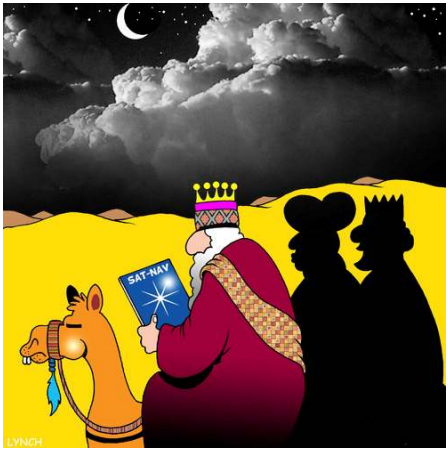
The History of Navigation

by Prof Michael Whittle, MB, BS, BSc, MSc, PhD

- From earliest times, people have had to find their way around, but the methods used have evolved considerably over the millennia.
- Navigation by description relied on memorising accurate descriptions such as “turn left here” and “turn right there”.
- Such navigation was aided by observation of the movements of the sun and stars, and related phenomena such as the location of moss on tree-trunks. *What is special about the star Eltanin, in the constellation Draco?*
- Some societies, such as the Polynesians, developed highly sophisticated methods of navigation, without the use of technology, by observing waves, clouds and wildlife.
- Before technological methods became available, charts and drawings, based on accurate observation and draughtsmanship, were the main tools for navigation at sea.
- Maps were originally based on observation, but the use of triangulation led to accurate mapping—at first using a plane table, but later using theodolites, and nowadays GPS.
- An early and important technological invention was the magnetic compass, which has steadily improved in accuracy over the centuries,
- The astrolabe gave way to the sextant (and similar devices) as the primary method for finding latitude. However, finding longitude was a much harder problem, which had to wait until accurate timepieces were developed. The turbulent competition for the ‘Longitude Prize’, and the development of John Harrison’s four timepieces, will be described.
- Measuring time was simplified by defining a prime meridian and 24 time zones. You may think that the prime meridian is at the Royal Observatory in Greenwich—but think again!
- During the second World War, electronic methods began to be used, which became increasingly sophisticated and accurate.
- Since the war, two methods have predominated—inertial guidance and the Global Positioning System (GPS). Inertial guidance has now largely been superceded, except for special purposes, but the GPS system is now widely used by ships, aircraft and (as “satnav”) in our own cars. The talk will end with an explanation of how the GPS system works!



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