Gateways to the Pole: Mapping Amundsen's and Scott's Routes through the Transantarctic Mountains Fifty Years Later

December 14, 2011 will mark the day when, exactly 100 years earlier, man first stood at the South Pole. That explorer, as we all know, was the Norwegian, Roald Amundsen, accompanied by his four companions and remaining dogs. Five weeks later a weary Captain Robert Scott and his four men arrived, painfully dragging their own sledges, devastated to find the Norwegian flag already flying at the Pole. Scott had endured the long, hard struggle up the seemingly endless, crevassed Beardmore Glacier through the Transantarctic Mountains, following the route pioneered by Ernest Shackleton on his own heroic, but failed, attempt three years earlier. Armchair explorers could only assume that Amundsen, who ascended the previously unknown Axel Heiberg Glacier and left only the sketchiest description of his route, must have found a much easier way up onto the Polar Plateau. For fifty years this glacier remained a mystery, untrodden and seen only once again briefly when Admiral Richard Byrd flew down it in 1929 when returning from the first ever flight to the Pole.

This was the fabled history of the region the 4-man 1961-62 Southern Party was assigned – indeed privileged - to explore and map fifty years later under New Zealand's Reconnaissance Mapping Programme covering 1,100 miles of the Transantarctic Mountains southward from Cape Adare. The region comprised a varied terrain of plateau and nunataks, mountains, dry areas and glaciers of the Queen Maud Range (see map) stretching 160 miles eastward from the mighty Beardmore to the small but spectacular Axel Heiberg, and about 130 miles north to the coast. The Northern Party, starting a month later, was to carry out a similar operation in the region extending northwest from the Beardmore. Our team was to be led by Wally Herbert, a Brit with already more than two years sledging experience on the Antarctic Peninsula, Vic McGregor, a bright and enthusiastic geology graduate as the geologist, Kevin Pain, an experienced Mt. Cook guide as our field assistant, and myself, a recently qualified land surveyor and a keen skier as the surveyor. Herbert and I had both spent the previous season as assistant surveyors but in separate field parties, and then wintered over at Scott Base preparing the dogs and field gear for the coming season.

Herbert's plan, based on my requirements for an effective ground control survey, was to skirt around the edge of the Plateau systematically occupying up to about 12 prominent mountain tops in the Queen Maud Range in order to map all the terrain from the Plateau to the coast. Several baselines were to be measured to provide scale for the survey network while daylight star observations to position the network accurately on the map would be made from minor stations close to camp. Herbert and I were to compute the survey and carry out the mapping from the US Navy's trimetrogon aerial photography on return to New Zealand, while the final map was to be published at 1:250,000 by the NZ Lands & Survey Department. The geological reconnaissance mapping was to be carried out in the locality of the survey stations, and in other areas of easily accessible snow free ground, and to be published separately. Although we made an aerial reconnaissance several days before entering the field it was of limited value. The pilot, not having a reliable map to navigate by, was virtually lost – and so were we. We would be embarking on a mission into famous but virtually unknown territory. Our 95 day mission would not only prove to be a true physical and mental test but turn out to be one of the most satisfying and rewarding experiences of my life – now just a memory but still fresh in my mind half a century later.

On November 6, 1961 our team was landed by VX6 on the Plateau just south of the prominent feature dividing the head of the Mill Glacier we dubbed “Mill Island” (later named the Otway Massif by the Geographic Names Board - with no prompting by its “owner”!). Jumping out of the old R4D (the US Navy's modified DC3), we were immediately struck by the icy -25 degrees F breeze and soon felt the effect of the 8,400 ft. altitude as we hurried to unload all our gear and provisions for 55 days - and 18 enthusiastic dogs. Then, with a mighty blast from the JATO (jet

assisted take-off) rockets underneath, the R4D finally lumbered into the sky leaving us utterly alone on the edge of a vast plain of snow. We picketed the dogs on their wire span and pitched our two tents – Camp 1 on the Polar Plateau. Our own challenge was about to begin!

Our first task, following a day to acclimatise, was to establish Station A on the western, 10,500 ft. high, summit of the nearby massif . This operation became typical of most of our high stations: climb for at least 4 hours to reach the site (naturally a virgin peak), set up the theodolite and take precise horizontal and vertical angles in a sub-zero wind to at least 20 selected peaks to form part of the survey network (my job), identified and labelled on a sketched panorama (usually by Herbert, the team's artist and chief booker), take a 24 frame photo panorama (the film often shattering in the cold) from which to later triangulate minor features, and take sun shots for azimuth followed by a team effort to erect a 5-6 ft. high cairn of rock (almost invariably dolerite) or snow blocks to mark the station. The whole procedure, including taking time off to jump around clapping hands together to restore circulation to frozen limbs, fingers and faces, and to grab lunch (a meat bar, chocolate, biscuits and several hot sweet drinks), would take 4 to 6 hours, but longer when interrupted by cloud or strong wind. During much of this time geologist McGregor, usually assisted by Pain, would be working on the snow free ground of the mountaintop systematically identifying and collecting rock specimens, recording their bedding and location and searching for fossils – an operation that "hit the jackpot" at only our second station when he discovered the first ever Triassic fossils in Antarctica: many well preserved ferns and conifers in shales of the Beacon group and an impressive coal seam - convincing evidence of a bygone semi tropical clime, but hard to imagine now! Finally, trudge for 3 hours or more back down to camp, feed the dogs, make the daily radio sked with Scott Base, transmitting in Morse code. Then wriggle into the double sleeping bag as the dogs had their evening "howlo" and prepare a dinner of hot soup and meat bar stew, diary writing, bedtime reading – and fall sleep to the sound of the flapping tent and hissing snow with hoar frost raining down from the walls.

The first day's sledging was a mild shock as we, the dogs and the sledge slipped and slid all day, travelling mostly uphill over a hard icy surface into a 20 knot -26 degree F headwind, on our way to establish Station B on "Windy Nunatak" (later identified as Mt Bumstead, named by Byrd). Frequent stops had to be made to check and thaw out frost nip on cheeks and noses in what would later be voted as the coldest day's sledging of the entire season. Camping on ice in the rising gale was no more pleasant, nor was the survey next day on the barren wind swept summit. However, after this experience, sledging (and surveying) became a little more pleasant, allowing us to again ski alongside the sledge as we journeyed back to the landing site. The following day was spent relaying the depot of food, fuel and rocks to a more central location before travelling down the Mill Stream Glacier the next day to spend several days measuring and observing our first baseline and associated minor stations. Then followed a potentially hazardous crossing of the main arm of the Mill Glacier, weaving between numerous crevasses, to finally camp in the Dominion Range. Our station on Mt Mills the following day was breathtaking, overlooking the barren Meyer Desert at Plunket Point and the full length and breadth of the notorious Beardmore Glacier. Looking out over the contorted Shackleton Icefalls, my respect soared for the dogged determination of Shackleton , Scott and their companions who had spent about 12 days man hauling their sledges up the 140 mile length of the glacier, past crevasses "as big as Fleet Street", en route to the Pole. A week later we were rewarded with another perspective of their route on the Beardmore from Station J on the 11,940 ft. summit of Mt. Usher, 37 miles further downstream.

Following a further two weeks of continuous field work and relaying to move the depot further on again, we managed to coax one team, pulling a lightened sledge, up to a 11,750 ft. snow summit, later named Husky Dome in recognition of the team setting a new Antarctic altitude record for dogs. Our survey station there gave us our first, magnificent, view down over a jumble of mountains and glaciers to the coast and Mt. Kyffin 80 miles distant. Four days later sledging came to a halt as the

R4D flew over dropping our re-supply of food and fuel as well as our much anticipated mail from home and “goodies box” of little luxuries such as two roast chickens, a tin of plum pudding and a small bottle of whisky to celebrate Christmas in a week's time. After this, however, our good fortune began to run out, with sledge runners becoming badly scratched by moraine embedded in ice and increasing the drag; then runners on both sledges breaking while carrying the heavy 1,100 lb. loads over sastrugi; a second dog, old Dismal, having to be put down after suffering a heart attack (his brother Joe had died from the same complaint two weeks earlier); and a painfully swollen face (mine!) from a tooth abscess – thankfully cured by borrowing antibiotic from the dogs' medical kit. Powerful stuff!

Worst of all, the weather which had until then been generally fine albeit windy and cold, abruptly deteriorated. After sledging to the foot of Mt. Black overlooking the upper Shackleton Glacier for a one day survey we “celebrated” Christmas by being pinned down in a 5-day blizzard with food running seriously low while the dogs remained buried – until their pemmican tin was opened for dinner when 16 howling, hungry mouths would erupt from under the snow. From then on the weather remained in “monsoon” mode, milder (8 to -10 degrees F) but with 33 of the remaining 43 days on the Plateau rated as either white out or full blizzard. This understandably caused a lot of frustration and anxiety as we painfully worked our way around the crevassed neves of the Shackleton and Liv Glaciers towards the Axel Heiberg, resulting in the team working sometimes in short bursts but at other times up to 34 hours on the move in a big push to complete the survey and keep relaying the depot forward. Our long hauls with heavy sledges around the edge of the Plateau in semi white out conditions were often cold and boring, with our minds as far away as possible, perhaps dreaming of a warm tropical island with friendly maidens cavorting on the beach. Back to reality: we couldn't really complain. We had our 16 dog companions, each one a different personality, to constantly entertain us with his or her antics. Life could have been so much worse!

Highlights during this time were our rare fine days when we surveyed from sites with magnificent views of unexplored mountains - some virtually bare rock, others heavily snow covered with flowing glaciers. Such was our station on Barnum Peak at the head of the Liv Glacier which Byrd, on November 29, 1929, had flown beneath as he struggled up the glacier towards the Pole, jettisoning surplus fuel and emergency gear to gain critical altitude. Probably the most spectacular alpine view was from a series of stations we established on Mt. Ole Engelstad, overlooking Amundsen's tracks on the upper Axel Heiberg. As Byrd wrote18 years later after flying down the glacier while returning from the Pole: “If ever I saw the inadequacies of words I did then. Cones, summits, peaks, flanks, ridges, turrets – scramble them all together, add a dash or two of adjectives, and one has, at best, an approximation.”

The most memorable episode of the entire survey was the 17-hour marathon to climb Mt. Fridtjof Nansen, overlooking the Axel Heiberg and, in extreme discomfort, establishing not one but four stations in a -20 degrees F rising gale for unobstructed views of distant features from the frustratingly flat summit. At an altitude of 13,353 ft. Fridtjof Nansen became the highest mountain so far climbed in Antarctica – but that seemed a very dubious reward at the time. On our long trudge back to camp we were close to collapse and our faces – mine in particular – so iced up it took nearly an hour to thaw out over a roaring primus. Ten days later we completed our final station, having established our planned network of control points. *(The actual survey computations and the mapping, extending over 21,000 sq. miles, were completed by Herbert and myself six months later and formally published two years after that, finally putting on an accurate map the gateways to the Pole of some of the world's most famous explorers.)*

One problem increasingly occupying our minds was how we were to be picked up on completing the survey, considering the R4D would have extreme difficulty taking off with a full load from the Plateau. Herbert's first proposal, endorsed by Sir Vivian Fuchs of Transantarctic Expedition fame,

was to sledge the 300 miles to the Amundsen-Scott South Pole Station and "hitch" a ride back in an empty Hercules C130 returning to McMurdo but vetoed by Admiral Tyree and VX6 who explained they could not guarantee being able to rescue our team should we encounter an emergency en route to the Pole. The alternative appeared to be to sledge down either the Shackleton or the Axel Heiberg Glaciers, but the surface of the upper Shackleton was exposed ice with extensive moraine deposits, and the much shorter Axel Heiberg was reputed to be a series of icefalls. However, knowing that Amundsen had proved this as a viable route for dogs, Herbert, during our party on 16 December to celebrate the 50th anniversary of Amundsen's reaching the Pole, was inspired to propose this as a surer option - but NZ's Antarctic Division, Scott Base and VX6 claimed this would be too dangerous and that we were instead to return to our original landing place for an attempted pick up Protracted radio discussions and negotiations continued for six weeks (a lot of Morse key tapping!), even after Herbert and McGregor had finally, on 23 January, flagged a route on skis to the bottom icefall – and yet Herbert was unable to convince anyone they had actually done so! The stalemate was finally broken by Dr. Charles Swithinbank, a highly experienced glaciologist, working on the Ross Ice Shelf nearby. Permission was granted on 1 February to descend the Axel Heiberg.

Unlike the big "outlet" glaciers such as the Beardmore, Shackleton and Liv, the Axel Heiberg is in effect an alpine glacier, cut off from the Plateau by a dolerite rim and fed entirely from the uncharacteristically heavy snow falling within its own catchment. It falls over 9,000 ft. in only 20 miles, most of it over just 7 miles. Entering it from the high rim following a full day of relaying loads on the Plateau, our sledges were immediately racing down the first snow covered icefall, despite the rope brakes wrapped around the runners to avoid overtaking the galloping dogs. Fortunately all ended well about 1,000 ft. lower and, for almost the first time in 84 days, we found ourselves out of the cursed Plateau wind. We camped there, under Mt. Ole Engelstad, in virtually the same spot as Amundsen on his way back from the Pole 50 years and one month earlier, surrounded by the same majestic mountains and tumbling icefalls he described. Unfortunately for us the sledging conditions did not match the scenery, for the next day found sledges, dogs and men wallowing in deep, soft snow. Geologist McGregor (having even run out of rocks to view) now proved his prowess as an excellent lead dog as we heaved and pushed our way across the gently sloping terrace, finally camping exhausted after only 5 miles. What a contrast to the hard surface Amundsen described racing across!

The following day was even worse, having to offload half our gear and relay, gaining a total of only 3.3 miles before camping but it had finally brought us to the top of the middle icefall at 6,500 ft. elevation. To compensate, the scenery by now was absolutely superb as we looked up at Mt Fridtjof Nansen towering nearly 7,000 ft. above us to the summit we had stood on just 18 days ago for our first view of the glacier while, on the opposite side, stood Mt Don Pedro Christopherson with ice cascading in slow motion off its flanks. The view down the glacier was far more sobering. Below us lay a very steep slope flattening out onto another terrace, but beyond that lay a river of contorted ice. Amundsen himself had exclaimed: "The wilderness of the landscape is not to be described: chasm after chasm, crevasse after crevasse, with great blocks of ice scattered promiscuously about, gave one the impression that here nature was too powerful for us." And when Herbert and McGregor were about to search for a route through the maze 11 days earlier, Herbert recorded: "At first I could not believe that Amundsen had made his way through the confusion of gigantic crevasses and icefalls below us." And then commented, as an avalanche thundered down off Fridtjof Nansen onto the far side of the glacier just as Amundsen had described, "Maybe he didn't come that way after all!" It was therefore a relief to be assured that Herbert and McGregor had already skied down through the icefalls and found the "little connected line among the many crevasses" that Amundsen had described. It was still there, a sinuous, narrow pressure ridge running right through the major icefall. So *that's* how he did it. Now it had been flagged and all we had to do was to follow the flags – in theory at least!

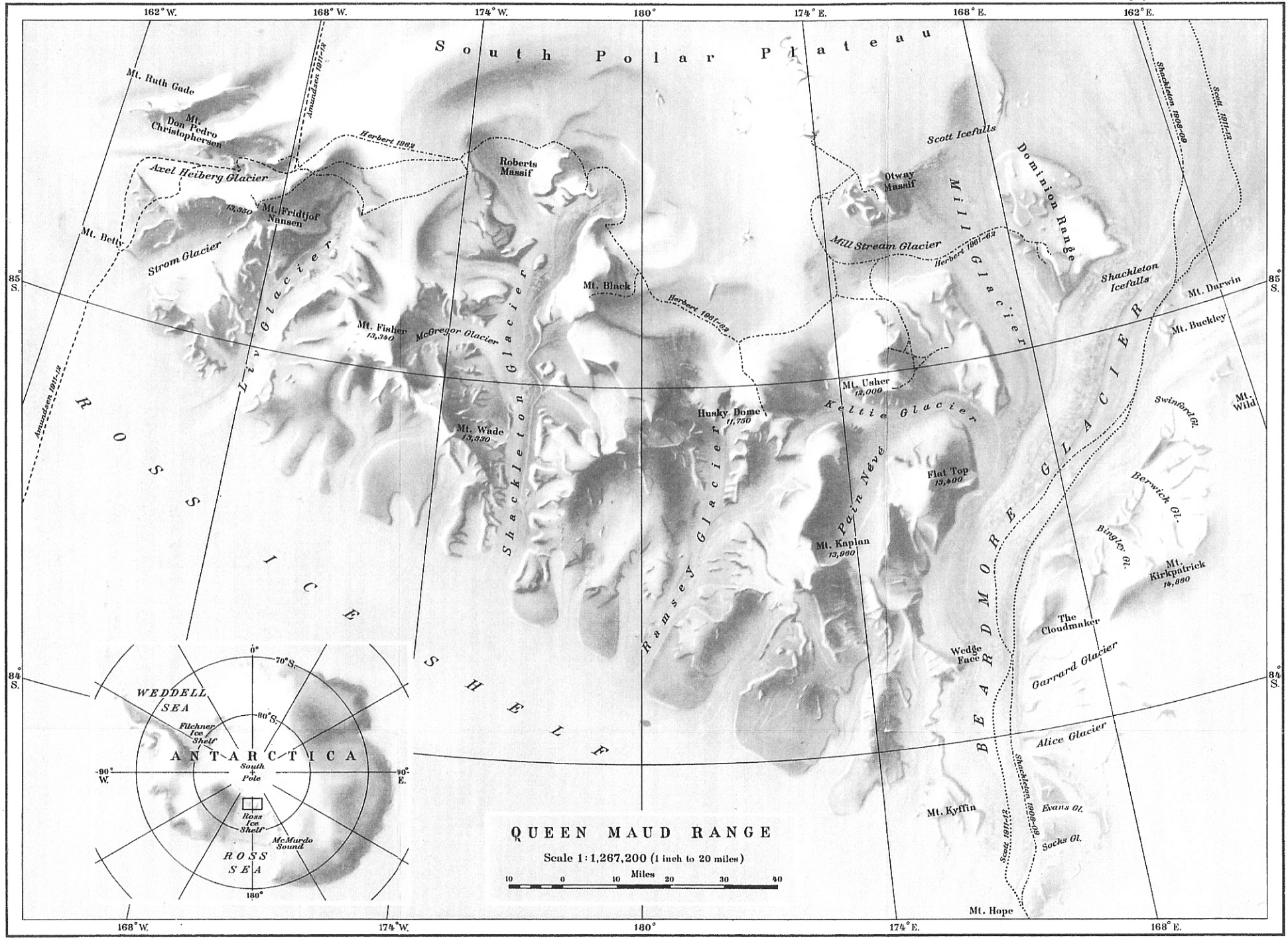
On breaking camp and harnessing up we were off down the first, steep section, almost immediately out of control on the 1 in 5 slope despite all our rope brakes, my sledge overtaking the dogs and dragging them behind us acting as remarkably effective snow anchors. The next section was more serious, following the flagged route winding between the numerous gaping blue-black crevasses, up and down over partially collapsed snow bridges, the heavy snow that we had cursed for slowing our progress finally proving a blessing by bridging over many of the crevasses. The main danger as we zig-zagged along the narrow ridge between them was that one dog team might be tempted to join its friends on the far side of a yawning cavern big enough to swallow us all. However, by firmly leading each team, we somehow managed to avoid disaster, but our relief, after clearing the first crevasse field, was replaced by frustration as we bogged down once more and had to offload half our gear. After making it through another distinctly unpleasant section we found ourselves on the first safe camping spot seen since we had left, so we unloaded the remaining gear and headed back uphill with empty sledges through the maze to collect the abandoned load.

That evening as we compared two of Amundsen's photos from his camp site with the scene around us it became clear that we had once again camped on exactly the same spot – the only safe area in sight. We concluded from the brief description in his book "South Pole" that the topography and crevasse patterns of the glacier had changed very little in 50 years and that we must have been have been following an identical route to Amundsen – in fact, the only route - for much of our descent. The only obvious difference was the hard snow that he commented on, allowing him to ascend the glacier, incredibly, in two short days, compared to the extremely soft snow that had cost us four days to *descend* - but helped slow our steep descents and assist our passage through the crevasses.

The weather for our last day on the glacier remained miraculously calm and clear, as it had for much of our descent. Being clear of the bottom icefall we now had an easy downhill run, although with the sledges side-slipping badly due to an uncomfortable cross slope, easily dodging the large, regular crevasses and covering the last 10 miles to the foot of the glacier thanks to a firming surface. That evening radio contact was made with Scott Base for the first time since venturing onto the glacier due to a prolonged blackout. Herbert was finally able to report our safe descent - to the obvious relief of all. Our final day's sledging of 16 miles brought us to our last camp, on a flat crevasse free area close to Mt Betty. Our journey was at an end, our 16 wonderful companions, the dogs, having tirelessly hauled their sledges for a total of 755 miles. Two days later, at 8pm on February 8, 1962, we were safely picked up by R4D, sledging into Scott Base just in time for breakfast the following morning.

Reflections: So, after all that, who did we consider had the toughest job gaining access to the Polar Plateau: Scott or Amundsen? That would be akin to comparing chalk with cheese, the challenges of the two glaciers being such a contrast. Ironically, I feel, the glaciers perfectly suited the temperament of each explorer: Scott's route up the Beardmore (and beyond) was a long, heroic struggle full of hardships; Amundsen's Axel Heiberg route, which he almost stumbled upon and described as "looking appalling", may well have looked impossible to anyone but a hardened, iron willed explorer such as himself. It is interesting to speculate whether Scott, had he been man hauling up the same route, would have attempted it - or been successful if he had. I am confident one point at least is clear: A highly experienced sledging man such as Amundsen using well trained dog teams would have had a clear advantage over anyone man-hauling regardless of their determination and courage.

Peter Otway September 21, 2011


162° W.
168° W.
174° W.
180°
174° E.
168° E.
162° E.
South Polar Plateau
Mt. Ruth Gade
Mt. Don Pedro Christophersen
Amundsen 1911-12
Herbert 1962
Axel Heiberg Glacier
Roberts Massif
Scott Icefalls
Otway Massif
Dominion Range
Shackleton 1908-09
Scott 1911-13
Mt. Fridtjof Nansen
13,330
Mt. Betty
Strom Glacier
Liv Glacier
Mill Stream Glacier
Herbert 1961-62
Mill Glacier
Shackleton Icefalls
Mt. Darwin
Mt. Black
Mt. Fisher
13,780
McGregor Glacier
Shackleton Glacier
Mt. Buckley
Mt. Usher
12,000
Husky Dome
11,750
Kettle Glacier
Swinford Gl.
Mt. Wild
Mt. Wade
13,330
Ramsey Glacier
Pain Neve
Flat Top
13,400
Berwick Gl.
Bingley Gl.
Mt. Kaplan
13,960
Mt. Kirkpatrick
14,860
BEARDMORE GLACIER
The Cloudmaker
Wedge Face
Garrard Glacier
Alice Glacier
Shackleton 1908-09
Scott 1911-13
Mt. Kyffin
Evans Gl.
Socks Gl.
Mt. Hope
ROSS ICE SHELF
Amundsen 1911-12
85° S.
84° S.
0°
70° S.
80° S.
WEDDELL SEA
Filchner Ice Shelf
ANTARCTICA
South Pole
-90° W.
90° E.
180°
Ross Ice Shelf
McMurdo Sound
ROSS SEA
QUEEN MAUD RANGE
Scale 1:1,267,200 (1 inch to 20 miles)
Miles
10 0 10 20 30 40