment. They carved the tunnels straight out of the snow, which is so compacted that it forms perfectly straight walls and ceiling. Every so often a small crack lets in a blue light.

Construction materials

Where the plumbers were working today was about 1200 feet into the tunnel system in a small side tunnel. They work for short stretches, take a break to warm up, and then return to work again. When we got there, I understood why I had been urged to come. Evidently, there is no breeze in this section, and the most elegant snowflakes have formed in long chains from the ceiling. They are so lacy and delicate that a slight breath will destroy them. Never have I seen anything like them. When we came out again, I took a picture of Janice with hoar frost on her eyelashes and balaclava. I suppose I looked the same… but at least I wasn't cold, not even around my eyes without the goggles. How often do you get to walk around and photograph at –60 degrees?

November 26, 2002. McMurdo. 8 degrees F, -14 degrees with wind chill.

I returned yesterday from the South Pole on a gloriously clear flight. I got to walk around and shoot through the windows of the cockpit. About the first hour of the flight was spent crossing the polar ice cap, icy and flat. Then come the Transantarctic Mountains with their dark heads stuck out of the two miles of ice that cover their base. We flew past the opening to the Beardmore Glacier, the route over the mountains that Scott and Shackleton took up from the McMurdo area to the Pole. It is an enormous glacier that swirls like a mighty river from the plateau down to the ice shelf below. By some optical illusion, it looked like it was flowing upwards rather than downward when I photographed it. After the mountains the plane flies over the Ross Ice Shelf for quite a while before reaching the McMurdo area. When you fly half way across the continent, you see how large and empty and white it really is. How amazing that we still have a whole continent on our planet that has no roads, structures, or power lines (except for the extremely small isolated stations like South Pole and McMurdo). We would certainly have occupied and exploited it if we had been able to, so the emptiness is testament to its total incompatibility with human survival.

A man told me today, just before I left the Pole: "When I'm here the outside world seems like a

dream. When I get home, the South Pole seems like a dream."

McMurdo has the smell of dirt. The Pole doesn't smell. Except for a certain amount of human debris and vehicle emissions, it has no dirt or dust.

Tunnel plumber

Fumaroles

Returning from the South Pole to life at McMurdo requires an adjustment. Life there is so hermetic that people become to tuned to each other's rhythms. There is a smooth flow of 200 people in a galley that can only feed about 50 at a time. Anywhere else, it would be crowded and unpleasant. At Pole, it is graceful and gentle. When you arrive in McMurdo, life seems abrupt, harsh. I can only try and imagine what it must be like for those who winter-over and then must re-enter the outside world. You don't have the web that connects those who work at Pole. People return year after year and call it their "family." The South Pole has the harshest and most unforgiving external environment that I have ever had to work in, but the community is the most gentle and open. You don't see people with large egos or flimsy personas. They don't last long where everything is so open and brightly lit.

Mount Erebus. –18 degrees, -45 wind chill

Downed helicopter

I returned to McMurdo for one night and then took a helicopter up Mt. Erebus the next morning. This meant I dashed around like a loca doing laundry, answering email, making phone calls, and greeting friends. By going up Erebus so quickly, I don't lose my acclimatization to the altitude that I gained at the South Pole. It is even higher on Erebus than at the Pole, but not so cold. It's about 13,500 feet physio-altitude where the Erebus hut is and –20 degrees. After the week at Pole, I am pretty well adjusted but still huff and puff whenever I carry gear or climb very far. The helo ride up here is spectacular since the helo ascends about a thousand feet a minute up the side of the mountain. This is a ride that people would pay lots of money to take—everyone in McMurdo wants to come up for starters. You aren't aware you are climbing that fast, but you get a grand view of Ross Island, the sea ice and the ever closer plumes of steam. At the end, the helo flies over the top flank of the mountain, giving you a view of the steamy crater before setting down outside the hut on the other side.

Testing with ice axe

Mt. Erebus is a live volcano with a lava lake in its crater. Officially, it is called an open conduit Strombolian volcano, which means it has a magma lake that is somehow connected to the earth's mantle and it sends up periodic puffs of gas that send car-sized bombs rolling down its sides. Researchers have been studying it for years but are still not sure of the size, shape, or depth of its magma chamber. It is the most active volcano in Antarctica and a natural laboratory since it is only about 20 miles from McMurdo. It is located in a rift area, rather than on the edge of a continental plate, and it is an area where the earth's crust is being gradually pulled apart. The crust beneath it is only about 10 miles thick (as opposed to about 20 miles thick in New Mexico), so magma can get to the surface. Although it is an active volcano, it is safer than most to study, since its open conduit magmatic system keeps it from building up pressure (although it has had major eruptions in times past and is certainly capable of doing it again). Its last largish eruption was in 1984, but since then it has been content to bubble and steam. With its magma chamber, it is a window to the center of the earth.

The field huts are just below the summit on a flat plateau. Thirteen people will be working at this camp starting next week. The main hut is about 20 x 25 feet and serves as kitchen/dining/communication and relaxation area. A Preway stove running on diesel provides plenty of heat. Four large windows look out toward the top of the mountain. The other building is storage and bathroom. I've elected to sleep on its floor for the couple of nights I'll be here. It's heated and I don't have to set up a tent. Since there are lots of supplies stored in it, it smells a bit of fuel. It's rough and ready but has plenty of room to spread a sleeping bag out on the floor, and I won't get cold.

Neither hut has any running water. All the water here comes from snow melted down in a giant pot on the Preway. Since it takes lots of snow to make water, it is used sparingly, mainly just for drinking and cooking. I wash my face with a tiny bowl of warm water. Even for those who work a season here, there are no showers or baths.

Melting snow for water

All bathroom waste is separately stored and eventually flown off the continent. That's true everywhere on the continent except on the sea ice and at the South Pole (where they drill wells for it and sink it into the two-mile thick ice sheet—which they justify by saying it will eventually flow down with the ice sheet and dump into the ocean. Ships are no longer allowed to send waste into the ocean so the rationale seems weak to me.)

Brian, my former sea ice instructor, is here helping Sarah (the camp manager) set up the hut for the researchers who will arrive this weekend. Dr. Phil Kyle has been studying Erebus for 30 years and knows her every mood. Most of the researchers are from Socorro, so I'm sorry I won't be able to stay for a period of time and get to know them better. I will also be unable to photograph them working, which is unfortunate. Once they get going, they lower ropes and ladders into some of the ice caves, which would be great to photograph.

Beardmore Glacier

Fire and ice. The upper slopes of Erebus have to be one of the most picturesque places in the world. Everywhere you look you see lava tumuli poking up through the snow and steaming ice sculptures. It is a fairy tale gone awry. The Snow Queen in her palace with underground steam vents. When I arrived at the field huts and started walking around, I realized that this is how I always imagined Antarctica to look—hilly, rocky, with lots of snow and ice. Gnarled, braided lava formations poke out of the snow. It is strange and beautiful at the same time. Photographing is difficult with the cold and high altitude. Brian helped me do one panorama session by carrying the Fujica camera so I could take shots of some of the steaming fumaroles in the area. Since the steam freezes into ice around the vents, elaborate towering ice sculptures form. You have to walk around them carefully since there are many places where the ice covers fragile areas.

Upper Erebus hut

Sarah made the three of us pizza tonight, mixing up the crust from scratch. I cut up onions and red peppers. We fried a little Italian sausage, roasted some garlic, put on tomato sauce and cheese. We told stories, ate pizza, and watched the snow glisten in the bright sun and Erebus puff above us. It's a very beautiful and strangely peaceful place despite the inherent threat of the volcano looming over us. Last year, a terrific storm broke up here and lasted a week. All the researchers left their tents (some of which blew away) and camped out on the hut floor while the winds gusted up to 80 mph for the better part of a week.

November 27, 2002. Since the sun is out and the volcano's plume is going straight up, it seemed like a fine morning for a hike to the summit. The hut where I'm staying is about 2000 feet from the rim. To get to the top, Brian and I took a snowmobile up about 1200 feet. From there we had to climb the last 800 feet to the rim. Not so easy at a physio-altitude of over 14,000 feet. Downright precarious in bunny boots (clunky rubber boots, well insulated, but with smooth soles). It took about 45 minutes to do the climb over loose lava, ice, and snow. Everywhere underfoot were Erebus crystals—feldspar crystals that are all sizes from tiny to about three inches in length. Other volcanoes have feldspar crystals but none are as large or perfect as these. Before I left, many friends asked me to bring them back a crystal, so as I huffed and puffed up the mountain, I slowly filled my parka pockets. By the time I reached the top, I was hot, panting hard, and had gained ten pounds.

The view from the crater summit was extraordinary. The crater is deep and lined with ice sculptures. Clouds of sulfurous steam pour over the side and obscure or reveal the crater below depending on the whims of the wind. One area at the bottom has the lava lake, another has a smaller vent that puffs and steams, and to one side is an ash vent that sends up clouds of ash every so often. Far below I could hear what sounded like waves breaking on a distant shore, followed by a hissing sound. I sat on a lava bomb a foot from the thousand-foot drop to the crater floor and thought that this must be how the earth will end, covered in ice with a few final openings like this to the last of the rapidly cooling molten core. The scope of the crater was impossible to

photograph, especially with the clouds of steam, but I tried to give a sense of its power and mystery. How could such a powerful volcano exist in this land of perpetual cold and ice?

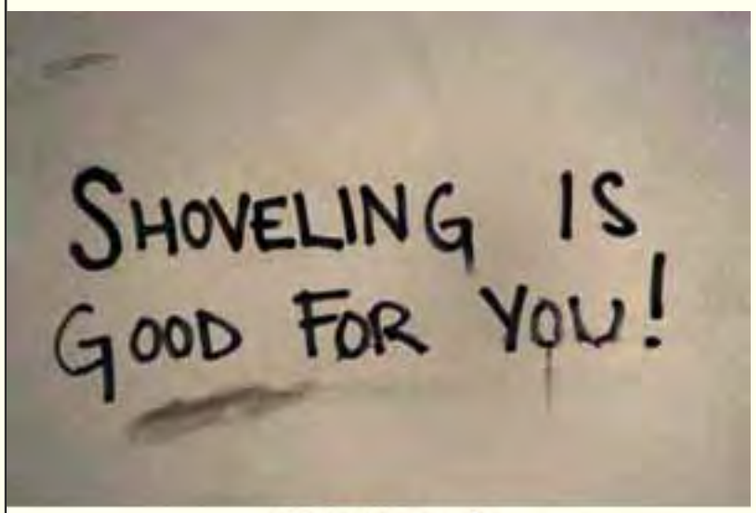
Crater rim

After dinner, Sarah took me on a magical snowmobile ride in the brilliant late evening sunshine. I held on tight to her, and we flew and bumped around the flanks of Erebus, through lava flows and fumaroles, across the snow and ice to an old hut that was used for research until the 1984 eruption. Since bombs rolled down the slopes near the hut, it was deemed too dangerous and abandoned. Inside it is still stocked with a stove, a bed, and cooking utensils and supplies, but it is more rustic than the hut we are now using. When we got ready to leave, we had difficulty starting the snowmobile but finally succeeded. The return was equally beautiful. A rough ride around the icy mountain with a grand view of the bay 12,000 feet below—Cape Bird, the large icebergs that are blocking the movement of the sea ice in the Ross sea, and Beaufort Island in the distance.

Our little camp grew today with the addition of Nelia and Rich, members of the Erebus research team, and Amy, who is here on a long-standing program that sends down a boy or girl scout every year, and Kelly, my fellow Artists and Writers grantee (who is writing the book on Shackleton's lost men). Neither Kelly nor Amy is feeling very chipper. Sarah fixed us a fine dinner with stir-fry chicken, a fresh salad (what a treat!), rice, and apples for dessert. Afterward, everyone sat around the table until late, playing cards and talking.

Today it is Thanksgiving, but they don't celebrate it here until the weekend. How far I am from home and family! I've had many kinds of Thanksgiving over the years but I've never spent it without family of some sort. Here on top of Mt. Erebus, one of the most beautiful places on the planet, I am surrounded by lots of wonderful people, but I miss Bernie, my kids, and all my extended family. I'm tired of photographing, of the cold and the ice. I'd like to smell trees, hug family and friends, and have an enchilada red.

Top of the Page



South Pole graffiti

Return to Photos

Previous Journal

Go to: Journal 10

November 30-December 6, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 9

McMurdo. 12 deg F, -10 deg F wind chill.

Waiting for the helo

Light snow. Thanksgiving is a highlight of the season here. Mainly that's because Thanksgiving and Christmas are the only times when the support staff gets a two-day weekend. Everyone here works extremely hard, usually a ten-hour day, and only gets Sunday off. That extra day of relaxation, whether spent in vigorous sports like skiing or the Turkey Trot (a 5 km run), or just hanging out, means a lot. Also, the kitchen staff prepares a feast for Thanksgiving dinner on Saturday afternoon. Lots of freshies (even arugula for the salad!), cheeses, fruits, and of course turkey and all the trimmings and several kinds of pies for dessert. Everyone puts on their best clothes. Sometimes that means their best t-shirt, but at least they aren't in dirty overalls and a baseball hat. Many people buy a bottle of wine from the store. Since all the food is prepared by the kitchen staff and dishes are cleaned by them, it's a very convivial and relaxing occasion. At the end of dinner, the kitchen staff comes out for general applause and a rousing toast of appreciation.

I sat with a table of former Polies (all of whom spent several seasons working at the South Pole and are now working in Mac Town for a season). Sally, the head chef, is also a former Polie and she came over in her whites to say hello to her friends. She was famous for her cooking at Pole, and people at McMurdo say how much the quality of the food has improved since she came here. They talked a little about how they used to get together at Pole and have potato-peeling and pie-making evenings before Thanksgiving, so it was more of a family affair. Her eyes watered and she looked around at them, "It's not the same, is it?" Thanksgiving at the South Pole, I have been told, is very close and special.

For me, Thanksgiving was a moment to stop and take stock. The last few weeks have been busy shooting times. My time here is now half over. I plan to spend this week looking over what I have shot with the digital camera (all the film from the panorama camera is still undeveloped and will be sent back home for processing when I return), making sure everything is labeled properly, and thinking about what I would like to shoot in the time remaining. It was also a time to remember how many, many people have helped make this experience possible for me and what a debt I owe all of them. I've had a very special opportunity granted to few. I have been able to see more of the continent than most people who have worked here for years. It's an honor and a great responsibility. I try and do small things for people who help me but I have no way to repay much of that debt other than to do the best photographs I can and get them out in the world when I return.

Hut Point

Last night, I took a walk down to Hut Point after dinner, photographed Vince's cross and Scott's Discovery hut a little, and looked back at McMurdo. As the snow melts, it begins to look more and more like a western mining town. When the wind blows, it picks up the light volcanic dust and swirls it through the air. As the temperature rises, the ice starts to melt and little rivulets run down all the dirt roads.

Today, by contrast, it looks like the real Antarctic. Light snow is being blown horizontally by 25 mph winds. No planes or helicopters are flying. Temperature is falling and winds rising, so that the wind chill has fallen to –35 deg F in the last hour. Time to leave my comfy office and take some photos!

December 3, 2002. 10 deg. F, -11 deg. F wind chill. The weather continues cloudy and snowy. When you go outside, it's like walking around in a bowl of whipped cream. You often can't see more than a few yards away. No flights are going in or out. Two people in the Dry Valleys have serious medical problems, one of them with a broken wrist, but since the helicopters are not flying, there is no way to get them here for medical care. It's moments like this that make me remember that, despite all the comforts here at McMurdo, we are on the most hostile and remote continent on the planet.

I thought about that tenuous existence a lot when I was at the South Pole. The station is such a minimal speck of human existence in the expanse of the polar plateau. The outside environment is too harsh to support life for more than a few hours without adequate clothing, shelter, food, and water. Fire is the most deadly danger. You wouldn't think so in all that cold, but if the dome were to go up in flames, and it would go quickly in zero humidity, it would take most of the station's fuel supply with it in a giant explosion that could well destroy much of the station's shelter. When I was eating dinner one evening in the galley at Pole, the fire alarm went off. All around me, people left their plates and sprinted for the door, grabbing their parkas at a dead run. No one paused even a second or said anything. The response was instant and well-rehearsed. Fortunately, it was a false alarm. In the austral winter, when no planes can fly in or out, a serious fire at the South Pole would be devastating.

December 5, 2002. 27 deg. F, 7 deg. F wind chill. What a spectacularly beautiful day it is today. Warm, blue skies, with a fine view of Black Island and Mt. Discovery. Yesterday, it was overcast and cloudy and no flights went in or out. I was sad because Sandy Blakeslee, my friend and book

collaborator, couldn't get in on the flight from Christ Church. Well, she certainly will arrive today!

Fish tank

Despite the bad weather, I kept busy yesterday. At 6 AM, I joined the Hofmann fish group and went out to their hut on the sea ice. They had set a 1000-foot line the night before with fifteen four-inch hooks and were hoping to catch Antarctic cod (Dissostichus mawsoni) for research purposes. Scientist Art DeVries has studied mawsoni for 40 years, trying to understand how they thrive in the cold Antarctic water. The scientists keep several of them in the tank down on the lower level of the Crary aquarium. They swim very slowly around their tank and look up questioningly at me as I try and photograph them. I have been curious how the scientists went about catching them.

Mawsoni is the only large fish found in these Antarctic waters below the ice. An average fish weighs 60 pounds and is about 52 inches long, but the largest ones get up to 200 pounds and nearly 80 inches. They grow slowly, at the rate of only about an inch a year, so a 130-pound fish is about 30 years old. Art DeVries has found that many Antarctic fish produce a natural antifreeze to help them survive the sub-freezing water… a finding that ice cream makers are interested in for keeping ice cream from recrystallizing.

Antarctic cod

In the small fish hut, a generator-powered winch slowly pulls up the stainless steel line from the five-foot circular hole cut in the sea ice. The first few hooks come up with squid bait still attached. Then Mackenzie, who is standing on a platform in the hole, cries, "Fish." It's a 65-pound mawsoni with bulbous gray eyes and fat lips staring up from the water. The crew pulls the fish out carefully and lay it on a wooden tray to remove the hook. Then, they measure and weigh the fish, take a few scale samples, tag its tail, and release it. A small white octopus comes up entwined with one of the other hooks. Then four more mawsoni about the same size. They are docile fish, true survivors in extremely hostile conditions.

In the afternoon, I flew in a helicopter with a couple of tech-support men to Mt. Newall and Lake Vanda in the Dry Valleys. I visited Mt. Newell earlier in the season but was happy to return. This time the sky was slightly overcast, but the mountains in the flat light reminded me of a Dasburg painting of the mountains of New Mexico.I shot for about an hour while the men worked in the seismic station hut. It wasn't cold, and we sat around on the snow talking as we waited for the helo to return and pick us up.

Lake Vanda was new to me. Bull Pass, where the seismic station is located is a couple of miles for the lake, but we got a good view of the lake as the helo swooped down. It is difficult to photograph the scale of these valleys. Without any vegetation, distances are impossible to judge. You know the mountain sides are bigger than they look, because enormous glaciers drip over their ridges. Mostly, the floor of the valley is clear of snow, but it is pocked with small wind-sculpted rocks. There is no vegetation or wildlife of any kind. Two small huts with seismic equipment and a few tents are the only evidence that the human race has ever visited here. No science is being done here at this time. It's a strange place, another planet sort of place, and one that I would like to have explored for several days. As it was, the men finished quickly and I reluctantly boarded the helo for McMurdo

Lake Vanda

Randy Davis gave the science lecture last night on the free-ranging seal research his group has been doing this season. Weddell World is his camp, which I visited a few weeks ago and photographed the seals with cameras on their backs. With the information his group is now obtaining, they can do three-dimensional drawings of the speed and path the seal takes as it forages for food beneath the sea ice. They are learning how the seals manage to conserve their metabolic resources to dive, capture prey, and digest it while diving 200-300 meters below the sea ice. They are learning how the seals locate prey in the dark depths of the ocean below the sea ice. Sometimes after diving they finally get back to the hole only to find it taken over by another seal. Then it's battle or die. They have to breathe. You have to admire and respect such amazing mammalian machines. When you see them lying on the ice like slugs you would never guess, but in fact they are extremely fuel efficient creatures that have evolved to maximize every ounce and calorie they can ingest.

Mt. Newall

We humans are considerably less efficient. We require a wide variety of food; all imported at enormous expense to Antarctica, as well as imported fuel to cook the food and to obtain water. I walked over to Scott Base today and photographed the contents of a Food Box. We Americans haven't got food boxes. We have a large field center, where, if you're leading a field party, you walk into a giant warehouse of frozen and canned and packaged food and make your choices. The New Zealand Food Box is a vestige of sledging times decades ago, when sturdy wooden boxes of dried and dehydrated food were loaded on Nansen sleds and dragged into the field. Brian, the field center manager, shook his head and told me that nobody wants the Food Box anymore. They want frozen vegetables and meats just like we do. Who wants to eat dried peas, tinned fish, potato flakes, freeze-dried meats, and cabin bread (crackers), if you have a choice? Plus, the wooden boxes, which were so indestructible for sledding, are very heavy for the helicopter flights that ordinarily transport field groups out to where they are working. Often a field party takes the box out and returns it the same way, basically uneaten. You then have very expensive dehydrated potatoes and crackers. Brian says he has worked at Scott Base for 16 years and that the boxes and their contents have remained basically the same for all that time. He is urging the Powers That Be

to at least switch to see-through plastic containers.

Field Box

December 6, 2002. 30 deg F, wind chill 13 deg. F. It's almost up to freezing outside. A beautiful day to take a walk (which I plan to do this evening). People are shedding their parkas in favor of lighter jackets. No hats or gloves are necessary!

The ITASE traverse team, which left here almost a month ago to travel between Byrd Camp and the South Pole, doing ice coring and climate measuring along the way, has had serious problems. Their fuel sled was too heavy for the snow conditions and the tracks on their Challenger didn't have enough traction to pull a heavy load. They started out and had to give it up after several days and return to Byrd Camp. Yesterday, a plane from New Zealand flew them a new fuel sled and two extra-wide tracks for their thin-tracked tractor. They will take a day or two to fit the wide tracks onto the tractor, pack up all of their gear, and prepare the trains ready for travel once more. Even if everything goes perfectly from now on (not likely!) they will arrive a month late at the South Pole.

A friend at my dinner table last night found a tiny green worm on her salad lettuce. This may be the only such worm in the whole of Antarctica! She put the lettuce leaf on the palm of her hand and carried it around the room, showing the worm to everyone. She said she was considering keeping it as a pet but, given our erratic supply of freshies, the tiny creature may soon go hungry.

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 11

December 8-13, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 10

McMurdo, December 8, 2002. 25 deg. F, no wind at 6:30 AM.

Weddell seal breathing

Yesterday was the first time that the temperature with wind chill has been above freezing since I arrived. Lots of people are walking around with shorts and t-shirts. Everyone is hot. I was so warm in my office that I began to picture myself in an itty bitty bikini. Lacking even a tank top, I finally asked for help from the maintenance staff to shut off the heater. It feels great to not be cold and not to have to wear all those extra layers of face mask, hat, and heavy gloves. It's equally wonderful not to have to worry about the camera fogging up and the tripod freezing solid. Not that I would trade those cold times at Pole and up Erebus for anything, but working under those conditions was exhausting and not always successful. You struggle so hard to lug the cameras around and to get everything to work that it's hard to concentrate on taking a good picture. Back home in Santa Fe, I would be all bundled up and cold at 36 degrees (which is what it reached yesterday), but after the last couple of months here, it feels like a heat wave.

McMurdo, December 9, 2002. A great journey to Cape Royds and Evans with Sandy Blakeslee. We enjoyed Sunday brunch, the best meal of the week, and then set off in a Piston Bully. It takes about 2 hours to get out to Royds. It was bright, clear, and warm. About an hour out, we came across a hole in the ice with a Weddell seal in it, just poking its head out for air. Its nostrils were icy and it peered through its eye slits at us watching it, showing no fear. It's amazing that its eyes can adapt to the extreme darkness of thousand-foot water under the ice and to the bright sun on land. Near the Barne Glacier we stopped to photograph several seals and half-grown pups lying out like giant slugs on the ice. It was a glorious day for a trip on the sea ice.

Cape Royds hut

As it turned out, it was probably the last day for such a journey. Where the edge of the Barne Glacier meets the sea ice, a giant, long crack forms every year. When we reached it, we could see it had opened up from the last time we crossed it. It was now more than a foot across and open to the water not far below. If we had taken a shovel and removed the snow and really taken a good look at the crack, we would have found it to be even larger. So, not good for travelers! A group of Kiwis just behind us also stopped to look. They had a couple of twelve-foot boards, which they put down across the crack to stabilize the vehicle tracks. We thus crossed safely with many joking comments about the best way to escape from a Piston Bully in case it sank. (Start by unlocking the roof hatch—we figured that at least a couple of us would have time to get out that way.)

Skua at Royds

At Cape Royds, we climbed over the narrow rocky spit and looked down at the sheltered bay. It's a lovely, serene site with the penguin colony to one side and the hut near the ice edge. I photographed briefly in the hut, especially trying to do a few longer views of the whole interior. I also photographed more of the outside storage, A pair of skuas, apparently hungry, were eating the beans and corn that were spilling out from several of the metal cans that had opened up in the course of the nearly 90 years since Shackleton's Ross Sea party had abandoned them. Sandy was pleased to meet several members of the NZ Historic Antarctic Trust, who were also there on an outing. In poking around, I was astonished to come across a mushroom, several inches across, growing in between some old lumber at one side of the hut exterior. It's amazing that mushrooms could grow in such a harsh environment, where every day has many hours below freezing. Yet here it was, a hitchhiker from the Shackleton expedition, managing to flourish despite the environment, in a way that we can't do ourselves. Just think how many years it has managed to winter-over!

mushroom at Royds

Dr. David Ainley, a penguin researcher, met me at the hut and led me over the ice to the penguin rookery. The colony is a special protected area, which I could only enter because I managed to acquire a permit for it. These are Adelie penguins, the species that looks most like the generic cartoons of black and white birds in tux and tails. They are a wonderfully curious species, which frequently sidles up to tourists to take a closer look. At Royds, however, the penguins are having a hard time. The giant icebergs, especially B15 which is the size of Rhode Island, are stuck in McMurdo Sound and have changed the water currents so that the sea ice doesn't break up as fast or as close to the shore of Ross Island as it

once did. The penguins have to walk 25 miles to feed. For a small bird with little stubby legs and flippers that is a very long walk before dinner. What has happened is that a pair comes in to their nesting area, the site of a thousand years of penguin settlement. They will not nest on the uncertain sea ice, so the volcanic soil of Ross Island is as close to the water as they can get. The female lays the egg and then the male sits on it to incubate it while she goes out to sea to feed. But, since the distance is so great, she can't get out and back in time to feed the chick. The mortality rate is very high. When I was in the colony, it was very quiet with lots of birds sitting on their nests. A few birds without eggs were walking about, stealing pebbles from unused nests and piling them up in their own nest. It was clear that the colony was smaller than usual with many unoccupied nests.


Nesting penguins

After a successful return over the Barne Glacier crack, we stopped briefly at Cape Evans. This hut is always a special place because of its sense of imminent return of the Scott party. You can almost believe that maybe they didn't die out there on the ice and if you just sit down and wait a little while, they will come into view over the sea ice, dragging their sleds and be ready for dinner. It was warmer, than the last time I was here, and I noticed that the seal blubber that is piled in the front passageway leading to the pony stalls was partially defrosted and oozing red. Rather than nearly a century old, it looked fresh enough that you could cut a slab off it to burn for fuel or to fry up for dinner. Inside you can still smell the smoke from burning seal blubber.


Chained dog

The hut was lighter than when I photographed in it six weeks or so ago, too. The snow is no longer covering the windows so they are letting in considerably more light. You can see the names on the tins and can photograph without needing a flashlight. Up on the hill behind the hut, we found the remains of a dog, which had been buried by the snow when I came before. It still had a collar and chain on its neck. I was told that it has a bullet hole in its skull and was thus shot when the men left rather than dying of hunger. It still looks eager, as if it was shot as it rushed forward to greet a friend. Unlike the site at Royds, this place does not have a peaceful feel. The hut was built solidly, but its chosen environment is harsh. Only the determination of its occupants permitted them to live here and only for a short time.

We arrived back at McMurdo in time for Randy Davis's seal lecture. He not only played some of the video footage of the seals eating and breathing but some of their sounds as well. Lots of trills and clicking sounds. Turns out that these Weddell seals are not as peaceful to their own kind under the water as they are to humans above the ice. The males do battle all the time, and sounds are a big part of their communication system.

December 10, 2002. Lake Hoare. Yesterday we took a helo to Lake Hoare in the Dry Valleys, about half an hour ride from McMurdo. Lake Hoare is the central field camp for all the Dry

Valleys climate research. The camp buildings are located a few hundred feet from the flat base of the Canada Glacier, which towers over it. You'd think that it would be a precarious existence, but the Canada Glacier is what they call a "cold glacier," which means that it is advancing and receding at about the same rate so it doesn't appear to change much. It doesn't calve off large pieces like the glaciers that flow down to the sea ice. On warm days where the temperature is around freezing, it drips down into small streams, which are measured by the scientists.

Research at Lake Hoare

The main camp building is built in the same basic plan as Shackleton's hut at Cape Royds. At one end is the kitchen and dining table, large enough to seat 20 people should it be necessary. Pantry shelves and cupboards line the counter tops and are filled with much the same supplies—canned goods, dried beans and rice, tea and coffee and other drinks. Coffee is especially important at this camp, so they have several kinds of drip and espresso makers, as well as Starbucks coffee brought from home. On one wall is the Preway stove with an enormous pot of water, melted from chunks cut off the glacier. Above the stove are clotheslines to dry wet gloves, socks, and towels. On the other side of the room, are the radio and telephone used for camp manger Rae Spain's daily communication with the helicopters and other camps. The main camp building works on solar panels with a diesel generator for backup. At the far end is a slightly divided second room with a couple of bunk beds for relaxing during the day (because of the constant activity in the hut, nobody sleeps there except in an emergency) and several desks with computers that have Internet access. All the cubbyholes in the hut are filled with extra clothing, books, science gear, and other odds and ends. The ceiling is festooned with Thanksgiving drawings, wire sculptures, and Christmas lights. Someone who had been coming here for many years could do a history of previous occupants from the artifacts that remain behind, just as historians are now doing with the Scott and Shackleton huts.

Lake Hoare camp

In addition to the main building, there are three small lab buildings, a Jamesway that is used for storage, and several rocket toilets. I can't describe the workings of the rocket toilet other than to say that when a toilet is full, it is somehow turned on and burns up all the waste (a black flag is hung outside to indicate the process is underway). The name is alarming, but they seem to work. Despite my difficulties with machinery, I found them to be more user-friendly than the usual outhouse here where you have to deal separately with different kinds of waste.

Sandy and I share a Scott tent down close to the glacier for sleeping. Everyone else has a small tent of their own somewhere up on the hillside. After my unpleasantly cold Happy Camper experience when I first arrived in October where I shivered through the night and frost nipped my finger tips, I wasn't looking forward to Antarctic tent camping. However, it wasn't cold last night, maybe in the 20s outside, and it was above freezing in the tent since my water bottle didn't freeze. My sleeping bag is rated to –50 degrees, and I had a thick foam pad, a Thermarest mattress, my pillow, and my stuffed cat. I also had an eye shade since it doesn't get dark. At least when you tent

in the Antarctic, you don't have to worry about other campers bothering you or insects or animals. I was comfy and slept soundly.


Tenting at Lake Hoare

In the afternoon, we took a six-hour hike up Lake Hoare, across Lake Chad, and around the Seuss Glacier to Mummy Pond. The hardest part was walking on the lake. It is now starting to melt slightly on the surface and is quite slippery around the smooth edges. If you walk more toward the center where the ice is rough, then you risk stepping on a melt hole where the ice has melted and refrozen right on the surface but is so thin that you fall through a foot or more into water. We put stabilizers on our boots, but they didn't fit well and so we moved slowly and uncomfortably over the ice, worried that we would slip and fall with every step. Eventually, we were moving so slowly that we left the ice and followed a path around the shore line, but it was equally difficult since it was rocky and hilly.


Seuss Glacier

The way was better when we reached the Seuss Glacier and began to circle up around its edge. This, again, is a cold glacier, that doesn't change shape rapidly. It's flat edge, some fifteen feet high, came down to form a slight trough that will no doubt run as a stream when the weather warms it just a little more. The hillside that it sits on is dirt, not snowy and not too difficult to climb. I could walk close enough to the glacier to reach up and touch its hard surface and yet walk on dry ground. I flashed on Ronald Coleman in the movie "Lost Horizon," trekking around the edge of icy mountains, with his beautiful love guiding him. Why wouldn't you stay young in a place like this where time seems to have no meaning? Time is so obviously an artificial construct in the Antarctic, irrelevant in a place that changes on glacial time.

When we reached the top of the ridge and began to descend, we could see Mummy Pond below us. It is a small icy lake with the glacier feeding it from one side and Lake Bonney crowding it on the other. Its name comes from the desiccated seals around the edges of the ice. We found four of them around the lake, several rather pleasant golden ones with their fur still intact despite the hundreds of years that they have been exposed to the elements. Mainly, I am told, they are crabeater seals rather than Weddells, and nobody knows how they got here or why they came. It's hard to imagine them slithering over our route up the ridge line next to the Seuss Glacier. Even allowing for possibly getting off course and being lost, it's hard to imagine them coming this far from the sea. Even considering that a few adventuresome seals might want to trek away from the pack for a special outing, it could not have been the sort of journey to write home to mother about.

The following day, we flew to the Beacon Valley, a majestic site of great sandstone and dolomite formations on the edge of the Taylor glacier. Dr. Ronald Sletten is tent camping out there with an assistant, living far from the relative comforts of heated field camp huts and walking for hours every day over extremely rugged terrain, to do his research. The camp consists of the two small tents, nothing else, in a slightly cleared area amid a boulder-strewn valley enclosed by a bowl-shaped rock formation thousands of feet high. Even communication is difficult. I spoke to him over an iridium phone connection the night before we left McMurdo and he had to reconnect four times before we could complete our short conversation since the satellite kept fading in and out. The graduate student he brought to work with him slipped on the rocky surface a few days after she arrived, broke three bones and dislocated her wrist. It took the helicopter support three days to fly in and medivac her out to Christ Church. Since nobody is allowed to work alone, Alan, one of my snow school instructors, flew in to help Ron.

Beacon Valley polygons

What Ron has found in the Beacon Valley is that there is a massive ice deposit, an ancient glacier, just a foot or so beneath the soil level. By dating an ash layer in the soil, he has determined that this ice is very old, perhaps the oldest ice on earth. It is at least 8 million years old and possibly as old as 20 million years old. Evidence of the cracking of this ice due to contraction during the rapid cooling of the frozen ground in the winter and the resulting disruptions of the soil can be seen in the polygon shapes so clearly visible from the air throughout the Dry Valleys, but especially in the Beacon Valley. Ron's study of the ice will lead to a better understanding of the stability of Antarctica's ice sheets and by extension, the Earth's climate.

Beacon Valley

At the tent camp, Ron met us and the helo then flew us down the valley to a site near where a variety of his soil and atmospheric measuring devices are located. To get there required a half-hour walk from the landing site out across an enormous field of rocks of all sizes and shapes. Many are ventifacts, rocks that have been sculpted into sharp ridges and worn smooth by the wind that blows most of the time in the area. Some of these are neatly organized into desert pavement but most are piled and jumbled, making walking hazardous with camera gear. On the edges of the valley are variegated formations much like the sandstone bluffs of the Four-Corners area, but on a grandiose scale and with glaciers dripping over their sides. I kept looking up the hillsides for bighorn sheep and down on the ground for Indian arrowheads. I took deep breaths of the cool air, longing for the scent of sagebrush. But, there is no wildlife and no visible vegetation of any sort. You hear no sounds other than your own breathing and the wind passing over your parka.

Back at Lake Hoare, we met Dr. Berry Lyons, part of the LTER team that is studying the ecosystem and climate of the Dry Valleys. Despite appearances in the Beacon Valley and at Lake Hoare, the Dry Valleys are from a sterile empty place. Antarctica is the coldest, driest, windiest continent on earth. Only 2% of the continent is free of ice and much of that land is in these Dry

Valleys. It is one of the most extreme environments on the planet, with strong winds blowing down from the polar ice cap, an average annual temperature of –4 degrees F and an average precipitation of only about an inch a year. Wildlife doesn't wander around here, except for the occasional suicidal seal over the millennia. No native people have ever lived here. No trees or bushes or grass grows here. Yet, life on the small scale is thriving here. Microbiologists are looking at the microbial life in the ice—and they are finding it down to the depths of the lake sediments. Dr. Laurie Connell is studying yeast, taking samples in the Dry Valleys and returning to the Crary lab to grow colonies (and she is finding species endemic to the Antarctic). Ron Sletten lifted off a piece of sandstone out in the wastes of the Beacon Valley to reveal the greenish stain of cyano-bacteria. Further up the food chain are rotifers, nematodes, and tartagrades. Anywhere that has water has life.

McMurdo, December 13, 2002. 28 deg F, 12 deg F with wind chill.
Who knows what interesting tiny critters will surface when we can sample other planets and moons? Scientists I have spoken with agree that as long as there is water, there will be life. What is it all about? You'd think that an answer might be visible in the Antarctic, if anywhere, a place where the light hurts your eyes and distances are so large that they cannot be judged by the human brain. But, this is a place where purpose is unimportant, where destiny is irrelevant. Human musings rattle around like a few grains of sand in the bottom of a 50-gallon barrel.

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 12

December 14-20, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 11

December 14, 2002. McMurdo. 25 deg. F, 12 deg F with wind chill

The weather this last week has been so pacific, so free of sturm und drang, that you can almost forget you are in the Antarctic. The seal camp researchers have all brought their huts in off the sea ice. The fish huts are finishing up tomorrow and will be towed off the beginning of the week. Before long, the ice runway will be unusable, and the planes will start landing on the ice shelf rather than the sea ice. Little rivulets of water are now running through much of McMurdo. It feels wonderful to walk around with the parka unzipped, just a t-shirt underneath, and no gloves or hat.

Observation Hill

One especially lovely evening, a friend and I decided to climb Observation Hill, a large volcanic hill that towers over McMurdo and served as a beacon landmark for arriving explorers early in the century. I tried to climb it when I first arrived in October, but the path was very icy so I didn't go all the way to the top. This time, the path was clear. It's a steep climb up volcanic cinders with a bit of a scramble over larger rocks at the very top but it isn't overly strenuous. We reached the top in about half an hour and had the tiny area with the cross all to ourselves. The view is spectacular in all directions—across the sea ice to Black and White Islands, down to Scott Base, over the ice shelf to Mt. Erebus, and down to McMurdo below. Scott's party climbed this hill and erected the large cross after they found him and his companions dead in their tent. Since the top of the hill is so small, with the cross in the center, you can't reach the top without remembering Scott and thinking of the hardships his party suffered. At the time, Apsley Cherry-Garrard wrote that they did not expect anyone to ever come to this place and see the cross again. Little did they anticipate that a field station of some thousand scientists and support staff would be built at the base of the hill and that workers would be climbing up it to work off their dinner.

Art DeVries

Sandy and I spoke for several hours with Dr. Art DeVries, the fish scientist, today. He grew up on a farm in Montana and first came to McMurdo as an undergraduate. He has been asking the same question for the 40 years that he has been coming to the Antarctic: Why don't the fish freeze? He has been studying the physiology of fish and larvae that live in the salt water here in temperatures that are several degrees below freezing. He has learned that the fish manufacture antifreeze glycoproteins that inhibit the crystallization of ice in their tissues. After all these years, he is still just as interested in exactly how the process works in the fish and now has the new tools of molecular biology at hand to help him find answers. Art is one of my favorite people here. He is a gentle curmudgeon. He fondly remembers the old days where there were fewer regulations and bureaucracy, but he manages to wend his way through the current climate and just keep working at what he loves to do.

One of the electricians said to me today, "This place is 360 degrees of wow."

Dream: I have arrived home with family for Christmas. Everyone is happy I am there. Dinner is about to start. I love being with everyone after such a long time away. Then I realize that I don't have a ticket back to McMurdo and I don't know if I can arrange it. I feel pain and despair because I want to return but I don't think I can get back.

December 16, 2002 McMurdo. 10 AM, 15 deg. F, 2 deg. F wind chill. The Hofmann fish camp was pulling up the last of their traps yesterday, in preparation for removing the hut from the sea ice. Since I have photographed many of their activities over the season, I enjoyed being included in the last outing. This particular hut was over near Scott Base, not too far from shore. The weather was overcast, a little windy, and chilly in comparison to the last week of sunshine and comparative warmth. Out on the sea ice, the wind blew the top layer of light snow into a strange flowing creature that rippled over the surface.

In the hut, a variety of problems with the generator slowed down the winching up of the traps. As I sat near the edge of the four-foot hole in the ice, a Weddell seal suddenly appeared, blowing air and foam from its nostrils as it reached the surface. On land they are sluggish but in the water, they are incredibly agile and hydrodynamic. Even though they are very large animals in this small hole, you can see how they use their tail and flippers and how easy it is for them to just flip upside down and depart. We closed all the window shades in the hut so that the only light was coming from the hole itself and the blue light under the ice and watched the seal swim up and down the hole. The seal was anxious, not about us, since he showed no fear of our presence, but of some other seal under the ice. He kept one eye down in the water, looking downward, nervous of attack from below. After several minutes of recharging his oxygen supply, he turned and swam down for another dive.

Bringing up fish traps

When the generator finally started and the traps eventually were

winched up from 1500 feet below on the sea floor, a variety of small fish and a lovely light-colored octopus had been caught. The sea floor has an amazing amount of life here. The Hofmann group has been keeping some of their finds in the aquarium tank here in Crary to show the community. I have convinced the carpenters shop to build a small Plexiglas aquarium so that I can photograph some of the fish and hoping that it will be ready in the next couple of days.

Later in the day, Sandy and I did an interview and portrait of Art DeVries. He then invited us to a party in the dorm lounge right before dinner. All of our fish friends were there, drinking wine and talking about the end of the season. Art was serving sashimi that he was carefully cutting from the cheeks of an Antarctic cod that had just been captured, along with soy sauce, ginger, and wasabi. It was a white flesh, very tender, and light-flavored, utterly delicious. After all the heavy galley food I have been eating it tickled my senses; it was a taste of a foreign world.

David Marchant and James Head

Today we talked with Dr. David Marchant, who has been studying the soil and ice of the Beacon Valley and other areas of the Dry Valleys where they meet the polar plateau for the last fifteen years. Like Ron Slatten, he has been dating the ice sheet below the valley floor, as well as taking core samples from the edges of the glaciers. He believes that millions of years ago the ice cap was at least twice as big as it is now and that it has very slowly decreased over the last 25 million years. It has not rained in the area that he has been studying for 16 million years. He brought back soil samples with him that contain tiny twigs and date back to the time before Antarctica split off from South America. He also brought back ice samples that are over a million years old, older than the cores taken at Lake Vostok. It is the oldest ice in captivity on the planet. He will be taking the samples back to do gas analysis on them, and I took a shot of him holding up one of the core slices that shows the bubbles of gas inside.

Ancient ice

The Dry Valleys of the Antarctic are pristinely ancient, unlike any other area of the planet. Topographically, they are identical to formations on Mars, according to Dr. James Head, who is a consultant for NASA. He has been here for the last few weeks working with Dave and is as excited as kid with a new Nintendo game. He is the man who chose the site for the first Mars landing vehicle and is been involved in the space program for more than 30 years. He told us that scientists have been unable to make sense out of the kinds of rock formations and topography that they see in the Mars photographs. When he went out to the polar plateau side of the Dry Valleys, he found very similar-looking situations. If he is right, this means that Mars at one time had glaciers…and if it had water, it had life. Marchant and Head believe that scientists will eventually find ice on Mars, quite likely buried under the surface soil layer. And, if Antarctica is any indication, they will find organisms in that ice that once lived or are still alive on the planet.

“We came to probe the Antarctic’s mystery, to reduce this land in terms of science, but there is

always the indefinable which holds aloof yet which rivets our souls." Douglas Mawson

December 17, 2002. McMurdo. 7 deg F, -34 degrees with wind chill. Sandy's flight out was delayed another day, so we went out on the sea ice this morning with Dr. James Raymond. His group has been drilling at different locations around McMurdo Sound, studying the sea ice diatoms that live just under the ice. The diatoms are a class of algae and apparently produce anti-freeze glycoproteins that keep them from freezing in 28 degree salt water (unlike diatoms in warmer environments). These glycoproteins share certain properties with the fish antifreezes, although they are different in structure. The diatom's anti-freeze proteins, unlike the fish's, allow it to attach itself to the ice surface without congealing.

Collecting diatoms

It was cool and windy this morning as we drove out on the sea ice. It has been so pleasant the last ten days or so that I had almost forgotten what cold fingers feel like. It didn't take long, standing in the wind, to realize I needed hand-warmers inside my gloves and a face mask for my cheeks. Even then I had to ball up my hands in the gloves to keep the tips warm. The driller moved the three-foot drill into position. The scientists wait until it goes down several times, bringing up crushed ice. Then at about eleven feet the drill begins to bring up sea water and the underside of the ice. The scientists use shovels and their gloved hands to collect the dirtiest-looking chunks to bring back and examine under the microscope in their lab. In this pristinely white place, dirty ice is hard to find. We joked that they could have gone to Chicago, Minneapolis or New York to collect dirty ice.

Diatoms

Later in the day, I looked at their diatoms under the microscope in the lab. Even magnified, they are still tiny. The Crary staff helped me set up the microscope with an adapter so I could use my digital camera to photograph what I saw. What was surprising to me was the number of different kinds of diatoms and how different they looked. Some were football-shaped, others were round, and others were lined up in short chains. I have a new appreciation for dirty ice.

From Stuart Klipper: "On this day in 1839, an American chemistry professor named John William Draper took a photograph of the moon with a camera made out of a cigar box. He used a process like Daguerre's, but he came up with it by himself; Daguerre hadn't made his invention public yet. The plate was exposed for twenty minutes, and the image was one inch across. It was the first time anyone in the U.S. tried to take a picture of something in the sky.

'The first photographic portrait from life was made by me,' he says, and 'the face of the sitter,' his sister Catherine 'was dusted with a white powder;' but a few trials showed that this was unnecessary."

December 19, 2002. McMurdo. 11 AM, 24 deg. F, 0 deg. F with wind chill. Sandy left this morning on the last flight out from McMurdo before Christmas. Many other scientist friends left

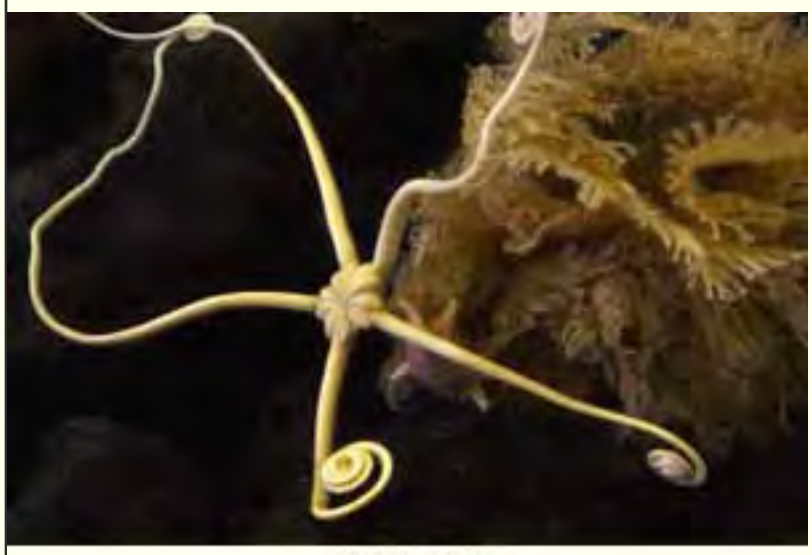
as well. It feels very quiet and a little dismal. Those scientists who are left are still working just as hard, but all the support staff is looking forward to a couple of days off next week. No other flights will depart until January. We are cut off from the rest of the planet.

This place may have lots of ice and snow but it's far from a Christmas place. Santa lives too far away to make the journey. Family and friends are not just miles away; they are continents away. All the small rituals and connections that one establishes over the years for the holidays are missing. For me those include the funky tree decorations that my kids made when they were in elementary school, the Cochiti pottery nativity scene, my mother's black and white meringue cookie recipe, and Gene Autry singing Christmas carols.

Sea ice

What is totally missing here is the consumer part of Christmas. The noise of Christmas is gone. There's nothing to buy here besides sundries, liquor, and t-shirts. Nobody is blaring Christmas music, trying to sell a product. The decorations that are hung on people's doors or in the galley are cut out of construction paper and scrabbled together. The handrails for the galley steps are wrapped in packing ribbon. It's an odd sort of quiet Christmas after the usual tumult of jangling music, fancy cookies and candies, parties, and last-minute present buying back home.

I chatted with Chico at dinner. He has been working in the Antarctic for 10 years, this year as a sheet-metal foreman. He has wintered over at Palmer and McMurdo. This year his daughter is here and working as a painter's helper. He has a house in El Paso and says this is his last year. It's comfortable at McMurdo. It's addictive because the community is the best in the world, but it's not solidly anchored in generations of family life. It's hard to have a life off the Ice because you're always thinking about coming back. But, you can't count on coming back here, he told me. You don't know from one year to the next whether you'll get a job or whether you will get medical clearance. You can't choose to live and work at McMurdo like you can decide to live in El Paso. You come here at the discretion of the NSF and Raytheon. In his free time, Chico does a weekly cartoon series for the Antarctic Sun, the station newspaper.



Brittle star

Yesterday, Mike helped me set up an aquarium for photographing fish and the strange invertebrates in the Crary tanks. The carpenter shop made a new Plexiglas aquarium, not too large, just the right size for photographing a couple of different species. Mike helped me collect some of the volcanic rock that is common on the bottom of McMurdo Sound, under the sea ice and fill the tank with sea water. I used a net to scoop out several of the small sea stars and fish and tried different techniques to photograph them. Since the room was very bright, I found I didn't need to use supplementary flash and could get sufficient depth of field to manually focus the entire fish.

I've never had the patience to photograph wildlife. Fish are even more difficult than mammals in

that they have no response to seeing or hearing you and don't perk up when you call out to them. The most difficult part of working with these fish is that the water in the tank is below freezing and whenever I have to put my hand in to move a rock around or to catch a fish, I have to be careful not to lose feeling in my fingers. They don't tire and are quite happy to swim from one side to another of the tank without ever stopping for their portrait. Fortunately for me (and sadly for them), many of the fish have been in the Crary tanks for some time and aren't swimming with their normal zeal. Still, after a couple of hours of photographing digitally, running back to my computer to check depth of field, and moving fish in and out of the tank, I had enough for the day.


Eelpout

What is most wonderful about photographing here at McMurdo (and it applies to all the scientists as well) is that you don't have to do all the ordinary chores of daily life. You don't have to go to the grocery store, worry about your car dying, or shovel your driveway. The galley staff cook the meals and wash the dishes, maintenance folks are constantly tweaking heat, water, and electricity to keep you comfortable, the Crary lab staff helps you with computer issues or to provide any equipment you need for your work. At home, the world is preparing for war with Iraq, and homes across the U.S. are bombarded with news reports detailing the evils of al-Qaida. Here in Antarctica, weapons are prohibited. We have no crime, no drugs, and very little real unpleasantness. Of course, sooner or later, everyone goes home, but until then you have the time and the support to do your work with minimal interruptions or stress. What a gift!


Snailfish

December 20, 2002. McMurdo. 4:30 P.M., 25 deg. F, -7 deg. F with wind chill. A blizzard found us last night and has played around station every since. You can only look on such a storm with reverence. Despite all the extra work that the snow drifts make for the work crews, you can't help but respect the beauty and power of the natural forces. Here at McMurdo where many support workers never get to leave the station to see the rest of the continent, this is as close to nature as you can get.

I photographed outside several hours this morning and again this afternoon. Unlike our previous storms, this one is warm. It's the first storm that I've been able to walk around and not have cold fingers. It's so warm that my parka, hat, and gloves were wet when I came back to my office. In earlier storms, the snow brushed off without sticking or melting. I could even stand in one place and plan a shot. In fact, I stood in one place so long preparing for one shot that a friend who walked by asked me if I had got my feet stuck in the ice.

It's not so easy to photograph in a blizzard. Even when it's not cold, you still have to contend with wind that tries to knock you down and snow blowing on to your camera lens. Once the lens gets wet, it's hard to dry it off and continue shooting. I keep the camera inside my parka until I'm ready to shoot. Then I pull it out quickly, turn it on, frame, focus, and shoot. If I'm somewhat protected from the wind, maybe I'll have time to put it on the tripod. After an hour or so, I begin to feel like I've been beaten up by the wind. Then it's time to come in, take off all the layers of

clothing, have a cup of hot chocolate, and relax before putting on all the clothing and going out again.

McMurdo blizzard

Chapel Christmas tree

"A blizzard is when the snow falls sideways," according to a child's definition hanging in the window of our little store. That child must have heard about our blizzards because they all seem to have snow blowing horizontally. They are usually more wind than snow, since this is such a dry place, but this one has dropped enough snow to make McMurdo look ready for the Christmas delivery. Santa has a long journey to come all the way down here but if he can make the journey, we'll be ready for him. Happy Holidays from McMurdo, Antarctica!

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 13

December 22-28, 2002

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 12

December 22, 2002. McMurdo. 12:30 PM. 23 deg. F, -3 deg F with wind chill.

Adelie penguin

"What an evening! The sun is high in the heavens in spite of the late hour. Over all this mountainous land of ice, over the mighty Barrier running south, there lies a bright, white, shining light, so intense that it dazzles the eyes. But northward lies the night. Leaden grey upon the sea, it passes into deep blue as the eye is raised, and pales by degrees until it is swallowed up in the radiant gleam from the Barrier. What lies behind the nigh-that smoke-black mass-we know. That part we have explored, and have come off victorious. But what does the dazzling day to the south conceal? Inviting and attractive the fair one lies before us. Yes, we hear you calling, and we shall come. You shall have your kiss, if we pay for it with our lives. " — Roald Amundsen

It is the austral summer solstice today. After a while, you get used to this continual light that never dims. As long as you can close your curtains a little in your room, you can sleep. But, if you wake up during the night, it's hard to go back to sleep. No matter when you wake, it looks like morning. Your mind doesn't believe that it's 3 A.M.

I did not sleep well and woke early on a Sunday morning. Finally gave up on sleeping and read for a while. No use getting up early on Sunday because brunch doesn't start until 10 A.M. Sunday brunch is the best meal of the week. Handmade waffles with berries and whipped cream, smoked salmon with cream cheese and bagels, sticky buns, omelets. Everyone is relaxed and sits around chatting and reading the weekly newspaper, the Antarctic Sun. Then it's laundry time or a couple hours of hiking or skiing. Monday morning comes all too soon for most folks

December 23, 2002. McMurdo. 2:30 PM. 24 deg. F., -2 deg F with wind chill. Today is Daisy Picking Day. Nobody can tell me where the name originated in this continent that doesn't even have a dandelion, much less a daisy. It's a station-wide initiative to pick up trash outside before the wind takes it out over the sea ice. Anything you find goes in one of the dumpsters, which are neatly labeled: Burnables, Food waste, Heavy metal, Wood, Glass, Plastic, Biohazard, Construction debris. Since all solid waste is recycled and removed from the McMurdo, proper sorting is essential. All the dorms have labeled containers for different kinds of waste and elaborate lists of what kind of trash should go in which bin. Aluminum foil it turns out goes into "Burnables," rather than Aluminum (which is reserved for aluminum cans). You can often see someone with an object in hand standing in front of the bins, puzzling over which is the proper container for it.

Christmas stocking

Christmas desserts

December 25, 2002. McMurdo, 10 AM, 24 deg. F, 0 deg F with wind chill. Christmas Day in Antarctica! From my window I see the white of the sea ice and the white of the sky with a thin line of blue mountains floating between them. It's as empty a landscape as any ever painted by a Japanese sumi-e master. Not a single tree, bird, or even vehicle occupies the foreground. It is as if the background had been painted but the artist never got around to painting the subject.

Gingerbread houses

Much of our Christmas happened yesterday. Dinner took place at three sittings in the afternoon. The kitchen staff once more outdid themselves. Bowls of shrimp for an appetizer, stuffed salmon, and a rib-eye roast of beef for the main course, accompanied by mashed potatoes, roasted vegetables, salad, homemade rolls, and a giant table of fruit, cheese, and desserts. How the kitchen manages to cook so well for so many is a mystery, but this meal was worthy of a fine restaurant anywhere. All of us pulled out our best clothes for the second time (after Thanksgiving). For most people, that amounted to a clean shirt and pants rather than overalls. The wine flowed. People sat with friends at long tables. For old-timers, McMurdo is their family, and they haven't spent a Christmas back in the States for years. In a place without shopping malls or Muzak, buying gifts is irrelevant. Much of the pressure of traditional Christmas is gone. For newcomers, it is sometimes an uneasy respite, a time to be concerned about family back home. One man I talked to had married shortly before coming down to work, and his wife was fed up with being alone and threatening to leave him. For another friend, her mother is so worried about her coming here that she breaks into tears whenever she

calls home. Despite such stresses, for everyone here, Christmas is the most laid-back two-day period of the work season.

As we ate our bountiful meal, I couldn't help but think of Scott, Wilson, and Shackleton struggling toward the South Pole in December, 1902, a hundred years ago. Their dogs were too weak to pull loads, and the men were struggling to pull 170 pounds each across the plateau on meager rations of pemmican, biscuit, and seal meat. They were hungry all the time and suffering from scurvy. Their eyes stung from snow-blindness, and their skin was dry and cracked. Yet somehow they were determined to enjoy Christmas.

Coffee House

"For a week we have looked forward to this day with childish delight. When we awoke to wish each other 'A merry Christmas' the sun was shining warmly through our green canvas roof." For the first time in weeks, they ate all they wanted—a breakfast of biscuit and seal liver fried in bacon and pemmican fat, followed by a large spoonful of jam. Later in the day they made a Christmas stew with a double serving of everything. "Meanwhile I had observed Shackleton ferreting about in his bundle, out of which he presently produced a spare sock, and stowed away in the toe of that sock was a small round object about the size of a cricket ball, which when brought to light, proved to be a noble 'plum-pudding.' Another dive into his lucky-bag and out came a crumpled piece of artificial holly. Heated in the cocoa, our plum-pudding was soon steaming hot, and stood on the cooker-lid crowned with its decoration."

Later in the evening, I joined a party given by the Hofmann fish group with many friends from the biology and Crary community. They had strung Christmas lights in the coffee shop, which is in a Jamesway that the Navy carefully paneled inside with wood strips sometime in the distant past. It's one of the old cozy buildings that the NSF keeps threatening to demolish even though it has character because it isn't efficient; meanwhile, it's a great place to go in the evening for a cup of good coffee or a glass of wine to chat with friends. In addition to several of the field groups studying fish and diatoms, our group included the head of Crary lab, the head of lab computer support, a Coast Guard captain, and Anne, who is a heavy equipment operator but once skied to the South Pole. One of the special joys of this community is the social mix of people doing different kinds of jobs. About twenty-five of us chatted, drank wine, and talked of anything other than work.

Everyone brought a small wrapped gift for a "White Elephant" gift exchange. When you put your gift down under the little artificial tree, you take a number. Then as each number is called, the person comes up and chooses a gift and opens it. Gifts are whatever each person has to share… from a partially drunk bottle of gin and a bottle of tonic (enough for 2 gin-and-tonics!) to a handmade hat to a tiny bottle of Essence of Polar (a faux perfume of made from lab alcohol by one of the scientists). You can also choose to steal what somebody else has opened if it is your turn, so often the best gifts go to several different owners before settling down. Someone suggested that if the wrapping or present included any red or green that everyone would take a drink… so with the cries of "Ooompah," it became a decidedly festive occasion. Being an early riser, I made it through a round of "Pin the Beak on the Penguin," a bit later in the evening, before calling it a night.

December 26, 2002 McMurdo. 7:30 P.M. 22 deg. F., -5 deg F. with wind chill.

Christmas day is a day of rest here, since our main celebrations were yesterday. In the afternoon, I walked over to the gym to watch a production of the "McMurdo Christmas Carol." Everyone brought pillows and blankets or sat on a parka on the gym floor. The story was a topical McMurdo telling of the familiar story. Scrooge worked at Fleet Ops and had been coming down so many years to McMurdo that he had not only forgotten the excitement of that first visit but had plans to commercialize the experience and bring in tourists. Needless to say, the ghosts of Christmas past, present, and future, showed him the error of his ways and with much laughter, the audience applauded the local talent. One of my friends from the power plant played the Christmas present ghost, dressed as a polar bear imported by the commercial scheming of Scrooge.

Put the Beak on the Penguin

Bowling alley

After dinner, I walked over to the bowling alley. Quite a number of friends had told me that I needed to stop in and photograph some evening. It is one of the few surviving alleys with hand-set pins. It evidently came to McMurdo in the 1960s but I suspect that it was acquired as a used system from an even earlier time. One of the bowling companies wants to buy it as a museum piece and has offered to give McMurdo a brand new alley in exchange. Fortunately, the deal has hung up over who is to pay the transportation costs. Kevin showed me around. It is quite a trip. It has 2 lanes with a funky ball return that runs down the middle. Since it was a slow night and only two women were bowling, Kevin was handling everything from collecting $3 per person for shoes and balls to setting pins. The machinery for setting the pins is quite ingenious. Kevin sits up on a ledge above the pins while the player bowls. The ball careens back with a bang and knocks over pins. Once it is safe, Kevin dashes down, picks up the pins and puts them into the machine, and returns the ball. After the second bowl, he lowers the pins, the metal sleeves release, and he pulls the machinery back up again. When someone bowls a strike, he has a wooden drum stick that he uses to strike a cymbal. Every week or so, they have "Cosmic bowling," where they use florescent pins and balls and turn on black light and a fog machine. I haven't bowled since high school but I'm coming back to try that!

Beaufort Island. Today was a special day. I wasn't sure whether I would make it out to Beaufort Island, even though it was listed on my projected itinerary for my time here. Very few people have ever set foot on the island. Only a few penguin researchers go there for a couple of hours several times during each season. The NSF did not want to give me a permit, since it is a specially protected area. They told me that there were no structures there and no human activity, so I should have no reason to photograph. I pointed out that it is a site of long-term penguin research. If scientists visit, it is relevant to my proposal. After lengthy consideration, I was added to a pre-existing permit and allowed to enter the penguin colonies at Royds, Crozier, Bird, and Beaufort Island, as long as a penguin researcher was present. Researcher David Ainley was kind enough to include me with his group visiting Beaufort Island today to check out the state of the colony.

Beaufort Island

Beaufort Island is a small island some 45 miles north of McMurdo in the Ross Sea. Its center is a tall volcanic mountain which extends nearly to the ice edge on all sides, leaving only a small rocky beach. On this beach the Adelie penguins have been living for centuries. On the far side of the island, where we did not go, is a small Emperor penguin colony living on the sea ice. Where the sea ice meets the land, large pressure ridges have formed, gorgeous blue jagged jumbles of ice. The Adelies pass through these ridges on their way to the water to feed, walking in long lines or pushing themselves down blocks of ice with their flippers.

Beaufort Island penguins

We flew by helicopter from Cape Royds, where I had been delegated to try and obtain a sample of the mushroom I photographed several weeks ago. Several science groups here are anxious to identify the mushroom and determine where it came from. They were quick to point out to me that my photograph, of which I was quite pleased, did not show the underside of the mushroom, which has the most salient characteristics for identifying which species it is. Then, they need a sample so they can check out its DNA. I could have at least taken a mirror and shown whether or not it had gills, they told me. Well, I practically had to stand on my head to get the shot I took and I don't carry a dentist's mirror around with me… and I wasn't about to pluck the mushroom from a protected historic site like Shackleton's hut. So, I promised them I would take sample bottles with me since we were stopping at Cape Royds to pick up Dr. Ainley and see what I could do. Sadly, after three weeks, no trace remains of the mushroom. It appeared to me that several feet of snow had fallen on top of it.

From Cape Royds, we flew to Cape Bird, where there is a small penguin colony. Three Kiwi researchers climbed aboard, and we set off for Beaufort Island. During the twenty-minute ride, we could see many seals below sunning themselves along the cracks in the sea ice. As we approached the island, it was clear that the sea ice has melted completely from the north side of the island and it is surrounded by water. On the south side near the penguin colony, it is impossible to land on the beach because of the penguin nests. The sea ice seemed solid but the helo pilot took no chances. After reconnoitering for several minutes back and forth across cracks, he very gently set the copter down on the ice near the shoreline. We remained buckled in while the co-pilot jumped down and drilled several ice holes to check out the depth of the ice. Finally, he shut down. The researchers grabbed their boxes of gear, I put on my backpack and took the tripod, and we all made our way gingerly across the cracks and pressure ridges to the beach.

Dr. David Ainley

Baby penguins

The Beaufort Island Adelie colony is large—some 50,000 birds—and much healthier than the one I saw earlier at Cape Royds. It is not far for the birds to walk to get to the water to feed. About 20% of the birds have nests, some with eggs, most with two healthy chicks. The chicks are tiny and gray and spend most of their time well covered by their parents. It is not easy to get good shots of them or the eggs because the adults are very protective. No wonder, with skuas flying constantly over the colony looking for available eggs or chicks to grab and eat. Broken eggs and the remains of penguin skeletons are scattered on the ground. Life here is not easy.

The skuas struggle for survival, as well. Several of them must nest further up the mountain because they dive bombed me as I got close to the upper edge of the colony. Four of them soared down, one after another, aiming for the top of my head. With their wings spread, they were like kamikaze pilots coming in for the kill. I put up an arm and they veered off at the last moment. After a very brief consideration, I decided that retreat was preferable to the picture I might get if I walked further up the hill, and as I moved away, they let me go without further assault.

We stayed on the island for several hours. The researchers weighed and tagged birds. The Kiwis attached an antenna and tracking device to a few nesting females to learn more about their feeding habits when they are feeding their young. I wandered along the edge of the pressure ridges, photographing the birds as they went out to feed and then walked slowly through the colony to photograph the adults feeding their chicks. As long as I didn't poke my lens right in their face, they ignored me. Small dramas played out in front of me—courtship displays, thievery, skua assaults and penguin defenses. I shot all the flash cards I had with me and wished I had several more.

Penguin bones and eggs

Beaufort Island is Antarctica as portrayed in National Geographic, the Antarctica that most folks who work in McMurdo never get to see. Most workers consider themselves extraordinarily lucky to see a lone penguin out on the ice runway, lost and searching for the rest of its colony miles away. Most only see a picture of a penguin in the town newspaper. Much of what appears in National Geographic is a result of careful framing to eliminate traces of our ongoing incursions into wildlife areas and less materialistic cultures. Beaufort Island is a magical place, a truly wild place. So few humans have been able to visit it that it has not been altered by their visits.

When I got back to my office, I was tired and very happy. I felt I had received a very special gift. I also smelled awful. The office stank so that one my friends who stopped by wrinkled up her nose at the doorway and asked me, “Are you sure you don’t want to put that into the freezer?” Nothing like walking around in a penguin rookery for several hours to acquire a distinctive aroma. I washed my boots off in the sink and took all my clothes back to my dorm laundry to wash.

December 28, 2002. McMurdo. 9 A.M. 27 deg. F., 11 deg. F. with wind chill.

The Hofmann fish group took a little time off last night to make ink prints on tissue paper of Pagothenia borchgrevinki, one of the most common fish that lives beneath the ice in McMurdo Sound. The fish is placed in a Styrofoam cradle with its fins spread carefully out. Then we painted the body lightly with a heavy oil-based drawing ink. A piece of tissue paper (rice paper would be much better but we don’t have any) is then carefully pressed down on the fish and then peeled off. The fish’s outline with all of its gills and scales and fins appears on the paper. I loved pressing down lightly on the fins and head and feeling the details of the structure of the fish through the paper.

fish printing

Top of the Page

Return to Photos

Previous Journal

Go to: Journal 14

December 30-January 5

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 13

December 30, 2002. McMurdo. 28 deg. F, 18 deg. F with wind chill.

Balloon launch

The morning was clear and warm as I walked from my dorm over to the galley for breakfast. I took a deep breath, as one does on such a pleasant day. And once again, I was disappointed. I've become accustomed to no children, no pets, and no insects but I can't get used to no smells. We do of course have the galley and food smells. With as many vehicles as McMurdo has to move crates, repair roads, provide transport, and grade runways, it's not unusual to catch a whiff of diesel fumes. But, that's pretty much all there is. With no vegetation and none of the usual soil decay, the usual smells of organic life on the planet are absent. The air is totally clean since we have no pollutants other than the vehicles for many hundreds of miles in all directions. When you breathe in deeply, you don't usually don't smell anything at all. It's like being in a sterile room.

All the senses are deprived, since there is little color or noise either. But for me, smell is the most difficult. I've found myself creating smells that are not there. A friend sent a picture of himself on the beach with a beer can, and I could smell the suntan lotion. Watching a hula troop in the Women's Soiree the other night, I could smell the moist sweet fragrance of Hawaii. It was so intense and I longed for it so much, that I found myself in tears.

Balloon payload

Yesterday, I went out to Willy Field (where they have recently moved the fixed wing aircraft runway) to see the launching of the first Long Duration Balloon (the ATIC project). During the austral summer in Antarctica, upper altitude winds form a vortex centered at the pole, so a balloon launched at this time travels with these winds, circumnavigating the continent in 12-15 days at an altitude of 120,000 feet, and returning close to its point of origin. At this altitude, above 99 percent of the Earth's atmosphere, the ATIC payload detects and measures high-energy galactic cosmic rays. I visited the balloon hangar a few weeks ago to photograph the balloon payloads. My mental image was of a small box but that was totally erroneous. The payloads for the two balloons to be launched this season are room-size winged creations that look as much like sculpture as science. BOOMERANG, the second payload, is especially beautiful with its foil covering and winged solar panels.

The launch of the balloon is logistically complicated since the fabric is only.7 mil polyethylene, about the thickness of dry-cleaners plastic, and the length of a football field. Conditions in both the upper atmosphere and on the ground must be perfect with very little wind. All of the electronic equipment must be checked and rechecked. The preparations go on for weeks with launch times being constantly set and then aborted. When the final countdown starts, the parachute is attached to the payload and then stretched out flat on the ice shelf. The balloon itself is slowly rolled out on a piece of cloth, attached to the parachute, and then inflated with .8 million cub meters of helium. Once inflation begins, they are committed to launch. I was allowed to photograph on the work site until inflation began so I was able to get good shots of the preparations. Once they release the balloon, it quickly springs up far above the parachute and then continues to fill as it ascends. What a lovely sight it was as it headed to the upper atmosphere—like a ballet dancer not subject to the pull of gravity! As I got back into McMurdo and walked to Crary with my photo gear I could see the balloon far overhead.

Notes on wind chill: The wind chill factor or wind chill index is a number, which expresses the cooling effect or moving air at different temperatures. It indicates in a very general way how many calories of heat are carried away from the surface of the body. The term was first coined by Paul A. Siple in 1939, the first Boy Scout to come to Antarctica. Siple was the youngest member of Admiral Byrd's Antarctica expedition in 1928-1930 and later made other trips to the Antarctic as part of Byrd's staff and for the United States Department of the Interior assigned to the United States Antarctic Expedition.

Balloon launch payload

Here at McMurdo, we have the following weather conditions:
- Condition THREE is anything better than condition II
- Condition TWO is when any one of the following are true:
Wind speed is between 48-55 knots
Visibility is less than 1/4 mile but greater than 100 feet
The wind chill is greater than -75 degrees F but less than -100 degrees F
- Condition ONE is when any one of the following is true:
Visibility is less than 100 feet

Wind is greater the 55 knots
The wind chill is greater than -100 F

January 1, 2003 McMurdo. 25 deg. F, -3 deg F. with wind chill.
Happy New Year! I always like to do something on the first day of the year that represents what I want to do most during the next year. Today that will be an adventure since I am to fly out in a few minutes to the Polar Sea, the Coast Guard icebreaker that is out at the edge of the sea ice some 45 miles from McMurdo. I had hoped to fly out yesterday and spend New Year's Eve with the Coasties. I got up about 5 in order to get to the launch pad with all my gear at about 6:30 AM but then fog rolled down and snow began to fall. The launch was delayed for an hour, then several hours. By mid-afternoon, my flight was finally cancelled for the day. By then, I was exhausted. I spent an hour photographing diatoms but came back to the computer to find them all slightly fuzzy. By early evening I was tired and in no mood to celebrate the year out. I went to bed early. Many others here had party time, but for most it's a work day today, like any other, and who has the energy for such a party!


Penguins admiring Dry Valleys

"Polar exploration is at once the cleanest and most isolated way of having a bad time which has been devised."
-Apsley Cherry-Garrard

New Year's Day is the time at the South Pole where the annual ceremony is held placing a marker at the exact location of the geographic pole. Since the bedrock below the pole is covered by several miles of glacial ice, the markers slide downhill toward the Weddell Sea at the rate of roughly an inch a day. The Pole moved 32 feet 8.4 inches during the past year. If the pole markers were left undisturbed and continued traveling at their present rate, they would fall into the ocean, about 840 miles away, in roughly 140,000 years. Making the Pole marker is an honor, and the one this year with an engraving of the moon rising over the old dome and the new elevated station is a work of art.

January 3, 2003. Polar Sea icebreaker. 23 deg. F., -2 deg F. with wind chill, cloudy.

The Coast Guard has three icebreakers of polar class (the Polar Star is in dry-dock in Seattle and the Healy is also in Seattle but works primarily in the Arctic). Every year one of them has the responsibility for cutting a channel through the sea ice in the Ross Sea for the boats that bring fuel and supplies to McMurdo for the following season. Without these deliveries, the station could not operate, nor could the South Pole Station. The 399-foot Polar Sea has the job this year under the command of Captain Miller…and a formidable job it is.


Cutting ice

The ship is an impressive bit of horseflesh. With a combination of turbines and diesel engines it is capable of 60,000 horsepower, more power than ten of the most powerful locomotives. Indeed, it

is the most powerful non-nuclear icebreaker in the world. When you stand on the fantail on the ship's stern, you see chunks of ice the size of small houses being tossed and overturned in the ship's wake as it plows through the ice. Alongside the boat, the ice cracks, tips and is thrown back. The power is awesome, the sight hypnotic.

Polar Sea bridge

That's when everything is working. The Polar Star is twenty-five years old, and the Coast Guard has no money to replace her. During the four days I was on board, she was using a combination of turbine and diesel engines, and one part or another was always breaking down. Out near the water edge, 45 miles north of McMurdo, the ice was only a few feet thick, and the boat made excellent progress, cutting five to ten miles a day. When I got on board, she was about 23 miles from McMurdo and was cutting well, except for frequent mechanical problems. I overheard one of the engineers say, "At some point, surely, we will run out of parts that can break down."

The ship breaks in the channel by ramming her front end up on the ice and using her weight to crack the ice below. She has a rounded bottom and almost no keel just for that reason. It means she can roll some 65 degrees in a bad storm (and the crew experienced one on their trip down from Seattle) but she does a great job of breaking ice. Part of its success is the sheer weight of the ship, which is in large part due to 1.5 million gallons of fuel on board. By our third day, when we reached a point some eight miles from McMurdo, the ice was considerably thicker—between eight and thirteen feet thick. What's more, it is third-year ice, ice that is sturdier from being compressed for several years. The ship's radar can see the channel that was cut last year and tries to follow that, since the ice is a little less strong with its mixture of third-year chunks and first-year ice holding it together. The force required to ram and crack this ice is prodigious. The ship rams her bow up on the ice, forces a crack here and there, then backs up and does it all over again. When I flew off this morning to McMurdo, she was about six miles from Hut Point but only making a few meters with each ram.

Ice channel

From the inside of the ship it is like being inside a metal battering ram attacking a major fortification. You can feel the movement forward and the moment of impact, and the follow-through of splintering ice. There is a short moment of calm while the propellers shift angle to back up, and it starts all over again. The engines and turbines run constantly so it's difficult to tell whether the boat is moving forward, backward, or at a moment of stasis preparing for the next attack. In my cabin down on the second deck, I felt like I was inside a metal monster bent on a demolition derby. Fortunately for sleep, the turbines are shut off from midnight to 8 P.M. for maintenance. Out on deck, the sound is tolerable and the motion more interesting than unpleasant. My cabin has two double bunks, a sink, and a bathroom with a shower. It's the "Women scientists's room," but I have it to myself right now. It's spacious enough, though its metal lockers, stone floor, and brown walls leave hominess something to be

desired. I am tempted to pin a few photos up on the wall but have none with me.

After three months of McMurdo good spirits, I find life a little dour on board. The officers are pleasant enough and work hard to help me get the photographs I want but they are simply doing their jobs, not loving what they do. The crew is mainly young, only eighteen to twenty-one and not college educated. Most sign up for three years at sea and then find they put into port rarely. It's hard to get leave on a trip from Australia to McMurdo. Even the captain gets only three weeks off a year. What is there to look forward to? No alcohol is permitted on board. There is nothing to buy and few perks: TV with old movies, an occasional bingo game, and Sunday night sundaes. The chief executive officer came from a small town in Iowa. He told me that he had never seen the ocean before and never taken a plane ride until he joined the Coast Guard. For him, like many young crew members, it was a way of finding new opportunities in a home situation that offered few.

Polar Sea liberty

The night we arrived, the crew was given "ice leave" from 6 P.M. to midnight. The ship rammed up on the ice. A gangplank was put down and everyone walked out on the sea ice. Beer was served. Some brought folding chairs and sat around in their parkas, drank beer, and talked. Most played football, hockey, or soccer or just walked around. Groups of penguins shuffled through the games, looking around at the strange creatures. They showed no fear of the vigorous activity all around them, and after looking about, proceeded on their way. The ship's doctor told me the next morning that he dreads such evenings because there are always injuries, and indeed I was surprised there weren't more since tackling one's fellows on the ice, which is considered good fun, is both precarious and potentially damaging.

While the crew partied, I accompanied diatom biologist Jim Raymond and his assistant Mike while they gathered chunks of algae-covered brown ice from the channel behind the ship for their project. Jim, who has worked in the Artic, has no fear of the icy water and jumped from chunk to chunk of floating ice, looking for the darkest samples. He was as excited as a small child over the magnitude of the diatom population. Before this trip he believed that they existed in only a few locations under the ice where conditions were perfect, but from watching the overturned pieces that fill the channel behind the ship, he believes that all the ice has a layer of diatoms beneath it, as long as there isn't too deep a snow layer to block light. The channel is speckled with brown ice. According to Mike, diatoms process 25% of the planet's carbon dioxide so they are a critically important part of the food chain.

Our food on board is excellent with fresh fruit always available for breakfast. One day we had great steaks with onions and mushrooms for lunch. Cafeteria food at McMurdo involves grabbing a tray, plate, and silverware, serving yourself from the buffet and then finding a table. Manners become a little lax, and some folks forget the plates and just pile food on their trays. To me that is efficient, but a little disgusting. Strange food combinations are the norm, so it's not unusual to find someone putting peanut butter on their mushroom omelet. On board the Polar Sea, life is more civilized, especially since I was asked to eat with the officers in their mess room rather than with the enlisted folks on the deck below. Place settings are neatly set out on tables with tablecloths and cloth napkins. Soup and salad are served first, followed by platters of meat, potatoes, veggies, rolls, and finally dessert. No wine, however, is served. The ship's executive officer heads the table. Yes, sir, and no, sir, are common, as is the use of last names. Being a Patrick O'Brien fan, I kept expecting Dr. Maturin to walk in for dinner and begin discussing his most recent penguin sighting.

Collecting diatoms

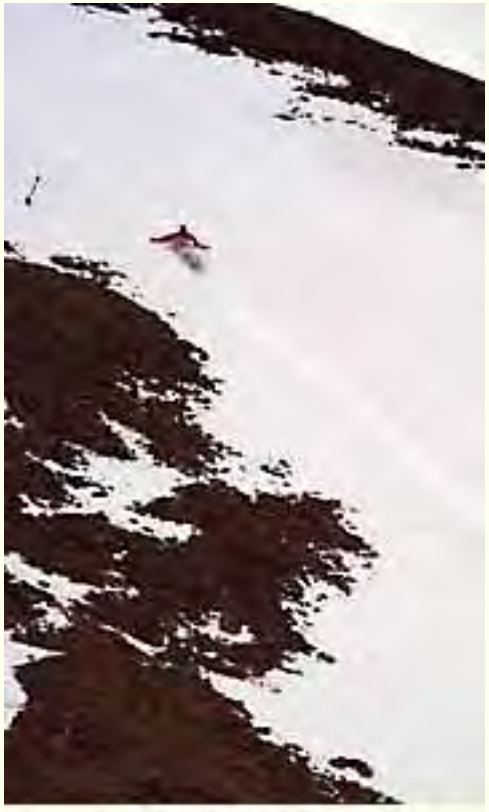
Rope ladder

Much of my time on board is spent climbing ladders. The ship is a labyrinth of staircases. For the first day I was completely turned around as soon as I walked a short distance because by the time I climbed up a ladder I would be heading another direction. "Just remember that your cabin is port aft and you can find your way back," I was told when I arrived. From the bowels of the ship, of course, it is impossible to get a sense of which direction the ship is moving. Fortunately, the decks are numbered, which helped a little, but I still had trouble finding the right ladder to reach the officer's mess. Photographing with the large Fujica was a challenge since when I carry the camera case and the tripod, I have no hand free to hang on to the stair railings while the ship jolts about ramming into ice.

I photographed some of the daily activity of the ship, including mechanics working on the engines and the lowering of the rope ladder. My mental image of crew members out swabbing decks and polishing brass has been largely replaced by crew members manning sophisticated computer read-outs of position, ice depth, weather, and mechanical functions. My most exciting photo op came when one of the Coast Guard helicopters landed on deck. You see this in the movies and it looks simple, but in reality it's a complicated and dangerous maneuver. At least six crew assist on deck, several in full firefighting gear, and all in flotation vests. At the last moment, I got a call from the bridge saying that I had been cleared to photograph. I dashed down umpteen flights of ladders to the hangar where I had to take off my parka and put on a blue flotation vest, complete with whistle, and a helmet with goggles. I couldn't understand why I was being asked to dress for possible water immersion when all I wanted to do was stand quietly in a corner and photograph the helo. Without my parka I was cold, even with gloves and the vest. When the helo arrived a few minutes later and began to descend to the deck, I finally understood. The air from the blades rushes out with terrific force, and there is no railing on the flight deck; several crew members grabbed my vest from the rear to keep me from blowing overboard as I tried to frame a picture.

January 5, 2002. McMurdo. 2:30 P.M. 25 deg. F, -4 deg F with wind chill.
Today, back in MacTown I photographed the Scott's Hut race, a 5-k run held just before Sunday brunch. Since it was snowing and the wind was blowing some 20 mph, it didn't look like a whole lot of fun to me, but for some 50 people it was anything from serious business to a weekend amusement. For $15, you get a number, a t-shirt, a chance to win a dinner for two in Christ Church, and a good time. Not bad. I am constantly surprised at how many different ways folks find to amuse themselves here with minimal resources.

Race beginning



Plastic sledding

Top of the Page

Return to Photos

Previous Journal

Go to Journal 15

January 6-January 9

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

Journal 14

January 6, 2003. McMurdo. 27 deg. F., 27 deg. F with wind chill, cloudy.

Dr. Barth Netterfield, a cosmologist with the Long Duration Balloon Boomerang project gave last nights lecture on the universe, the beginning of time, where we're headed, and things everyone wishes they knew but don't. Our universe, he said, went from a singularity (which we don't understand) to a beginning (which our physics won't explain) to plasma, hot and dense. It is composed now of normal matter (about 5%), dark matter/particles (about 35%), and something they are calling dark energy because they don't know what it is (65%). The dark energy is forcing it to expand, and it is cooling as it expands. That expansion is accelerating and will continue to do so forever until it approaches a state empty of matter. It is a Euclidian universe, not curved or bent or closed, and now some 14 billion years old. It was cosmology for the novice, told with such graphic examples that I didn't glaze over in frustration at the abstract mathematics of it all. When someone asked him to give us perspective on how much we know about the universe in comparison to Galileo, he said it was like an onion. You keep peeling layers off but the onion keeps growing larger. "The more we learn the more there is to know." Which is why we are here in Antarctica.

News for the day: The salt water intake pipe for the water plant has frozen up, leaving the station with a three-day supply of fresh water.

Before the lecture last night, I went out with several friends who wanted to do a Polar Plunge. This is not a sanctioned activity by the NSF but the powers-that-be prefer to turn their heads the other way rather than to forbid it. To do the Polar Plunge, you have to take off your clothes and completely submerge in the below-freezing salt water of McMurdo Sound. My friends were younger than I and more open to new experiences; I made it clear that I was along to document, not participate.


Polar Plunge

We walked out a short distance on the sea ice to a small unheated hut with a dive hole used occasionally by the Kiwis. Allen brought with him an ice axe to enlarge the opening and a long-handled net to scoop out the several inches of brash ice that covered the top of the water in the hole. Barbara, who had decided to go in, had come prepared with a bathing suit (claiming modesty) and socks. Allen attached a large rope to her waist just in case she didn't surface immediately (the heart can stop with the shock of the sudden cold). She hesitated only a moment on the edge of the hole and then jumped in. After she was helped out, her hair covered in brash ice, her teeth chattering, Judy came next. She was less determined and a moment of panic set in as she sat on the hole edge and realized what she was about to do. Allen encouraged her. Finally, she held herself up by her arms over the hole until her arms gave way and she fell into the water, emerging with a cry a second later. Everyone left satisfied, either by the spectacle or the experience….ready for a drink at the Coffee House.

Carpenter's Shop

January 7, 2003 McMurdo. 29 deg. F, no wind chill. Partly cloudy.

For the last couple of days, I have been photographing some of the activity of the Raytheon support staff around the station. After all, the scientists are outnumbered several times by the support staff here. You wouldn't think it would take so many people to keep the station in operation, but the longer I am here the more I understand why the support system is so large. When you only have twenty scientists you can get by with a minimal support crew, but by the time you have 150 scientists, you not only need a support crew, but you need a support staff for them. By the time you get this many people, you need administrative help for planning the logistics, staff to help move everything around, and supervisors. At Scott Base, everyone helps wash the dishes; here, we need a dishwashing crew. Over the time I've been here, I've come to know many of these people who work on station. When I mention at lunch that I want to photograph people working at their jobs, I quickly get invitations.

Metal Baler

Yesterday, I hiked up to the top of McMurdo (which is built on quite a hill) to Fortress Rocks and photographed part of the waste recycling system. Anne invited me to come up and see the strange machinery since she was working with the wood chipper and the light metal baler. When I got there, the chipper had suffered mechanical problems, but the baler was munching up large metal conduit and squashing it into rectangular cubes. While I was photographing there, several folks came up behind me and said they thought it was the coolest machine on station. Everyone likes to operate it. It has great pincer jaws that grab the metal and dump it into the hopper, the cruncher squashes it, and then the pincers lift the cube out. Like much of the heavy equipment here, it was being operated by Denise, who was happy to lean out her window and smile at me. I don't know why so many dozers and forklifts are operated by women here, but I've also seen women mechanics, plumbers, electricians, and just about any other trade occupation you can think of. 40% of the work force here is female, but the percentage is higher in the heavy equipment operation.

Today, I walked down to the new Waste Water Treatment Plant, which is under construction and due to be finished in about a month. For the first time ever, McMurdo will not be dumping raw sewage into the ocean. It's a giant building with enormous tanks and lots of outside plumbing that requires heat tape and thick insulation so that it doesn't freeze. I photographed plumbers, electricians, welders, pipe fitters, and carpenters.

Waste Water Plumbing

In the evening several of us walked down to Hut Point to look out at the icebreaker. The Polar Sea has been making better time over the last twenty-four hours and is now approaching McMurdo and only about 3 miles away. The weather has improved somewhat as well, but we haven't seen the unfettered sun in weeks.

Forty-seven years ago today, John Williams broke through the sea ice north of McMurdo in his bulldozer and drowned. In January of 1956, the Navy had begun Operation Deep Freeze to build US stations on Ross Island and at the South Pole in Antarctica. The icebreaker got stuck in the sea ice, some 40 miles from where McMurdo is today and made slow progress. The ninety-three men began to worry that they wouldn't have time to build shelter before the coming winter. None of them had any experience on the sea ice but they set out on foot and by tractor to reach Hut Point. The ice was rotten in many places. When they reached an especially bad three-foot open water crack, they put down large timbers and started across. First Class Petty Officer Bevilacqua, then 25, walked and driver U.S. Navy Petty Officer Richard Williams drove a tractor. In an instant, the tractor broke through the ice, and Bevilacqua and the driver went down. The driver and Bevilacqua hollered to each other: "Jump." Bevilacqua came to the surface and then dove repeatedly in the icy water to look for Williams, but no trace of him was ever found. Willy Field, where the large Hercules planes now land and where the balloon launch took place, is named after him.

Waste Water Pipes

January 8, 2003. McMurdo. 33 deg. F., 10 deg F with wind chill. Partly cloudy.

John Behrendt gave a lecture with slides from his work in Antarctica over six decades. He first came down with the IGY on the Ronne expedition to the Weddell Sea and then visited McMurdo a few years later. Not a single building remains from that early period on station, he said. What are the biggest changes since that time? The presence of women (which made the place more civilized and pleasant), the advances in telecommunications (which made it considerably less isolated), and the civilian administration (the NSF rather than the Navy). What does he see as likely changes in the next few years? More tourists.

People are willing to pay lots of money to get to Antarctica, especially the South Pole, to the considerable amusement of the working folks of McMurdo and Pole who are getting paid to be here. A pair of Irishmen just gave up at an attempt to get to the pole with sledges pulled by very large kites. Last year five people ran a marathon at the South Pole at a trip cost of $25,000 each. The NSF frowns on all these endeavors and refuses to provide support for them. A recent group of wealthy independent travelers, who flew into the South Pole and got stranded due to poor weather, were refused the comforts of the Dome and had to spend several days in tents out on the polar plateau. Since the temperature on a good day at the South Pole reaches a –20 degrees, they must have had enough unpleasantness to make a juicy adventure story when they got safely home.

Petrified Wood

My roommate came back from a week at Odell Glacier near the Allan Hills. She brought back a beautiful piece of petrified wood that she found hiking in that area for me to photograph. It's hard to imagine forests in this icy world. However, during the late Paleozoic age, from about 310 to 275 million years ago, all the continents were connected in a single land mass, called Pangea. What would eventually become Antarctica was situated in the south polar portion of the Pangea super continent, but it looked much different. Glaciers lined the edge of a huge lake with submarine slumps and slides along the lake bottom and icebergs floating on the surface. The lake was gradually filled by large deltas and braided rivers. As the climate warmed, plants took root. Forests grew near the Pole with ferns growing beneath them. Dinosaurs roamed about. This rock came from the Triassic Lashley Formation, a sequence of sandstones deposited in a braided stream and flood plain environment 225-190 million years ago. The rock is heavy. When I photograph it, I hold the history of the planet in my palm.

Laurie Connell

One group of scientists that has an office and lab near mine in Crary is Dr. Laurie Connell's group studying yeast. We've become good friends, and I stop in every so often to chat and see how their cultures are doing. They have a good balance between work and play, and we occasionally hang out together in the Coffee House in the evenings. The soil community of the Antarctic polar desert out in the Dry Valleys contains few endemic species of bacteria, fungi, and invertebrates. The yeasts are an important part of the ecology of the polar food web and are probably the primary organisms that synthesize the sterols required by soil invertebrates. This group has done lengthy transects across several of the Dry Valleys and then brings back soil samples to the lab and cultures the yeast. The last time they brought samples back, they had a factory operation going, preparing some 5000 samples in petri dishes. I photographed them hard at work and some of their cultures.

January 9, 2002. Onset D, 15 deg. F, -20 deg. F with wind chill. Clear.

25 knot winds pushed me and my cameras along as I walked from the shuttle to the Twin Otter at Willy Field. Snow began to blow across the runway. I wondered if I had made the right decision to leave behind my comfy and busy life in McMurdo to fly six hours in a small plane across the ice shelf to the remote field camp of Onset D. The offer to go on the flight had come with little notice and offered an opportunity to photograph a deep field camp. I am not a good adventurer. I'm a coward and a wimp. I don't like cold. I don't like sleeping in a sleeping bag in freezing weather in a tent. Each time an "opportunity" like this comes along, I inwardly moan. Unlike many folks here, I don't get high on unexpected hardship. But, I'm here to take pictures and I won't turn down adventures just because of anxiety and discomfort.

Twin Otter crew

Once airborne, we quickly rose above the clouds and wind. I was the only passenger and rode in the back seat. The center of the plane was piled to the ceiling with lashed cargo pallets, leaving me a tiny compartment from which I could not see the three crew members. After passing White Island, we traveled across an area of Antarctica where there are no mountains, only the flat ice shelf as far as the eye can see. No rocks or mountain formations, just hundreds of feet of ice. The surface of the snow and ice varies; it's not featureless. In some areas it is composed of endless ripples, sastrugi they are called, waves of snow and ice blown into waves like sand dunes in the desert. Sometimes, the patterns appear more curved and random, like hand-troweled plaster.

]You don't get a sense of scale of Antarctica from living on its edge in McMurdo. You can travel a ways and it looks just the same. You go further and it still looks just the same. You go further, and there's still more, as far as the eye can see in all directions. From McMurdo to Siple Dome, where we set down for fuel some 3 _ hours into the flight, there is no human structure or activity. No remnant even exists of former human activity. Nor is there any non-microscopic life form. What

an empty place! I could see a horizon that separated white ice from blue sky; otherwise I would have believed it a void, a place empty of even our projections It isn't really a landscape at all since nobody has had much luck encompassing it in literature or art.

Siple Dome is a small field camp of three people who have had the job this season of removing what remains of a site where much of the early ice coring was done in years past. I would have loved to photograph that process. The cores are a way of seeing time. But, nothing is left to photograph from that operation since all the machinery has been taken away. What remains of the old camp is now crated and ready for aircraft removal in a few weeks. My friend Alice works here and was driving the fork lift when we unloaded some of the pallets in the plane cargo. She and I met on a walk to Hut Point in October and she told me she was going to work four months with two men she didn't know at this isolated station. A day later, her mother died and she flew home for several weeks. But she returned and was clearly enjoying herself and proud of what their little group had accomplished.

The sky was a perfectly even blue that bears down heavily on you rather than rising in a dome overhead. "We live in the Banana Belt here, one of the workers told me. "You folks in McMurdo should be so lucky as to have this kind of sunshine!" The pallets sit on a slight ridge at 2200 feet elevation. No outcropping or distant telephone wires mar the view. 360 degrees of white. As he told me, "When I climb up on that big box over there I can see to the end of the world in every direction."

Onset D camp

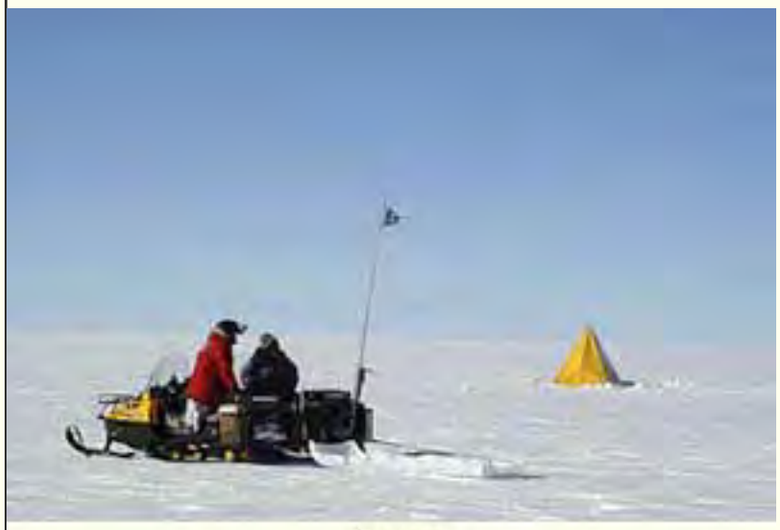
Another hour and a half of flat white, and the plane landed at Onset D, the largest of the field camps this season. Out here on the West Antarctic ice sheet, the camp is dwarfed by the white expanse that surrounds it further than the eye can see in all directions. Flora, the cook, is the only woman with fifteen men. She told me she lives along the Yukon in Alaska, and this is her first time in Antarctica. She got the job by simply applying on the Raytheon website. She has enjoyed it, she said, though she wishes there was another woman or two for company. She is hoping to cook next summer at Palmer Station on the Peninsula. The men love her cooking. No wonder; we had roast beef, lobster tails and crab legs for dinner last night, and a wonderful vegetable frittata for breakfast with several kinds of homemade breads and muffins.

Sridhar Anandakrishnan, the primary investigator on this project, is studying the topography beneath the ice sheet some mile and a quarter below us by blasting and doing detailed seismic readings. In particular, he is studying the ice streams, the sections of the ice sheet that move much faster than the surrounding ice, to understand what is happening on the bedrock below. Much of their work is being done by skidoo. They often commute 20-30 minutes each day to their work site, do their blasting, and then return at night. As we flew in, we could see where the ice streams meet the regular ice because there is a shear zone, an area of fractures and crevasses.

I photographed the camp—the Jamesways, the tents, and flagpole. The large Jamesway is the center of camp life. Inside are the kitchen and dining areas, a cold pantry, and an entry area with a place for coats and the radio and computer links. Communication is more primitive out here, but satellite does provide an Internet connection for several hours a day and radio gives a scratchy link with McMurdo and the South Pole. Along one side of the main area are two sinks with cold running water and drains; all water is frugally used, however, since it all comes from the usual pot on the stove of melting snow. Chunks of ice are placed on a sled, dragged to an open window, and shoveled into a melt drum.

Onset D Jamesway

At meal time everyone grabs a plate and cup and helps themselves to the food from the large pots and casseroles. Nobody ever goes hungry in a field camp, and the food is delicious. At Onset D, where the temperature is 20 degrees colder than at McMurdo (about 10-15 deg. F. while I was there), you burn calories so quickly that you eat more than usual and probably still lose weight. Even at McMurdo I seem to eat about 30% more than I do at home and don't seem to gain weight even when I do little more than work at my computer much of some days. At Onset D, I heap my plate with food and then come back for a large piece of fruit tart.



My tent

I slept alone in a Scott tent that had been set up in the tenting area to one side of camp. I've never seen this sort of tent elsewhere, but it is very functional in the Antarctic; as long as there are a couple of people to put it up, it erects quickly and comes down easily. You sort of roll in and out of a Scott tent since it has a double set of drawstring circles for the opening. It's not a graceful exit but the double drawstring is very effective at keeping out the wind. Despite my apprehensions about the cold, I slept deeply and well and was toasty warm in my sleeping bag.

At one side of camp on a slight berm is Al's castle, a snow-block creation with turrets and a curved wall. Al, the mechanic on station, was elusive, and I never managed to meet him. When I said I wanted to meet him, excuses would be made: "Al's an early-morning person" or "That's him way over there on the storage berm, can't you see him?" A smile would follow. I did photograph his construction and was amused that when I walked behind the blocks, I could see his small yellow tent sheltered by a front and side wall. He had built a Hollywood façade, not a solid structure.

Before we flew back, Spore, the camp manager from Bozeman, Montana, drove me out on the ice sheet in the Tucker. The Tucker is like a tractor and was so high from the ground that I had a hard time reaching the hand holds to pull myself up in it. It is another one of the strange tracked vehicles that abound on the Ice from bygone eras. The Tucker dates from the 80s and can travel through either soft snow or over ridged ice with east at the robust speed of 10 mph. We drove away from camp in a straight line toward Siple Dome for about half an hour. To my surprise, the flat white wasn't really flat at all but composed of long rises and valleys. We would see camp for a while, then lose sight while we descended, then see it on the next rise. Ahead of us, there were no tracks, nothing but ice and sky. It was eerie to believe that we could drive all the way to McMurdo (given a large supply of fuel) without seeing another trace of human life.

Al's Castle

Tucker Tracks

The flight back was long but uneventful. A couple of the guys from camp returned on the flight, exuding a powerful aroma from weeks of camp life into the plane's cabin. We landed in a blizzard at McMurdo. The snow was blowing so thickly across the runway that we couldn't see the runway lights until the last minute or so. My pager rang as I landed: the Polar Sea had just docked at McMurdo.

Top of the Page

Return to Photos

Previous Journal

January 12-January 18

Antarctica Journal

"Why does Antarctica matter? Why go there? Why have men and women risked life and limb in such a hostile environment? Why do we still spend money for research there? This photographic project, with its resulting exhibitions and book, will suggest answers to these questions by linking the past years of exploration visible in historic huts with the ongoing research at McMurdo, field stations, and the South Pole, as seen in the structures that cling to the Antarctic ice and in the faces and stances of those who work there."
-Joan Myers

This is my final journal from Antarctica.

January 12, 2003. McMurdo. 23 deg. F, 20 deg. F. with wind chill. Cloudy.

McMurdo peace sign

This will be my final journal from Antarctica. I plan to leave January 22 on the Russian icebreaker, the Khlebnikov and return via Cape Hallett, Terra Nova, Cape Adare, and the Balleny Islands to Christ Church, New Zealand, for a couple weeks vacation before returning home.

Antarctica is the world's premier meteorite hunting ground. ANSMET (the Antarctic Search for Meteorites program) has retrieved more than 10,000 specimens from locations along the Transantarctic Mountains in the last twenty-five years. Since it is not possible for me to photograph the group hunting meteorites out on the ice sheet, I arranged to photograph three meteorites that were found here in Antarctica, now in the collection of the Smithsonian Institution, which are kept in a locked case in the Crary lab. To get permission to do this and to arrange the session took several weeks.

To prepare the slab of ice that the meteorites sit on, I found a large white plastic tray and filled it with distilled water. A friend helped me carefully transport it on a cart into the –25 deg. Freezer room. Then, we left it to freeze. Since I got called away for a couple of days, it sat about 4 days and a large crack down the center of the ice split the corners of the plex tray. So, another week passed while Huck sealed the edges and taped it up. I filled it again. This time, as we rolled it up the ramp, I let my end of the cart down too soon, and water spilled into the cart. Susan brought rags and I mopped it up as best as possible. When I was ready to leave the freezer, I realized that she had closed the door when she left and I couldn't get it open again. At –25, I was getting cold very fast and beginning to panic. I pulled harder but it wouldn't open. Since nobody was likely to open the door for another day or so, I could just imagine my body being found frozen solid… frozen to death in a freezer in the Antarctic! Then I found a little handle with instructions on

Iron meteorite

turning it counterclockwise in case of a failure to open the door. I turned it until it fell off in my hand and then gave the door a very hard yank… and it opened.

The actual photo session was less traumatic. Susan helped me wheel the tray of frozen ice outside the lab on one of the loading docks. We handled the meteorites with gloves and kept them in plastic containers when they weren't being photographed. The two smaller meteorites are ordinary chondrites (found in the Elephant Moraine ice field) from the asteroid belt, made up of millimeter-sized spheres called chondrules originally formed in the solar nebula. The third, more unusual, and larger one (from the Darwin Mountains) is iron, part of a planetary core thought to have originated in the asteroid belt. This larger meteorite is only about nine inches long but weighs 22 pounds. Estimates are that they are at least 4.56 billion years old. Can this be? The geologists assure me that it is so. I have to hold the heavy meteorite with both hands because it is so heavy. With its weight and dark color, it quickly begins to melt a hole in the ice so I have to shoot quickly. I am shooting and handling one of the oldest objects on Earth.

MAAG

Many people here have wacky creative talents. Last night I went to MAAG (McMurdo Alternative Art Gallery). This is another of those events that isn't Raytheon or NSF sponsored but is a community creation. It's held in the Mechanical Equipment Center where much of the machinery around station is serviced and has a funky, industrial feel. Anyone who wants to can do a performance piece or make a piece of art to hang on the wall. An electrician's apprentice did a piece where he sat with his hand on his knee in a single position for an hour and a half without moving. He told me later that he had more women come up and kiss and hug him, trying to get him to move, than he had touched all the time he has been here. A booth was set up giving "Bad Advice." A shadow puppet show was mounted. The highlight of the evening was an industrial fashion show with a walkway where men and women strutted in bubble wrap and duct tape. The final model was a man with angel wings and a minimal crocheted bikini who descended by a crane from the ceiling, grabbed the previous male model who was dressed in foil overalls, and ascended to audience cheers. That's when the wine was flowing, the music was gearing up, and the party was just getting going, and I went home to bed.

Paint Shop

Carpenter Shop

The McMurdo community, I am convinced, is the finest on the planet. The filter system that gets people down here makes sure that they are healthy, don't have AIDS, don't bring drugs with them, and have no weapons. Life here is remarkably free of violence; I am unaware of any fights, rape, or assault. People are kind, and many go far out of their way to offer assistance when they see it is needed. Conversation is on a high level, whether you chat with janitors, administrators, or scientists. You get the sense that most people want to learn, that they are interested in the world around them, and they care about their lives. They are not just doing work to pay the bills. They are not just floating through life.

McMurdo station

Early tonight, I went to a reception for John Truesdell (Deputy Assistant Secretary of the Air Force) and Col. Dick Stedding (Air National Guard). McMurdo has a constant stream of Dvs (Distinguished Visitors) passing through. The NSF finds that showing people the program in action is the best way to get support for it. McMurdo has a special building, Hut 10, that is furnished like a home with small living room, dining area and kitchen for small receptions and parties. I worried that my dress might be too casual for the occasion (fleece tights, a tunic, and hiking boots are hardly D.C. attire) but I did put on some lipstick and combed my hair. Nobody else did anything more… down here, a clean shirt is a major concession. I haven't seen a suit on anyone, visitor or otherwise since I got here. It was a pleasant affair with an enormous tray of shrimp and another of grapes and watermelon. John Truesdell, who is living night and day at the Pentagon when he is back in the States, gave a short speech describing how much energy is going into war preparations at home and how the Antarctic program will be still functioning and producing good science long after those concerns have passed. From my perspective in this peaceful continent without weapons or nuclear materials, the world outside has gone mad.

Today I photographed a wedding ceremony, actually a renewal of vows, held at Hut Point. The couple lives in Alaska, and they were first married on a glacier there so they felt it appropriate to do a vow renewal ceremony at McMurdo in their parkas and gloves. Hut Point is always windy and cold so our small group of well-wishers was dressed in ECW (extreme cold weather) gear, and the ceremony was short, followed by cake and coffee back in the galley.

January 15, 2002. McMurdo. 22 deg. F., 11 deg. F. with wind chill. Mainly cloudy.
Another group of Dvs arrived last night, seven Representatives from Congress on the House

Science Committee and Rita Colwell, the director of the NSF. They were supposed to arrive on a C-141 which takes around five hours to get here, but because of weather they were instead put on a Hercules which takes about nine. The plane launched, the weather improved here and the C-141 took off, getting here before they did. Welcome to Antarctica.

Fortune for the day, compliments of the Housing Department (a slip of paper pulled out of a fish bowl): “And if not now, when?—Talmud”

I chatted again last night with John Truesdale, the Deputy Assistant Secretary for the Air Force, whom I have met several times while he has been here. He was holing up in the Crary lounge until the C-141 arrived in to transport him back to Washington, D.C. “There’s no way we want to run into those Congressmen,” he whispered. He told me that he had loved seeing the program here but was utterly exhausted. “First, we fly to the South Pole, walk around in the cold for several hours and fly back, then the next day we spend eight hours in a helicopter seeing all the field camps near McMurdo, and then yesterday we went aboard the Polar Sea and climbed up and down all those ladders. Now we have another very long flight home, where I have to immediately go to work at the Pentagon.” It’s a tough life being a Distinguished Visitor.


Snowmobile

It’s not always easy being a photographer either. I’m exhausted and stiff today from a great outing yesterday to the IMAX crevasse, so called because it was used a shooting location for an IMAX film several years ago. Eric, a mountaineer, and Dawn, the Field Support Coordinator, and I set off from the transition area near Scott Base about 10:30. Although I have been on snowmobiles a number of times, I hadn’t actually driven one before. I am such a klutz with machinery that I was apprehensive; both of the snowmobiles I rode on when I was on Erebus died and required major repairs…and I wasn’t even driving them! We all dressed for cold with balaclavas, hat, goggles, bear-paw gloves over fleece liners, and our parkas. I put hand warmers in my gloves, knowing it was an hour drive. We set off in single file, following the flat track to Windless Bight on the south side of Ross Island. The temperature was in the mid-twenties, not especially cold, with little wind. Snowmobile driving isn’t difficult, since you have only one gear and a throttle, so I got the hang of it quickly and felt comfortable. The weather slowly closed down as we drove, however, from a light overcast to a milky soup. The route is flagged so we could see a couple of flags ahead of us but the tracks on the ground blended perfectly into the surrounding ice and sky so that we couldn’t see bumps or potholes until after we had driven into them.

About an hour out, we stopped near a rescue Scott hut, called locally “room with a view,” but this day it was without view in the white world that enveloped us. We spread sandwiches out on the seat of one of the snowmobiles and drank hot cocoa. Eric said we were at the edge of a dangerous area The crevasse was not much further, and we would need to rope up. I wondered to myself whether it made sense to head out across a major crevasse field when you could hardly see your own feet. We drove the snowmobiles a short distance further to a pair of crossed black flags and shut the machines down. We put on harnesses with locking metal karabiners and roped ourselves together. Eric warned us that if anyone fell down a crevasse, the remaining party members were to immediately fall to the ground and dig in their boots and their ice axe. He showed us how to keep the rope taut, warned us to walk only in his footsteps, and we set off in the whiteness.

Snowmobile picnic

We picked our way through foot-deep snow for a short distance to the foot of a slight rise. Below us was a blue ice hole, the size of a small car. When we got closer and looked down, we could see that it was the slanted mouth of a crevasse. The passage down was covered with blocks of ice that had fallen from an overhanging snow bridge. We picked our way down slowly since our ice axes revealed areas of little substance. We watched overhead so that we didn't tarry under the long overhanging icicle-like formations. Eric told us that they were not opening the crevasse up to general visits this year because the opening is unstable and the footing for the descent precarious. We marveled at the delicate hoarfrost crystals on the sides of the snow blocks. When we eventually reached the floor of the crevasse we paused to hear the silence. Down several hundred feet in the ice is like being in a deep cave. If you listen long enough, you can hear your blood moving through your body because there is no other sound. Unlike a cave, however, the crevasse is lit by a neon blue light that filters through the ice.

IMAX Crevasse

From the bottom of the crevasse, we could see behind us the bright light of the opening from which we had descended and then a long narrow passage with an oval of blue light at the end. High overhead was a snow bridge that covers the crack so that it would be invisible from the ground surface. We followed this passage several hundred yards through the crevasse. The straight sides were rippled and snow covered. At the far end was another opening that in years past allowed an exit but has now been sealed by falling ice rubble.

After retracing our steps and clambering carefully back to the surface, we found that the overcast had lifted. We could see blue sky and a long view of White Mountain, Black Mountain, and Mt. Erebus puffing away. We roped back together and returned to the snowmobiles. We returned via Castle Rock, a more challenging snowmobile track that required hanging off the snowmobile on the uphill side for some stretches so that it wouldn't turn over. I found this a strenuous undertaking and went completely off the track at one point down a hillside. The views went forever. It was probably my last outing on to the ice sheet, and I loved it.

"It is not clear that intelligence has any long-term survival value." –Stephen Hawking

Today, after months of pleading and cajoling, I finally managed to get to Cape Crozier. This is the place where Apsley Cherry-Garrard went to collect Emperor penguin eggs in the dead of winter in his classic account, The Worst Journey in the World. Sadly, I was given only about fifteen minutes of ground time. I had no time to walk to the penguin colony or climb the hill above the hut for a good overview. It is a wild and special place and I would loved to have been able to spend several days there with Grant Ballard and the other penguin researchers. They urged me to stay, but I knew that I could not since I didn't have a sleep kit and had no way of knowing when I could get helo transport back to McMurdo. What I did succeed in photographing, especially in panorama

form, was B15, the giant iceberg that is blocking the ocean currents and causing all the sea ice to remain in place to the north of McMurdo. On the way back to McMurdo in the helo, we flew over the ridge of land where Cherry-Garrard built his stone shelter. It was difficult to see the remains from the air but one of my photographs clearly shows piled up stones. It looked like a dreadful place to try to camp in the middle of the winter since the katabatic winds flow down the sides of Mt. Erebus and over the ridge. It was there that the men suffered a terrible storm that nearly cost them their lives.


Iceberg at Cape Crozier

January 17, 2003. McMurdo. 27 deg. F., 23 deg. F. with wind chill. Light snow.
News: The Polar Sea has been out churning up the ice in the channel, trying to keep it open of solid ice. Yesterday, a blade broke off from one of its three 45-ton propellers and fell to the bottom of the Ross Sea. Not a simple matter to repair even here at McMurdo where they can fix almost anything. The cutter will have to return to dry dock. Meanwhile, they are not sure whether they can still break enough ice with the remaining propellers to be able to keep the channel open. They are not even sure whether they can break through the pressure ridges that have formed to be able to get out of the channel; the boat may be frozen in until the second icebreaker, the Healy, arrives in several more weeks.

Last night I went to a reception for the seven congressmen on the House Science Committee and Rita Colwell, the director of the National Science Foundation. With everyone in jeans and clean shirts, it was difficult to tell the congressmen from the scientists and electricians. I babbled away about my day's outing to Cape Crozier to one youngish man, thinking he was a Raytheon administrator, and then found out he was Rep. Anthony Weiner from New York.

The food for this event was specially made by the head of Food Services, Jan Jasperson, whom I had photographed in the kitchen during the afternoon. Nothing is too good for this group of DVs who oversee the budget for the NSF. One of the congressmen had specially requested Antarctic cod as part of the menu, so the Crary lab staff were given the unwelcome job of butchering one of the research fish in the aquarium. The fish was steamed and beautifully displayed whole on a large platter. I tried a small bite but kept thinking of how the fish looked mournfully up at me in the aquarium tank with its large eyes and couldn't eat any more.


Kitchen

January 18, 2003. McMurdo. 20 deg. F, -21 deg. F. with wind chill. Blowing snow.
A helicopter crashed about 3:30 yesterday afternoon at Lake Fryxell in the Dry Valleys. Details are still not clear, but evidently the men were removing camp equipment, probably with a sling load, and had mechanical problems. They fell from about 100 feet on to the ice of the frozen lake. The helo was destroyed, and the pilot, Greg, and helo tech, Steve, are badly injured. A Search and Rescue team was able to reach the helo, extricate the men with considerable difficulty, and fly

them by helo to the airfield at McMurdo around 10 P.M. Fortunately, the snowy weather lifted briefly and permitted them to be flown by Hercules LC-130 to the hospital in Christ Church, where they arrived in stable condition this morning about 6 A.M. In this small community, you get to know most everybody; I have flown with both men and got to know Steve. Antarctica is an unforgiving place. The work being done here is planned carefully to minimize risk but sometimes I think that it is pure luck that keeps accidents from happening. Yesterday, that luck ran out.


Crozier hut

I love to fly by helo because you fly low to the ground and can photograph out an open window. It's more dangerous business than flying in a fixed-wing aircraft, however, and I try not to think about that too much until something like this happens. The pilots here are careful and very experienced, but your margin of safety when you have mechanical problems or errors in judgment in a helicopter is not large. I thought about it on my trip to Cape Crozier a few days ago, because the weather was poor, and we were never sure if the clouds might not suddenly descend and put us in a complete white-out on the slopes of Mt. Erebus. What's more the katabatic winds would suddenly pour down off the sides and tossed us around. We were lucky.

Everyone is talking about what they are doing when they leave here. For most people who work for Raytheon that is sometime in February. I sat during dinner with a group of janitors, all in their twenties and thirties, who were talking about where they were going to travel when they left. One of the best perks for working here is that you save up all the money you make and you can go almost anywhere in the world on your way home. Laura told me that she has decided to go to Alaska with a friend she met here. She owns her own business in California and had originally planned to go straight home and take it up again. Now she says, she has found she doesn't want that much stress in her life anymore. She is going to travel a little and then decide what to do next. "I've changed," she told me, "I want to savor life."

For me, it's time to return to all the ordinary pleasures and responsibilities of marriage, family, and business. I find myself pausing more to enjoy the daily activities—looking out across the white expanse of sea ice toward Mt. Discovery from my Crary office window, listening to the volcanic stones crunch beneath my shoes as I walk around station, chatting with friends at meals and smiling at the greetings that I give and receive as I see people. For most people here, leaving is part of a cycle; they know they will return and see friends again. I am not returning.

This time has changed me. I have seen part of the planet that few have seen and I have had the time to walk and photograph and feel our world without its veneer of human activity. Antarctica cannot be tamed. It has never been inhabited by native people and can only be the site of a station like McMurdo because of the enormous support of fuel and supplies. Here at McMurdo, you can pick up rocks that are chunks from the Earth's mantle. You can see meteorites that are as old as our planet. Your connection to the prehistoric planet is ever-present and often frightening. You are always aware that you are at the mercy of forces you don't understand and certainly can't control. I have done many things that I was afraid to do. I have done much that I didn't really want to do because it was uncomfortable, dangerous, and uncertain. For me, that has given me a core strength that previously I had counted on from others.

It is too soon to judge the images I have taken here. I have thousands of photographs from the last three months. Not one is as powerful as the experience itself. It's always like that. Hopefully, some will be strong enough to convey a sense of this extraordinary place to those who cannot get here or who have been here and hold a piece of it in their heart forever.

Top of the Page

Return to Photographs

The Geographic South Pole is remapped periodically due to the ice on the surface moving each year.

The South Pole's elevation is 9,301 feet.

The Magnetic South Pole is the point on the Earth where a compass needle is vertical. The magnetic pole is due to magnetic fields from within the earth. This is NOT the geographic South Pole on the map.

At the South Pole, the sun rises once a year in late September and sets in late March.

The average elevation of the continent is 8,000 feet.

The continent is surrounded by ocean.

There are no indigenous people in Antarctica.

No nation rules Antarctica.

*"Climate: severe low temperatures vary with latitude, elevation, and distance from the ocean; East Antarctica is colder than West Antarctica because of its higher elevation; Antarctic Peninsula has the most moderate climate; higher temperatures occur in January along the coast and average slightly below freezing.

Terrain: about 98% thick continental ice sheet and 2% barren rock, with average elevations between 2,000 and 4,000 meters; mountain ranges up to 5,140 meters; ice-free coastal areas include parts of southern Victoria Land, Wilkes Land, the Antarctic Peninsula area, and parts of Ross Island on McMurdo Sound; glaciers form ice shelves along about half of the coastline, and floating ice shelves constitute 11% of the area of the continent.

Ports and harbors: there are no developed ports and harbors in Antarctica; most coastal stations have offshore anchorages, and supplies are transferred from ship to shore by small boats, barges, and helicopters; a few stations have a basic wharf facility US coastal stations include McMurdo; offshore anchorage is sparse and intermittent."
*Sources include: http://www.cia.gov/cia/

Top of Page