known. All the conclusions of Mixed Mathematics are conditional, and may be expressed thus : *if these facts are true, then these conclusions follow.* The inference, *as an inference*, is necessary and certain, but it rests upon the foundation of facts which lie in the department of the experimentalist, not of the mathematician ; and the conclusion is not more certain, although not less so, than the facts from which it is drawn.

The application of Mathematics to the results of experiment and observation, often simplifies these results in a remarkable degree. For example, the great astronomer Tycho Brahe made and recorded a number of observations on the movement of the planet Mars. He noted the apparent places of the planet from time to time, but did not succeed in discovering the orbit in which these places lay. Kepler, taking up the records which Tycho had left a mere mass of unconnected facts, succeeded, after immense labor, in shewing that all the places admitted of expression in two simple laws, viz. : that the planet moved in an ellipse, of which the sun occupied one focus ; and that its velocity was such that a line drawn from the planet to the sun would sweep over equal spaces in equal times. Newton, coming after, deduced these further inferences, viz. : that the force acting upon the planet was always directed to the centre of the sun ; and that the force varied according to the planet's distance from the sun at a rate which admits of easy calculation, and which mathematicians denote by the phrase "inversely as the square of the distance." Kepler's discoveries were a remarkable instance of the simplicity which Mathematics can introduce into the classification of a number of isolated facts. Newton's were a remarkable instance of the aid which Mathematics gives in drawing inferences extremely remote from the premises.

The study of Mathematics is generally allowed to be one of the best exercises for the reasoning powers that can possibly be obtained. Indeed there is no other study in which the act of reasoning is practised to anything like the extent that it is in this science ; nor is there any other in which such complicated chains of reasoning are fabricated. In other sciences we begin to doubt of our ground when many links of reasoning have been interposed between our facts and our conclusion—the certainty diminishes the further we proceed ; but in Mathematics the last link in the chain is equally certain with the first. The tracing of these long trains of reasoning requires a careful exercise of attention, and encourages that habit of concentrated and connected thought which is the essence of all true study.

Though fashion has been powerless to shake the *deductions* of mathematical reasoning, it has exercised considerable influence upon the course of mathematical study. The most important point for decision as regards the course to be followed in this Institution, is the comparative preference that should be given to the theoretical and the practical part—the former consisting in the