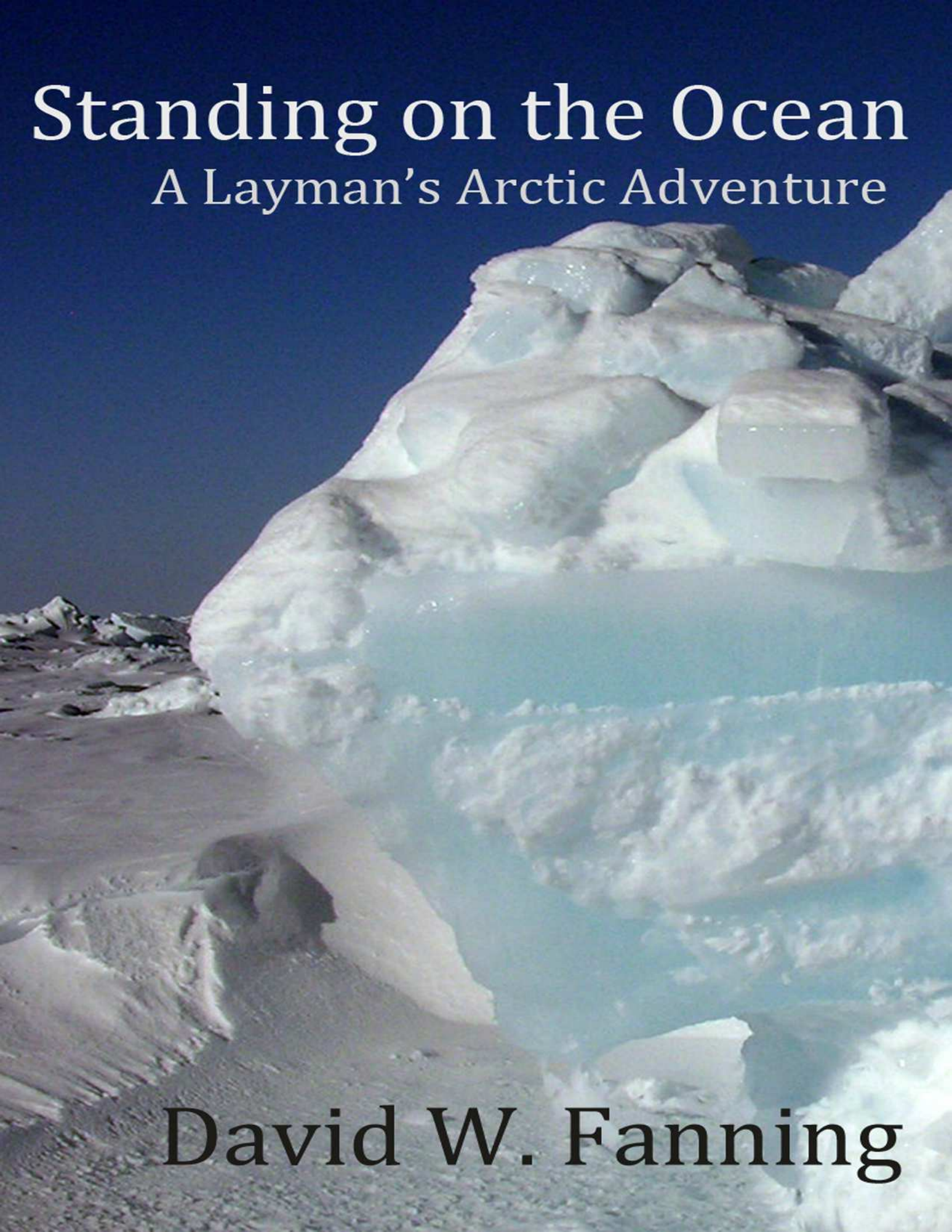
Standing on the Ocean

A Layman's Arctic Adventure



David W. Fanning

Getting Out of Town

"Yeah, and good riddance to you, too!," John Christensen muttered as we watched the wrench disappear down the hole we had drilled in the sea ice. Christensen, an oceanographer as well as a first-rate tinkerer, likes to solve problems, which is fortunate because we have a lot of problems to solve. One of which—now—is how to disassemble the instrument string lying on the ice in front of us like a soggy, segmented eel without the benefit of our only wrench.

Even though we lack a ship, this is a oceanographic research cruise, since we are—literally—somewhere in the middle of the Arctic Ocean. The four of us, the ship's crew, are here to study the nutrient composition and productivity of the northern Arctic land shelf and how it interacts with the open ocean. Our plan is to drill a hole through six feet of sea ice and lower our instruments to a depth of 1500 feet before collecting samples and hauling them up again. We expect to drill five holes a day for several weeks. But we have been averaging closer to one a day because of persistent equipment problems. At the moment we are on sea ice 100 miles northwest of Prudhoe Bay and the town of Deadhorse, the northern-most outpost of any size in Alaska, and drifting westerly with the sea ice in the Beaufort Sea. In other words, we are a long way from a hardware store and another wrench.

Christensen is 54, but everyone guesses ten years older from his gaunt appearance. He is tall and slender and doesn't like to have his picture taken. He is the leader of our ship's crew. He is a senior researcher at the Bigelow Laboratory for Ocean Sciences in Boothbay Harbor, Maine. The man staring forlornly at the dripping instruments is Claude Belzile, a Canadian post-doctoral researcher at Bigelow. It is his instrument that has been giving us trouble this week and is the reason Christensen had the wrench out in the first place. The young woman energetically in charge of the sampling bottles and gear is Sarah Olivo, a 18-year-old freshman intern from the University of New England. In a few more days, she will be known as "Sweetie" by Belzile and as "Chief" by me, but always behind her back. No one her age could possibly be as competent as she is at nearly everything she does. By unanimous consent, she will be my boss for the duration of the voyage. I'm about Christensen's age and a software programmer with no particularly useful skills for a voyage of this type, except an appetite for adventure and a willingness to haul heavy equipment around. I'm here because I injudiciously told a friend I wanted to "get out of town." I had in mind a small Mediterranean village where no one spoke English, not this cold,

windy place on the edge of beyond. But, like Lily Tomlin, who always wanted to "be somebody," I wasn't specific enough.

The ship's crew: Olivo, Christensen, Belzile, and Fanning.

"I couldn't feel the wrench," Christensen offers as explanation for dropping it. It's a plausible excuse. It is 20 degrees below zero Fahrenheit outside the tent, and a bit warmer on the inside, where the winch motor provides a bit of heat. Plus, the tent keeps us out of the wind, which adds a special bite to the freezing air outside. It is delicate work to pour the samples from the collection vessel into the small sample bottles that Olivo holds, and both Christensen and Olivo prefer to work without gloves in the freezing slush around the sample hole. Christensen's hands have been wet for nearly 30 minutes. As I pull my parka closer around me and slap my

gloved hands together for warmth, I estimate I would have dropped the damn wrench in the first couple of minutes.

But we don't worry about it for long. Christensen is incapable of staying serious for more than a minute at a time, and is forever breaking into nonsense patter or (worst of all) a silly song. But this time, I start it. "It's odd," I remark innocently. "Most scientists get into trouble when they *feel* a wench." Belzile suggests we would probably all stay out of trouble if we just threw our heaviest piece of gear, the "winch," into the hole, too. By now, we are smiling again. And so it goes. This is our fifth day on the ice and nothing much has gone right yet. Did we really expect today to be different? We begin gathering and stowing our gear back in the helicopter for the long, slow ride back to the hangar. It is going to be another long night for all of us, getting ready for an even longer day tomorrow.

Deadhorse, Alaska

We arrived in Deadhorse the first week in April. The week before, when I checked the weather report at the Deadhorse airport from my home in Colorado, the temperature was -35°F and there was a wind chill of -65°F. It has warmed up since, to -20°F when we land in clear skies and a light breeze. I once went winter camping when it was close to -10°F and I don't remember having a wonderful time doing it. As I step off the plane, I do remember the feeling of nose hairs freezing immediately.

The Air Alaska flight to Deadhorse from Anchorage on an intermediate-sized jet was full, and I felt odd being the only one snapping photos of Denali as it passed out the left side of the aircraft on a sunny, clear day. Everyone else dozed or read the Anchorage paper. The plane was full because this was shift change day, when half the town leaves and the other half arrives. Everyone, without exception in Deadhorse, job shares with another person. One person works 12 hours a day for two weeks, then has two weeks off while his counterpart works. No one lives in Deadhorse. There are no schools, no churches, and no bars, since the North Slope Borough is completely dry. When work is over, everyone returns to wherever it is they came from and tries to put the past two weeks behind them. For most of the workers flying with me, home is Alaska or the northwest United States and Canada. But some come from much farther away. Our he-

licopter pilots are commuting from Virginia. You can live anywhere you like if your skills are valuable enough and your company will pay for you to travel back and forth. Welders are in particularly high demand, I learn later.

Some workers use their frequent flyer miles to travel from their more distant homes. Spending a few extra dollars is not a problem. The workers are well paid and their contract with the devil is termed, in common language, "golden handcuffs." It is hard to leave once you come here. Our helicopter mechanic, who has worked in Alaska for a long time and desperately wants to work somewhere else, told me later, "I'm tired of the dark and cold. You come here, your whole life goes by, and what do you have to show for it? Money in the bank. That's all." It can be a hard bargain. Marriages don't always survive.

Deadhorse, Alaska resembles a derelict truck stop on the edge of nowhere.

Christensen and Belzile arrived yesterday and are there to meet me, and I meet Olivo for the first time, as she is also on this flight. Many eyes follow us around the terminal. There are few women in Deadhorse, and none as young and pretty as Olivo. For some of the young men milling around the terminal with us, spring has apparently arrived. Or, at least, the rutting season.

Deadhorse resembles nothing so much as a derelict truck stop somewhere way to hell and gone out by the Interstate. Some place you end up in after an all night drive fueled by stale coffee and too many cigarettes. It's unlikely that Merle Haggard will write a song about the place, even with all the heavy-duty pick-up trucks parked in front of the airport. It's not the kind of town you dream about coming back to.

Most of the people getting off the plane are oil workers. Prudhoe Bay is the largest oil field in the United States. Oil is pumped from here, down the Trans-Alaska Pipeline, to the ice-free port at Valdez, where it is loaded onto tankers to be shipped to thirsty automobiles in Texas and California and other far-flung places. These workers live in "camps" outside of Deadhorse. Since September 11th, 2001 these camps are off-limits to the public and a special pass is required to get through the fence built around them. Unfortunately, the Arctic Ocean is also behind the fence, so the occasional tourist who braves the dangers of the unpaved 415-mile Dalton Highway to travel here and dip his toe into the Arctic Ocean is sorely disappointed to find the only way he can even see the ocean is to pay $37 to the "tour company" headquartered over at the double-wide trailer, euphemistically called the Arctic Caribou Inn, for the "official tour." The proprietors will truck you out to the ocean in a van and let you skip a few rocks and enjoy the bleak view for 15 minutes before they return you to the Inn. That, and the all-you-can-eat buffet at the Prudhoe Bay Hotel, are about as good as it gets for tourists.

There isn't much to see here. Two hundred species of birds make this place home in the summer, congregating and socializing on Lake Colleen, the flat, iced-over area out behind the general store, and the only area around here not covered in rusting machinery and old pipe. But their arrival is still a month or so away, and their only representatives this afternoon are a couple of hungry looking ravens hanging out in back of the hotel, hoping the cook will have pity on them. I caught a glimpse of what I thought were musk oxen off in the distance on the approach to the airport when I arrived in Deadhorse, and on the helicopter flight out to the ice yesterday we saw a few caribou, part of the 25,000 strong Central Arctic herd. An occasional polar bear will

wander into town. It happens often enough signs are posted by the front door of every hotel in town: "*Bears Are in the Area. They Like to Maul People. Be Careful Outside. No Kidding! Look Both Ways when You Exit.*" Polar bears are held in high esteem by the residents of Deadhorse as vicious and opportunistic killers with infinite patience. They have been known to stalk humans. The chance to see one in the wild is what has brought me here.

Trucks lined up for the all-you-can-eat buffet at the Prudhoe Bay Hotel.

We collect our gear from the baggage carousel and throw it in the back of a rented four-door Dodge diesel pick-up truck in front of the airport, idling there along with 40 or 50 other trucks, each throwing up a plume of white exhaust. The stench of diesel fuel is overwhelming. Except when we are parked at the hotel for more than a couple of hours, and have access to an electrical outlet to plug the truck's engine block heater into, the truck will run continuously for the four

weeks we are here. In fact, every truck and piece of heavy machinery in town will run continuously while we are here, until the smell of diesel fuel and the sound of heaters, fans, compressors, and idling trucks will more or less permeate the very fabric of our lives.

I came to the Arctic expecting peace and tranquility, but reality is exactly the opposite. Except for those few brief moments on the ice after I exit the helicopter and the engines shut down and before someone jerks the portable generator to life, the Arctic is like living within spitting distance of a freeway, all noise and fumes.

The Camp

We are staying on the other side of Lake Colleen at the North Slope Borough "camp," in this case another name for hotel, although the North Slope Borough office is located there, too. It is a couple of miles from the airport and the hangar which we will use as a base for our scientific work, but is close to the world's best hardware store, which is destined to become our home away from home. The hardware store has the same boxy, pre-fabricated look as every other building in town, the result of building materials being in short supply and the necessity of hauling everything needed to build a town in the middle of nowhere on the backs of flat-bed trucks, rolling slowly up the Haul Road from Fairbanks. The store is open 24 hours a day, seven days a week, and is staffed by people who are intimately familiar with tools and how to use them. My grandfather, a diesel mechanic for the railroad, and a man who could fix anything in his garage workshop, would feel at home here, surrounded by kindred spirits. There is a friendly dog, too, who serves to remind people—to judge from the number of people who stop to scratch his head—they used to live a normal lives somewhere else.

There is little time to lose when we arrive at the hotel, so after a short orientation from the hotel manager and a peek into the previously empty office where Christensen and Belzile have moved in about three tons of "stuff," Christensen assigns Olivo and me the task of getting the tent we will use on the ice sorted out. He wants us to practice setting it up in the hotel parking lot "so we will have some idea of what we are doing when we get on the ice."

In fact, setting up the tent will be my job, as Olivo will later be assigned to operate the GPS unit to precisely determine our position, while Christensen and Belzile drill the hole in the ice.

Once the hole is drilled, Olivo will use the depth finder to determine the depth of the water at that location, and as soon as she is finished, I'll fling the now free-standing tent over the hole and anchor it in, and we will be ready to begin our scientific measurements. At least, this is how our plan works in theory.

In practice, the wind will be blowing so hard on the ice that it will be all I can do to hold on to the damn, flapping fabric with one hand and the tent poles with the other. I'll try to keep the tent from ending up in Siberia until the others finish their jobs, and then the four of us together will wrestle the tent into submission.

The North Slope Borough camp when we arrive.

Olivo and I got a taste of the problem that first evening we arrived. It was about 8 PM by the time we had located and put on our cold weather gear, had a close look around for marauding

polar bears, got the tent out of its bag, and were standing around stamping our feet and looking at the mess in the hotel parking lot. There are only a couple of hours of "night" at this time of year in Deadhorse, but dusk can last a long time, and it was fairly dusky as we tried to determine what we needed to do to set the tent up. The temperature was hovering around -20°F, but there was a breeze and my jacket hood kept pushing my balaclava down over my eyes as I worked.

Fortunately, Christensen had the foresight to color-code the tent poles and the pole sleeves, so it was really just a matter of finding the right parts and fitting the small pieces together with heavily gloved hands and a blind-fold over my eyes. That is to say, it took us most of 45 minutes to figure it out the first time, but eventually we had it standing, and we stood there huffing and puffing, flapping our arms back and forth to get warm, feeling proud of ourselves.

That was when I noticed a pick-up truck stopped in front of the hotel, its occupant watching us. No matter, Olivo and I wanted to get somewhere warm, so we immediately began to take the tent down. The driver of the pick-up walked over to us. "I noticed you over here. What are you doing?," he asked.

"Oh, Sarah and I thought it would be a lovely night to camp out, but we've decided it's too cold," I replied. The man stared at us. Ten seconds later, he shook his head and walked back to his truck without saying another word. So much for the Arctic sense of humor. We quickly stuffed the tent into its bag and went back inside for a mug of hot chocolate, aware now that almost anything you want to do in cold weather is going to take two or three times longer than it would have otherwise. It wasn't the last time we would learn this lesson.

The camp where we are staying is one of only three or four in Deadhorse where people who are not employed by the oil companies stay. The accommodations are adequate, but not as luxurious as those that house the oil workers, or so we've heard. The oil companies provide small theaters, gymnasiums, the latest fitness equipment and other amenities. We have a recreational room with a big screen TV and three comfortable lounge chairs, next to a pool table and a couple of video games, but although I walk through it on my way to and from the dining room, I have only ever seen one or two people using it. The "fitness" room down the hall has ancient equipment and looks as though no one has used it in years.

The major recreation for most Deadhorse residents is eating, and most of the hotel guests

look like they get plenty of exercise raising forks to their mouths. The food is good, and there is a lot of it. In fact, you can eat all you want, 24-hours a day, seven days a week. The kitchen is always open. If meals are not currently being served, there are snacks of all types, which always include pop-corn, rice crispy snacks, and probably a stack of cookies the cook has recently baked. Two display cases, one serving desserts, and well-used, the other containing fresh fruit and opened rarely in my experience, are also available. Coffee, tea, hot chocolate and soda drinks are always available. If you are going to miss a meal, there are sandwiches and other items in the cooler that you can pack for your lunch.

Christensen is the only one of us who complains about the meals, just picking at his food most of the time. "I'm to the point where food isn't even appealing to me," he told me. "I eat some and I know it provides nourishment, but I don't taste it." I asked him what he liked to eat at home. "Well, I finally convinced my wife that I don't like fat, so we eat a lot of broiled chicken, vegetables, things like that, but in smaller portions. My wife still likes to eat. She is a big woman."

People are not particularly friendly. No one seems curious about why we are here and who we are, although Olivo sometimes draws eyes as she walks across the dining room. At meal times, people eat in more or less the same groups day after day. Or, more likely, they come to the kitchen and put their meals into Styrofoam containers to take back to their rooms, where they can watch television in peace and quiet. In the four weeks we spend here, only the hotel manager and a woman who works for the North Slope Borough sit down and talk to us. We meet one person who sometimes watches television in the rec room after dinner. He has an expensive digital camera, the top of the line, but nothing to take pictures of. He wants us to take it out on the ice with us in the hopes we might get a picture of something. But with the way our luck is running, it would probably end up in the ice hole, too, and I don't want to take a chance on ruining an expensive camera.

The rooms here are overly warm. Mine was about 85°F when I arrived, and after turning the thermostat all the way off and waiting half an hour, I realized things were probably not going to get much better, so I opened the window slightly and went to dinner. When I got back the window had frozen open, so I'm living in a schizophrenic room. The area by my desk is freezing and there is a thin layer of snow on my laptop computer, where it blew in through the window.

The bathroom on the other side of the room is, apparently, a private sauna. I find that if I position myself in the very center of my bed and roll over frequently, I can achieve a nice overall temperature.

It turned out the bathroom was, in fact, a sauna, if by sauna you mean a place that is overly hot because of water. The hotel boiler apparently works overtime to keep hot water running through the water pipes, including those filling the toilet. (I probably would have realized this sooner had I been a woman.) Flush the toilet here and the temperature in your room goes up 10 degrees. And, for goodness sake, set the water temperature correctly before you get into the shower and fiddle with it or you are likely to come flying out of it with third degree burns over 85 percent of your body.

It turned out that a goodly portion of my day was spent digging around the room to find my Hawaiian shirt and shorts to wear to breakfast, and then bundling up in four or five layers of wool and polyester to go outside and work. The process was reversed in the evening. Everyone rejoiced when the outside temperature climbed all the way up to a balmy 5°F and we could just wear our Hawaiian shirts all the time.

Field Operations

I'm not a field scientist, and I have never been on a field expedition before. So I had no idea you had to bring everything with you. But, it makes sense. In this place, if you don't have it with you, you aren't going to buy it at the corner store. But even so, the 24 crates of what looks to me like antique office equipment and supplies seem more like something you would buy by the lot at an estate sale than something you would want on a scientific mission. "What is all this stuff?," I asked Belzile when we were alone with it in the corner of the Conoco-Phillips airplane hangar the National Science Foundation liaison officer had arranged for us to use as the base of our operations. He just shrugged.

The hangar is meticulously clean and polished. Every tool has a place, and if you take it out and use it, you will put it back in a special drawer where it can be cleaned and returned to its rightful place before the end of your shift. Gayle, the manager and head mechanic, is a gentle soul who seems like someone's grandfather and is incongruous here. You wonder what unfortu-

nate calamity befell him in life to cause him to end up working in Deadhorse. You imagine his wife has run off with the Guatemalan gardener and that living without women is the only way he can still work and remain sane.

Gayle's patience and orderly nature is about to be severely tested by our presence in his workspace. Christensen is, well, not organized. In fact, he is only truly happy in the midst of chaos and junk, as I am about to learn. There could not be two more completely opposite men working in the same building, although both have the same keen appreciation for sharp machine tools and unique solutions arrived at with innovation and critical thinking. Christensen just prefers to work with found objects and materials that are at least 20 years old. He abhors the new and current and is a connoisseur of the cobbled together solution. "Duck Tape and Spit" could be his motto.

We brought 26 crates of gear and dumped them in the center of a meticulously clean airplane hanger.

As evidence of this, Christensen now removes from a box the heart and sole of our scientific enterprise, our water sampling bottles. A standard oceanographic technique for sampling water at different depths in a water column is to use a Niskin bottle. This is simply a cylindrical body, with spring-loaded stoppers at either end. The bottle is attached to a wire with the stoppers cocked open so water can flow through the bottle. It is then lowered into the water and allowed to sink to the desired depth. At that point, a "messenger" (in our case, a small, heavy brass weight), is clipped into the wire and allowed to descend along the wire to the bottle where it trips the springs and closes the stoppers, thereby sealing the water of a particular depth in the bottle. The Niskin bottle is then hauled up and the water sampled from a small port in the side of the bottle.

A wire can be loaded with multiple bottles and messengers, so that when the first messenger trips a bottle, it releases a second messenger below the first bottle to travel to the second bottle, and so on. At -20°F having this process work flawlessly is essential. If a messenger gets hung up below a bottle, for example, then the whole string has to be winched back up and reset for another try, adding another half hour, at least, to your time on the ice. For this reason, there is great anticipation as the first messenger is sent down the hole and an ungloved hand is placed gently on the wire to feel the "bumps" of the messengers crashing into the bottles. Everyone counts silently to themselves, "one one thousand, two one thousand," anticipating how long a messenger should take until another bump travels up the wire.

While standard for oceanographic research, the Niskin bottle is still specialized equipment and, because of this, expensive. For example, the stopper mechanisms have to be machined to close tolerances, since it is essential that when they spring closed they seal completely. Any leaking will either contaminate the collected water with water from different depths or cause the water you collected to leak out of the bottle before you have a chance to sample it. Christensen didn't want to spend good money on commercial Niskin bottles, which are made of sturdy heavy-duty plastic, so has decided to risk all on six or seven bottles of his own design, patterned after the principles of the Niskin bottle, and cobbled together from parts found in his lab. As he takes them out of the box, eyebrows are raised. These flimsy things are what we are using on the ice? We start calling them "Christensen bottles," so there is no question where the fault lies if we get back to the lab with no data. Christensen will spend a considerable amount of time and

attention on this cruise working on and improving his design.

Next, Christensen brings out and starts dusting off a computer I am certain is older than Olivo. This is the data collection computer and the brains of the operation. All the data we collect from the two powered instruments we send down the hole will be sent to and stored on this computer. At least it will if we can remember what ancient language the computer software is written in. Aramaic, it looks like to me. Christensen claims he has perfect data security, since no one now alive, except him and the ancient guard of the computer exhibit at the Smithsonian Museum of American History, knows how to run his Easy-Calc programs. I realize now I was hired for my willingness to work cheaply and not for my software skills.

The "Christensen" bottle cobbled together from spare parts and used for water sampling.

Christensen's preference for the cheap and under-appreciated solution may have been forged

on the summit of Mount Whitney on a hiking trip Christensen took with a group of people when he was a graduate student. The rest of the group "all pulled their expensive 35mm cameras out of their backpacks and every single one of them was frozen. Meanwhile, I pulled my cheap Instamatic out of my pocket and shot a whole roll of film. I was sitting there eating my lunch while they fussed around with their cameras."

Belzile told me that Christensen is known to be terribly disorganized and that some people consider the chaos in his lab to be "dangerous." A couple of years ago, the Lab made him clean it up, but it never seems to stay that way. The 24 crates we have scattered over the floor here is "way more than other scientists bring," and shipped at greater expense because Christensen didn't get the crates packed until it was too late to send them cheaply. It is clear, just by peering into them, that they weren't organized ahead of time, either. It looks as if someone just tipped a desk upside down and let the contents pour out. I asked Christensen later if he had brought his whole lab with him. "Oh, no," he said, "there is plenty more where this came from, and it all looks just like this." I took this to mean old and disorganized. Belzile assured me this was true.

In any case, it falls to Olivo and me to organize this chaos while Christensen and Belzile get the scientific gear together. We begin to spread out on the floor, and I notice the look of alarm on Gayle's face. He comes to the hangar less and less frequently over the next week or so, until it is time for him to leave and the alternate manager comes to deal with it. By that time, we have man-handled about half the mess over to an empty office in an adjacent building, where Belzile can process samples and build cables in peace and quiet.

After a couple days of organizing, we are all tired of it, and since the pilots have arrived, we decide to make a reconnaissance flight out over the ice. This is my first flight in a helicopter and I am disappointed it is not as much fun as I expected it to be. For one thing, this is a work helicopter, not a pleasure helicopter. More often than not it is used to transport fire fighters and their gear to fires. The passenger seat is nothing more than a piece of canvas suspended between two long poles. The back of the seat is a similar contraption, designed to poke you between the shoulders so you can't catch up on your sleep when you are suppose to be thinking of, say, fire safety.

A sadist designed the engines, and placed them about six inches from the back of your head so that by the time you arrive anywhere your brain is so addled and shaken you can't feel the

pain of slouching in your seat to avoid the pokey thing in your back, or the cramps from putting your feet on the portable generator in front of you so that your knees are above your chin. (Olivo, a foot shorter than the rest of us, looks perfectly comfortable, which gives me another reason, besides her obvious competence in all things and her boundless enthusiasm, to be irritated with her.)

We have to wear seat belts and a helmet, of course, but if the helicopter goes down we are going to be crushed by the unfettered heavy winch and other loose gear at our feet. It will, in all probability, be a merciful death. Christensen had recommended fire-proof Nomex undergarments in his pre-trip letter to us, but with my current salary I've had to make do with what I had, which is the kind of polyester that melts into your skin in the event of fire, the most likely cause of death in a helicopter crash. I try not to think about it.

I've negotiated a window seat for the duration of the cruise in lieu of receiving minimum wage, since it is my intention to see a polar bear. My solace is looking out the window, searching the bleached landscape for a brief glimpse of *Ursus maritimus*.

We are not carrying polar survival suits on this flight, so flight regulations require that we cross open-water leads at a minimum of 1500 feet so that we might have a chance of dying on ice instead of in water in the event of an emergency landing. But for some reason there are no open water leads today, so we chug along at between 500 and 1000 feet, low enough to spot polar bear tracks in the snow below, and there are a lot of them. I begin to get excited. But for over two hours all we see are tracks, nothing else, and everyone but me has grown bored trying to follow them. The ice looks good to me, although the few people in the cabin with Arctic experience say that it seems unusually rough this year.

One person in the cabin with us is Andy Greenblatt, a fixed wing aircraft pilot, who is considerably interested in the surface of the ice, since it will be his job to take off and land his plane on it. Our problem is that our farthest sampling locations are far enough from the airport in Deadhorse that the helicopter can get us there, but doesn't carry enough fuel to bring us back. Greenblatt is our solution. He will load his small Cessna with four 50-gallon barrels of high octane kerosine fuel and follow us out to our first sampling location. We will try to select a site close to where we want to sample that has about 1500 feet of clear ice for Greenblatt to land and take off again. While we perform our scientific chores, Greenblatt and the helicopter pilots will

hand pump the fuel from the barrels into the helicopter so we can make it back to Deadhorse.

The Research Agenda

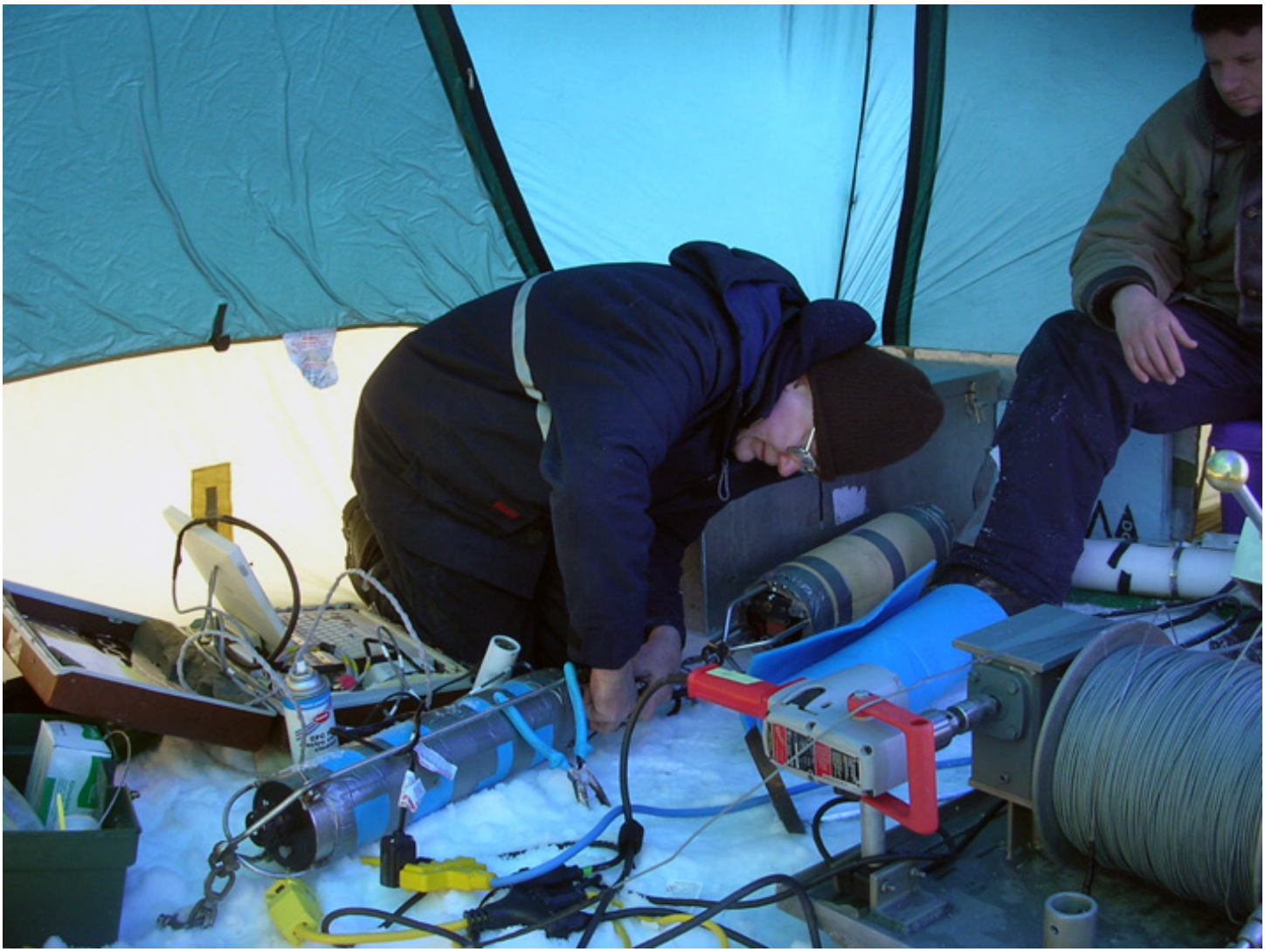
We've been at this for almost a week now, and we are feeling peevish. It is not going well. Each day starts out reasonably well. We have had a bit of morning fog, which has grounded us for a couple of hours or so, but we have been able to fly every day. The real problem is with equipment. Especially with Belzile's CTD instrument, with which we measure conductivity (or salinity), temperature, and depth (or pressure). These are three essential measurements and the instrument is working only intermittently. When we test the machine back in our makeshift laboratory in the aircraft hangar, it works perfectly. And it works perfectly out here for the first cast or two. Then it starts getting flaky, recording in short bursts as we haul it up and down the water profile, rather than continuously. Christensen and Belzile have both focused their considerable equipment skills on it, but so far the problem, whatever it is, remains unsolved.

We have tried completely repacking the battery pack that provides power to the instruments with fresh batteries (we have brought more than enough). We have completely re-soldered the connections at either end of the instrument case. Christensen confided privately to me that he thinks the problem lies in faulty cables that Belzile had to build for the project. But Belzile is a careful worker and it seems unlikely to me. Christensen has not expressed the slightest criticism of Belzile, figuring this is something Belzile needs to learn. But Christensen and Belzile will stay up until 1:30 in the morning rebuilding cables just to see if they can eliminate this disagreeable possibility.

Of course, conditions on the ice are extreme. It is cold, the pressure at depth is high, we are working in salt water and electrical connections must be kept absolutely dry or they are prone to short. In truth, there are about a thousand things that could go wrong, and we have only been able to eliminate a couple of hundred in our short time on the ice. Plus, we have had to deal with the wind.

Each day is windier than the day before. We do the deep casts first, because they are farther from shore and we need to refuel the helicopter at the farthest point so we have fuel enough to return, stopping in succession at the closer-in locations along our sampling transect. We lower the instruments on a winch to a depth of about 1500 feet. We have about 1600 feet of wire on the winch, and it weights close to 200 pounds. We had most of it played out yesterday, along

with about 100 pounds of instruments attached to the wire, when we noticed a distinctly different sound from the portable electric generator that powers the winch. It started to sound anemic.



The instrument string, winch, and ancient computer that collects the data.

I usually drive the winch, but yesterday Belzile was driving and I had been assigned to plant my rear end on a corner of the tent to hold it down in the wind. Since I had my hands free, I was asked to go outside and investigate the source of the strange choking sounds the generator was starting to make. We had the generator upwind of the tent and as far away as our large extension cord would reach. The generator makes a lot of noise, and having it next to the tent makes it hard to communicate inside. As I walked over to it, even I could see the source of the problem. Snow had blown into the air filter, had partially melted and then frozen as a solid sheet of ice, preventing air from entering the carburetor of the engine. The choking sounds we heard were

the generator gagging on too much gasoline. We had to do something quickly or we would be man-hauling our instruments and 200 pounds of cable out of that hole. A task that seemed totally impossible under the circumstances.

Unfortunately, the only means we had of melting the ice were the hair-dryers that were powered by the generator. We immediately ceased all science operations and turned our attention to getting the instruments out of the water. In the end, we barely made it, but the generator was a complete mess, with gasoline coming out all possible pores. When we removed the spark plug to have a look, gasoline poured out of the hole, And it certainly wasn't going to start again, so another day was lost to equipment failure. We spent the rest of that day trekking to the hardware store to buy new spark plugs and filters for the generator and cleaning it up completely. We also resolved to put the generator downwind and close by the tent where it can be protected from the wind from now on, which means the aesthetic experience of collecting science data is compromised even more.

We have been working 14-16 hours a day for a week now and the close physical proximity, the lack of sleep, the problems out on the ice, and the tough weather conditions are having an effect on morale. Not that you would notice with Christensen. He seems unflappable, able to role with any punch this mission can deliver, indefatigable in his constant stream of stupid jokes, loopy stories, bad puns, and stream of consciousness narration. The goofy smile and his propensity to break into some nutty song, apropos of nothing, is beginning to remind me of Jack Nickleson in the movie One Flew Over the Cuckoo's Nest. I'm convinced he suffers from adult Attention-Deficit/Hyperactivity Disorder. I even asked at the general store to see if they had any Ritalin, thinking we might all catch a break if I spiked his morning tea with it. They didn't. I'm convinced he looks older than he is because he puts in about two and a half days of work for every one of ours, although Belzile is trying hard to match him.

Olivo was an eager volunteer, too, jumping at any chance Christensen gave her to do extra work. But I noticed, when I volunteered to go fill the truck with gas, Christensen was also willing to take advantage of our generosity. I learned I was expected to use my own credit card to pay for the gas or purchases on our frequent runs to the hardware store. But, I have my own cash flow problems to solve. When I told Olivo I was no longer carrying a wallet on this trip and I recommended that she not either, she looked at me like I was an ungrateful freeloader. But

financing our research is not my responsibility, especially when the gas bill just about equals my weekly salary. Belzile confirmed later that Christensen was not always careful with other people's money. "He has a reputation of not keeping careful account of expenses," he told me. This doesn't seem like malicious behavior. Christensen just doesn't think about money at all, except for how much he needs to do the research he so clearly loves.

The constant togetherness is wearing on me. Normally, I spend much of my time in my own company. I am not used to working on someone else's schedule. One night, to get a few hours alone with my thoughts, I offered to do laundry for anyone who wanted to keep working. Christensen took me up on my offer. This much is clear: he doesn't waste research money on clothes. And like everything else in his life, nothing is thrown out, every bit of utility is extracted. One morning, Christensen showed up for breakfast in a pair of gray, checked pants of the sort worn by line cooks. The seat had worn out and Christensen had carefully sewn a new one into them in a contrasting green color. When we go outside, Christensen wears one of those furry Russian hats with the ear flaps and the brim that flips up in front. But, he wears it backwards (I don't know whether intentionally or not), which causes Roger, the helicopter mechanic, to laugh every time he sees it. I'm not sure I would have been eager to sit with us at meals, either.

The Research Leader

Despite the constant stream of inanities that flow from his thoughts, Christensen is extremely smart. His graduate school mentor at the University of Washington still considers Christensen to be his best student ever, 25 years after Christensen graduated. It takes me a while to realize this, but he thinks about science constantly. The inanities appear to be a way to keep people at a distance, so the real brain power can be focused on the important problems that don't involve people at all. And, like many self-absorbed, intelligent people, Christensen can't understand why the people around him can't keep up. He reserves most of his contempt for persons in positions of authority or power. His slovenly organized lab, his fascination with old equipment, his personal habits and personality, all seem to be devices designed to thumb his nose at and push the buttons of conventional authority. He is a rebel to the very core of his being. He appears to have no interest in behaving in polite society.

Nor does he have much interest in other people's ideas. He comes at science from first principles. He looks, always, for the simple, straightforward solution to a problem. To a solution that illuminates the essence of the problem. He uses his intelligence as a knife to cut away everything about a problem except what he considers essential, which he then likes to solve in the most efficient (you could read inexpensive, if you like) way possible.

I asked Christensen how he keeps up with the latest research in oceanography. "I don't," he replied. "I used to subscribe to the journals and try to keep current, but I didn't want to pay for something I never read so I let my subscriptions lapse. And, anyway, when I was reading the journals I had a hard time getting funded. I would write two or three grants every four or five months, and I got tired of my ideas, some of them very creative, being rejected. So I stopped reading the literature and writing those kinds of grants. Now I only write grants about things I think are important and my success rate has gone up to nearly 80 percent." He paused, as serious as I have ever seen him for a moment. "But it's still not enough to keep me in a full-time salary."

There are, among Christensen's colleagues, those who hope a lack of salary might eventually push Christensen out of the business entirely. He is not known at Bigelow for his collegial spirit. He admits he hasn't had a pleasant conversation with the woman Belzile works for in "four or five years." He claims she is "always complaining about something or other. I was the same way the first 10 years or so I was at Bigelow, then I just learned to ignore it." And he is especially annoyed by faculty meetings called to discuss "faculty titles and who's responsible for the coffee fund and making coffee." He has had run-ins with the administrators. "I have a real problem with authority, which is probably why I have stayed at Bigelow for as long as I have. I think that may be the one place where I can actually survive," he told me.

The Bigelow Laboratory for Ocean Science was founded in 1974 and was named after a famous oceanographer who studied ocean currents off the coast of Maine in the 1920s by dropping whiskey bottles off his ship and tracking where they ended up. Christensen admires the low-tech nature of this work, "which hasn't been improved upon much since then." Bigelow's web page describes the laboratory as "distinguished by a spirit of scientific freedom, a tradition of open, interdisciplinary team-building, and mentorship." But "team-building" and "mentorship" do not seems to be Christensen's strengths.

Belzile acknowledges this, “although he did tell me thank you for coming over and working with him until after midnight the other night. I was shocked. I’ve never known him to do that.” In fact, I’ve never seen or heard Christensen thank the pilots for their help and support. I’ve gotten into the habit of thanking them every day when I get out of the helicopter, and on the last day I made a point of walking around and shaking hands with them. Christensen was already out of the helicopter and sitting in the truck waiting for the rest of us to go to dinner.

I’ve felt Christensen’s lack of acknowledgement in a physical way. I’ve learned never to follow him into a building, because the door is going to close in my face. Not once, in over four weeks of working with him, have I ever observed him holding a door for someone. He just walks into the room and lets the door close behind him. This is especially true if you have your hands full carrying a box of gear from the truck. I usually just wait until he is inside, then kick the door with my foot until he opens it. One night I reached the door of the hotel first and pushed it open for everyone else. When Christensen got there he insisted that I go first, but I said, “No, you go ahead,” and I made the mistake of releasing the door as he walked though, thinking he would hold it open while I followed him. It still slammed in my face.

Belzile knows of at least two people at Bigelow who have worked for Christensen, but will never work for him again because of his tendency to blame other people when things go wrong. I noticed he has given Olivo tasks to do with the data, but has deliberately not told her how to do what he wants done. I thought it was a kind of test he was using to see what Olivo actually knew about oceanography. (Although, as a freshman, she probably doesn’t know much.) Belzile thinks it more likely that this is a way to blame Olivo if it turns out later there are problems with the data.

Given the stated aims of Bigelow and Christensen’s tendencies, Bigelow seems a strange place for him to have ended up. But among Bigelow’s assets, which Christensen says is a short list, he includes the fact that Bigelow “won’t, or can’t, damage the career of a scientist.” Bigelow doesn’t offer a scientist much in the way of support, which means the senior scientists exist mostly on soft grant money, but “Bigelow doesn’t get in your way, either. If you can find the money, you can do the research.”

Perhaps because everyone is fighting for a limited pot of money, Bigelow operates in practice more like a small academic department without strong leadership. That is to say, there is

bickering and snubs and other petty behavior that get in the way of the ten senior scientists talking to each other and working cooperatively, or even knowing what the others are doing. Add to that the fact that "the current leadership is all about senators and representatives and could care less about the actual science," and you have a place that is just about tailor-made for someone of Christensen's inclinations. Christensen adds that "Bigelow's greatest claim to fame is that it has survived. And there is something to that." He could be describing himself.

Christensen graduated from Prescott High School in Arizona in 1967 and attended Northern Arizona University on a music scholarship. He played the saxophone in high school, but the University needed a trumpet player for the marching band, so they asked him to play that. Later he learned the flugelhorn. "I never was very good at it," he tells me, but his knowledge and interest in jazz belies his answer. In any case, it was the saxophone he loved to play. At one point in his life, when funds were low and science wasn't paying well, he had to travel to a shop in Boston to sell it. "I couldn't find the store," he told me, "partly because Boston is confusing, but mostly because of my state of mind." He hasn't played since then, until a year or so ago, when he bought his daughter an alto saxophone. "I picked it up one day and honked around on it. My daughter came in and told me they could hear it clear out by the street." He would like to purchase a soprano sax so he and his daughter could play duets, "but soprano saxes are only made in professional quality, so they cost a couple thousand dollars," a sum that is beyond his means.

Like many a scientist, he wanted to be an oceanographer after seeing a Jacques Cousteau special on television. He received his Ph.D. in oceanography from Washington University in Seattle. But he has never really liked the way science is done. Even the Shelf-Basin Interactions Program, of which our research is a small part, annoys him. "I've attended meeting after meeting," he complains to me "in which the science director starts with a litany of the instruments we will be using in the project, but doesn't say one word about what the goals of the project are going to be. What scientific question do we want to answer? What is the purpose of the research? Not one word!"

Christensen did express admiration for another project he worked on, in which the stated goal was to measure the heat budget of a specific block of ice. "The goal was stated and not a single proposal was funded that didn't contribute to this goal." Christensen thinks that the instruments the researchers have lying around unused in their labs is what has determined which

scientific questions are being asked on our current project.

On the Ice

The first impression a newcomer to Arctic ice has upon landing on it is how absolutely beautiful it is. From above, the ice looks like a huge, flat, monochromatic desert. But close up, near the pressure ridges where huge blocks of ice are tossed around by ice sheets crashing together, there is only breath-taking beauty. Aqua-green colors of such subtlety and shade that they cannot be described on this Earth. Nor can it be captured by a cheap camera, no matter how many pictures you take. Even Photoshop doesn't help. It can exist only in memory, and it is as indelible there as any memory can be.

The ice is breath-taking in its beauty.

There is much to do when we land on the ice, and everyone has their assigned tasks. Olivo uses the GPS to establish our precise location. I unload the helicopter, starting with the drill and generator to drive it, so Belzile and Christensen can start drilling the hole. Then I work on getting the tent set up. After a week or so of this, repeated from one to five times a day, we have all gotten good at it. We can set up and break down a camp in about 15 minutes time, which leaves about an hour or so for the scientific sampling, if nothing goes wrong, which happened only rarely early on, but is happening more frequently now that we have learned more about how to innovate on the ice.

Eventually, we all duck into the tent to set up the science equipment. I'm fairly useless at this point, having been judged too clumsy to work around the hole, which is how I like it. Depending upon how we have arranged the winch, which takes up about half the space in the tent, it is sometimes convenient for me to drive the winch, but sometimes Belzile is closer to it and takes on that responsibility in addition to his science duties. On days the wind is not blowing, I like to stand "guard" outside the tent, near the rifle all scientific parties are required to carry on the ice, and watch for polar bears. God knows, I seriously doubt whether I could actually get to the gun and fire it with my heart beating as loud as it probably will be if I see one of those magnificent creatures, but it gives me an excuse to look around.

The two pilots are in the helicopter, and they are supposed to be keeping watch for bears, too, since we wouldn't be able to see them at all from inside the tent, but the helicopter windows are usually pointed the wrong direction, and I don't get the impression they take this part of their job seriously anyway. Although they are incredibly respectful of the bears. They won't walk 20 feet away from the helicopter to urinate without slinging their own rifles over their shoulders. The rest of us have grown fairly casual about the danger, although we did get excited a couple of days ago when we found prints wandering across our sampling location.

It was hard to say how fresh they were, but the prints were large enough to comfortably encompass a large mitten. Big enough to engage the imagination. We were sampling in a small clearing or bowl, with pressure ridges in a circle around us. We were near the center of the bowl, and it was perhaps 50 yards to the nearest block of ice. I had heard that polar bears can run 30 yards in about 3 seconds. Yikes! So was standing guard and keeping a sharp eye on the ice blocks. I couldn't be sure, but I thought I saw about 20 bears lurking in the area. I was glad

to be leaving there.

Thin Ice

Yesterday was the most exciting day so far. We had finished one of our transect lines the day before, so we started at the far end of another line. We were perhaps 125 miles off-shore. The ice was fairly rough where we wanted to sample, so we had to fly around for several minutes looking for a spot where Greenblatt, the fixed-wing pilot, could land with the re-fueling barrels. Finally, we found a reasonably flat surface that looked like there might be enough room for Greenblatt and he made a couple of low-level passes to see what he thought about the situation. He decided he could make it work, so we landed ahead of him, and started to set up for drilling.

Drilling through the sea ice with the electric auger. Sea ice is normally six feet thick.

Sea ice is normally about six feet thick, but in rough areas like this, where ice sheets are crashing together, one sheet can slip over the top of another, and we have found ice that our nine-foot auger can't penetrate. In that case, we have to move the generator and drill to a new location and try again. This happened to us early on, but since then we have been better at locating ice we can drill through. No one wants to move the gear, because lugging the heavy generator and auger over the ice is hard work and no fun, and it means all our gear has be to hauled back and forth to the helicopter from a greater distance. It takes time, everyone is more exposed to the cold and wind for a longer time, and it makes all of us irritable.

The auger comes in three, three-foot sections. The driller usually starts with the first section, drills a three-foot hole, then pulls the auger out of the hole, attaches the second three-foot section, sticks the auger back in the hole, and drills three more feet, and so on. Sometimes, if two people are available to help with drilling, or Belzile is feeling particularly lucky and invulnerable, we start with two sections of the auger attached to save time. (Belzile told me later this was in the Top Ten of the most stupid things he has ever done in his life and it's a miracle he still has working arms and legs.) The idea is that one or two people ought to be able to manage three or four feet of auger outside the hole. The auger is quite heavy, especially when you get all three sections attached to it, so when you punch through the ice into the water below, and the auger all of a sudden heads south, it is good to have two people attached to it who can catch it. Most of the time we get through the ice with just two auger sections.

Belzile generally starts the drilling, and Christensen helps him when he gets the first three feet finished. While Belzile was setting up, Greenblatt had landed and taxied over to the helicopter, where he and the two helicopter pilots wrestled the 50 gallon barrels out of the plane so they could begin refueling. It was a pretty day, and warmer than usual, so we weren't in our normal intensely focused hurry to get out of the cold and wind. In fact, we were all more or less standing around the hole, like a street maintenance work crew, watching Belzile drill the hole. He had just started when, all of a sudden, he pitched forward and the auger started moving quickly down the hole. Christensen was just able to reach out and grab the auger as the top of it went down to about hole level. "What the hell...?!"

As Christensen and Belzile recovered and pulled the auger out of the hole, Olivo and I looked in. We were standing on what looked to be about six inches of ice. Moreover, we had

two aircraft practically on top of us, and the winch (which, if you had to lift it, you would swear was as heavy as an aircraft) sitting within four feet of the hole. Not a word was spoken, but four pairs of eyes were completely wide open. Six inches of hard lake ice is one thing, but six inches of soft sea ice is something else entirely. Seals can break though six inches of flexible sea ice quite easily. "Oh, shit," someone finally said.

I glanced over at the pilots, still busy with the refueling. "What are we going to do?"

Nobody knew, although the fact that all of us weren't swimming at the moment was a good sign. Finally, synapses started firing again. "Well, we're here, and we're on top of the ice and not under it. I guess it's going to hold us." Three of us looked dubiously at the speaker. "

After a couple of minutes of further discussion, it was decided that we would sample this station, but that it probably wasn't a particularly good idea to, you know, alarm the pilots just yet. I walked casually over to the helicopter and grabbed the red survival bag that contains a few sleeping bags, a tent, and a couple days worth of rations from beside the helicopter where we usually drop it as we are unpacking. I started dragging it away from the helicopter, which was clearly going to fall through the ice first, over in the direction of our tent, where it might actually do us some good if the helicopter suddenly disappeared. "What are you doing?," Jim, the head pilot asked me. "Oh, you know, just getting this out of the way," I lied unconvincingly.

Later, in the air, Christensen told the pilots about the ice. Two heads swiveled around simultaneously. "The ice was *how* thick!?"

"Well, you know, maybe a foot," Christensen said. From that moment on, we bounced the helicopter on the ice several times and we had to get the okay from the copilot that the ice was safe before we ever opened the doors and turned the rotors off. As we flew on to the next site, I started thinking about the arctic fox who showed up in our sampling site one day last week. I thought then, and I was thinking now, what a wonderfully lucky ship's crew we are.

Several uneventful days passed, Belzile's instrument seemed to be working reliably, at last. The continuing design work on the Christensen bottles was paying off. We learned to avoid the first couple of bottles off the assembly line, and to twist our mouths just right as we cocked the springs of the stoppers so we could put multiple bottles on the wire. We had fewer and fewer leaky bottles and we only had to haul the lines a couple of times now, rather than the three or four tries the bottles used to require.

We got the instrument string stuck a couple of times. The current will sometimes twist the instruments in such as way that it is difficult to get them straightened out so they will fit back into the hole in the ice. Christensen worked for 20 minutes one day to get a string unstuck, then turned the job over to Belzile as a lost cause. Belzile worked for another 15 minutes before we finally got them out of the hole. I saw Christensen making a note in the data entry log on the flight back in the helicopter, *Day was saved by a man from Quebec*.

We have lost a couple of bass messengers, which we use to trip the sampling bottles. I accidentally dropped one in the ice hole the other day, and another must have become unclipped on the way down the line, as we never recovered it, but we still have one extra, and there are probably more in the five or six crates of junk back at the hangar that Olivo and I didn't unpack.

OSHA regulations required that the pilots have two days off for every 14 days. We took one day off for fog and another just for the hell of it and because we had worked about 14 days in a row at that point. We drove 55 miles up the Dalton Highway to Pump Station No. 2, but didn't see much. A couple of caribou, a red fox stalking a mouse, a pingo (a mound in the middle of a dry lake bed that results from the ground freezing). The Brooks Range, which we can see on clear days from the helicopter, is completely fogged in and invisible to us, even though we were standing on the foothills at its base.

But, no polar bears, and I am beginning to get worried.

Polar Bears

And then it happens. We fly out to the middle of our next to last transect line. The wind has shifted in the past couple of days, and the pack ice is now broken up here and there by long open-water leads. Our first sampling location contains no ice, so we move on to the second. What in the world! As we reduce our elevation to 500 hundred feet all we can see are polar bear tracks. It looks as if there had been a polar bear convention here in the past 24 hours. The entire area is a jumble of random tracks of enormous size.

The pilots are as excited as we are, and maybe as nervous, although I don't see why. They don't have to get out of the helicopter and sit in a windowless tent waiting to be mauled. But they, as well as we, want to circle around for a few minutes to be absolutely sure there is not a

welcoming committee down there to greet us. We make three circles, each with a larger radius. Nothing. All eyes are pasted on the windows. We decide to land. Hearts are beating a little faster than normal. Cameras are out.

We get within 10 feet of the ground, when the copilot, who is flying this morning, gets a shiver. “I’m not comfortable, I just want to have one more look around,” he radios back to us. As he maneuvers the helicopter forward, I suddenly see the bears out my window on the right side of the helicopter, less than 50 yards from us. A sow and a yearling cub. The cub is now running away from us, in a posture that more resembles a race horse straining for the finish line than a bear. The sow is watching us, sizing us up, thinking about lunch, it seems to me.

We finally see polar bears no more than 50 yards from the helicopter.

The helicopter suddenly lurches to the right, as six bodies simultaneously switch positions for a closer look. The door I am pinned against and my seat belt hold, thank God. I somehow

get my camera up to my face and snap a couple of pictures. My first thought comes straight from the zoo, “Oh, look at how cute they are!” Then I remember our indoctrination and realize a sow and her cub are about as dangerous a combination of bears as it is possible to get. The sow is shaking her head and doesn’t look pleased to have visitors drop by unexpectedly.

There is nothing to do. We have missed our first sampling location, if we miss this one we might have to call it a day. And, anyway, we have the advantage of noise. It is illegal to harass the bears and we are certainly not going to shoot them. The amount of paperwork we would be required to fill out, even if we did it in self-defense, would keep us in the Arctic for another couple of months. We decide to just fly back and forth, posturing, beating our chest for a couple of minutes.

The sow holds her ground, then looks back at her cub, retreating quickly in the distance. “Oh, the hell,” you can hear her thinking. She casts one more disdainful look back at us and galumphs off in the direction of her cub. They are heading south, in the direction of our next sampling location, a mile or so away. “Uh, is that a good idea?,” I ask the pilot.

After a few more minutes flying back and forth, we land. Normally, we jump quickly to get the camp set up when the pilot gives the all-clear sign, but today we move deliberately. It seems we want to stand around and process our experience, like people do who have witnessed a traffic accident first hand. “Did you see how that sow looked at us! Did you see how fast that cub was moving!” Only Christensen seems unaffected by the experience. “Why do you think it is so exciting to see polar bears?,” he asks me. “I don’t know,” I replied. “Probably because you have to travel a long way from home to see them.”

Eventually, our breathing returns to normal and we get on with our business. But there is no way I can enter the tent today. I locate the rifle, make sure the clip is full, check the safety, but I don’t load a bullet in the chamber. I suppose I could fire on one of those beautiful animals to save the life of a companion, but it would only be after I had exhausted all other options. Polar bears are why I am standing here. I’m not sure my grandchildren will ever have the opportunity to see polar bears this way. I want to remember the experience forever. As cold as it is, I feel warm all day, standing with my face toward the sun and my eyes scanning the icy horizon.

Leaving Deadhorse

After the polar bears, the remaining days turn routine. The ice continues to break up and huge open-water leads appear everywhere. We spend much time each day threading our way around them, as we don't have the necessary survival gear to fly over them, according to flight regulations. I turn my attention from looking for polar bears on land to searching for whales in the water, but I don't see any. Thoughts begin to return to family and friends at home.

We continue to work long days, trying to catch up from our problems early on. Most days we leave the hotel about 7 AM and return after 10 PM. The cook sets our dinner aside for us, so we can heat it up when we get back. One day we can't fly—fog—so we spend the morning cleaning and organizing our gear for our return later in the week. After lunch there is a near mutiny when most of the crew wants a nap, and Christensen is ready to do something else. "My God, John, can't you sit still for an hour!," I snap at him. "I'll think of something to do," he says as he takes the truck keys from Belzile. He will putter in the shop while the rest of us try to recover our good dispositions.

Christensen thinks he might call home. His daughter was in a play last weekend. He has mentioned his daughter a couple of times, but hardly ever mentions his wife. Belzile told me he drove his daughter to Portland four or five times so they could see the Lord of the Rings movie together. He said it meant a lot to Christensen to be able to do that. But his marriage appears to be more of a matter of convenience than a steadying emotional relationship. I asked him once if his wife asked him to fix things around the house, since he was so handy at this kind of thing. "She tries," he said, "but I don't like to do it. I like to fix things that require a certain kind of thinking to solve. I like to think about things for awhile before I do them. I don't like to fix things just because they are broken. There has to be a problem to solve."

Christensen prefers to be incommunicado when he is doing field work. On his last cruise he was away for well over a month on an icebreaker. The scientists were assigned e-mail addresses to use on ship so they could communicate with family and colleagues. But Christensen doesn't bother to check e-mail often, and never on a cruise. His wife sent him an urgent e-mail. He didn't know about it. Finally, his wife had to track down the e-mail addresses of other people on the cruise and get them to ask Christensen to check his e-mail. "It turned out the dog had died. As if I could do anything about the dog dying," he said disdainfully. You get the impression

science problems are the only problems worth thinking about. “When you go into the field, you should just go. Your family should just get used to you being gone. If you stay in touch, it just makes things worse.”

Olivo finally has become exasperated enough with my clumsiness to snap at me. We are packing boxes to be shipped out, and I am fumbling with the doohickey thing you use to put straps around a box. I think I had it upside down. When she had seen enough, she yelled at me, “My God, haven’t you ever made anything in your life!”

The Brooks Range on returning.

“No, Sarah, if it doesn’t involve improving my backhand or sitting in front of a computer 10 hours a day, I haven’t done it for at least the last 20 years,” I replied, “That’s why I’m here, to do something different.” Belzile chimed in with “He looks like he’s just muscle, but there is some intelligence there. Maybe he could write a book,” referring to my propensity to write in my journal at odd moments when there is nothing else to do. Oddly, this outburst serves to clear the air between us, and for the rest of our time together we feel more comfortable with each other, more accepting of both our strengths and limitations. We laugh together more.

The last night we are in Deadhorse, Belzile and I stay up late in the TV room of the hotel, watching a program called The Morning After: The Top 40 Country and Western Drinking Songs of All Time. He confides to me that he is “thinking about getting cable TV when I get home, just so I can understand Americans.” Good plan, I think, but we seem so different from each other in so many ways, I am afraid he is going to have to watch a lot of televi-

sion to come to a reasonable understanding.

Finally, everything is packed, and we are ready to board the plane back to Anchorage. Christensen tells us that he has found a stash of candy bars in his luggage and that "I always travel with a couple of candy bars in case the plane is delayed on the runway." I say, "That's the difference between us, John. I always travel with a couple of books for the same reason." He smiles at me.

It is cloudy today, and Denali is invisible. But as we begin our approach into Anchorage, color returns to the world, and it is breathtakingly beautiful. Browns and greens of every conceivable shade and texture. Imagine a northern Inuit growing up in the frozen north and seeing this for the first time. It might appear as a nightmare, rather than the paradise it seems to me. The fecundity, the smells. It seems a long time ago when I left this place.

We are staying overnight in Anchorage and all taking different flights to different places in the morning. When we get to the hotel, we all choose to go in different directions, agreeing to get back together for dinner later that evening. I certainly feel a need for solitude, and for readjusting to this warmer, more colorful world. I buy a newspaper and find a bar. I nurse my beer for an hour and a half, reading the newspaper cover to cover. When I am finished, I feel ready to face the world again.

When we meet for dinner, it is obvious I am not the only one happy to be out of the dry North Slope Borough. Christensen has clearly already had a couple of drinks in the restaurant bar, enough so that he has already made a reputation for himself as a "smart ass." We are underdressed in this place, considering it is prom night and we are surrounded by elegant young couples. Christensen is not setting a good example for the young diners in his conversation with our waitress, and the rest of us look at our hands wishing he would just shut the hell up, or at least keep his voice down.

But, finally, dinner and drinks arrive and the talk calms down while we eat. Someone wants to know what our major impression of the trip has been. For me, it was the ephemeral color of the sea ice. For Olivo, it was how flat and white the Arctic is. For Christensen and Belzile it was the large extent of oil exploration apparent in the area. We talked for a while longer, and then Christensen picked up the check, a surprise to all of us.

We walk outside into the warm evening air, thick with humidity and the smell of the sea.

Christensen clearly wants to get drunk tonight. There is some kind of chemistry going on between Belzile and Olivo I don't want to interfere with. They wander ahead, no particular destination in mind. Christensen and I follow for about half a block, talking quietly. He admits he is "tired." I would think so, he has worked about twice as many hours as I have, and I'm exhausted. But, abruptly, Christensen decides his kind of bar is in the opposite direction to the way we are walking. He shakes my hand and thanks me for coming, and then he is gone. Our good-bye takes maybe 15 seconds.

I walk slowly up to Belzile and Olivo, who have waited to see what was happening. "I think I'm going to call it a night," I say, "I'm tired and I have an early flight in the morning." We spend another five or ten minutes reminiscing and saying good-bye. Then I leave and walk back to the hotel, happy to be returning to the place I so desperately wanted to get out of just one short month ago.

About the Author

David Fanning is a software consultant, author, and part-time wilderness ranger living in Fort Collins, Colorado. His job sometimes takes him to far flung locations around the world, where he tries to fit a bit of adventure into his free time. Fanning's idea of a perfect vacation is to end up in some Godforsaken place where no tourist would want to be seen. His only qualification for Arctic research was being a warm body (at least, at the start) who worked cheap. He went to the Arctic because, as he put it, "you are not going to see polar bears in Colorado."