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Prof. John P. Katsufrakis

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THE ANTARCTIC ENVIRONMENT: A DIFFERENT PERSPECTIVE

by

Joyce Jatko
Environmental Officer Office of
Polar Programs National Science
Foundation

on

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7:30 PM

National Science Foundation
4201 Wilson Blvd., Arlington

Room 340

(Entrance at back of building on the
corner of N. 9th St. & N. Stuart St.
one-half block from Ballston Metro Station)

Ms. Jatko is the Environmental Officer for the Office of Polar Programs at NSF. A newcomer to NSF, Joyce is responsible for coordinating and integrating the environmental aspects of the different components of Polar Programs, including planning, operations and science. Among the issues she is concerned with are waste management, impact assessments, and the effects of human presence on the polar environments.

Ms. Jatko received a B.S. in chemistry from Rensselaer Polytechnic Institute, a M.S. in environmental engineering from Kansas State University, and is currently enrolled in a doctoral program at the University of Southern California's Washington Public Affairs Center. Prior to coming to NSF, Joyce headed the Environmental Management Branch at NASA Headquarters.

COME ONE! COME ALL!

Bergy Bits

Elle Tracy, Guest Editor

On the evening of April 18,1990,1 sat in the basement of Elliott Bay Books in my Seattle neighborhood and listened as Will Steger spoke of his book, *Saving the Planet,* the preface for which he wrote before he walked across Antarctica. That night, he'd been off the ice for about six weeks.

As he read, I thought about how natural it is that a human would pursue a personal passion. Will used his parka belt to demonstrate an effect of the hole in the Ozone layer. Now bleached white from its original turquoise, he'd worn the belt under the hole for four weeks. Twenty-eight days of 24-hour sun, mind you, but only four weeks nonetheless.

Listening to Will, I made the connection between my sense of living an environmentally sound life and the Antarctic continent, the only place where scientists can study the biological health of our planet. I realized I would become passionate about Antarctica.

Next morning, I phoned the National Science Foundation. "I want to work in Antarctica," I started. "You and 8,000 other Americans," the NSF operator's tone of voice told me. She gave me the number of the sub-contractor in Colorado.

Finally in September 1991,1 deployed to Antarctica where I spent the next year living the most interesting, exotic adventure of my life. I returned to America researching my way through the New Zealand Antarctic Centre Library, Australia's Mawson Institute at the University of Adalaide (which closed weeks before I arrived, so I studied rare polar books at the South Australia National Library next door), and Scott Polar Research Institute at Cambridge University, Cambridge, England.

My passion for Antarctica has lead me to this place: an opportunity to promote the Antarctican Society in a way that I humbly hope contributes some to its rich legacy. We 257 souls isolated during the winter of 1992 decided that since there were 260 million American citizens, we were indeed "one in a million." So I welcome this chance to influence my share of the million others who can experience Antarctica through my stories.

I wrote a column for the Navy newspaper during the summer. During the winter-over period, I published a bi-weekly newspaper in McMurdo with all earnestness, and with blessings from the NSF representative and the US Navy OIC in residence. *The Dark Star* gave me license to complete scientific and explorer research in the richly populated polar library at Scott Base, our New Zealand neighbor, to assist in the work of others to learn more about all the work done on Ross Island during the winter, and to filter Antarctic images, ideas and great stories with the muscle between my ears.

I work in the general field of adult computer literacy, and when I developed an opportunity to author a CD-ROM title about Antarctica (essentially an electronic book designed to be "studied" on a computer monitor), I wrote Paul and Ruth asking if I could include material from the Antarctican Society Newsletter in the title. "By the way," I added, "I understand you're looking for an apprentice editor," and "I'm interested. I have experience."

So here we are, you and I, sharing this time and space about Antarctica together. As many people—tall and short humans alike—as I've talked with about my Antarctic adventure, an expression of my deep gratitude is buried among these lines in appreciation of this privilege to share Antarctica with people, who like me, have walked in this pristine place and felt a spirituality present that occupies no other landscape on earth.

Dream Big and Dare to Fail

Norman Vaughan celebrated his 89th birthday at 8,200 feet, on top of Mount Vaughan (85°58'S 155°10'W)— between Mounts Goodale and Crockett in the Will Hays Mountains (all named by Byrd for his [musketeers] dog handlers), which lie between Amundsen and Robert Scott Glaciers in the Queen Maud Range— by fighting back tears that rushed to bless his 65-year old dream. With his voice accompanied by wind howling under him, he conducted a telephone interview from the Patriot Hills using a "telephone in a suitcase." At the top, "I couldn't believe it," he said. 'Then I said to Carolyn, 'Only two more feet.'" One guide, Vern Tejas, slid his cap off his bald head, and garnered a kiss from both Carolyn and Norman.

The team included Zippy, their stuffed toy husky, who paid humble tribute to the end of the Husky Era in Antarctica. They buried a cache (a Mount Vaughan Antarctic Expedition mug) filled with mementos of MVAE, Alaska, the Iditarod, 1929 Byrd Expedition pictures, a scroll from the Charles J Givens Organization, a copy of the summit speech and a history of the expedition.

"Was it difficult?" asked the interviewer. "Nine days to get to the top. For me it was exhausting, not zig-zagging, but climbing straight up through the 6-9,000 steps cut in by guides. But we got there two days ahead, on the 19th. We pitched a tent (p.8) and the four of us, Vern, Gordon Wiltsie, Carolyn and myself, slept on top through the night." Hearing the tone of his voice, his authentic enthusiasm, even saying "Over," is unforgettable. No one we know deserves a mountain top with 89 sparklers as a birthday cake. We're howling for you, too, Norman. Congratulations.

Watch for the National Geographic Explorer Series coverage on TBS April 2nd, and for the LIFE Magazine spread. *Thanks to Tana Warren for the Internet text used to fill in the particulars.*

BAS 24 November 94

The Twin Otter aircraft belonging to Kenn Borek Ltd., an air charter company of Calgary, crashed at 0300 GMT on take off from Rothera Research Station (67°34'S 68°08'W), Antarctica, located on Adalaide Island off the Antarctic peninsula. All four crew members, presumed to be Canadian citizens, were killed.

The aircraft, mobilizing for charter to the Italian National Antarctic Programme, had been granted land and refuel facilities by BAS, at the request of Italian authorities. It landed at 0110 GMT in transit from Punta Arenas, Chile to Terra Nova Bay on the Ross Sea.

BAS personnel observed that the aircraft failed to gain sufficient height on take off and was seen to stall and crash into a large iceberg situated in the sea immediately off the southern end of the runway. It subsequently erupted into a fireball on the iceberg. Station personnel executed immediate emergency procedures and undertook an inspection of the area by crash boats, which revealed no survivors.

Rothera Research Station is the principal base from which air operations are conducted in support of the BAS science program during austral summer. It features a 915 metre crushed gravel runway, hangar, fuel farm and accommodation for 80 personnel. The air facilities were completed in 1991 and BAS routinely operates its four wheel-ski equipped Twin Otter and one DHC-7 aircraft from this base. An investigation is planned. *Thanks to our friend Charles Swithinbank for the press release.*

Remembering John Katsufrakis and Hugh DeWitt

Rob Flint, who acted as a pallbearer at John's funeral, sent a copy of his recollections, noting primarily that at John's death he'd lost "the most influential person in my life, outside my parents." Apparently the ever astute John organized his last weeks, catching up with lifelong friends and other special people, with such grace and generosity that the ritual around his death was almost as provocative as his life.

John Katsufrakis served twenty-two tours on the ice, totaling nearly thirty-six months. He earned the nickname, "Mr. Siple Station" recruiting researchers and managing Stanford University's radio science laboratory there.

Professor Katsufrakis earned NSF's Distinguished Public Service Award in 1981, the Soviet Academy of Sciences bronze metal for his Antarctic work, and the honor of an Antarctican peak that bears his name.

Hugh DeWitt, beloved son-in-law of Mrs. Ruth Siple and loving husband of Jane, passed away unexpectedly recently. With Paul away and me lacking the proper materials to pay an appropriate respect in this issue, let me simply say to his family, our thoughts and prayers are with you in these days. A proper Antarctican Society tribute will appear as soon as possible.

Tea with the Wash burns

Paul Dalrymple suggested I phone a local member of the Antarctican Society and arrange for tea. So I did. They invited me to their gracious high-rise home near Seattle. Within the ninety minutes I spent with them, we soon chatted like old friends. Mrs. Washburn treated me to raspberry white chocolate cookies, and Mr. Washburn proffered Earl Gray tea.

"My interest is more Arctic than Antarctic," "Link" confessed, but both areas have some of the same geological properties that interest me. Perma-frost and its effect on landscape has drawn the Washburns to high latitudes since the fifties. Tahoe (she comes by the name honestly) showed me photos of their homes in Northern Canada and Greenland. "Historic sites by now," she mused. I remain struck by the photo she showed me of her three children standing on tiny ice islands totally engaging their curiosities in the natural world.

It was in that moment that I decided to include articles I wrote while in Antarctica; hoping my stories would satisfy some curiosities about how people work and live at McMurdo Station. Tea with the Washburns also convinced me that this time, I was with an Antarctic crowd in whose company I will be very comfortable.

These articles will appear again in my book *The Antarctic Method: Hiring and Managing High Performance Impermanent Workers.*

Scientific Souls and Sundogs November 1991

Science is hard work. Three four-meter holes had been drilled for divers in the Cape Armitage sea ice, and underwater foot of Observation] Hill. By comparison, the Observation Tube's diameter would crowd a diver wearing air tanks. The dive holes had grown eight-inch [thick] ice plugs since last being used. Hunter S. Lenihan, the alternative PI, carved a square within each hole using a Stihl chain saw strung with an ice chain.

Dive tenders and other members of the science team picked, chipped and hacked at the ice plugs, scooping out chunks and slush with landing nets to round out the holes.

This team, from the Moss Landing Marina Labs in California, is assessing the biological impacts of anthropogenic (our) chemical disturbances to the marine benthos (ocean bottom) in Antarctica.

Hunter describes the study: "Our job is to study pollution ecology in the benthic habitat. In one study, we deposit marine animals into environments where we can choose between two sediments pulled from under the ice at the Outfall, the Jetty, Cape Armitage, Winter Quarters Bay or Hut Point. Then we can observe their preferences. Sometimes they float on top of the water, as far away from both sediments as possible." The requirement to obtain sediment and animal samples precipitates dives under the ice, usually one or two a day.

Now clear of ice, ropes tied with colored flags and a weight could be dangled into the sea to mark each diving hole, top to bottom. We draped the entry hole (furthest away from land) with mats to protect the divers from the stinging cold of sea ice. Both divers slipped into their tank vests, and tugged on flippers, close-fitting rubber hoods and gloves. Both requested assistance to seal out 27 degree water, to zip suits shut, to double neck bands and roll them inward, and to press air pockets out of the suits' tight-fitting neck, wrist and ankle bands. The divers strapped on weight belts.

Perched on the edge of the hole, a diver spat in his goggles, rubbed his finger inside the lenses, then rinsed them in the sea. He double checked redundant regulators, hopped in, stuffed the primary air source into his mouth and dropped into the navy blue water.

The second diver leaped in, as off a cliff. The tenders watched all three holes and each other—tending the dive, waiting. We watched slush coagulate and the sea ripple in an occasional gust of wind. I sucked a piece of sea ice to taste thirty-three percent salt. All the shades of blue evident in the ice caves bleed into the remaining blue shades visible in the sea water column. We waited.

Under us, the divers dropped through the ice into open water "...floating, like soaring over a rolling desert. Eyes adjusting to the dark reveal the benthos littered with white sponges, and the ice ceiling holding back the light. We hovered over the base of Ob Hill, then ascended to the watery plateau to gather samples. And spotted a school with a bajillion fish."

Twenty-six minutes later, the flagged line suspended into one hole twitched. The sea inside churned and rolled with bubbles. The dive tender waived both arms and hollered, drawing all tenders to the "lucky hole," to pull the divers out. We watched closely for each diver's gesture signaling the quality of the dive. Unreserved, both divers transmitted "a WOW dive." Out of the hole they rolled on the sea ice, becoming more human looking with each peeling—of tanks, masks and flippers—being peeled off by the tenders.

Hunter described his harvest in the shorthand of his science. We watched him talk through blue lips outlined by his frosty beard. The wind froze water on his exposed skin. Gently, he gathered animals from the dive sock, a vivid yellow sponge that looked like a cactus, "toe biters," long brown worms, wide, flat worms that reflected a purple sheen in the sunlight and invisible animals hunkered in the sediment.

After transferring the harvest into buckets, Hunter grinned with a genuine enthusiasm for his work, like a child exposing a new kinda critter to his pals.

Later, we sorted animals at the Aquarium. Our tool kit included a plastic picnic knife with a square inch of screen stapled to the tip, used to relocate wee animals from the sorting basin into carefully marked experiment beakers. We sorted out specimens for the Aquarium's observation pool, and watched tiny delicate animals under the microscope to witness movement, observe colors, shapes and component parts.

One diver turned sorter, sitting in a sunlight stream and picking through a sponge "a big underwater house" plucked out minute animals with tweezers. "Some of these animals may never have been seen before," he said.

Science is—fun, rich—hard work.

Survival School January 1992

I poked the tip of my ice ax through the glacial blue ice next to my uphill knee and watched the granular snow and ice drop into the darkness. All morning we had climbed up the hill and slid back down, practicing a variety of self-arresting techniques. Thus when we might find ourselves on a steep, icy Antarctic slope, we can minimize any danger. We were learning atop the sturdy roof of a crevasse. Sixteen of us spent an evening, two days and a night together in Snowcraft I, a [required] option for winter-over survival training.

The first evening, Steve Dunbar, a Berg Field Center Safety Training Instructor, talked us through gory worst-case possibilities the cold, offending environment can visit on the human body. Frostbite that can lead to self-amputation of digits, body core temperatures so low as to mimic death, and severe hypothermia sufficient to render one truly obnoxious and deathly dangerous to self, and a liability for a group field expedition.

After a clever ice ax relay Steve used to (sorry) break the ice the first morning that introduced us practically to the effects of hypothermia, eight of us tagged behind Lucy Smith for her Survival School lessons. Her teaching techniques were both demonstrative and intelligent with clear, descriptive language that included the new terminology. So whether we learned by watching—she'd kick a foothold step into the ice hill spraying the snow in front of her carefully scooping toe—or learned by incorporating our intellect into the process, she made her snow skills accessible to every student.

Snowcraft I helped me focus on the Antarctica where I now make my home. Snow Mound City, [a] McMurdo blue ice district, serves as the ultimate school site. It resembles a homemade, very Spartan "Street of Dreams." Baronial ice domes and chunky ice brick fences curve across the [Ross] Ice Shelf. It lacks every other feature of a neighborhood: no kids, no dogs, no station wagons, no property lines, no lawns, no utility easements, no taxes and no neighbors except those who tagged along with Steve.

Lucy chartered our group, as Steve did his, to erect sleeping space for eight, in which we could comfortably be protected from the wind and cold. Two snow caves resulted from our efforts. One, called a *quin-zhee,* we built by piling all our bags in a heap, covering them with snow, then beating the snow mound with the backs of shovels until the snow melted slightly, freezing together

in a rough dome shape. We also built an igloo using quarried snow blocks. Both domes rose no more than three or four feet off the surface of the snow; we made them taller by digging under them into the snow.

Two men dug under the *quin-zhee* and pulled out the bags. Then we dug down to a sleeping floor, carved out a wider bell around the base of the dome, leveled the floor as best we could, and dug a step down under the front entry arch. Keeping the top of the entry way close to the sleeping floor's height blocked out errant night winds.

Our igloo, mastered by our tallest member, rose brick by brick by brick by brick. (Next class can use it as a basketball sports dome.) Our wind break, also made of quarried snow blocks, marked the extent of our survival home. Benches carved inside our wall, steps cut into entry ways for each sleeping cave and a playful sense of providing nest for all, finished out our survival complex....

In all this work—some for big gorillas, some for little gorillas—we began developing a sense of community. Everybody worked hard. Self-directed, we drifted into tasks we felt comfortable performing, switching off jobs to stretch and use fresh muscles. We also shared a playful, cooperative tone in our labor.

At the completion of our day's work we melted quarry casualties (broken snow bricks) for water. We gathered inside the curve of our wind break, sitting together, drinking and eating water-warmed food stuffs, acknowledging our accomplishments. I spent a charming, comfortable evening in the company of my school chums, enjoying them and feeling very confident I would survive the night. Sleeping through the bright night in snow caves with seven strangers on the [Ross] Ice Shelf in the ice fog-veiled shadow of Erebus might be my most exotic Antarctic activity to date.

The portable lessons, available from Lucy, Steve and other Field Safety Training Staff (and from books) came along easily. Accepting people different from ourselves, appreciating the value of a different set of experiences, and actually hearing others' ideas are personal lessons that are also available.

I graduated rich with personal lessons: unless we provided for the survival and inclusion of everyone, we would fail in our survival task. Cooperation in these situations is imperative. Taking care of another soul feels as satisfying as being taken care of. In Antarctica, to avoid community is to remove key value from the privilege of surviving comfortably in the wildest landscape on earth.

[Station closed on February 28, isolating us. I started *The Dark Star* and pursued science support stories. About 60 people of our 257 served there with the United States Navy. I found them uniformly pleasant, able and extremely supportive of every maintenance task they performed.]

We Dig Lights

April 12,1992

I saw him sitting astride a runway light fixture at Willy Field, looking like he was having the time of his life. I'd asked a SeaBee what he was doing when I walked up to him on a Black Island Flagging Expedition. He explained he and his team were digging out lights: sixty-two light stanchion sets carefully littered over ten thousand feet of runway approach and skiway. Secretly, I wanted to play, too. But I'm a Red Coat [civilian] and work inside.

After completion of the necessary perfunctory, ritual approval procedures, I was allowed to accept the invitation to accompany the team on their last day of digging lights. They made this Red Coat welcome, and kindly allowed me to work beside them. They clearly possessed the strength, stamina and experience only three straight weeks of this kind of work melds.

Some lights only require eight inch [deep] holes to elevate them to operable heights. Some holes are dug eight or nine feet into the Ross Ice Shelf, the average being between four and five feet. Some holes can be dug by a solo SeaBee, others require a team. The SeaBee and I dug a four to five foot hole; twice as deep on his side than on mine. The three-foot deep ice core surrounding the light's transformers and heavy cabling had melted into high-quality ice. High quality that is, if you want to carve swans. We hacked and picked and scraped and shoveled until all the cabling revealed itself.

Three ten-foot poles were inserted beside the original poles, lights spliced into power with extensions to accommodate the new operating height and the hole refilled....

I felt the teamwork and the sense of purpose even while they called each other by names that didn't match ones they'd given me, names with heavy story lore. Sure, I played in the ice and snow with SeaBees. But I dug working with this team as they clearly dedicated themselves to the task at hand, ribbed each other mercilessly and looked to me like each was having the time of his life. Thanks!

Who Needs Television? June 1992

Recently, several of us bundled up in our ECW gear and got away from the lights of town to gaze at the stars Two of our Scott Base neighbors joined us. As we trudged up the road lit by only starlight, I watched the dark forms move like I imagined heroic explorers had moved along these same paths eighty and ninety years ago. Yet we were on a modern adventure, with a happy chance collection of hungry eyes and minds, bundled in as many layers as we could manage.

"Get up here to the top, you won't be sorry," somebody yelled. A faint green glow seemed to be projected up from behind the crest of the hill. As I reached the top, I could see a quarter of the sky bowl in front of me dance with the slow-motion ballet of an aurora.

For the next long while, after moving out of the wind and making our way to a protected place in our path, we lay down on our backs, the better to witness the sky show. The Milky Way fairly sparkled its way from the Royal Society Range to the saddle just this side of Terra Nova. The ambient light silhouetted Mt. Erebus in this cloudless, moonless sky. In fact, the Milky Way appeared freshly dusted with the atmospheric ice fog we see here occasionally. Unlike its appearance from town, with a few stars splattered here and there, this sky looked like a very busy place.

This view of the night sky was the clearest I have seen of any night sky. I know the Milky Way is a typical spiral galaxy, and may contain several *hundred billion* stars. And the atmosphere through which I viewed the stars is less than five miles thick directly overhead and several tens of miles thick as I looked at the horizons. But our Antarctic skies are so clear and free of atmospheric gases, compared to skies in more populated areas, I can't imagine being more rewarded by a star gazing adventure anywhere else on earth.

As gazing intensified, and as our eyes became accustomed to the low light, the aurora appeared to swoop and hover over the Ross Ice Shelf lingering over Scott Base and Minna Bluff.

One of the Kiwis knew astronomical facts and names providing a narrative for the whole group. No one was bored. Many of us lay silently as long as we could tolerate attempting to warm the Antarctic continent with our body heat, then would get up, move around to warm up, and lay back down again...for more.

Suddenly, the aurora appeared directly overhead and I felt like I was standing under a curtain, looking up toward the Milky Way through a nap of dust made of light. The aurora was still visible in all the other places we'd seen it; it appeared to simply expand itself.

As the overhead ions vibrated their way toward the Royal Society Range, their silhouette, too, and Mt. Discovery's became defined. Finally we watched the aurora curl and weave back on itself, and braid itself in a dazzling finish over the Royals. It wasn't finished, but I was. It was 11:30, two and a half hours after we'd started out.

We made our way back to town. I fell into bed and slept as well that night as I have since my arrival. I could feel myself smiling as I drifted off, knowing I'd been privy to a spectacular, singular performance. Humbled me, too.

After two months without sunshine on the ice, and with the volcanic rubble of Ross Island, a look skyward confirmed that yes, I am still a resident of planet Earth. And the sun isn't the only show in town, especially when a great one like this plays on the road.

National Science Foundation Air Drop

An interview with the Winter OIC details our mid-winter resupply. "Weather permitting, on June 13 and 15 [full moon], some 110-120,000 pounds—mostly fresh fruit, personal cargo and mail—will drop out of the sky onto the Ross Ice Shelf. After weeks of careful and coordinated planning among [NSF], the Military, and Scott Base, everybody will be anxious to harvest and savor our ice pickings. An air drop-configured C-141 Starlifter from the 619th Military Airlift command...will fly...to Christchurch, to prepare for the two-day Air Force training event.

"Historically the bundles have measured two feet by four feet by fifty-four inches or by ninety-six inches. Sometimes they've dropped into the ice far enough to have to be retrieved by a crane. This year, however, we'll be receiving palettes with a bigger footprint; four feet by four feet by four and a half feet, or by eight feet. This should lessen the number of palettes we all have to manage. It will be interesting to see if any imbed themselves this year. [Only one did: it landed on its head and was the last to be recovered.)

"Although palettes can weight up to 2,000 pounds, typically each weighs in the 900-1,000 pound range. Even though parachutes—each requiring 500-600 pound loads to pull chutes out of the bay—are attached to the bundles, their function is to stabilize loads, to guide the load's landing—at 60 MPH—onto the energy absorbers packed at the bottom of the palette. This year, we're using some unproved, but possibly sensible technology. Every bundle will be packed in a canvas containment bag to contain the explosion upon impact. [Three-foot thick corrugated cardboard energy absorbers footed every bundle and guiding chutes oriented them foot-down. The technology was a roaring success.]

"The first day we can expect half the C-141 load to drop here—estimated to be twenty palettes. Then the C-141 will close its hydraulic doors and fly up to resupply our cohorts at Pole. The C-141 will be accompanied by a KC10 refueling aircraft—a modified Boeing 707. To the best of my knowledge no KC10 crew has believed McMurdo was far enough South—we expect them to continue to the Pole.

"At Pole, the remainder of the first day's payload—mostly mail—will be pushed out of the paratroops' doors on the sides of the Starlifter over the Amundsen-Scott South Pole Station. At those low temperatures, the crew won't take the chance that the hydraulic systems used for the unloading bay will freeze the bay open, rendering the aircraft at least fuel inefficient. It's too risky.

"On the second day...the C-141 will aim for the now-familiar drop zone, a 3,000 foot patch of blue ice marked al the beginning with two rows of five, twenty-gallon drums filled with two gallons each of MoGas fuel mixture. The

end of the drop zone *is* marked with a single row of similarly configured, flaming drums.

"MACenter acts as Regional Aircraft Following Center, picking up the aircraft at 60° South Latitude, guiding them to 90° South and back to 60° before returning control to New Zealand Air Traffic Controllers. MACenter will probably have control for five to six hours of their total flying time. [C-141 Starlifter flight time from Christchurch to McMurdo is in the eight-hour range.]

Sightseers may view by the light of the moon, which helps in recovery visibility, and lights up landmarks possibly aiding the drop visibility, and if the wind's not blowing you may even be able to hear the planes' engines 1,000 feet overhead.

[That morning, from a viewing position on the T-site Road, matching altitude with the top of Observation Hill, the sound and sight of that Civilized Creature bearing down on the blue ice target was truly a lift. Three and a half months without communication with our culture, save MARSgrams and New Zealand Antarctic telephone calls (at $5.50 a minute), I was startled at how excited I became as I watched that bird slow to about 250 knots and slide in about 350 feet off the deck, open the bay doors then head nearly straight up, dumping its belly full onto the Ice Shelf. Yes, NSF air drop is a major morale-booster.

As spring approached, having marked the winter with the Scott Base Swim Club three ritual dips, sunset, mid-winter's day and sunrise, I anticipated the end of my Antarctic year. I posted sunrise and sunset times during fall and spring, and posted Civilian Twilight (sun 6° or less below the horizon), Nautical Twilight (sun 12° or less below etc.) and Astronomical Twilight (sun 18° or less below etc.) in *The Dark Star.* Of the later, we enjoyed over three hours of it on mid-winter's day.]

Nacreus Clouds... The Science August 1992

Although Nacreus—*nacre,* Latin for mother-of-pearl, clouds were first identified by H. Mohn in 1892, they remain a special, rare and astonishing vision. This atlas* defines them as "...clouds resembling Cirrus—white, delicate filaments or white or mostly white patches or narrow bands with a fibrous, hair like appearance, or a silky sheen, or both, or Altocumulus lenticularis—lens-shaped upper air clouds that appear diffuse and frequently partially translucent. Further nacreous clouds show very marked irisation—rainbow-like colouring—similar to that of mother-of-pearl; the most brilliant colours are observed when the sun is several degrees below the horizon."

Nacreous clouds are rare and seem to occur only in certain regions. Scotland, Scandinavia, occasionally in France during winter months, and Alaska. According to one scientist the clouds observed in southern Norway occurred at an altitude between 21 and 30 kilometers—70,000 and 100,000 feet. [In 1975, mind you, Antarctica's Best Kept Secret?*]

Bill [Haals] suggests that at McMurdo Station, "nacreous clouds generally start forming near sunrise [August 17,1992], only a couple at a time right on the horizon. Their colors are not as vibrant as they will become. Scientifically, the clouds become more colorful when the sun is about 7 to 10 degrees below the horizon. So a week or so after the sun officially rises, that's when the clouds really show off—sunrise and sunset.

"The last several years there has been one day when the sky just explodes in color and that day usually occurs a week to a week and a half after the official sunrise. Each morning, small wisps of white clouds start to form in the northern sky and turn color when the sun sets. On the day when the sky explodes with color, many of these white clouds will be seen in the sky."

'Scientific material taken form the World Meterolological Organization, International Cloud Atlas, Volume I, Manual On The Observation of Clouds and Other Meteors, WMO No. 407, *Secretariat of the World Meterological Organization, Geneva, Switzerland, Copyright* 1975, *World Meterological Organization.*

[So my Antarctic adventure ended, a privilege few can experience, and even fewer can share with others. Bless us all.

To clarify a point I read in the last issue, I would return to Antarctica in a heartbeat, but I would not return under the same arrangement under which I served in 1991-1992.]

Antarctic Navigation, a novel by Elizabeth Arthur, Knopf 1995

Unencumbered by national pride, underutilized war machinery or the spirit of competition, Morgan Lamont's 90 South adventure retraces Scott's *Terra Nova* expedition. I appreciate the notion that a woman can recreate and command an Antarctic expedition, especially one that captured the world's imagination in 1913, and probably inspired countless youth who served their countries during the first World War. Arthur's story comes packaged with appealing ingredients: a feminist to cheer on, a combination of Antarctic history with current events and it's a meaty—eight-hundred page—book.

NSF Poets and Writers grantee Arthur moves Morgan from her Colorado birthplace, through her American life, and finally to her Cape Evans base camp. Throughout, Morgan's behavior demonstrates nearly self-righteous attitudes toward rules, guidelines and others, perhaps reflecting a certain self-centeredness of polar explorers. My cheering waned as I read on, watchful for and never finding the graceful balance, the generosity of spirit, the ableness that can grow out of Antarctic expedition leadership, the stuff that inspires imagination.

Primarily, Morgan's 90 South expedition represents one way a person can return to Antarctica, after being exported from the ice for being caught breaking NSF rule Emotionally, she may emulate Shackelton in this passion to return. She echoes Scott somewhat, by changing her

mind, late and impetuously (about different particulars), and may also expect that her expedition can explain her mother's death, who ala Titus Dates, walks to death in a Colorado blizzard.

In planning, like all expedition leaders, Morgan enrolls comrades from her life. She includes her child hood friend Wilbur, who reads dog's minds; and Brock, met outside the 'Tilted Place," whose congenital talent is navigation, with and without tools, their trekking tasks pre-ordained. And though she includes New Zealanders, she makes no mention of the Antarctic Treaty, its spirit, its usefulness or its power.

En route, and given the luxury of a conflict-free expedition, we read Morgan's mental discourses about women in Antarctica, about Greenpeace's policing of the US Antarctic Program, about judgment—good and bad— edicted at McMurdo Station (its $37 million environmental cleanup plays a cameo role), the Gulf War and our nationalized gluttony for gasoline, and that threat to a pristine Antarctica. She also muses about Quantum Mechanics.

She takes direct aim at NSF Polar Program's rules, policies, survival guidelines, the contractor, and some authoritarian personality types. One could argue, she has a point. But I sensed empowered (by a $10 million gift to pay for the expedition) inexperience in some of this unrelenting bureaucracy bashing. Although it seems natural and comfortable for Morgan Lamont, the dose here can irritate those who appreciate the merits of sensible guidelines. Admiral Byrd, after all, spent Rockefeller and Ford money, but with considerable respect for Antarctic experiences and proven guidelines.

This OAE can only imagine events that make up Morgan's Antarctic experiences. Unlimited access to fondle and ponder over artifacts inside the *Terra Nova* and *Discovery* huts; mid-winter, solo access to the Cape Evans landscape; abundant pre-expedition free time; American entitlement to New Zealand assets, and full medical services at McMurdo Station (as a rescued, badly injured private expeditioner), courtesy of taxpayers like you and me. Although recent South Pole Station events demonstrate a softening of this anti-expedition NSF formality, the feminist in me bowed my head, slightly shamed.

Elizabeth Arthur has earned some poetic license in six books. Here, that the Chalet at McMurdo began life as a chapel, and that a hike from Cape Evans to the top of Mt. Erebus and back takes place in a day, understandably stretch truth.

But I'm less willing to abide some license she employs. At 90° South, the sun can never be "directly overhead." Emperor penguins possess no architecture for "sitting" on eggs. Sun-glow (Astronomical Twilight) on mid-winter's day (at 77°S) is over three hours long, and when the sun begins to rise in the spring, only one 24-hour period has four hours of it. Will Sieger's name is simply misspelled. (Antarctic buffs can have a field day straightening out her Antarctic-based facts.)

She explains why she fictionalized some USAP-related events in her acknowledgments. But I wonder why an accomplished novelist would fictionalize Antarctica's natural wonders. Since none of the unnecessary license really moves the story along, one might wonder why it survived the fact-checking process.

A woman recreating the Terra *Nova* expedition is a worthwhile and provocative premise, and Arthur crafts that story with a certain tension around her heroine. If you're a woman, an Antarctic traveler or cruiser, been benefited by anyone in NSF Polar Programs, love a feminist, have an extra $10 million, or have accomplished major hiking or expeditionary feats, you should display this book in your library. But if you want to learn more about Antarctica or America's presence there, be warned: *Antarctic Navigation* is a substantial work of fiction.

[This newsletter reflects the opinion and experiences of the guest editor. Please mail comments to Elle Tracy, The Results Group, Pioneer Square Station #4178, Seattle 98104-0178, Seattle USA.]

** Actually they reached the top of Mount Vaughan on the 16th three days before Norman's 89th birthday.