THE POLE SEEKERS: A COMPARISON

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 Three expeditions to the North Pole by dogsled are here compared; that of Robert E. Peary in 1909, of Will Steger in 1986, and that led by Tom Avery in 2005.

 The Barclay’s Capital “Ultimate North” expedition to the North Pole led by Tom Avery in 2005 in 37 days confirmed Robert E. Peary’s successful 37 day expedition in 1909. Avery’s expedition closely duplicated Peary’s route of 413 nautical miles by dogsled. Their sleds were the “Peary” design with very similar loads. Avery’s team included a 53 year old female member, about the same age as Peary in 1909.

 The expedition led by Will Steger and Paul Schurke in 1986 also closely paralleled Peary’s. All three expeditions were done without external material support. Like Peary, Steger’s navigation was done solely by sextant, magnetic compass, and visual sastrugi wind surface markings, and was accurate to within less than one mile of the North Pole as confirmed by Global Positioning System (GPS). In various ways these 1986 and 2005 expeditions were more difficult than Peary’s, yet matched key aspects of Peary’s speeds.

 Avery’s 2005 trek matched Peary’s total time of 37 days to the Pole, and except for bad weather near the end, they likely would also have matched or exceeded Peary’s final 5-day dash speed between 88O N and 90O N. Steger’s 1986 trek did match Peary’s speeds in their last 5 days of northward travel, but took 6 days with no headway on the fifth day due to problems with their sextant. Their progress was monitored externally by GPS for safety purposes, and showed that their travel path was essentially a straight line to the pole.

 While these three expeditions were very similar; there were significant differences. Peary’s pioneering trek was easier for several reasons. Global warming has altered the polar pack ice. Avery stated that the average ice thickness in 2005 was less than 8 feet. Steger reported it at 10 feet in 1986 compared to 12 feet in Peary’s time. This thinning lends to more breaking of the ice with more raised pressure ridges, more open water and more drifting. Steger and Avery also started onto the polar sea ice later in the season than Peary did, giving them brighter daylight and higher temperatures.

 Peary’s teams took to the sea ice on Feb. 28 with sled loads of less than 500 lbs and reached the Pole on April 6, 1909. Steger’s party set out on March 8 with sled loads of 1200 lbs. This required back and forth relaying of supplies during their first 24 days, thus tripling their travel distance until they got beyond the shear zone’s rough ice. Here they encountered an early start of the spring ice break-up so they didn’t reach the Pole until April 30, 1986, for an exhausting total of 53 days.

 Avery’s party set out still later on March 20 and reached the Pole on April 27, 2005. They were occasionally hampered by periods of strong head winds that caused the ice to drift south. Per Avery, had this not occurred, they would have averaged about 27 to 28 miles per day for that final dash, 88ON to 90ON (120 miles). (Peary’s final five days dash average speed was 25 miles per day for his last 125 miles, or 26.6 miles per day for his last 133 miles, depending upon which distance was counted as his final dash.)

 Then there was the different manner and make-up of the travel parties in the number of persons, sleds, and dogs. Avery and Steger were handicapped by what they started out with to the Pole. Peary had the benefit of others designated to break the trail and set the course. Two experienced arctic navigators did most of it; Capt. Robert Bartlett for 19 marches and Professor Ross Marvin for 2 marches, and Matthew Henson for 4 marches. The magnetic compass variation was found to be essentially constant on their longitude all the way northward, since the Magnetic North Pole was about 1000 miles to their southwest. Indeed, it is constant as stated by Steger. Setting the clock at noon on the meridian starting point enables an easy check along the way, and tells if one is east or west of the desired longitude, and in any case, the direction of true north.

 Peary set out onto the polar sea ice with 6 expedition members, 21 Eskimos, and the best 140 dogs (out of 246) with 19 sleds carrying loads of 450 to 500 lbs. He formed them into 6 teams (divisions) and they broke the trail, established igloo camps, and carried out a system of one-way relays to move supplies forward, sending the injured and poorer performers back to land, one team at a time along the way to 88O N, while Peary saved his own energy for the final dash. By 88ON, Peary had the choice of the 4 most motivated Eskimos, the best 40 dogs and 5 sleds. (Bartlett had established their position at 87O47’N; 133 miles left to go.) There Peary had to choose between his long time companion of all his arctic expeditions, Matthew Henson, or his ship’s Captain, Robert Bartlett, who at that time was a British citizen. Henson knew the Eskimo language best, had rapport with them, and was arguably the better dogsled driver of the two.

 All three expeditions experienced improving ice conditions beyond the wide shear zone that separates the drifting polar pack ice from the shore fast ice, at and beyond Ellesmere Island’s relatively shallow continental shelf which extends out about 50 miles. Both Peary and Steger encountered the so-called “big lead” of open water at approximately 84O N, while Avery apparently did not.

 Steger’s expedition set out with 7 men and a woman, 5 large sleds and 49 dogs with average loads of 1200 lbs, vs. Peary’s nominal 450 lbs. During their first 24 days, they had to relay partial loads, going back and forward, thus tripling their travel distance until they got beyond the rough ice of the shear zone. Steger’s party encountered two major storms with very strong winds at about 84ON and at 85ON, which caused slight northeasterly drift of the sea ice. They were delayed three times while they sent out 2 men and 28 dogs by aircraft. This left them with 3 shortened sleds, 21 dogs and 5 persons on their 36th day at 86O10’N. They too enjoyed better ice north of 86ON. (In this stretch, they also met solo skier Jean-Louis Etienne who also made it to the Pole.) Between 88ON and 89ON, they had a problem with their sextant, and finally corrected it at 89O30’N. Moisture had gotten into its internal mirrors and frozen. This caused the loss of one day’s travel northward and a detour during their final dash from 88ON. Otherwise as above, they would have matched or even exceeded Peary’s final 5-day dash to the pole. Like Peary, they achieved the Pole solely by sextant and magnetic compass, and their position was within a few hundred yards of the Pole by GPS; 6 of 8 persons and 20 of 49 dogs remaining. They were picked up at the Pole by aircraft.

 Avery’s expedition in 2005 set out on March 20 with 5 persons (one, a woman about Peary’s age) with 2 Peary design sleds and 16 dogs, 21 days later in the season than Peary. Based on the limited available details they apparently did not encounter the so-called “big lead” in the shear zone, but did encounter 40 to 50 open leads en-route, and strong winds that caused them to drift south on their 34th day of 37. As above, Avery wrote that lacking this happening, they would have matched or exceeded Peary’s final dash speeds. They did match Peary’s total of 37 days to the pole, even beating him by a few hours.

Related matters

Polar Sea Currents: Peary’s and Avery’s routes to the Pole were along the 70O W meridian from Cape Columbia, and Steger’s from adjacent Ward Hunt Island at 75O W, essentially the same distance to the Pole. This is mostly within a zone of sea current null, wherein the currents have little effect until near to the North Pole. The drift of the pack ice is affected more by strong winds. And as we have seen, the magnetic compass variation is approximately constant all the way to the Pole.

 Water flows north from the Pacific Ocean into the polar sea where its multiple directions are effected by the surrounding land configurations, and finally outward into the Atlantic Ocean. The primary outflow is via the east side of Greenland with lesser flows southward through the Canadian arctic islands to the west of Ellesmere Island, and through the narrow channel between Ellesmere Island and northwest Greenland, with gyral currents flowing in different directions. The distinctive clockwise Beaufort Gyral is well to the west of this 70O or 75O W longitude route with its drift rate of one to three miles per day. On the east side of this route to the pole, the currents vary in direction as one goes northward; first southeastward toward NW Greenland’s Smith Sound, then into a lesser clockwise gyre’s westward flow, then northward, then eastward, then west again, and finally east again as one reaches the transpolar stream flowing to the Atlantic via the east coast of Greenland.

 The net effect of these multi directional and frequently opposing currents was illustrated by the track line of Steger’s expedition that was plotted externally by GPS. Their actual track was essentially a straight line from land until they had problems with their sextant and thence to within less than one mile west of the pole. Two minor deflections eastward were caused by very strong winds at about 84ON and 85ON, and one westward at 89O30’N to avoid bad ice and open water near the pole late in the season.

Navigation

 As one approaches the North Pole (beyond 88ON), longitudes become increasingly meaningless and the Sun’s elevation approaches being constant except for its daily rise. Thus one has to depend on the compass heading in order to maintain direction north and distance by “dead reckoning”. Peary made his initial polar sextant observation to determine his latitude just after noon on April 6th, and then did a series of observations; 10 miles further, then back, then from 8 miles at a right angle, and then back again taking sights at midnight, then at 6 am, one in between and at noon again on April 7th. This, as a sailor knows, amounted to a “4 line running fix” spanning 12 hours. Per his calculations, the Pole was somewhere within his “fix”, or close enough. Steger’s observations were similar and, put him within less than one mile from the pole by GPS. Peary’s primary concern at that point, with no aircraft to take him home, was their safe return to land.

Recap (distance 413 nautical miles

 Peary (37 days) Feb 28 to April 6, 1909 - Set out with 7 expedition members, 21 Eskimos, 19 sleds, 140 dogs with sled loads of 450 to 500 lbs. Final dash 88ON to 90ON in 5 days ; Peary and Henson, 4 Eskimos, 5 sleds, and best 40 dogs

 Steger (54days) March 8 to May 1, 1986 - Set out with 7 men, 1 woman, 5 sleds, 49 dogs with sled load of 1200 lbs. Reached Pole with 6 persons, 2 sleds, and 20 dogs. A close match to Peary’s final dash speeds.

 Avery (37 days) March 20 to April 27, 2005 - Set out with 4 men, 1 woman, 2 sleds, and 16 dogs with same sled loads as Peary’s. Final dash was close match to Peary’s and slightly shorter overall.