

there learned the accurate measurement of the Earth by Picard, differing very much from the estimation by which he had made his calculation in 1666; and he thought his conjecture now more likely to be just."<sup>2</sup> M. Biot gives his assent to this guess.<sup>3</sup> The English translation of M. Biot's biography<sup>4</sup> converts the guess into an assertion. But, says Professor Rigaud,<sup>5</sup> Picard's measurement of the Earth was well known to the Fellows of the Royal Society as early as 1675, there being an account of the results of it given in the *Philosophical Transactions* for that year. Moreover, Norwood, in his *Seaman's Practice*, dated 1636, had given a much more exact measure than Newton employed in 1666. But Norwood, says Voltaire, had been buried in oblivion by the civil wars. No, again says the exact and truth-loving Professor Rigaud, Norwood was in communication with the Royal Society in 1667 and 1668. So these guesses at the accident which made the apple of 1665 germinate in 1684, are to be carefully distinguished from history.

But with what feelings did Newton attain to his success? Here again we have, I fear, nothing better than conjecture. "He went home, took out his old papers, and resumed his calculations. As they drew near to a close, he was so much agitated that he was obliged to desire a friend to finish them. His former conjecture was now found to agree with the phænomena with the utmost precision."<sup>6</sup> This conjectural story has been called "a tradition;" but he who relates it does not call it so. Every one must decide, says Professor Rigaud, from his view of Newton's character, how far he thinks it consistent with this statement. Is it likely that Newton, so calm and so indifferent to fame as he generally showed himself, should be thus agitated on such an occasion? "No," says Sir David Brewster; "it is not supported by what we know of Newton's character."<sup>7</sup> To this we may assent; and this conjectural incident we must therefore, I conceive, separate from history. I had incautiously admitted it into the text of the first Edition.

Newton appears to have discovered the method of demonstrating that a body might describe an ellipse when acted upon by a force residing in the focus, and varying inversely as the square of the distance, in 1669, upon occasion of his correspondence with Hooke. In 1684,

<sup>2</sup> Robison's *Mechanical Philosophy*, vol. iii. p. 94. (Art. 195.)

<sup>3</sup> *Biographie Universelle*.

<sup>4</sup> *Library of Useful Knowledge*.

<sup>5</sup> *Historical Essay on the First Publication of the Principia* (1838).

<sup>6</sup> Robison, *ibid*.

<sup>7</sup> *Life of Newton*, vol. i. p. 292.