

THE ISLANDS OF THE TRISTAN D'ACUNHA GROUP

Positions amended from *Challenger's* original survey of 1873
after a lapse of 60 years.

by

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In January 1934 a report was received from the Royal Research Ship *Discovery II* that the positions of Inaccessible and Nightingale Islands in the Tristan d'Acunha group were incorrectly shown on British Admiralty chart No. 1769. The report originated from local information, and was to some extent confirmed by patent log distances run by *Discovery II*, and by sea sights, but no really definite evidence as to the correct position of the two islands was received. In effect, the report merely stated that both Inaccessible and Nightingale Islands were considerably nearer to Tristan Island than charted.

An examination of the original documents in the possession of the Hydrographic Department disclosed the surprising fact that the positions of Inaccessible and Nightingale Islands as shown on chart No. 1769 were not taken from any known original survey, and provided a mystery which was only solved after much research.

The British Admiralty chart of the Tristan d'Acunha group No. 1769 was published in September 1922. The charting of the group as regards both outline and position is identical with the cancelled plate of chart No. 2228 which was withdrawn on the publication of No. 1769, except that an adjustment has been made to the longitude graduation; this was on account of a decision to accept the mean of two determinations of the longitude of Herald Point, Tristan Island, obtained respectively by Captain DENHAM in 1852 and Captain Sir George NARES in the *Challenger* in 1873; for the earlier chart (No. 2228) Captain DENHAM's longitude had been accepted.

Apart from the longitude adjustment referred to above, the position and outline of Tristan Island on the British Admiralty charts has remained unchanged since the first publication of chart No. 2228 in 1853, and is in agreement with the original survey rendered by Captain DENHAM of H.M.S. *Herald* in 1852.

Inaccessible and Nightingale Islands were originally shown as rough pecked areas on chart No. 2228, being taken from Captain DENHAM's original survey of 1852. In 1874 they were engraved on the chart with their present outline, and their positions relative to Tristan Island have never since been changed. The outlines are taken from the original survey by *Challenger* in 1873, but the positions of the islands do not agree with any original survey in the possession of the Hydrographic Department.

Challenger rendered two original charts as a result of her visit to the Tristan d'Acunha group in 1873; the first consisted of plans of Inaccessible

and Nightingale Islands on a scale of 1 inch to a mile and contained no indication of the geographical position of either island; the second was a compilation of the whole group on a scale of $\frac{1}{2}$ inch to a mile which, according to the title, showed DENHAM's charting of Tristan Island, and *Challenger's* charting of Inaccessible and Nightingale Islands: this original is graduated and the positions of the two off-lying islands are both some two miles further to the northward than they appear on the published chart; the position of the observation spot on Tristan Island by graduation corresponds to its position as determined by Captain DENHAM in 1852, and the outline of the island appears at first glance to be identical with DENHAM's charting.

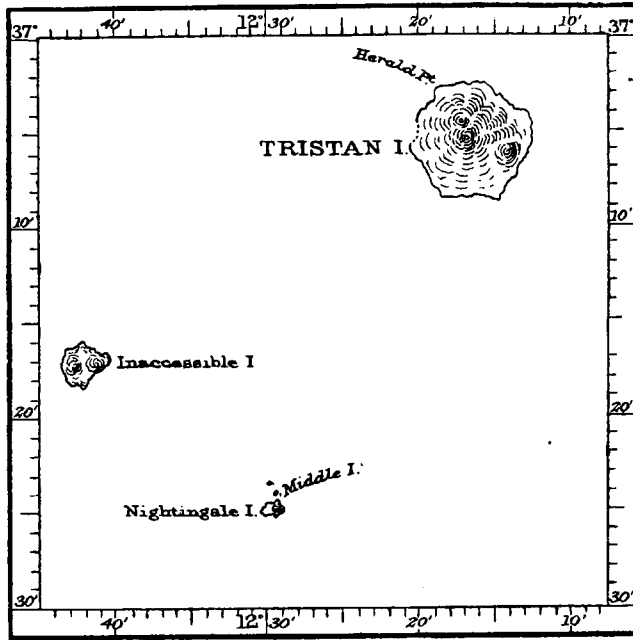
Reference to the "Report of the Scientific Results of the Exploring Voyage of H.M.S. *Challenger* 1873-76" showed that all positions in the Tristan d'Acunha group given in this report corresponded exactly with the cancelled chart No. 2228, but, as this report was not published until 1885 — twelve years after the chart was amended for *Challenger's* survey — the fact was of little real significance. The perusal of the report did, however, produce one very illuminating piece of information, which was a definite statement that a party from *Challenger* landed on Middle Island, a small rock close northward of Nightingale Island, and obtained sights for latitude, longitude and azimuth, also angles to the summits and salient features of the other islands of the group. Confirmation of this was eventually found in the original Remark Book kept by *Challenger* during the cruise, but no record of the results of the observations was to be found either in the Remark Book, or in original reports and letters of proceedings, whilst Middle Island did not appear in any list of geographical positions received from *Challenger*. The original work books containing the calculation of latitude and longitude sights during *Challenger's* cruise were then consulted, and amongst the former was found the latitude of Middle Island, which agreed with the *Challenger's* original graduated chart of the group; no trace of any sights for longitude at Middle Island could be discovered.

It should here be mentioned that, at a later stage in the investigations, Admiral J. D. NARES examined the journal of his father, Sir George NARES, and found therein a record that no sights for longitude were in fact obtained at Middle Island. It is therefore clear that the longitude accepted by *Challenger* was derived from the true bearing of the summit of Tristan Island.

The discovery of the original record of the latitude of Middle Island dispelled any lingering doubt as to the accuracy of the positions on *Challenger's* original graduated chart, but it did not help to solve the problem of the origin of the positions on the published chart.

The clue which eventually led to the solution of the mystery was the discovery that the size of Tristan Island on *Challenger's* original chart was smaller than on the published chart, which, as has already been mentioned, is in agreement with Captain DENHAM's original. The difference in size was not readily noticeable, being a reduction of scale of approximately $8\frac{1}{2}\%$. Following this up, it was found that all distances on the published chart as compared with *Challenger's* original were increased in about the same propor-

tion, and the published chart was, in point of fact, nothing more or less than a reproduction of *Challenger's* graduated original on a different scale.



The questions which now called for some explanation were: firstly, why did *Challenger* alter the scale of DENHAM's survey of Tristan Island? and, secondly, why did not the Hydrographic Department accept the geographical positions of Inaccessible and Nightingale Islands from *Challenger's* fair chart?

There can be little doubt that the answer to the first question is that *Challenger* discovered by means of the angles to the tangents of Tristan Island observed from Middle Island, that the scale of DENHAM's survey was too large. DENHAM's was only a "sketch survey" made from "passing observations", and was almost certainly dependent for its scale on patent log distances; such methods seldom produce anything but approximate results, and there was ample justification for preferring to base the scale on angles obtained from a known position.

In considering the second question, it must be borne in mind that at the time the published chart was corrected, the Hydrographic Department had no means of knowing that sights had been obtained at Middle Island; the only documents which contain any record of these observations, i.e. the Remark Book and Work Book, were still on board the *Challenger* when the new edition of the chart was published in 1874. It must also be remembered that there was no clue to the reason for the alteration in the size of Tristan Island; indeed, everything pointed to it being an error in the scale, as the title of the original chart dated 1873 stated that Tristan Island was from the survey by Captain DENHAM in 1852. Bearing these points in mind, it is not difficult to understand the action taken. There was every reason to suppose that the *Challenger's* original chart represented the relative positions of the

various islands and quite reasonable grounds for assuming that the graduation of the chart was based on an incorrect scale. The answer to the second question is therefore that there were grounds for assuming that the geographical positions were incorrect owing to an error in the scale.

Having arrived at an explanation of the inaccurate charting of the two islands which, although incapable of proof, is almost certainly correct, it will be interesting to review the causes which led to the mistake being made, and incidentally, to consider whether similar occurrences are adequately guarded against in modern procedure.

The action taken in the Hydrographic Department was perfectly logical in the light of the information available, but it is difficult to understand why steps were not taken to verify the assumption that an incorrect scale had been used for the graduation. The obvious procedure was to demand an explanation from *Challenger*, and it is safe to say that this would be done nowadays. The alteration of information contained in original reports without reference to the source of such information is fundamentally wrong, and although some essential details were not furnished by *Challenger*, the Hydrographic Department cannot escape their share in the responsibility.

The principal cause of the mistake undoubtedly lies in the facts that *Challenger's* original charts gave no indication that the position of Nightingale Island was dependent on astronomical observations, and that so far as can be ascertained, no report of the latitude obtained at Middle Island was ever rendered. A secondary cause is the alteration to the scale of Tristan Island without any explanation why it was done.

Challenger's failure to quote a geographical position on the large scale plan of Nightingale Island was contrary to the directions contained in the "General Instructions to Hydrographic Surveyors" in force at the time, but the absence of information on the original graduated chart of the whole group was in accordance with the normal custom of the period, when charts did not carry an explanatory memoir regarding their construction. The failure to include the latitude of Middle Island in the lists of geographical positions rendered was presumably an oversight, but it should be observed that no specific instructions regarding the rendering of such returns were included in the current "General Instructions".

Nowadays original charts carry memoirs, which, besides explaining how the charts are constructed, contain definite references to all appropriate returns of geographical positions; in addition, the observation spot would be clearly marked on the charts. It is therefore considered that modern procedure leaves no chance for the occurrence of a similar mistake.

There is one further point which requires elucidation. Why was the error not discovered when the "Challenger Report" was compiled? We have seen that certain essential information was lacking when the chart was corrected, but such was not the case when the report was compiled. The hydrographical portion of the report was the work of Staff Commander TIZARD, R.N., who was the Senior Assistant Surveyor of the *Challenger*. This duty fell to him because the Commander of the *Challenger*, Sir George NARES, was recalled

to take command of the British Arctic Expedition before the completion of *Challenger's* cruise. Now Staff Commander TIZARD was actually the officer who obtained the latitude sights at Middle Island, and must have been fully aware of the whole situation. He quoted positions from the published Admiralty chart instead of going to the original charts and records for his information, and we can only assume that the possibility of the information rendered by *Challenger* having been amended in the Hydrographic Department never occurred to him; even so, his action was irregular, as the principles of accuracy demand the use of first-hand information in the compilation of such a report.

It is salutary to reflect that more than sixty years have passed since the Tristan d'Acunha group was surveyed by Sir George NARES, and that only now are the islands being placed in the positions determined by *Challenger* in 1873.

