torial diameter of the earth exceeds its polar about twenty-seven miles; the length of the equatorial diameter being 7927, that of the polar 7900 miles.

The relative density of the sun, the earth, and of the other planets, is estimated by the attractive force which they exert on each other, as they move round their common center of gravity. The absolute density or the quantity of matter contained in the earth, compared with an equal bulk of any known substance, may be nearly determined by the attractive force which any given mass of matter exerts upon a plummet (when suspended in its vicinity) to draw it from a vertical line. This will be proportional to the absolute quantity of matter in that mass compared with that of the earth. By this method, it has been found that the mean density of the earth is about five times greater than that of water, or nearly twice the average density of the rocks and stones on the surface.

Hence it has been inferred that the interior part of the earth is solid; or, if it be cavernous, that the solid matter must possess great density. It is not improbable that iron, nearly in a metallic state, may be one of the constituent parts of the central mass, and to this it may owe its magnetic polarity.

Dr. Halley supposed that the earth is a hollow sphere, containing within it a central magnetic globe, and that the revolutions of this globe on its axis, occasioned the variations of the magnetic needle. Laplace, the celebrated French astronomer, asserts, that the nutation of the earth's axis, and experiments on the vibration of the pendulum, indicate an increase of density of the mineral beds, as they approach nearer to its centre, at least to a certain depth from the surface. The rapid transition of motion to very distant parts of the earth during violent earthquakes, renders it probable that there are cavities filled with fluid or gaseous matter, which extend to different parts of the globe, at great depths under the surface.

An opinion has long been entertained, that our planet contains within it a mass of igneous matter, the source of central heat, which is supposed to be an important agent in maintaining the present temperature of the globe, nor are facts wanting to lend support to this opinion. The occurrence of numerous active volcanoes in both hemispheres, and in every degree of latitude; the existence of extinct ancient volcanoes, and of rocks of igneous origin in almost every country; and the numerous hot and warm springs that preserve an unvarying temperature for centuries,—all indicate the existence of a source of heat deeply seated beneath the surface. It seems also to be proved by observations made for the purpose in deep mines, that the temperature of the earth increases as we descend; though at a small distance from the surface, the temperature of the ground and of wells is the same in every season, but it varies in different latitudes. The animals and vegetables whose remains in a fossil state are found in northern climates, are, generally, analogous in structure