

Michell, John (1724-1793), held the Woodwardian Chair of Geology at Cambridge between 1762 and 1764, but it was in astronomy that he achieved lasting fame. In 1767 he took up the post of rector at the parish church of St Michael in Thornhill, near Dewsbury. In the same year that he took up his post at Thornhill, a paper by him appeared in the Philosophical Transactions of the Royal Society, which suggested for the first time the existence of true physical binary stars. He pointed out that the frequency distribution of the angular separations of known double stars deviated radically from what might be expected if double stars were simply chance 'line of sight' effects amongst stars uniformly distributed in space. In Thornhill, Michell devised and constructed a torsion balance (independently of Coulomb) and with it attempted to measure the density of the Earth. It was with the same equipment, purchased from Michell's estate, after his death, that Cavendish refined and repeated the experiment and gained renown for 'weighing' the Earth. In 1783 Michell sent a paper to the Royal Society in which he postulated the existence of black holes – stars so massive that even light would not achieve the escape velocity needed to leave the surface. Michell, is also credited with the first ever realistic estimate of a stellar distance. Observing from Thornhill in 1784, he noted that Saturn, at opposition, appeared as bright as the star Vega. Saturn appeared from the Earth to be 20" diameter and consequently, from the Sun, would appear to be 17" in diameter. Consequently, reasoned Michell, Saturn – shining by the reflected light of the Sun – would intercept 4.245×10^{-10} of the light of the Sun. Saturn was known (from Kepler's Third Law) to be 9.548 times the distance of the Earth from the Sun (the 'astronomical unit'). Therefore, based on the inverse-square law for the attenuation of light with distance, and assuming that Vega had the same intrinsic brightness as the Sun, he calculated that Vega was 463,000 astronomical units from the Earth – i.e. 7.32 light years. To be sure, parallax measurements by Struve eventually found Vega to be four times this distance, but Michell's splendid effort has rightly entered into the annals of science!