

Antarctic Impressions

In Four Episodes

WILLIAM SIRI

EREBUS rose from the sea in undulating folds of ice but still preserved its figure as a near-perfect volcanic cone. As if to prove its distinction as the only active volcano in Antarctica, a thin column of vapor stood above its 13,120-foot summit, rising to a level where upper winds abruptly bore it northward in a long streamer. The mountain seemed disturbingly familiar, as though I had seen it many times before.

From the foot of Mount Erebus a long, thin peninsula ran southward, hardly distinguishable from the sea ice of McMurdo Sound on the near side and the Ross Shelf Ice on the other. The peninsula ended in a cluster of low volcanic cones that sheltered the main American base in Antarctica, and the remnants of Scott's base at Hut Point.

Twelve hours had elapsed since we took off from the green meadows near Christchurch, N. Z. In half a day the Air Force Globemaster had flown across one of the most inhospitable of oceans and into a totally different world.

Pilots and crew were now engrossed in the seemingly intricate business of putting a Globemaster back on the ground. With assurances from the Captain that they could probably struggle along without my assistance, I retreated from the cockpit into the cavernous hold of the plane. Again I was struck by its immense size; in it eleven tons of cargo and a dozen Christmas trees seemed little more than hand luggage.

Nello Pace had already strapped himself into a seat and I joined him next to the drums of fuel for Sir Edmund Hillary's unscheduled push to the South Pole. We waited impatiently as the plane slowly circled the ice runway and thought fleetingly of the 16 engine failures on Globemasters already this season. We fervently hoped this landing would not be one to deprive Sir Edmund of his gasoline.

Together, Nello and I stepped forth upon the Antarctic Continent. For a brief inspiring moment standing in the cold air and bright midnight sun, I knew how Captain Scott, Amundsen, Admiral Byrd, and the other great explorers must have felt when they first set foot in Antarctica.

"Awright, tourists, here's your transportation," ordered an unidentifiable person in assorted arctic military garb. "Let's get off the ice and check in." My illusions completely shattered, I crawled onto the heap of cargo on the tractor-drawn sledge along with 30 other newly arrived "Admiral Byrds." To be painfully honest, I told myself, we had not even reached the continent. Beneath us lay twelve feet of ice and beneath that a thousand feet of sea water. The Station, two miles away, was on a volcanic island and the mainland lay 40 miles westward across the Sound.

Williams Naval Air Facility, McMurdo Sound, was a bustling growing community, a beehive of experts. To a person who usually slept on the ground and carried all his needs on his back when in the field, the Station seemed to have everything but women and children. But then the absence of the former provided lasting substance for lively discussion when the other diversions of a well-equipped polar outpost failed. The Station sat in a basin of volcanic ash facing the Sound. Three well-defined rows of bright red buildings formed the center of town. Scattered everywhere over the basin lay equipment and materials of all description, most of it like the torn hulk of a Globemaster that had made a very bad landing, half buried in the snow and ice. Later, as the advancing summer melted the snow, it was astonishing to see what emerged to the surface. By no means the most curious was a gaudy juke box that blossomed through the snow like a clump of spring flowers.

This was the main staging area for U. S. operations in the Antarctic. Geophysicists, old polar hands, and hundreds of tons of material passed steadily through the Station during the summer months. The geophysicists were in constant flux. They were either on their way to, or on their way back from remote stations and field parties.

The Navy bore the burden of opening the Antarctic and making it accessible as a gigantic laboratory. Its officers and men struggled with the elements—and occasionally with us misguided scientists—to provide every form of support, including air transportation needed to conduct the far-flung IGY program and to maintain the many stations.

After a quick survey of the Station, Nello Pace and I set about getting our own program in motion. The first move generated a small flurry of radio messages to find out where in the seven seas and several likely continents our sixty tons of equipment might be at that moment. Our affairs were conducted under the encyclopedic title of International Physiological Expedition to Antarctica. During the months ahead we were to run physiological tests on most of the Antarctic field parties, including Hillary's polar team and the Commonwealth Transantarctic Expedition.

The remaining four members of our team had been displaced on the Globemaster flight by Sir Edmund's gasoline. By later accounts it is evident they did not suffer while waiting in Christchurch for the next flight.

Griffith Pugh was a charter member of the group, having participated in the planning from the start. Some of his studies on Cho Oyu and Everest were to be extended to polar environments. With him came James Adam who had a vast experience in conducting metabolic measurements under all kinds of environments. Charles Meyers from the Naval Biological Laboratory in Oakland, California, was, among other exemplary things, a bacteriologist bent on sampling and culturing everything in the Antarctic that could be put into a test tube. Peter Hildebrand had recently arrived from Germany to take a position in the Physiology Department at the University of California with Nello Pace. Hildebrand and I usually worked together in our rather singleminded quest for blood and urine.

A few days before our four associates arrived, the icebreaker *Glacier* crashed her way to within five miles of the Station where she proceeded to off-load cargo on the sea ice. Huge tractor-drawn sledges then hauled the cargo to the Station. To our amazement the first of these drew up in front of our hut. Neatly stacked on it was our equipment and, to our still greater wonderment, not a single item was missing or damaged. Our respect for the Navy knew no bounds. We were now completely self-sufficient, with everything from applesauce to zinc oxide. Moreover, through the local C.O., LCDR. Ludemann, we had for our own use two Jamesway huts for quarters and laboratory.

Acquisition of the canvas-and-frame huts came about after our first night in the Antarctic. Nello and I had been assigned bunks in a permanent building but quickly discovered what seems an almost universal tendency among Antarctic personnel living in huts. Possibly as a reaction to the cold, the huts were kept at unbearably high temperatures. One night of this, finding even a sheet too warm to sleep under, we resolved to sleep out in the snow. The Jamesway was a compromise, but it had ample unintentional openings that allowed free circulation of air and drifting snow, and an oil stove that we could leave unlighted. Nello laid down the challenge. "The first man to light the stove is chicken." For some days life in our hut was pleasant. The temperatures inside and out were about the same and sleeping was a pleasure in arctic bags. The light covering of powder snow and the heap of snow inside the ill-fitting door seemed only natural. But it could not last. One day as we sat several hours writing, my fingers grew stiff and unworkable. "Nello, I'm chicken. Let's light the stove."

THE SUN streamed hotly through the clear plexiglass shell. Instinctively I opened my down jacket and flapped it several times to vent the warm air. The whole act suddenly struck me as incongruous in this setting. It seemed almost indecent to feel so warm, so completely comfortable.

Directly below the plane was the spot on the lower Beardmore Glacier where Seaman Evans of Captain Scott's five-man polar team died of his injuries 40 years ago. At this point, too, Scott and his remaining three companions were dying of starvation as they fought their way down the last few miles of Beardmore Glacier. They would never reach the safety of McMurdo Sound but were destined to die in the storms and bitter cold of approaching winter only 11 miles short of a major depot of food and fuel in the middle of Ross Shelf.

Ahead of us now lay the magnificent expanse of Beardmore Glacier, cutting a broad white avenue through the mountain ranges straight to the polar plateau, at 10,000 feet, more than a hundred miles ahead.

Seated in the clear plastic bow section of the Neptune I seemed to be suspended in air over the sparkling landscape. Not a cloud marred the sky and in the crystal clear air the crevasses and changing surface of the glacier stood clear and sharp. On all sides rose the distinguishing landmarks that seemed so familiar from the accounts of Shackleton and Scott. A few ridges and rock buttresses bordering the glacier stood free of ice, but everywhere else the snow and ice extended in an unbroken mantle. It seemed incredible as I watched the glacier surface drift by below us that men could have man-hauled sledges over its entire length. Almost none of the huge expanse seemed free of crevasses and in most areas they were so chaotic and densely packed as to make any kind of progress on the ground impossible.

Toward its upper end the glacier branched into great tributaries, tens of miles wide, that rose above the summits of the peaks to merge with the Polar Plateau.

Ahead the Plateau gradually opened as a featureless white plain. In an hour and a half we would cover the remaining 300 statute miles to the South Pole that it had taken Scott nearly four weeks to haul his sledges.

Despite the traffic in polar regions these days, there is still excitement, gratification, and often enough adventure, in traveling about the Antarctic. The fact that the south geographic pole is a wholly undistinguished point in the middle of three million square miles of wind-swept ice does not detract in the least from the satisfaction of standing there for the first time. Today it is not a sense of achievement one feels, but rather a sense

of intimacy with a brilliant history of adventure and exploration. Any foolish notion of achievement is instantly dispelled by the sight of the ring of oil drums that now encircle the exact spot from which all directions point north. Even the drums were placed with scientific precision, to represent the statistical uncertainty in the somewhat ephemeral location of the exact axis.

A thousand yards from the pole, I entered the comfortable quarters of the U. S. Amundsen-Scott Station. Sir Edmund Hillary and his tractor team, who had arrived the day before to complete their remarkable trek to the pole, were the chief object of my visit. I found them comfortably relaxing in the small mess-hall, patiently awaiting the planes that would take them back to their base at McMurdo Sound.

"Hello, Ed," I said, greeting him with somewhat deliberate familiarity. "Glad to see you again." The look of puzzlement gave way to a broad friendly grin as I hastened to add, "Remember, Will Siri. We crossed paths, fumbling about the Barun Valley in 1954." I clasped his large bony hand in greeting and we sat down to talk over aspects of his trip that would interest a biophysicist.

In my rucksack I carried all the equipment necessary to secure blood specimens and 12-hour urine collections. With so little time before Hillary's departure, I got down to business. Handing out plastic bottles for urine collection never met with objection, just amused tolerance. The bottles were, in fact, rather a handy thing to have around at night in polar regions. Moreover this part of my work always solicited a good deal of earthy humor that followed us about the Antarctic. Perhaps one of the most unusual radio messages broadcast that season to a remote field team in Marie Byrd Land, was "Please do not urinate for four hours before our arrival."

Collecting blood was a very different matter. The sight of a 20-cc syringe and needle does things to the most courageous of heroes that the most terrifying natural dangers could never do. Men who had endured months of the worst kind of hardships needed the strongest kind of persuasion and assurance, as well as the exercise of a highly deceptive technique in making venepunctures.

The last professional act at the South Pole was to descend to the bottom of the "snow cave" with Dr. Vernon Hauk, C.O. of Pole Station. There, a hundred feet beneath the surface the temperature was always -60° F. and the ice like green glass. With sterile implements, bits of ice were chipped into sterile jars and carefully sealed. If the ice contained microorganisms, we could reasonably presume they had survived dormant in

the ice for hundreds of years since the time they were deposited on what originally had been the surface.

Weeks later in the laboratory hut at McMurdo Sound, Meyers proudly showed us the thriving cultures he had grown from the South Pole ice. Antarctica is many things but it is not a sterile continent.

* * * *

THE RECOLLECTIONS were still clear. As a small boy nothing seemed more exciting and glamorous nor evoked more challenging daydreams than Admiral Byrd's departures on his early Antarctic expeditions. Newspaper accounts and newsreels stirred a youthful imagination to new heights of adventure and glory, especially during arithmetic classes.

And after his return I waited eagerly for the films and pictures of rugged explorers with frozen beards and the snow-encrusted scenes of Little America digging out after the long Antarctic winter. Even in later years the fascination of the Antarctic was never less compelling than as a boy. But the prospects for ever visiting there always seemed too remote to consider seriously.

The insistent voice of Vickers, muffled in the cluttered tunnels, broke into the reverie. With a warm feeling of satisfaction I was again aware that the youthful dream had materialized. I was, at this moment, standing in an Antarctic ghost town that was Admiral Byrd's Little America in 1937.

Yesterday Peter Hildebrand, Bill Vickers and I had flown here by helicopter from modern Little America (L.A. 5), some 40 miles east along the Barrier at Kainan Bay. We had pitched our tent near a group of seemingly short radio masts, the only evidence of Little America 3 that remained above the flat surface of the Ross Shelf. Everything else, the buildings, tunnels and the monstrous snow cruiser lay buried under 28 feet of ice.

A hole had been dug through the hard snow to the roof of the power house and from there most of the old huts of Byrd's camp could be reached through a maze of connecting tunnels. The place was now a frozen shambles. The tunnels were littered with equipment and food, frozen into a congealed mass of ice crystals and drifted snow. Thousands of cases of food that once formed the tunnel walls were slowly but inexorably being crushed by the immense weight of ice above and spewing forth their contents of graham crackers, oatmeal or canned peas. The more remote tunnels had collapsed altogether, leaving at most small crawl spaces. As we made our way in the dim purple light that filtered down from

the surface, we were constantly more impressed with the tons of foodstuff locked in the ice. It was like being given free run of a supermarket after closing hours. It was depressing, too, to recall that it would not be here long. In months, perhaps a year, it would all settle to the bottom of the ocean when, in the natural course of events, this entire section of the Ross Shelf would be cast adrift to become just another melting iceberg in the Ross Sea. Little America 1 and 2 had already vanished and L.A. 3 was now less than half a mile from the Barrier's edge.

Perhaps no experience we had in the Antarctic created more mixed feelings than the hours spent delving into the past under the ice at Little America. The remnants that remained from the community of adventurous men lay shrouded in a lacework of ice crystals woven by 20 years of cold still air. But the sight of the abandoned huts, work benches and even the galley with its partly used boxes of food brought back rich memories of Admiral Byrd's exploits.

* * * *

THE P2V NAVY "Neptune" seemed to drift slowly over the high cliffs that bordered Ferrar Glacier. Ahead, the Glacier disappeared in graceful curves under broken cloud, and the high peaks of the Royal Society Range were hardly discernable in the massive banks of gray cloud that spilled down from the Polar Plateau.

The four of us who were passengers on this one-way trip silently watched the gloomy gray scene unroll beneath us. The appearance of the weather, the problems ahead, and especially a fresh memory of a miserable overnight camp on the edge of the Plateau left us a little apprehensive. We were now committed to a precarious operation on the Victoria Land Plateau, but it was an adventure, amply justified by the scientific returns, that none of us would have missed whatever the outcome.

The idea had been conceived a year earlier in someone's comfortable office as an "IGY Airborne Traverse" into an area that had not previously been explored. The geophysicist regarded Victoria Plateau as a choice parcel of polar ice cap for the very reason that so little was known about it. Moreover, according to at least one meteorological theory, this region of Antarctica might be a key feature in the formation of southern hemisphere weather. Great masses of cold air are supposed to funnel at high speed down the mammoth trough formed by the Victoria Plateau and into the southern seas.

With a more realistic appraisal of the operation at McMurdo Sound, no one seemed very enthusiastic, no one that is except two indomitable

geophysicists named John Cook and Bill Vickers and two naive physiologists, Hildebrand and Siri who could only think of the unexcelled opportunity to study acute effects of cold and stress. CDR Coley of the naval air squadron who would have the responsibility for getting us there and back, justifiably took a dim view of the operation. They were not certain they could successfully land a large, heavily laden plane on the 9000-foot high plateau whose surface might be a sea of rock-hard sastrugi. A more disturbing objection was the possibility they might have serious trouble finding us again.

Since relocating us on the Plateau appeared in some doubt, the four of us spent no little thought and time on the problem. For weeks we tested every scheme anyone proposed. We had hopes for a smudge fire and its expected long trail of black smoke. Repeatedly we dragged gallons of fuel oil, scrap rubber and other rubbish out on the sea ice and set it afire to test smoke visibility. Even in a five-knot wind combustion was so complete only a thin white smoke formed that was virtually invisible against the snow. We settled instead for a collection of intricate and expensive radios, radio beacons, flares and other paraphernalia, none of which could guarantee the needed range of detection. In retrospect, it is amusing to reflect that the device that really worked was made from a few bamboo poles and a dollar's worth of wire window screen that we scrounged just before boarding the plane.

As the plane flew westward over the Plateau, the heavy overcast thinned into scattered clouds. Sometime past noon the navigator informed CDR Coley we were at 77 S, 140 E, some 400 miles out on the Plateau. The four of us took crash positions against bulkheads as the plane slowly settled, reaching tentatively for the icy surface with its skis. With a rude shock the plane touched ground and even with propellers reversed, the rebounds and jolting seemed interminable before the plane came to a stop.

Little time was lost in depositing the four of us and our ton of equipment—including 500 lbs. of explosives that might have made a bad landing look even worse. JATO bottles were quickly mounted and the plane taxied back to the start of its own tracks. With its reciprocating and jet engines at full throttle and 16 bottles of JATO belching smoke, the plane heaved itself across the rough surface and slowly rose in a screaming fury. It quickly joined the still circling guard plane and vanished into the overcast. For a brief moment this seemed the loneliest place in the world.

Seven days from now, weather permitting, the planes would attempt to pick us up. Between now and then an immense amount of work was scheduled. Two tents were immediately erected. Hildebrand and I used a superb

four-man tent weighing only 12 lbs. made by the Ski Hut. The other was a huge complicated military affair, its eight sides so strung with guy ropes that it resembled a plate of spaghetti. It obviously was designed to sustain direct hits from artillery. Despite its size, it was soon a litter of scientific paraphernalia and a more unlikely mixture would be hard to find. The short center pole rested on 50 lb. cases of explosives that also served as a table for the primus stoves.

Time passed quickly the first day. After assembling the intricate seismic recorders with their long tentacles of wire running out over the snow from the tent, Cook shot our position with the theodolite and then carefully established true bearings with flag markers. This was comforting, I thought; at least we would know the starting direction if we had to walk out. Vickers had been busy for some time digging furiously into the hard snow just outside the tent. I admired his doggedness; only his shoulders were now above the surface and for every shoveful he threw out, half that amount of loose powdery snow blew back in. As the week progressed the hole and Vickers sank deeper as he pursued a descending line of snow temperatures, densities and strata. Once he had passed a depth of ten feet where the temperature passed -40° , one of us checked him every half hour to be certain he did not quietly freeze to death during the hours he sat working in the bottom of his deep freeze. On other occasions it was an inspiration of sorts to watch a dedicated scientist at work when Vickers, squatting on the hard snow outside the tent, meticulously brushed, weighed and measured his snow slabs and cores. The inspiration derived from the fact that it was 15 degrees below zero and he and his instruments were engulfed in swirling clouds of fine dry snow whipped across the plateau by the wind.

Almost daily Cook and Hildebrand set out into the wind and drifting snow with a sledge loaded with equipment for seismic measurements. Throughout the day they bored holes 5 to 10 meters deep, pulled out cores for Vickers to study and then stuffed the holes with explosive. Back in the tent, Vickers and I periodically awaited their radio signal to start the recorders and then listened for the dull thump that reached up from the bowels of the Plateau after they fired the charge.

From the chaotic mass of squiggles on the chart paper came an indication of what was beneath us. Our altimeters indicated 9000 feet, yet the ice at this point was about 10,000 feet thick.

Hildebrand and I spent most of our time assisting the geophysicists, since our own studies called for little more than collecting blood and urine. However, after a week of this the accumulation of the latter, all frozen as hard as glass, began to occupy a distressingly large part of the tent. Sooner or

later it all had to be put through a simple laboratory procedure and small measured samples transferred to vials for later biochemical analysis. My most memorable day of the Plateau was spent in the tent attempting to melt down huge quantities of urine on a Primus stove mounted on 150 lbs. of explosives. But it was, after all, warmer than Vickers' job at the bottom of the pit.

Time passed quickly on the Plateau. One day merged into another without distinction except in our logs. The sun rolled steadily around the horizon, hardly changing its elevation from noon to midnight, contributing to the illusions of one interminable day. Steady winds constantly kept the surface of the Plateau alive; sometimes whipping up clouds of minute glittering snow particles that all but obscured the sun; at other times it drove the fine sand-like snow in long tentacles along the ground among the sastrugi, making the whole surface a sea of writhing white creatures racing intently down wind.

Experience elsewhere had taught us the vicissitudes of weather and we fully anticipated foul examples of it during our stay. But day after day the deep blue cloudless sky hung down to the horizon of the featureless landscape. As the time approached for the plane contact, with growing apprehension we found ourselves checking the barometers more frequently. Certainly the weather could not hold out indefinitely. Our small supply of frozen steaks was about gone and if we missed the contact we would soon have to resort to the unmentionable emergency trail rations.

The day before the expected plane contact, I dug out the bamboo poles and wire screen. While the others worked, I struggled in the wind with 60 feet of copper screen that was determined both to roll up and to blow away. Toward evening the baling-wired structure, 10 feet by 30 feet, was complete and there ensued an hour-long Mack Sennett comedy trying to raise it against the wind. The result of the effort was a thing of pride, a huge radar corner reflector that glistened in the sunlight and sang like a choir as the wind streamed through the wire mesh.

At almost the appointed minute, the Neptune flashed overhead and circled to land. They had picked up the radar reflections 40 miles away and beamed straight into camp.

Everything but our essential instruments had to be abandoned to lighten take-off load; but CDR. Coley had been so impressed with the radar reflector's performance that he could not leave it. Before takeoff he rolled up the awkward structure and stowed it in the plane. Who knows, maybe there will be other crazy scientists who will want to be set on a plateau somewhere.