

Mr. Airy undertook the task; employing for that purpose, the Observations of the Moon made at Greenwich from 1750 to 1830. Above 8000 observed places of the Moon were compared with theory by the computation of the same number of places, each separately and independently calculated from Plana's Formulæ. A body of calculators (sometimes sixteen), at the expense of the British Government, was employed for about eight years in this work. When we take this in conjunction with the labor which the observations themselves imply, it may serve to show on what a scale the verification of the Newtonian theory has been conducted. The first results of this labor were published in two quarto volumes; the final deductions as to correction of elements, &c., were given in the *Memoirs of the Astronomical Society* in 1848.¹

Even while the calculations were going on, it became apparent that there were some differences between the observed places of the Moon, and the theory so far as it had then been developed. M. Hansen, an eminent German mathematician who had devised new and powerful methods for the mathematical determination of the results of the law of gravitation, was thus led to explore still further the motions of the Moon in pursuance of this law. The result was that he found there must exist two lunar inequalities, hitherto not known; the one of 273, and the other of 239 years, the coefficients of which are respectively 27 and 23 seconds. Both these originate in the attraction of Venus; one of them being connected with the long inequality in the Solar Tables, of which Mr. Airy had already proved the existence, as stated in Chap. vi. Sect. 6 of this Book.

These inequalities fell in with the discrepancies between the actual observations and the previously calculated Tables, which Mr. Airy had discovered. And again, shortly afterwards, M. Hansen found that there resulted from the theory two other new equations of the Moon; one in latitude and one in longitude, agreeing with two which were found by Mr. Airy in deducing from the observations the correction of the elements of the Lunar Tables. And again, a little later, there was detected by these mathematicians a theoretical correction for the mo-

¹ The total expense of computers, to the end of reading the proof-sheets, was 4800*l*.

Mr. Airy's estimate of days' works [made before beginning], for the heavy part of calculations only, was thirty-six years of one computer. This was somewhat exceeded, but not very greatly, in that part.