

Latitude

Latitude is a coordinate that, in association with "[longitude](#)", enables the position of a point on the globe to be known. Certain cosmic characteristics of the movements of the Earth are used for this purpose. The Earth rotates on an axis between the poles joining the only two points that do not move with the rotation. An infinite number of perpendicular planes can be defined in relation to the polar axis.

In earlier geographical manuals, it was stated that the Equator was an imaginary line. This is not really appropriate. True, the line is imaginary, human beings did not find it engraved on the surface of the Earth, but its location is by no means arbitrary. The plane that intersects the polar axis at its centre divides the globe into two hemispheres. It is known as the equatorial plane, and the circle it forms is the equatorial line, or more commonly the Equator.

The equatorial plane is used to define latitude. For each circle parallel to the Equator, latitude is measured by the angle in the centre between the circle and the Equator. It has become habitual to give the measure of this angle in degrees, minutes and seconds; nothing however prevents from using other types of graduation. Latitudes thus range from 90° north (the latitude of the north pole) to 90° south (latitude of the south pole). Latitude is null on the Equator (latitude 0°).

Each degree of latitude is subdivided into 60 minutes, and each minute into 60 seconds. Since the Earth's circumference (ignoring the fact that it is not a perfect sphere) is about 40 000 km, the distance between degrees of latitude is about 111km100m. Therefore one minute measures about 1km850, and a second 30m90. Thus it can be seen that a position in terms of latitude can be very precise. Furthermore, there is nothing to prevent us from subdividing seconds even further.

The latitude of a place can be measured from the height of the sun above the horizon at midday, that is to say at the moment when it reaches the highest point, or its zenith. This height varies according to latitude and date. Knowing the height, and consultation of tables and ?graphs? integrating the effects of annual variation, thus make it possible to calculate latitude.

This calculation has been possible in an accurate manner since Antiquity, since the instruments required are relatively simple. The use of tables that take account of seasonal variations is very ancient.

In practice, of course, there are numerous obstacles to accurate measurement. First of all the sun has to be shining. In the higher latitudes, the polar night prevents the observation of the sun for long periods. And naturally to obtain an accurate and precise measure, instruments must not be too rough-and-ready. Until the generalisation of modern techniques like the GPS (Global Positioning System) which does not use the height of the sun but a positioning by artificial satellites, the most widely used and accurate instrument was the sextant.

Here we can find a good example of self-enhancing progress. The ability to measure latitude with ever greater accuracy and precision has enabled the establishment of more and more accurate and precise maps; once the latitude of where one is standing is known, it is possible to position oneself accurately and precisely on a map.

It is however easy to see that knowing latitude alone is not sufficient to fix the position of a place. Its longitude is also required. This requires the use of accurate, precise and robust clocks, which only became available from the 18th century.

1.Accuracy relates to a measure that is correct, exact, conforming to a standard; precision refers to the refinement of a measure

Bibliographie