inverse of differentiation,-led early to investigations of the kind just mentioned. The experience that ordinary fractions might be expressed by decimal fractions-i.e., by finite or infinite series-led to the inverse problem of finding the sum of such series and many other answerable and apparently unanswerable problems. The older method of research consisted in treating these problems' when and as they arose: new chapters were accordingly added to the existing chapters of the text-books, dealing with special functions or mathematical expressions. It was only towards the end of the eighteenth century, and at the beginning of the nineteenth, that Lagrange, Gauss, and Cauchy felt and proclaimed the necessity of attacking the question generally and systematically; the labours of Euler having accumulated an enormous mass of analytical knowledge, a great array of useful formulæ, and amongst them not a few paradoxes which demanded special attention. Ι have already had occasion to refer to the problem of the general solution of equations as an instance where, in the hands of Abel, the tentative and highly ingenious attempts of earlier analysts were replaced by a methodical and general treatment of the whole question. Another chapter of higher mathematics, the investigation of expressions which presented themselves in the problems of finding the length of the arc of an ellipse, and which opened the view into the large province of the so-called higher transcendents, gave Abel further occasion of laying new foundations and of creating a general theory of equations or of forms.

But yet another interest operated powerfully in the