

# REPORT OF THE HYDROGRAPHIC EXPEDITION OF "AMMIRAGLIO MAGNAGHI" IN THE RED SEA.

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by

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## SURVEYS

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A complete survey was made of the channel to the N. E. of Massaua, across the archipelago of the Dahalak Islands.

In joining up the surveys previously made in 1892 and in 1924, the work was extended as far as the central deep of the Red Sea.

On the whole, the bathymetric survey embraces a zone of more than 1000 square miles and the topographic survey embraces 24 islands having a total coast line of about 250 kilometres.

An examination was made of all of the approaches leading to the good anchorage of Gubbet-Entatu.

The survey was made with the greatest possible accuracy. A base of 1224 metres in length on the Island of Harmil was measured with four invar wires, and this was extended in accordance with BESSEL's standard method.

The azimuth of the base was determined by means of observations of Polaris.

The triangulation was made with 6 repetitions. It includes 29 main stations.

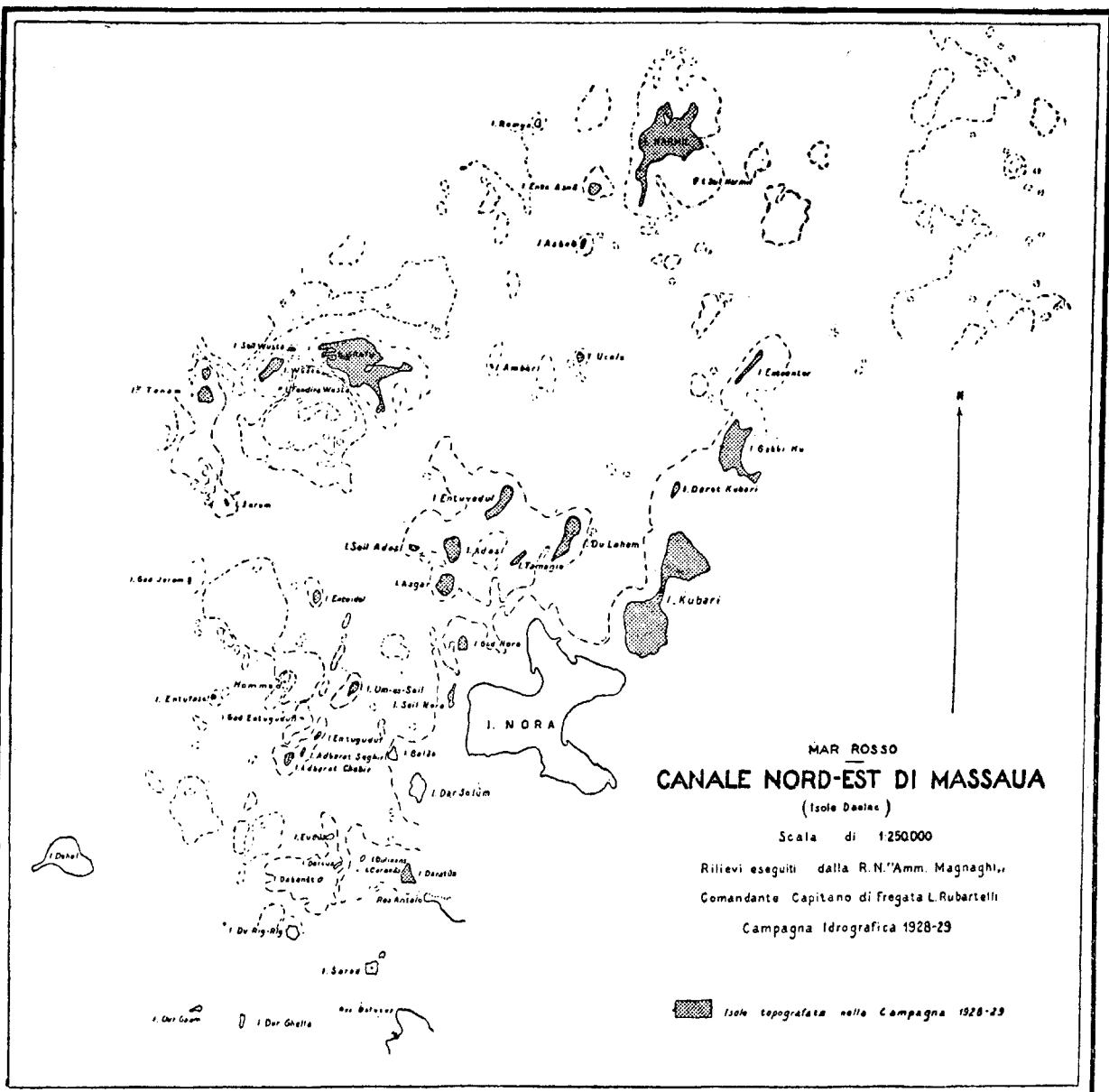
Out of the 43 triangles, practically all close to within 5 seconds and half of the remaining close to within 3 seconds.

The detail points were determined by direct intersection or by the subtended angle method.

In the course of the expedition great use was made of a large number of special floating beacons. These certainly answered very well for the purpose intended. For the topographic survey use was made of the tacheometer and stadia rods, or else the tacheometer and the ZEISS telemeter.

The survey of the bottom was made on a very large scale.

More than 200,000 soundings were taken at the stations and between them. The vessel made use of the LANGEVIN apparatus throughout, checked at frequent intervals by the LUCAS sounding machine or the MAGNAGHI sounding machine. The boats employed a modified type of the MAGNAGHI sounding machine to which a fish lead was fitted.



For determining the datum for the reduction of soundings, three tide-gauges were placed successively on the islands of Nora (Sahelia), Isratu and Harmil.

An astronomical observing station with a prismatic astrolabe was established at Harmil on one of the pillars of the base.

Following this several permanent beacons were erected to facilitate navigation in the channel.

Among the beacons may be mentioned :-

- 2 large iron quadrangular pyramids 15 metres high ;
- 2 cement beacons equipped with top-marks, 6 metres high ;





*Relative Gravity measurements :*

Complete gravimetric stations were made at Massaua, Asmara and Harmil.

On the island of Harmil a base was measured, the azimuth determined, and astronomical and gravimetric stations made at the same time.

*Meteorological Observations :*

Systematic meteorological observations were carried out during the entire duration of the expedition ; an abundance of data was collected relative to a zone exposed to entirely maritime atmospheric conditions which make a very interesting study and will provide information useful to Mariners.

*Thalassographic research :*

The investigation of the seasonal currents in winter in the central and northern parts of the Red Sea was completed. Some interesting research was carried out during the summer season in the central region and along the shores of the Strait of Bab-el-Mandeb.

*Thalasso-Biological research :*

On behalf of the Ministry of National Economics, a great deal of biological material was collected and an examination of numerous samples of sea-water was made.

