

U3A-GROUP ASTRONOMY (23-3-2007)

THE ROYAL OBSERVATORY GREENWICH - “The Home of Time”

Established in 1675 by King Charles II, with the aim to improve navigation at sea and find the longitude of places by astronomical means. Latitude was never a big problem (altitude of the Sun). Longitude was much more difficult, and with the increase of sea-travel (trade and military) the number of shipping disasters grew proportionally. John Flamsteed (the first *Astronomer Royal*'s) task was to produce reliable tables about the position of the Moon against the background of the fixed stars. Almanacs with these data were to be used at sea in order to establish longitude.

The Observatory was built by Sir Christopher Wren (himself a professor in Astronomy!).

In the meantime, maritime disasters caused by the longitude problem kept taking place (worst in 1707: four Navy ships lost off the Isles of Scilly, taking nearly 2000 lives). Parliament then appointed the *Board of Longitude*, which in 1714 offered a prize of £ 20,000 to anyone who could discover a method to determine longitude at sea to within half a degree.

Simplest way would be to have a reliable clock: difference in time between position at sea and Greenwich in hours, multiplied by 15 = number of degrees E. or W. from Greenwich. But until middle of the 18th century no clock had been designed that kept running on a ship (heaving motions of the ship + large variations in temperature). Eventually, the problem was solved by John Harrison, son of a village carpenter in Lincolnshire. He spent most of his life constructing clocks to be used at sea. He produced four clocks, the last one in the form of a large pocket watch. It was tested on trial voyages to Jamaica and Barbados, with great success. In the meantime, the ‘astronomical’ method had also been greatly improved. Shortly after 1800 most ships – certainly those of the Royal Navy – made use of both methods, using astronomical almanacs as well as Harrison-type clocks. That remained the case until computers and the *Global Positioning System (GPS)* appeared.

The Observatory in Greenwich also played an important role in establishing the *Standard Time*. Until the middle of the 19th century each town had its own time, based on the altitude of the Sun. Became a problem with railways. In 1880 GMT became British Standard Time. In 1884 an international conference decided that the meridian at Greenwich was to be the Prime Meridian of the World (partly because most sea charts already used it as such!). In the 1940's, air- and light pollution began to hamper Greenwich's astronomical observations. In 1946 the Observatory moved to Herstmonceux Castle in Sussex, in 1990 to Cambridge. But most observations are nowadays done at the Canary Island of La Palma, at the ‘Overseas facility’ of the ROG.

Both of the former observatories – Greenwich and Herstmonceux – got a new role as museums, exhibitions, conference centres etc. The Greenwich Observatory became part of the big Maritime Museum, with a planetarium and a splendid collection of instruments – among which the 4 Harrison clocks, three of them still running (after extensive restoration in the 1920's and '30's).