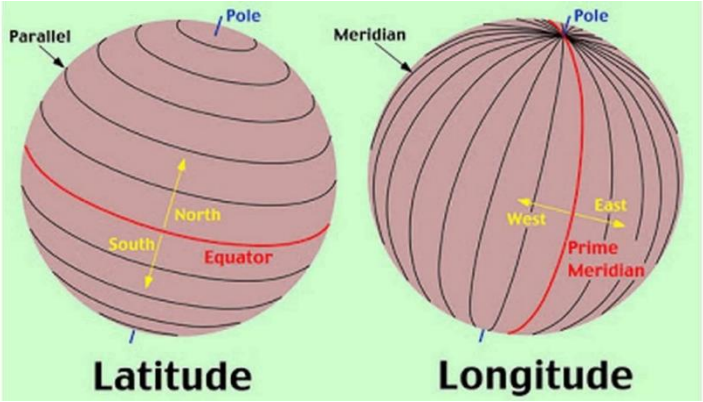
Where am I?

These days, thanks to GPS (the Global Positional System), it is easy to know exactly where you are. Until quite recently this was not always the case.

Knowing where we are in the world involves knowing our latitude and longitude. Our latitude describes how far we are north or south of the Equator, and longitude how far we are east or west of the prime meridian, which is located in Greenwich, in the UK. Measuring our latitude is easy; determining our longitude is much harder.



We have known how to measure our latitude for thousands of years. We simply measure how high the North (or Pole) Star is above the northern horizon. On long trips east or west, you can avoid the problem of not knowing your longitude by sailing at the latitude of your destination.

That's how Columbus found his way to America. However, not knowing your longitude makes sailing very dangerous.

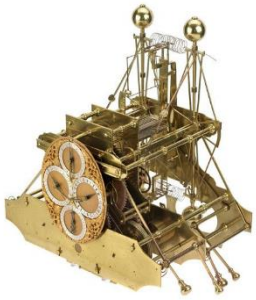
Steering along at a constant latitude certainly guarantees you will reach your destination, but not when. The offshore seabed of Eastern North America is littered with the wrecks of ships that arrived earlier than their navigators expected. Sailing in more northerly or southerly directions, not knowing your longitude can be just as dangerous.

In 1707, a fleet of five warships under the command of the unusually named Admiral Sir Cloudsley Shovell was heading back to the UK from the Mediterranean. The Admiral planned to take his fleet to the end of the Brittany Peninsula and then turn right into the English Channel. One of the crew, who had been keeping his own reckoning of the fleet's position, had the temerity to say to the Admiral that the fleet was badly off course. In those days a crewman questioning the judgement of an Admiral was deemed mutiny, and he was hanged on the spot. Few people joined the navy voluntarily in those days.

It turned out the crewman was right. The fleet was well to the west of where Shovell thought it was. The fleet piled up on the rocks around the Scilly Islands. Four of the ships sank; and almost two thousand men lost their lives. Shovell survived to swim to the beach, where he was robbed and murdered by a local woman.

This disaster was a major factor in the decision to build the Royal Greenwich Observatory, to provide the astronomical information and techniques necessary for navigation at sea. Observatories were also established in Paris, Ottawa and other places to address the same navigation problems.

All sorts of complicated astronomical techniques were tried, but in the end, the solution was found to be a clock. If you sail from Britain carrying a clock set to show the time in Greenwich, then measuring the local time during your voyage and subtracting the time in Greenwich will give you your longitude. Each hour of time difference is equal to 15 degrees of longitude. Knowing the solution did not mean the problem was solved, because getting a clock to keep very precise time on a rocking and rolling ship proved to be extremely hard. However, a self-taught clock maker solved the problem. His name was John Harrison and over decades of effort, he developed clocks that would maintain accurate time while rocking and jolting around on ships.



His first successful clock, named H1, is an amazing contraption of two-ended pendulums and incredibly technical artistry in shiny brass. It is now a working exhibit in the National Maritime Museum at Greenwich. His final version was a sophisticated and accurate device the size of a pocket watch.

Harrison's enormous contribution took a long time to be recognized, because the astronomical establishment of the time was resistant to outsiders butting in on their territory.

Venus is very low in the sunset glow and getting hard to find. At midnight Saturn lies low in the south, with Jupiter and Mars rising in the northeast. The Moon will be Full on the 17th, and at its closest in 2024 - a supermoon.

Ken Tapping, 15th October, 2024

Ken Tapping is an astronomer with the National Research Council's Dominion Radio Astrophysical Observatory, Penticton, BC, V2A 6J9.