

Book Review

La Meridienne

By Denis Guedj, Published in French by Robert LAFFONT, p. 300, 24 avenue Marceau, 75381 Paris Cedex 08, France

In 1790, one year following the beginning of the French Revolution, in order to unify the country and to facilitate commercial exchanges between the various regions, Talleyrand proposed that the National Assembly adopt a coherent and universal measurement system, ie: a *standardised unit* of length. Inevitably, political equality could not be envisaged without a standardised unit of measurement. The great number of dialects was criticised in the same way that the large variety of weights and measures was: lengths were measured in 'toise' and in 'pied du Pérou' (foot of Peru), which equalled an inch, a 'logne et 8 points du pied du Roi', the foot of the King who was King Philictère, King of Macedonia and the King of Poland; also the Kings of the Towns of Padua, Pesaro or Urbino. What confusion! Between 7,000 and 8,000 names! The definition of the new measurement, which was called the 'metre', is the tenth million part of the quarter of the Earth's circumference. To establish the standard metre, it was first essential to measure the terrestrial meridian line. This had already been partly done, but, at the end of the XVIIIth century, the instruments' precision resulted in much more accurate measurements. That was the adventure of the Meridian of Paris, the biggest geodetical measurement in history, an adventure that was to last seven years, the duration of the French Revolution.

Denis GUEDJ'S book, mathematician and scientific historian, starts in June 1792, when Jean-Baptiste DELAMBRE, astronomer (1749-1822) and Pierre MECHAIN¹, (1744-1804) 'Hydrographer-Astronomer', left Paris, respectively for Dunkirk and Barcelona, in coaches filled with measurement instruments, in order to measure the meridian line over a distance of a thousand kilometres. First, they worked out a series of triangles, pointing at landmarks (such as towers, bell towers, summits) with the help of an instrument devised by Charles de BORDA, the repeating circle, and equipped with two sets of sights. The distance between two points of a triangle was measured by hand!

Their task was very often complicated both by the meteorological conditions (fog hiding the landmarks, storms destroying their signals, etc.) as well as by the vicissitudes of the French Revolution or of the national wars (the large white sheets constituting landmarks visible from far were taken for Royalist signals, because of the telescopes, they were taken for spies, etc.) The two scientists were regularly arrested in France, as in Spain – which had just entered the war. The organisers of the expedition, LAVOISIER and CONDORCET, both died: the former was guil-

¹ « ... He was in charge of the discussion of astronomical observations in order to determine the basic positions for the charts... Extract from 'A la mer comme au ciel' d'Olivier Chapuis, Presses de l'Université de Paris-Sorbonne, p. 224

lotined and the latter committed suicide. The Academies which were supporting the expedition were abolished in August 1793. However, in spite of these vicissitudes and adversity, the two scientists completed their journey and, after a Committee of foreign experts had checked their calculations, on 22 June 1799, they were able to present a platinum ruler: the standard metre, today at the Pavillon de BRETEUIL.

So the standard metre was thus defined, but it was not until a King returned to power that it became mandatory, in 1840, first in France then worldwide. Later, in 1884, the Greenwich meridian was chosen as the international reference.

On the other hand, the adoption of the metric system on nautical charts was much more laborious and the task was enormous. C.P. de FLEURIEU, in 1799, wrote a very long text – entitled « *Application du système métrique décimal à l'hydrographie et aux calculs de la navigation* »² [Application of the decimal metric system to Hydrography and navigational reckoning]– and presented it at the 'Bureau des Longitudes'. The changes involved were significant not only as regards all the existing astronomical and nautical documentation, but also as regards the instruments, including the most basic such as the log and the clock. Although all the former measurements were prohibited as of 1st January 1840, the old sexagesimal system lasted a long time. It was only in 1960 that the metric system was adopted on English charts.

Denis GUEDJ has a remarkable talent as story-teller. Under his pen, revolutionary France comes to life with an amazing realism and what might have simply been an anecdote becomes, page by page, a splendid story in History. Readers will certainly appreciate it.

This book will be of particular interest to those readers who enjoyed Dava SOBEL'S non-fictional book 'Longitude' (1995).

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² Extract from the book 'A la mer comme au ciel' by Olivier Chapuis, Presses de l'Université de Paris-Sorbonne, jointly published with SHOM