the last hundred years has grown in proportion to the methodical study and stricter definition of the notions of the complex quantity, of the continuous, and of the infinite. And these conceptions indicate three important logical developments which characterise modern mathematical reasoning. The conception of the complex quantity or the complex unit introduces us to the possible extension of our system of counting and measuring, retaining or modifying, the fundamental rules on which it is based. The conception of the continuous and its opposite, the discontinuous, introduces us to the difference of numbers and quantity, numbers forming a discontinuous series, whilst we conceive all natural changes to be made up of gradual—*i.e.*, of imperceptibly small—changes, called by Newton fluxions. The discussion, therefore, of the continuous leads us ultimately to the question how our system of counting can be made useful for dealing with continuously variable quantities—the processes of nature. The conception of the infinite underlies not only the infinitesimal methods properly so called, but also all the methods of approximation by which—in the absence of rigorous methods—mathematical, notably astronomical, calculations are carried out.

12. Complex quantities.

13. The continuous.

14. The infinite.

Problems involving one or more of these conceptions presented themselves in large number to the analysts of the eighteenth century: there were notably two great doctrines in which they continually occur—the general solution of equations,[1] and the theory of

[1] As it may not be immediately evident how the ideas of continuity have to do with the general solution of equations, I refer to the first publication by Gauss, in 1799, containing a proof of the fundamental theorem of algebra, and its republication fifty years later (see Gauss,