

# PROJECTION OF THE POLAR CAPS OF THE GENERAL BATHYMETRIC CHART OF THE OCEANS.

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For the first two editions of the General Bathymetric Chart of the Oceans, Mercator projection between the North and South latitudes of 72° was adopted. The same projection was kept for the third edition. There could be no question of altering it if the topography of the second edition and the transfers from the preserved stones were to be utilized.

In these first two editions, the polar caps from the 72nd degree of latitude were represented in gnomonic projection (see: *Bulletin du Musée Océanographique de Monaco*, N° 21, 25th December 1904, pp. 9-10 and 23). The scale was selected so as to be identical with that of the sheets in Mercator projection on the common 72° parallel.

Although the various kinds of projections which may be employed affect but slightly the shape of polar caps, the choice of a gnomonic projection does not seem to be a very happy one, because it is of no advantage in polar regions and has the disadvantage of preserving neither angles nor surfaces. Besides, as explorations undertaken since the publication of these charts have led to very considerable alterations in topographic plottings, there is no longer any object in utilizing transfers from old stones, it being possible to employ an other method of projection entailing no extra expenditure. In order to maintain the same property as afforded by Mercator projection to preserve angles, we adopted the conformal central projection, which would be identical with polar stereographic projection if flatness be left out of consideration and whose tables for the international ellipsoid were given by Captain L. Tonta, Director, in Vol. VI, N° of the *Hydrographic Review* of May 1929, pp. 102-103. The linear alteration modulus given therein is 1,025 at 72° and goes on decreasing to equal unity at the pole; while the modulus was between 1,106 and 1,051 for a gnomonic projection on the same parallel, as compared with the unity at the pole. The scale was selected so as to be the same on the 72nd parallel as on sheets in Mercator projection.

Under these conditions, the scale is  $\frac{1}{3099.608}$  on the 72nd parallel and  $\frac{1}{3177.338}$  at the pole. For the plotting sheets the scale of  $\frac{1}{2.000.000}$  at the pole has been adopted. This allows the adoption, for the radii of parallels, of half the table figures given in the *Hydrographic Review* and to trace a graduation from 10' to 10' or better from 5' to 5' or even from 2' to 2'. The minute of latitude is 0 m/m 942, on an average.

Sixteen polar caps sectors were printed, which represent plotting sheets to which topography and soundings may be transferred.

In order to enable the engraver to make his projection, it will be necessary to give him a list of lengths of radii from degree to degree. These lengths will be obtained by multiplying the table figure by 0.314729, whose log is 9.4979365.

On the chart the outercircle radius will be 637 m/m 839.

On the minutes 1013 m/m 315.

P. V.

