is able to comprehend the difficulties and dangers that this gallant little vessel and her crew encounter in their successful efforts to add to our knowledge of terrestrial magnetism. Captain Ault writes :—

"After a delay of one day spent in preparing records ready for the mail, and in securing two seamen needed to fill the ship's complement, we left Fremantle on October 1 at 10.20 a.m., and were towed well out against a light head wind. During the night the north-west and west-north-west wind together with a southerly current set the vessel well in towards Cape Naturaliste, so that by 8 o'clook on October 2 we were only 10 miles off the cape. A gale from the west was blowing at the time, with heavy squalls, making it uncertain that the vessel could clear Cape Leeuwin. It was decided to run the engine and proceed, trusting that the wind would not shift ahead until we got clear of the cape. The engine held the vessel up to her course very well, probably overcoming a point of leeway.

"We were thus skirting the coast at a distance of about 10 miles from 8h. until 21h., the wind shifting ahead just slowly enough to allow us to keep a clear course with careful steering, as the direction of the coast-line changed from south by west to south-south-east. We cleared the dangerous point of Cape Leeuwin at a distance of three miles. The gale died down to a calm during the night as we proceeded on our way south into the cold and stormy regions of high latitudes.

"On October 5 the next gale began from the north-east, and continued with fog, mist, and rain until October 7, shifting through west to south-west.

"Another short gale blew from the north-west on the night of October 10. A display of aurora australis was visible during the entire night of October 10, 1920, and again on October 11, in the form of a series of arches of white light stretched across the southern sky, with white vertical streamers extending up to the zenith.

"At 8h. 15m., October 12, the vessel was within one mile of the charted position of the Royal Company Islands. Stieler's Atlas gives the position as 50° 24′ S., 142° 45′ E.; H. R. Mill gives 50° 15′ S. and 142° 45′ E.; and Bartholomew gives 50° 18′ S. and 143° 00′ E.: the mean of these, 50° 20′ S. and 142° 50′ E., was the position assumed. Nothing was in sight for a radius of forty miles with very good visibility. The 'Carnegie' sailed eastward all day at about 50° 20′ S. latitude, and there were no signs of land. These islands have been searched for unsuccessfully by several navigators, and they might well be eliminated from the charts. Our own experience in these latitudes in 1915–16 showed the ease with which icebergs could be taken for land when seen at distances even less than 5 miles. For several days before reaching the position given for the Royal Company Islands birds were particularly numerous—albatross, molly-mawks, petrels, Cape pigeons, &c.—and penguins were heard near the vessel at night. Floating kelp was passed in considerable quantities. But these indications cannot be taken always as signs of the proximity of land, as has often been done by earlier navigators in confirmation of their reports of new islands found.

"Our heaviest weather began on October 12, a westerly wind developing into a gale, shifting to north-west, back to south-west, again to north-west, and back again to south-west on October 15, moderating at south on October 16, and maintaining a force of 7 to 9 during the entire five days.

"The heavy wind and sea from the north-west prevented our making the northing necessary for a passage through Cook Strait useful, so it was decided to proceed to Lyttelton by way of the Snares, south of South Island, a much easier, safer, and direct route.

"The Snares were picked up on October 17 as calculated, and anchor was dropped in Lyttelton Harbour at 3 a.m. of October 21. Owing to calms and head winds the engine was operated for two days before arrival at Lyttelton. The last fifty miles were made running before a heavy south-east wind that came out of a practically clear sky, within one minute of the dying-out of the north-east wind that had been blowing for several hours.

"The usual meteorological conditions for these latitudes were experienced, but a fairly complete programme of observations was carried out in spite of fogs, storms, and heavy seas. Declination observations were made daily, and usually twice a day. The total number of miles traversed from Fremantle to Lyttelton was 3,157: hence the average daily run for the 19·7 days at sea was 160·3 nautical miles."

It is fairly obvious that the existence of the Royal Company Islands above water is disproved. Nothing but marine surveys and soundings can show whether there are not shallows which might account for the floating kelp; if there were shallows the possibility is then that the islands first discovered have become submerged.

The largest chart error in declination on the voyage was found just off the coast of Australia in latitude 33° 09′ S., longitude 114° 43′ E., when the declination was observed to be 4·8° W., whereas on the British Admiralty chart the declination for that place is given as 6·3° W., and on the United States chart as 6·4° W.

The second-largest chart error in declination on the voyage was found by the "Carnegie" at 50° 20′ S. lat., 142° 25′ E. long., when the declination was found to be 6·8° E., while the British Admiralty chart showed for that point 5·5° E., and the United States chart 5·8° E.

The declination observed at 44° 16′ S. and 173° 03′ E. was 17·6° E., a value 0·3° larger than the values given on both the British and United States charts. This point is approximately 34 statute miles south of East Head.

At 44° 42′ S. lat. and 172° 30′ E. long. the value found by the "Carnegie" was 17·6° E., a value 0·2° larger than the British and 0·3° larger than the United States chart value. The value at Christchurch Observatory for October, 1920, was about 17·1° E., and the Magnetic Survey of New Zealand showed an increasing value for declination of approximately + 0·2° for each + 1° of latitude, so that the chart values agree with the Observatory values fairly well if we neglect the merely local peculiarities revealed by the survey.