

# THE **White** CONTINENT **HEATS UP**

A 600-MILE EXPEDITION DOWN THE ANTARCTIC COAST REVEALS A CONTINENT AT A TIPPING POINT. SOLDIERS ARE POSITIONING FOR A LAND GRAB. THE ICE IS CRUMBLING. THE PENGUINS ARE MOVING SOUTH. AND TRAVEL—BY FOOT, SHIP, OR KAYAK—IS JUST GETTING WARMED UP.

BY **JON BOWERMASTER** || PHOTOGRAPHY BY PETER MCBRIDE



**CRACKING UP** The Ocean's Eight team, led by the author, skirts a crumbling iceberg in the Lemaire Channel.

BEST NEW TRIPS '09: ANTARCTICA

On a January morning, three days after leaving the southernmost yacht club in the world, Club Naval de Yates Micalvi, in Puerto Williams, Chile, we begin our hunt for the one thing Antarctica offers in greater numbers than anywhere else on the planet: icebergs. • About 200 miles from the continent's mainland, surrounded by black, 12-foot seas, we spy our first and float by quietly, reverentially. It is easily a hundred feet tall, solid and old, its glacial ice so compacted that the air pockets has been squeezed out, making it ever more blue. • Ice is everywhere here. The 74-foot *Pelagic Australis's* deck is sheathed in a thin layer of it. The boat glances off sizable pieces broken away from the 700,000-square-mile pack that surrounds Antarctica each spring. While I've been here several times before, a few of my teammates are seeing these big bergs

for the first time. Armed with digital video and still cameras, they're like kids on Christmas day.

We've been sailing hard for nearly three full days across the notorious Drake Passage, and now we're nearing King George Island, 75 miles off the tip of the Antarctic continent in the South Shetland Islands. Home to a dozen international science bases, it's where I'd stashed our kayaks during a recon trip aboard the *National Geographic Endeavour*.

We are exhausted after sleeping in two- and three-hour spurts, thanks to mandatory watches. But now, leaving the Drake behind, that exhaustion is replaced by trepidation: For the past year I'd started each day by punching *polarview.aq* into the nearest com-

puter, trying to get a peek at just how the ice rimming the continent was growing or shrinking. But we still have no idea exactly what conditions we'll find until we drop our kayaks into the Southern Ocean. The only sure thing is that the water will be cold (30 degrees, nearly the freezing point of salt water) and that the katabatic winds will be fierce, building as they race off the continent's sloping plateau out to sea.

Our plan had been straightforward enough: Get as far south as we could—by kayak, sailboat, and foot—before the ice stopped us. It would amount to the second most ambitious Antarctic kayaking expedition in history (New Zealander and tripmate Graham Charles paddled 528 miles down the coast in 2000). Along the way we'd meet a handful of scientists and soldiers to get a firsthand assessment of how the rapidly rising temperatures (it's nearly four degrees warmer on the peninsula on average than it was 50 years ago, among the most dramatic changes on the planet) and record-setting tourist numbers are affecting life at the end of the Earth.

But nothing in Antarctica is straightforward: Any private expedition must provide its own search and rescue. There is no 911 service. No navy. No coast guard. If someone on our team were to



**CAMP COOL** Chilean mountaineer Rodrigo Jordan hauls his custom kayak to camp. Opposite: tktktktk.

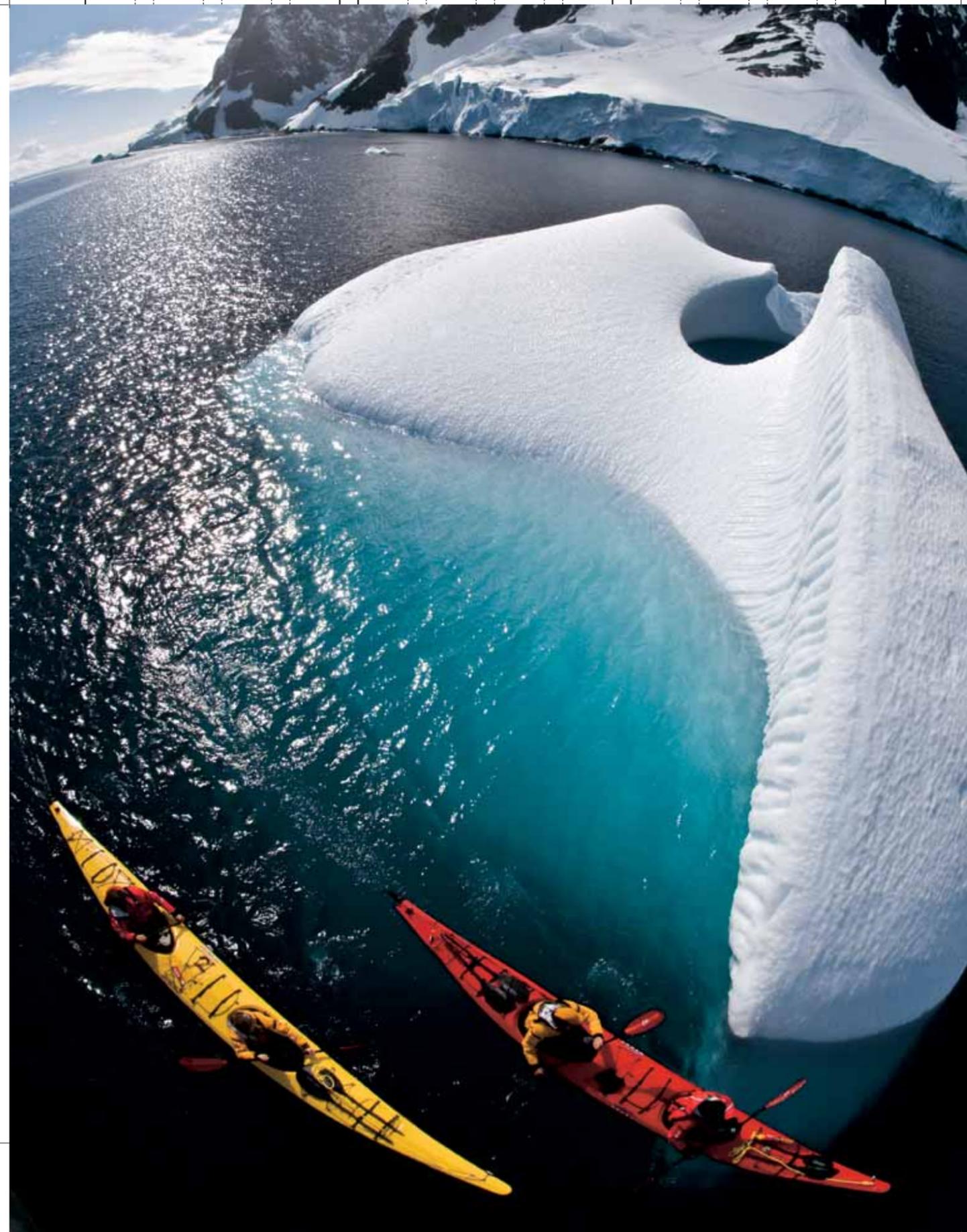
break a bone or rupture a spleen, we would have to provide our own ride back to the tip of South America, which explains the *Pelagic Australis*, a ship I chartered from American captain Skip Novak for \$5,000 a day.

We also needed the permission of the U.S. State Department, the National Science Foundation, and the Environmental Protection Agency. The process took more than a year, dozens of lawyer hours, and permits as thick as telephone books, a painstaking pursuit but one that keeps out the daring and unprepared—those who want to bicycle to the

South Pole, for example. Ironically, since we planned to camp, we had to fill out more paperwork than the *Princess*, which carries 3,200 passengers.

But while our approach is unique, it's clearly not the only way to visit. For the past decade, each tourist season in Antarctica has set a record; in 2007-08 more than 40,000 visited by big vessel, compared to a few thousand a decade ago. With prices down on the largest ships and demand up (see it before it's gone!), every tour operator in the world is trying to come here. Permits are required by the International Association of Antarctic Tourist Operators (IAATO), but its online guidelines for tour operators, including designated landing sites and rules to obey onshore, are unenforceable. Ice-ready boats are also not mandated (a few of the ships operating in Antarctica last worked as ferries in Denmark and Norway). Some predict that within two years the number of visitors will double.

For now, however, we are alone. And standing on the bow of the *Pelagic* on a 20-degree morning, I tighten my grasp on a cold metal stay as we nudge past a three-foot-thick piece of ice, mindful of the



one steadfast rule of sailing in 30-degree water: Fall off the boat and you're dead. Tumble, trip, stumble, catch a toe, lose your balance, or for any other reason find yourself in the Southern Ocean, just raise a hand and wave goodbye because the boat will never return fast enough to save you before hypothermia sets in.

**CHANGE IS IN THE AIR—AND IN THE SEA**

We take our first paddle strokes on a gray day, about 150 miles down the west coast of the Antarctic Peninsula, circumnavigating Enterprise Island. I measure the temperature of the ocean; it's 30 degrees exactly. Air temperatures are in the low 20s. Photographer Pete McBride and videographer John Armstrong, each with thick drysuits, are the only ones thinking of swimming. The team—a group of seven adventurers, including Chilean mountaineer Rodrigo Jordan, Tasmanian naturalist Fiona Stewart, Orange County-based navigator Sean Farrell, Armstrong, McBride, Charles, and myself—will spend the next few weeks nudging our way southward in custom-made

kayaks made of carbon fiber, Kevlar, and fiberglass. The boats, which are reinforced to withstand the ice, weigh 600 pounds when fully loaded. Tipping one, and rolling upright again, would be a challenge. If we flipped, we'd have less than five minutes to surface before hypothermia began to slow our hearts.

For now the gray sea is calm as we pull around the first corner to find the channel leading out to the Gerlache Strait, one of the Peninsula's so-called Kodak Alleys (for its typical lineup of picture-perfect bergs). Near shore we thud the boats through thick brash ice. It's like paddling through a field of bucket-size ice cubes.

Each austral winter, a halo of sea ice forms around the continent, and each spring trillions of tons of fresh water are released into the ocean as it thaws. This is the Earth's thermodynamic engine, the beating heart that drives the circulation of ocean currents, redistributing the sun's heat, regulating climate, forcing the upwelling of deep ocean nutrients, setting the tempo of the planet's weather. The Antarctic affects all our lives, but through forces so deep and elemental that we're not even aware of them.

Two of the ten shelves along the Antarctic Peninsula have vanished completely. Another five have lost between 60 and 92 percent of their size.



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### BEST NEW TRIPS '09: ANTARCTICA



**PLAYPEN** Gentoo penguins cruise with kayaks. Below: King George Island.

be the collapse of the Peninsula's ice sheets. This is exactly what is happening now.

In March 2002 scientists watched the 500-billion-ton Larsen-B ice shelf shatter into thousands of tiny icebergs. This past March a 160-square-mile section broke off the Wilkins ice shelf. Two of the ten shelves along the Peninsula have vanished completely within the past 30 years. Another five have lost between 60 and 92 percent of their original size. Of the ten, Wilkins is the southernmost shelf in the area to start buckling. The dramatic changes suggest it's possible that the rest of the Peninsula's ice may deteriorate soon.

### HUMANS IN THE KINGDOM OF ICE

Rounding Enterprise Island takes nearly five hours. The ice that lines the Peninsula forms an intimidating spectacle: one Alaska piled on top of another. Yet already our interactions with wildlife are intimate. We often hear the blow of humpback whales breaching nearby before we

seen them; likewise the plop-plopping of hundreds of porpoising penguins. We stop and study a half-ton leopard seal floating by on an ice floe. He looks up at us, belches, then goes back to sleep.

We finish alongside the wreck of the *Governoren* in Wilhelmina Bay. A turn-of-the-century, 5,500-ton floating whale factory, only the rusted bow of the ship now points out of the calm sea. In 1913 the Norwegian craft was considered the most sophisticated whaling boat working in Antarctica, producing more than 22,600 barrels of oil from over 550 whales. But on January 27, 1915, sitting in this harbor stacked with more than 16,000 barrels of oil, its crew threw a going-

away party, which resulted in a massive fire. Though all 85 crewmen survived, the boat was a total loss. As we float over its sunken deck, its rusting side rails angling down through the clear sea, it's an eerie reminder of how risky any kind of business in Antarctica must inevitably be.

In the early 21st century tourism has replaced whaling as Antarctica's boom industry. Demand has rocketed at the same time that big-boat operators have figured out the best routes, landings, and anchorages. More than 30 cruise ships, ranging from the hundred-passenger *Endeavour* to the 3,200-passenger *Princess*, make back-to-back-to-back visits each season from (Continued on page 120)

### ADVENTURE GUIDE

# Antarctica

THE ONLY THING CHANGING FASTER THAN ANTARCTICA'S LANDSCAPE ARE THE WAYS YOU CAN VISIT: BY KAYAK, SHIP, AND PLANE

#### BY KAYAK

Expedition-ready paddlers can explore the continent just like writer Jon Bowermaster, traveling from anchorage to anchorage while camping on the Antarctic Peninsula. **Explorer's Corner's** new sailing-and-kayaking combo

launches this month and offers the best of both boats (28 days, \$TK; [explorerscorner.com](http://explorerscorner.com)). For a more modest paddle, **One Ocean Expedition** specializes in daily five-hour guided kayak trips from its icebreaker (\$TK; [oneoceanexpeditions.com](http://oneoceanexpeditions.com)). "Paddling in Antarctica is surreal," says owner Andrew Prosser, veteran of more than a hundred Antarctic expeditions. "There is no place as pristine, no place where seals and whales put on shows for you."

#### BY SHIP

During the fall and summer (October to March) sailboats tack between Tierra del Fuego and Antarctica. **Ocean Voyages** can help would-be Shackletons find a berth on a number of small sailboats, including the



ten-passenger *Pelagic Australis*, which sails from Puerto Williams (\$5,400 a night; [pelagic.co.uk](http://pelagic.co.uk)). Nonsailors can climb aboard the *National Geographic Explorer*, the new, state-of-the-art expedition ship operated by **National Geographic Expeditions** in conjunction with **Lindblad Expeditions**. Bowermaster will be on board for the December 9 journey (\$10,500; [nationalgeographicexpeditions.com](http://nationalgeographicexpeditions.com)).

#### BY PLANE

A massive bankroll has replaced massive cojones as the prerequisite for visiting the Pole.

**Adventure Network International's** flights to the Amundsen-Scott South Pole Station run \$35,000 (departs from Punta Arenas, Chile; [adventure-network.com](http://adventure-network.com)). More frugal aviators can board **Croyden Travel's** chartered 747s, which soar over the ice sheets on the far side of the cold continent and give passengers the opportunity to usher in the New Year while drinking champagne 30,000 feet above an emperor penguin colony (flights into and out of Sydney, from \$999; [antarcticaflights.com](http://antarcticaflights.com)).

—Andrew Burmon



MAP BY HANSAH HUSSEIN

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Ushuaia, Argentina.

The boats offer vastly different experiences. The smaller touring vessels, like the new, 150-passenger *National Geographic Explorer*, which has an onboard ROV (remotely operated vehicle) and an underwater microscope, make two or three Zodiac landings each day (50 passengers onshore at a time), giving visitors a chance to mingle with the penguins, visit with scientists, even kayak. Passengers on the *Princess*, meanwhile, watch icebergs drift by from the comfort of a Jacuzzi or casino but do so knowing that ships carrying more than 200 passengers can't land anyone onshore. Better are the retrofitted Russian icebreakers, like the *Ioffe* or *Kelebnikov*, chartered by outfitters, which offer dedicated kayaking and hiking opportunities. One outfitter, Berkeley-based Explorer's Corner, is leading two kayaking-and-camping expeditions this season, freeing five travelers from a big cruiser for six days.

But with so many ships, it can be difficult to stay out of each other's way; expedition leaders now spend much of their time communicating with the fleet, attempting to remain out of sight. Still, more tourists mean an increased risk of catastrophic sinkings, fuel spills, and accidents. Last November I was lecturing aboard the *Endeavour* when we came upon the very first tourist ship to sink off Antarctica. Its captain reported hitting ice, which tore through two watertight compartments. Forty-nine thousand gallons of fuel spilled into the Southern Ocean, but all 154 passengers were safely evacuated. "This was just a drill," said a fellow guide as we winched the *Explorer's* Zodiacs onto our deck. "Next time I'm sure it will involve people dying."

In January a brand-new Norwegian ship, the *Fram*, lost power near Brown's Bluff at the tip of the Peninsula and was blown into a glacier, destroying its lifeboats. Miraculously, the bang jump-started the ship's power and it was able to limp back to Ushuaia.

The upside to all these new trips is that more and more visitors are experiencing a conversion of sorts. You cannot Zodiac through one of Antarctica's iceberg alleys without realizing it's the most stunning place on the planet. You cannot stand in the midst of a penguin rookery, watching 10,000 of the little buggers file away over the hill in a single line, without smiling. You cannot watch a hundred-foot-tall glacier crack and roar and fall into the sea without feeling a certain awe. Even the most cynical of tourists, those simply out to check the place off some kind of list, cannot help but be moved by Antarctica.

## THE GREAT PENGUIN MYSTERY

Ten days into our exploration we drag our kayaks onto Peterman Island, where we've spied a big yellow tent. Temperatures have been typical for summer—30s during the day, teens at night—but we've paddled through some heavy rains, which have turned the ice and snow along the coast to slush.

Calling out, we can hear rustling from inside, and researcher Melissa Rider crawls out under a light snowfall. Pulling up the hood of her red parka, she motions for us to follow her alongside a penguin trail deep-etched into the snow. This is the fifth summer in a row she's camped on Peterman, performing thrice-daily countings of Adélie and gentoo penguins and blue-eyed cormorants on behalf of the Washington, D.C.-based environmental group Oceanites, which has been monitoring wildlife in Antarctica for nearly two decades. On Peterman the results are clear: The Adélies are disappearing.

"French explorer Jean-Baptiste Charcot was here a hundred years ago," Rider says as we walk. "He photographed the island covered with penguins, so we know exactly how much things have changed. In five years the Adélie population has dropped dramatically."

"Dying?" I ask. "Not necessarily," she says. "They may just be moving farther south. They are cold-loving birds and are having a hard time 'making a living' here, which means building nests, having chicks, and feeding them. It's simply gotten too warm, which I can't believe I'm saying, since it's Antarctica. What we don't know is where they're going. There aren't many scientists working farther south of here to monitor them."

It's an overcast day, sleeting softly, as we wend our way among the stone nests of three birds (Adélies, gentoos, and blue-eyed shags). The screeching of parents imprinting the sound of their voices on chicks is ever present; when the chicks leave the nest for good in a couple of weeks, they will recognize each other only by squawk.

"I was surprised when I started coming here four years ago," Rider says. "I had worked previously in other, colder parts of Antarctica. One hour after the first time I arrived, it started to rain and didn't stop for 14 days. I was shocked. All this warming means that just since last year we've lost 20 percent of the Adélie population on Peterman. If you do the numbers, that means the island will be devoid of them by 2020."

## COLD HARD SCIENCE

The Antarctic Treaty—signed by 12 nations in 1959 and revised most significantly by 49 nations in 1991—specifies that Antarctica "is a natural reserve, devoted to peace and science," free of nationalistic or militaristic claims. It specifically bans commercial exploitation—primarily for the oil and minerals that everyone is certain lie beneath 7,000 feet of ice—until 2041.

But now those supposedly binding dictates are being tested. Most brazenly, last October the U.K. announced a new claim to nearly the size of Alaska, overlapping existing claims made by Chile and Argentina. The government, it seems, wanted to stake out its territory now, before inevitable disputes break out—as they have in the Arctic.

At a few of the bases we see far more military men than scientists, representing nations that don't want to relinquish claims to Antarctica but are unwilling to invest in real science programs. When we visited KGI in early January, home to a dozen bases, the Chilean science station was shuttered, unoccupied. Several of the other contingencies—including South Korea and the Ukraine—seemed to be represented by military personnel rather than scientists.

Five days after leaving Rider, we pull into a Chilean base called Gabriel González Videla (named in honor of a Chilean president, the first president to visit Antarctica, in 1948). We are welcomed with open arms. "We are here for four months," the base *comandante* tells us, as we tiptoe among the penguin droppings, "so are pleased to see everyone!"

He asks if we know where the penguins go in the winter.

"Can't your scientists help you with that?" I ask, assuming he's joking.

"There are no scientists here, just us. Fifteen soldiers, plus me."

The greeting is generous—and practiced. The *comandante* welcomes more than 6,000 tourists a year to his base for a walking tour, glimpses of the three albino penguins that live on the island, and even a small museum.

Meanwhile, very real science is still done at the Ukrainian base of Vernadsky. Once a British base called Faraday, ten years ago the U.K. gave it to the Ukrainians rather than tearing it down. We pull into the station on a sunny day; from Vernadsky south, Antarctica grows more exposed, windier, and wilder.

Fourteen Ukrainian men, most from Kiev, live, sleep, and work at Vernadsky for 12 continuous months. Strangers when they begin

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their yearlong assignment, they maintain what may be the best meteorological record on the continent, started by the Brits and going back more than 50 years. It was at this isolated metal-and-cement block station, on an island separated during the summer months from land by the Didier Channel, that the ozone hole growing above Antarctica was discovered 20 years ago.

A rudimentary wooden ladder leads up to a tiny bedroom where, five times a day, Dennis TKname—a geophysicist from Kiev, known simply as “Ozone Man”—slides back a small square panel in the roof and pushes the scope of his oblong measuring machine out into the sky. Every day for more than 20 years someone has been doing exactly the same from this same small room—it is the reason the world knows about the hole in the Earth’s ozone layer.

Black ponytail hanging down his back, light blue overalls over a heavy wool sweater, Ozone Man shows us graphs pinned to the wall charting monthly variations in ozone coverage going back two decades. It was at its thinnest in the mid-1990s, and he explains how proud he is to be only person in the world monitoring the hole, which has filled during the past decade, in part due to the global ban on new chlorofluorocarbons.

Armstrong and McBride have squeezed into the tiny bedroom with me, and we exchange looks of amazement that from such a humble place, great science is made. When Armstrong expresses his surprise that such a seemingly simple machine, jammed up through a small hole in the roof, is responsible for such an important discovery, Dennis smiles defensively. “It is not a simple machine! There are very complicated opticals inside! There is nothing automatic about it, it is all manual. It is the very best!” When the Brits first detected the hole, they replaced the machine, thinking it askew. When the new machine returned the same results, they reinstalled the original.

Showing us out, Dennis tells us the exact date and hour he’ll return to Kiev. It has been a long ten months, three weeks, four days, 12 hours, and 37 minutes since he and his 13 comrades were dropped off last March. For nine months they were completely frozen in, unreachable from the air or the sea.

### WHERE THE WORLD ENDS

Our camping experience is, in a word, wet, thanks to the rain and sleet. Most mornings, the inside of our tent walls are covered with

frost; outside, the kayaks anchoring the tents are covered with ice. We had hoped to climb several of the 4,000 peaks we passed along the Peninsula, but the rain makes crevasses hard to identify and avalanche danger high.

But a few days after paddling away from Vernadsky, the skies clear. And on a sunshine-filled January day, we reach nearly 68 degrees south, at the southernmost point of Crystal Sound. We are some two degrees south of the Antarctic Circle, and the temperatures climb into the 40s; sunburn is our biggest concern.

Our map shows a pair of channels leading to Marguerite Bay. Our goal is to sneak through one to reach the gravesite of a good friend of mine, British polar pilot Giles Ker-shaw, whose gyrocopter crashed near there in 1990. Knighted by Queen Elizabeth for his flying derring-do (among other feats, he once rescued a pair of Saudi scientists from a floating ice floe), Giles was integral in starting the Antarctic tourist boom, if unwittingly. He was one of a trio of explorers who set up the very first tented camp in the interior, to serve climbers headed for 16,050-foot Vinson Massif and trekkers going to the South Pole. I can’t help but think that if he were still alive and flew a Twin Otter low over a gaggle of red-coated tourists, he’d keep on flying, seeking out an undiscovered land.

We attempt to thread our way through the two-foot-thick pancake ice before running into a frozen barrier. Through powerful binoculars we see that the two channels we’d hoped to navigate are shut off. Clambering onto an ice floe, we pull our kayaks up and consider our options. One is to drag the kayaks 30 miles over the ice to Marguerite Bay, which might allow us to keep paddling south to Giles’s grave. But we would most likely have to drag them back again, requiring a weeklong journey we simply can’t afford. Sadly, like every visitor to Antarctica, we’ve reached our turnaround point.

At the edge of the big floe I look back toward the 600 miles we’ve floated by over the past month. Spiky mountain ranges covered with snow lead to glacial skyscrapers running down to the edge of the ocean. I recall a conversation I’d had with Rick Atkinson, caretaker of Port Lockroy, an island that welcomes more than 17,000 tourists a year. He first came to Antarctica 35 years ago as a dogsled driver and has overseen the renovation of the small hut turned museum on Lockroy. Surveying the whiteness around us, I told him I couldn’t imagine this place truly warming, its ice vanishing anytime soon. “This rain,” he countered, “is the worse thing

that can possibly happen. It’s a triple whammy: It falls into the crevasses, lubricates the bases of glaciers so they move even faster, and eliminates the insulating layer that keeps the snow solid. Ice has a horrible habit of disappearing fast when you get to a critical point, and I think we are at that point now.”

We dig a red cabbage out of the hold, jump up onto a sheet of floating berg, strip to a single layer of fleece, and play a short game of cabbage rugby. It’s our way of toasting the ice before the long, slow, beautiful ride north.