A BATHYMETRIC CHART OF THE RED SEA

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1. INTRODUCTION

Following preliminary geophysical surveys in the Red Sea by R/V *Vema* (DRAKE and GIRDLER, 1964) and H.M.S. *Dalrymple* (ALLAN, 1964), R/V *Aragonese*, of the SACLANT ASW Research Centre, conducted a detailed gravity, magnetic and bathymetric survey during November-December 1961. The soundings obtained were combined with all soundings in the Red Sea available to the British Hydrographic Department of the Navy and a bathymetric contour chart was produced which has since been published by the Hydrographer of the Navy (chart No. C6359). The method of producing this chart is presented in this paper.

2. CONDUCT OF THE SURVEY

A total of 54 transverse crossings were completed in order to study the geophysical properties of the axial rift. Profiles were made to approach as close to each coast as the limits of safe navigation would allow. Unfortunately, the prevalence of shoals makes the distance of safe approach rather large and, in the extreme south of the sea, it becomes impossible to make any transverse tracks of reasonable length.

Depths were recorded on a Times Facsimile Precision Depth Recorder MK. 5, which has a chart width of 400 fathoms, allowing depths to be read to $\pm$ 1 fathom. The instrument is calibrated for a velocity of sound in seawater of 800 fathoms/sec. All observed soundings were corrected using Matthews' Tables (1939).

Navigational control depended on radar sights on landmarks, supplemented whenever possible by celestial sights. Most profiles approached to within 30 miles of either coast where the relative accuracy of a radar sight was estimated as $\pm$ 1 mile. In the centre of the sea, where no radar sights were possible, positions were plotted by dead-reckoning from the start of the profile. The probable error is 2-3 miles.

The absolute error in position will be affected by any errors in the charted position of landmarks, which are known to be uncertain in some

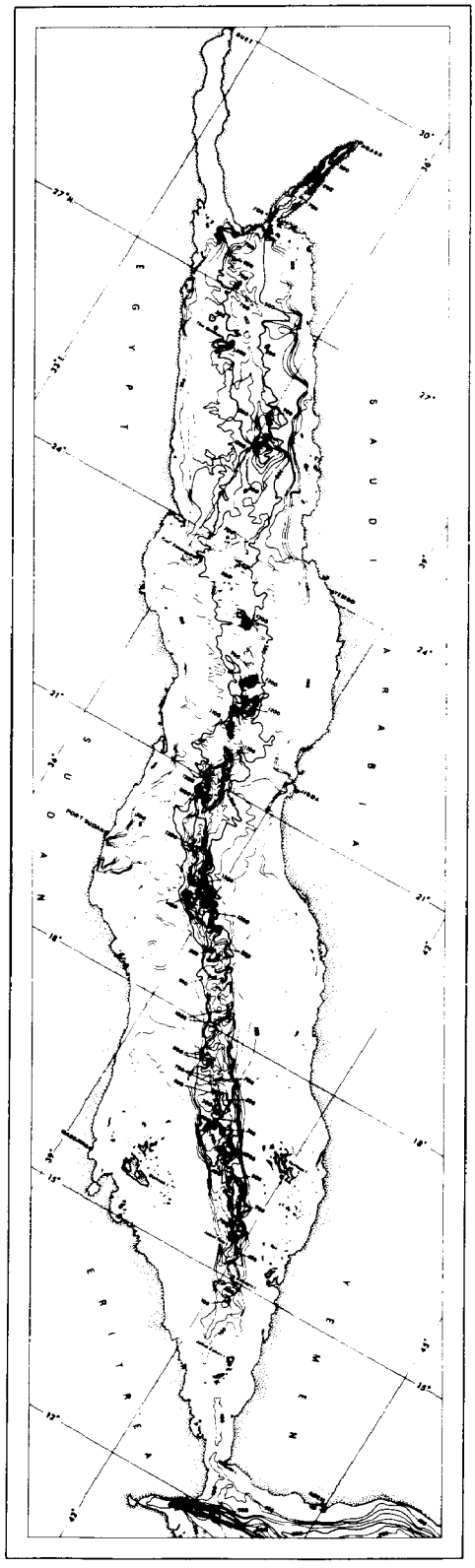

FIG. 1. — Bathymetric chart of the Red Sea.
The depth contours are shown at intervals of 100 fathoms.

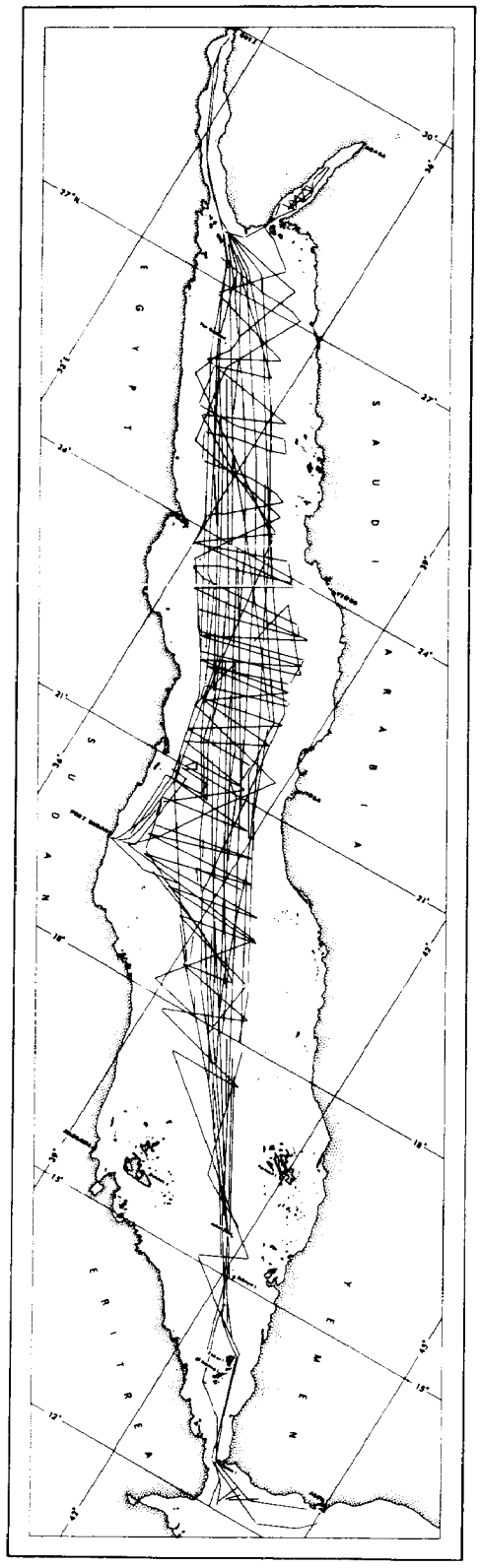

FIG. 2. — Density of sounding lines used in the compilation of the bathymetric chart.

areas. For example, the U.S.O.O. chart from Suez to the Brothers (No. 2812) gives a warning that along a 45-mile strip of coast in the north-eastern part of the Red Sea the relative positions of the coastline, topography and offshore islands have been reported to differ by up to 3 miles from the charted positions.

Small adjustments were made to the tracks to obtain the best possible agreement in gravity, magnetic field and depth at the various track intersections.

3. CONSTRUCTION OF THE CHART

The bathymetric chart (fig. 1) was constructed as follows. Plotting sheets covering the Red Sea area on a scale of 1/1 000 000 (Nos. 105, 130, 157) were supplied by the British Hydrographic Department of the Navy, Ministry of Defence. These showed all available soundings, plotted on undeformable material, and the *Aragonese* soundings were superimposed on them. The sheets were then contoured at 100-fathom intervals and the contour sheets reduced photographically to a scale of the British Admiralty's general nautical chart of the Red Sea. Finally, the bathymetric chart (fig. 1) was drawn by superimposing the reduced contour sheets over the general chart. The shallow depth contours (usually 100-, 200- and 300-fathoms) were drawn directly from the general chart.

For the Gulf of Aqaba, the British Admiralty nautical chart No. 756 (scale 1/308 250) was used in place of the plotting sheet when drawing the original contours.

Fig. 2 indicates the density of the sounding lines used. In general the transverse tracks are those of *Aragonese* while the longitudinal tracks are taken from the plotting sheets.

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