

Notes on Azimuth reckoned
from the South*

A hasty examination of the early records of the Coast Survey, Hassler's work in 1817 and work from 1830 on, suggests that there was no great uniformity of practice in the reckoning of azimuth. In working up astronomical observations it was sometimes reckoned from the north, apparently in either direction, without specially mentioning whether east or west, that point being determined by the attendant circumstances.

However, in computing geodetic positions a form was used not unlike our present logarithmic form for the computation of geodetic positions. This form was at first made out by hand but afterwards printed. In this form azimuth was counted from south through west up to 360° . A group of exceptions was noted, apparently a mere oversight. All this refers to the period around 1840.

The formulas on which the form for position computation was based apparently came from Puissant. The proofs given in the earlier editions of Special Publication No. 8 resemble those in Puissant's Traité de Géodésie. The Library has the second edition dated 1819. Another source (Poggendorff) gives the date of the first edition as 1805.

*See also 2nd paragraph on p. 94 of Special Pub. 8

The following passages are notes on or free translations from the second edition:

Puissant

Vol. I, p. 297

The formulas for position computation

"But it is agreed in practice to reckon azimuths and longitudes from south to west and from zero to 400 grades" (360°).

Puissant

Vol. I. p. 305

The formulas for position computation

"The method just set forth for determining the geographic positions of the vertices of oblique triangles was proposed as early as 1787 by Legendre in a memoir on geodetic operations published by the Royal Academy of Sciences and is the one chiefly used by Delambre in the recent measurement of a meridional arc. Each of them arrived at our formulas (a), (b) and (c), but Legendre, who considered also the special case of a geodesic line perpendicular to the meridian, gave formulas deducible from Series (a) by making $V = 100$ grades and by reckoning azimuths from the north."

Puissant

Vol. II, p. 155

Azimuth of a terrestrial object
from observations of the sun

The azimuth of the rising sun on a spring day is computed to be 96° , evidently from the north. The azimuth of the terrestrial object is then determined from the azimuth of the sun and the inclined angles between sun and object, this inclined angle being reduced to the horizon. The azimuth of the terrestrial object is finally stated both from the north and from the south.

The reference to Delambre's work is to the triangulation extending from Barcelona to Dunkirk, used to determine the length of the meter, that is, the relation between the meter, defined as one ten-millionth of a meridional quadrant, and the Toise of Peru. This monumental geodetic operation is fully described in the three-volume work of Delambre and Mechain, Base du Système Métrique, 1806-1810.

The following are notes on or free translations from this work.

Delambre and Méchain

Vol. II, p. 122-138

In determining azimuths by astronomical observations the azimuth is given from the north, either toward the east

or toward the west. The azimuth from the south is then stated. These are the astronomical azimuths taken at the ends of the arc and at a few intermediate points to keep the triangulation properly oriented.

Delambre and Mechain

Vol. III, p. 22

"But if we count azimuths as I have always done from the south point of the horizon toward the west, continuing up to 360° , and if we call Z this azimuth," etc.

Delambre and Mechain

Vol. III, p. 246-265

On these pages are given tables of azimuths, all counted from the south through west up to 360° . These are geodetic azimuths for the most part, derived from the few astronomical azimuths previously mentioned and the angles of the triangulation.

On p. 265 it is noted that on the Borda circle used to measure angles the readings increased from right to left, instead of from left to right, as would have been more convenient for the adopted system of reckoning azimuths.

In conclusion it looks as if the early geodesists here and in France from 1800 to 1840 were more set on reckoning azimuth from the south when they were functioning as geodesists than when they were functioning as astronomers.

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