The Ross Sea Drift of the "Aurora" in 1915-1916
Author(s): J. M. Wordie
Source: *The Geographical Journal*, Vol. 58, No. 3 (Sep., 1921), pp. 219-224
Published by: geographicalj
Stable URL: http://www.jstor.org/stable/1780489
Accessed: 27-06-2016 08:03 UTC

physical and chemical changes—those variations in the volume and density of the rocks—to which Sir Sidney Burrard has alluded and to which he attributes the elevations of the Earth's surface.

The atoms would always be tending to gravitate towards the centre of the Earth. But the evidence of clouds and trees shows in that the concentrating tendency of gravitation is more than balanced by an excentrating tendency impelling the atom to fly *outward*—that is, to those appropriately situated, *upward*, and from the operation of this force will have emerged those elevations of the Earth's surface which to us appear great heights, but which in reality are only of the order of the thickness of note-paper in comparison with a school globe. So it is in the interaction of our highly impressionable and responsive Earth with the multifarious energies of the Universe at large that I suggest to you we shall find the ultimate origin of mountains. From this cosmic interaction—the action between Earth and the other parts of the Cosmos—is generated an excentrating, uplifting force (or complex of forces) which, acting in successful opposition to the concentrating, lowering force of gravitation, raises mountains as it raises clouds and trees.

THE ROSS SEA DRIFT OF THE "AURORA" IN 1915-1916

J. M. Wordie

THE story of how the *Aurora* broke away from her moorings at Cape Evans, Ross Island, on 6 May 1915, and drifted helplessly in the pack ice for nearly a year, has already been partially told by Sir Ernest Shackleton in 'South.' The extracts which he gives from her captain's log were selected to illustrate how the party carried on during the winter and the ensuing summer before the ship was free again, and in a more or less crippled condition finally reached New Zealand. References are made to her position from time to time sufficient to give a fair idea of her track. A somewhat similar story, based on a newspaper report, is told by Dr. Mill in the *Geographical Journal* for 1916 (vol. 47, pp. 372-374). Commander Stenhouse, however, the captain during the drift, very wisely thought that the full and correct details of the ship's drift should be made available, and to this end gave me his diary last spring, at the same time asking me to work out the course, etc., with a view especially to comparison with the *Endurance* and the other Antarctic drifts.

The material available consists of a type-written copy of his diary made in New Zealand in May 1916, and a list of corrected longitudes from October 1915 to April 1916. Unfortunately, many of the loose sheets of the diary, most of them dealing with the first month of the drift, are missing. Commander Stenhouse volunteered to get the original sent over from New Zealand, and telegraphed and wrote accordingly, but without satisfactory result: the original may eventually be found, and if so will of course add a few more details. A more serious loss, and which cannot be made good, is that of a bundle of diagrams and drawings, some

of new land possibly, and others of the little-known Oates Coast, which were left at the *Daily Chronicle* office in 1916 for better security during the war: these also have disappeared, and their recovery is most unlikely.

From every point of view it would have been better to have worked from the original log and work-books, and to have had Commander Stenhouse's own chart before me. There is uncertainty, for instance, about a few positions, probably due to copying errors, which might have been cleared up by reference to the originals. This being impossible, the only other course open is to omit them altogether. Only positions about which there is no doubt are shown. A very useful check is supplied by the force and direction of the wind, which was recorded daily in the diary.

The positions fall roughly into two sets: those up to August 23, in which the longitude was obtained from bearings to mountains or capes on Victoria Land; and those from September 22 onwards, in which the longitude was worked out by chronometer. Neither set is entirely satisfactory. As regards the first, Victoria Land has never been very accurately charted; and, moreover, the magnetic declination was seldom checked or observed. As regards the second set, the chronometer rate was found to have altered very considerably by the time the ship finally got into wireless touch with New Zealand. The original positions were corrected accordingly, the difference sometimes amounting to between 3° and 4° (*e.g.* in 64° – 66° S. lat.). In both series, even with these corrections, it would certainly be unwise to claim a closer accuracy than 10 miles. Commander Stenhouse says in one place, "The bearings as laid off on a small chart of gnomonic projection are very inaccurate, and here we are handicapped as our chronometers have lost all regularity"; and again, "The temperature in the chart-room ranges from zero to a little above freezing point. This is a very disturbing factor in rates of the chronometers, which are kept in cases in a padded box, each case covered by a piece of blanket and the box covered by a heavy coat."

The *Aurora* broke away from her moorings at Cape Evans at 9.45 p.m. on 6 May 1915. In the first five days the wind blew a moderate gale from east-south-east, south, and then south-south-east; and by the end of the week the ship is stated to have drifted 45 miles. She was carried to the west side of McMurdo Sound, and was somewhere off Granite Harbour between May 14 and 22. She apparently went diagonally across the sea to the north-west, and in this was merely following the route which parties on Ross Island have seen bergs taking in summer. These come round Cape Bird from the east, and after drifting a little southwards into McMurdo Sound move straight across to Granite Harbour; their route is governed partly by a true current, partly by the force and direction of the wind. On May 24 a second blizzard from south-south-east carried the ship rapidly to a position about 20 miles east of the Nordenskjöld Ice Tongue, and here she remained several days till variable winds,

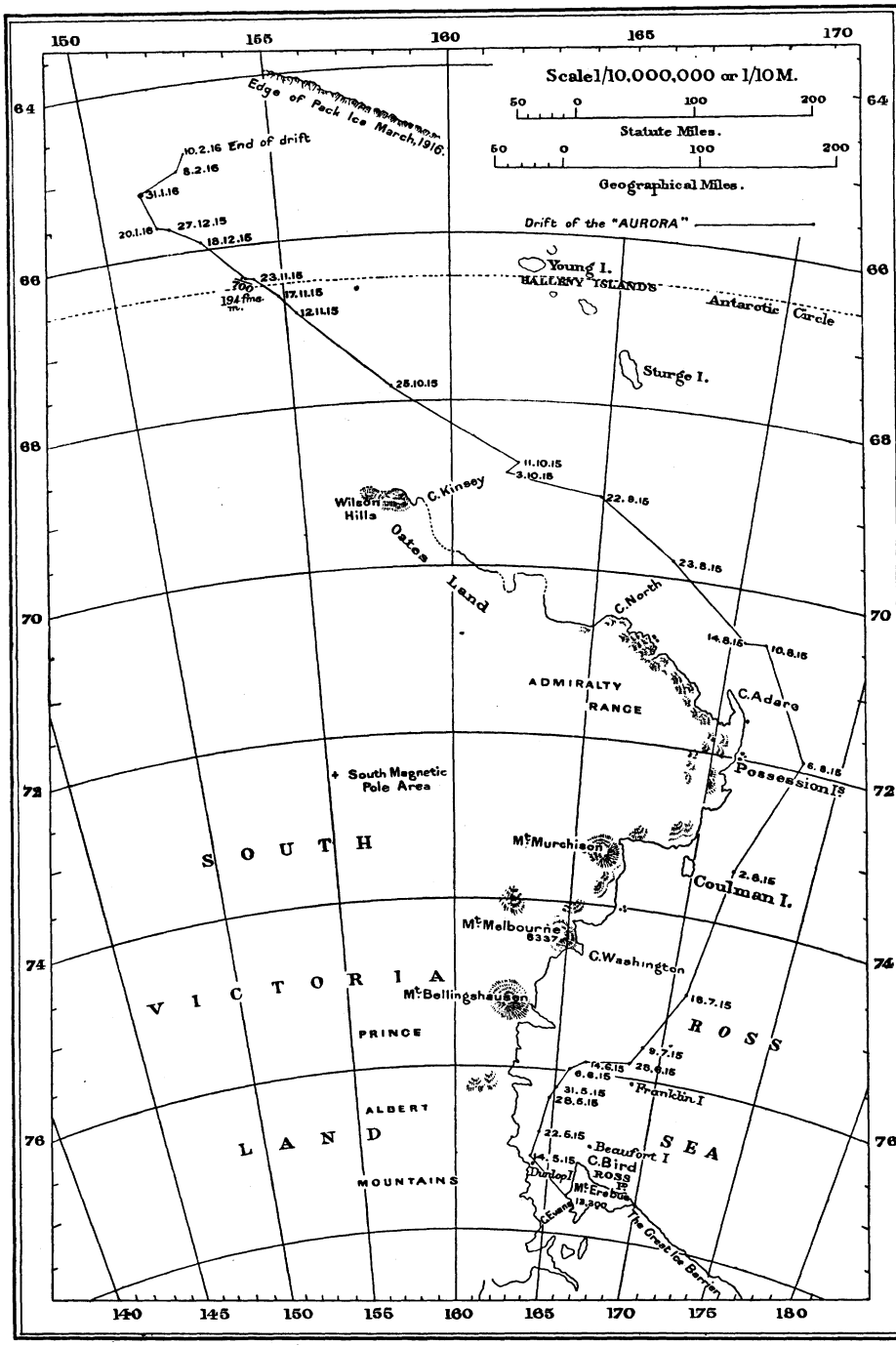

Chart showing the drift of the "Aurora" in the Ross Sea.

and then persistent westerlies of force 3–4, drove her about 60 miles east-north-east to somewhere north of Franklin Island. "During the last westerly blow the ship's position has altered appreciably and her head has swung through south to south-west. It would appear that Franklin Island has acted as a hub round which the field of ice in which we are has wheeled."

From July 9 to 18 the ship drifted fairly steadily to the N.E., averaging 5–6 miles a day, wind force generally 3. Then a succession of south-south-west winds of force 4 between July 18 and August made her travel N. by E. about 6–7 miles a day. From August 2 to 6 the wind blew hard from south and south-south-west, force 8–10, and drove her 100 miles N.N.E. in that time; and in the next four days a wind of the same force, but from south and south-south-east, drove her 88 miles N.W. by N. The rate of drift of these last eight days has no parallel in the Antarctic, and can be matched only in the East Greenland Current. She was now due north of Cape Adare, and the course so far followed was roughly parallel with the coastline.

During the middle of August the prevalent winds had all something of easting in them; she travelled N.W. about 7 miles per day between the 10th and the 23rd. From August 23 till September 22 the rate of travel only averaged a little over 2 miles per day; this was a slow rate, and to judge by the winds it can be accounted for by a good deal of back and forward drifting over the same ground—a feature which positions determined at long intervals does not of course bring out. From the middle of August onwards the mean north-west course (whatever the details may have been) is very striking; the rate, however, was very variable. From September 22 to October 11 the average rate was 4 miles per day; from October 11 to 25, eight; from October 25 to November 23, four; from November 23 to December 18, two; and from December 18 to January 20, just over one. At the end of January, however, the steady N.W. drift came to an end: from the 20th till the 31st the ship drifted 27 miles N. by W. and then in the next ten days 47 miles N.E. by E.

On February 10 she was free to use sail and steam once more, but it was another month before she finally quited the pack ice in 64° 27′ 30″ S. lat., 157° 32′ E. long. on 14 March 1916. Though very near the pack edge during this time, as almost daily references to heavy swells prove, progress was very slow, as, owing to lack of fuel, she was generally under sail. The month's work amounted to only 130 miles in an E. by N. direction. It looks, therefore, as if the region of westerly winds begins just north of 65° 30′ S.

During this nine-month period only two new soundings were made, whose positions could be fixed definitely: on November 17, in 66° 40′ S., 154° 45′ E., 194 fathoms, dark-brown glacial mud and a few small stones; and on November 24, in 66° 26′ S., 154° 17′ E. (or thereby), 700 fathoms, no bottom. More soundings would have been welcome, but at any rate

these two definitely fix the position of the edge of the continental shelf north of "Cape Hudson."

During the drift along the Victoria Land coast, various landmarks were passed in turn—Mount Melbourne, Coulman Island, and Cape Adare. On August 23 Commander Stenhouse says: "Saw the land in the vicinity of Cape North: to the south-south-west the white cliffs and peaks of the inland ranges were very distinct, and away in the distance to the south-west could be seen a low stretch of undulating land." Thereafter there were numerous glimpses of the land, and on September 22 a rough sketch was made of Oates Coast. More of this land was seen bearing south-west on October 3; and the next day a very prominent peak was noticed, probably farther east than the Wilson Hills. On October 14 there was land to the south and south-west, probably Cape Kinsey and the Wilson Hills. Finally, in November, land was seen to the south very far off; if correct, this last observation extends Oates Coast 80–90 miles farther north-west beyond the Wilson Hills.

On November 23 land was seen bearing N. 54° E. (true); it was thought to be Young Island, Balleny Group, but the direction does not agree. Later in the day land was seen bearing S. 60° W.; this was supposed to be "Cape Hudson," and was described as a "high, bold headland with low undulating land stretching away to the south-south-east and to the westward of it." The next day, however, the weather was very clear, and not a vestige of land was to be seen in either of these directions. The appearances of the day before were simply mirage. On November 16 the Balleny Islands were thought to be visible to the east; there is some little doubt apparently, but on a previous occasion, September 22, they had actually been seen, for on that date Sturge Island was sighted bearing due north (90 miles), and appearing like a faint low shadow on the horizon.

There are now four well-observed drifts in the Antarctic: the *Belgica*, south-west of Graham Land; the *Deutschland* and the *Endurance*, in the Weddell Sea, and the *Aurora*, in the Ross Sea. Two others are less important: the to-and-fro drift for a couple of months of the *Antarctic* in the north-west corner of the Weddell Sea, and the besetment of the

	Date.	*Latitude.*	*Longitude.*	*No. of Days of Drift.*	*Dist. point to point.*	*Rate per day. Sea miles.*	*Dist. sum of courses.*	*Rate. Sea miles.*
Belgica Beset ...	2 Mar. 1898	71° 30′ 0″ S.	85° 15′ 0″ W.	376	333	0·9	1706	4·5
Free ...	13 Mar. 1899	70° 50′ 0″ S.	102° 15′ 0″ W.					
Deutschland Beset	8 Mar. 1912	73° 40′ 0″ S.	31° 0′ 0″ W.	261	630	2·4	1633	6·3
Free	26 Nov. 1912	63° 42′ 0″ S.	36° 20′ 0″ W.					
Endurance Beset	19 Jan. 1915	76° 34′ 30″ S.	31° 30′ 0″ W.	447	960	2·1	1816	4·1
Free	9 April 1916	61° 56′ 0″ S.	54° 5′ 0″ W.					
Aurora Beset ...	6 May 1915	77° 38′ 0″ S.	166° 24′ 0″ E.	282	800	2·8	1191	4·2
	12 Feb. 1916	64° 49′ 0″ S.	152° 40′ 0″ E.					

Gauss off Wilhelm Land. Neither of these ships drifted over any distance or for any length of time. The four first-named (see table) illustrate the westerly drift of the pack round Antarctica, and show that this drift is practically parallel to the coast.

A comparison of the rates of drift is important, for an idea of the relative amount of pack in the various areas may perhaps be deduced from it. The comparison can be made in two ways. To measure point-to-point distances is one; but in this case the tracks of the *Aurora* and the *Deutschland* are curved like a bow, and that of the *Endurance* also, but to a less extent; whilst the *Belgica*, except in the last two months of her drift when she travelled rapidly westwards, drifted mainly back and forwards over the same ground. This method is therefore only satisfactory for comparing the somewhat similar tracks of the *Aurora* and the *Deutschland*; and gives the *Aurora* a 16 per cent. faster rate than the *Deutschland*. The other method is to work with the sum of the distances between observed positions. In the case of the *Belgica*, *Deutschland*, and *Endurance* this gives quite satisfactory results, for in all three cases positions were determined every three or four days; so that the rate so got is very nearly the daily one. The respective speeds following this method are 4·5, 6·25, and 4 sea-miles per day. For the *Aurora*, however, this method is quite unsuitable, for positions were only fixed about once in ten days. Presuming, however, that she drifted in much the same way as the *Deutschland*, but 16 per cent. faster, her daily rate works out at 7·3 miles per day.

That the *Aurora* and *Deutschland* travelled so much faster than the *Endurance* is due perhaps, but not with certainty, to stronger winds. During the *Endurance* drift, however, it was found that the same wind strength made the floes travel very much faster when nearer the pack edge. The view is therefore taken that the *Aurora* and the *Deutschland* drifted faster than the *Endurance* because they were both nearer the edge of the pack.

In the latter part of her drift the *Aurora* was probably in the area of westerly winds; and, if she had not won free when she did, she might quite easily have undergone the back and forward experience of the *Belgica*. In the latter's case, though on the whole she was south of the region of westerly winds, yet, as Arctowski shows, there were seasons when the westerly system did extend as far south. Speaking as a whole, this was the most interesting side of the *Belgica* drift—this and the sudden dash westward in the last two months.

Whether or not the *Endurance* track ran parallel to the unknown coast of Graham Land has yet to be settled: but the striking way in which the *Aurora* follows the Victoria Land coast strengthens the probability. Only once did the latter ship break away from the coast, namely in June, when the wind blew steadily from the west: it is just likely that this was due to the big glacier on the adjacent coast, which acts as a funnel. But for this, the track of the *Aurora* makes a grand sweep right along the coast, round Cape Adare, and away to the north-west.