1. THE GEOGRAPHICAL GRATICULE AND TOPOGRAPHIC GRID

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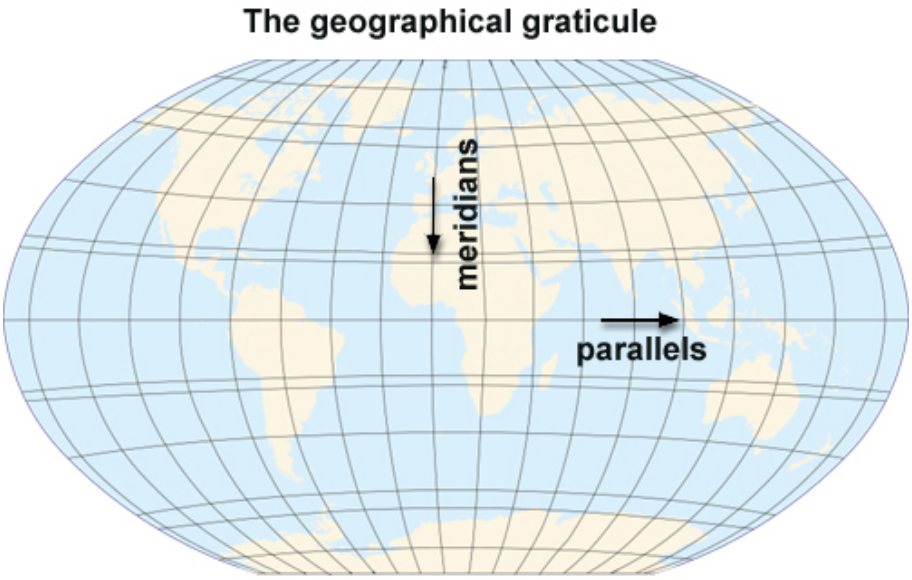
Geographical coordinates seem to be the most ancient quantitative method of defining locations. The earliest list of geographical names complete with quantitative locators is *Ptolemy's "Geographia"* of the 2nd century AD, which records some 8000 places by their names and their geographical coordinates.

The net of lines of latitude on the globe, also called parallels (because their planes are parallel to that of the equator), and of lines of longitude or meridians (which are half "great circles" extending from pole to pole), is called the geographical graticule.



Latitude of a place on the globe, is measured north or south from the equator as angles, in degrees, minutes and seconds. Longitude is similarly measured as an angle east or west from the prime meridian of Greenwich, England. These measurements thus constitute a precise quantitative system.

It is sometimes convenient to deal with only a limited portion of the Earth's surface and regard this not as curved but as a plane. This is what every conventional topographic map enables one to do, and the method of transferring places from the spherical surface of the Earth to the plane map sheet is called a ***cartographic projection***.

Since the representations of the lines of the graticule in a plane map are curved (except in the so-called cylindrical normal projections), and therefore inconvenient for measuring coordinate values from them, it is common practice to superimpose a plane rectangular net of squares on the map, of the well-known type called ***Cartesian coordinates***, and this is called a ***topographic*** or ***local grid***, or, if it covers a national territory, a ***national grid***, the coordinates then being called national coordinates. Such a grid is always based on a particular cartographic projection and it has a point of origin from which the coordinate values are measured.

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