THEORY OF NUMBERS AND OF EQUATIONS.

Introduction a l'Étude de la Théorie des Nombres et de l'Algèbre Supérieure. Par ÉMILE BOREL et JULES DRACH, d'apres des Conférences faites a l'École Normale Supérieure, par M. JULES TANNERY. Pp. ix.+350. Paris, Nony, 1895.

THE beginning of the present century was signalized by epoch-making advances in two of the most interesting and beautiful fields of mathematics. Gauss crystallized the theory of numbers into a well-formed and polished science in that masterpiece of mathematical genius, the *Disquisitiones Arithmeticæ*, while the acumen of the brilliant Galois pierced the mist which had enveloped the theory of algebraic equations, and gave to the mathematical world the clue to the path which must be followed in their further treatment. The work of these masters has borne rich fruit, and we have now reached the stage at which the researches so inspired, have been carried far enough to admit of their results being collated from the journals and other scattered places of original publication, reduced to a common notation, unified, sometimes simplified, and the whole presented in an orderly systematic form. The need of such work has been felt less in the theory of numbers because the treatment of Gauss was so thorough and complete, his results so clearly put and so well arranged that the *Disquisitiones Arithmeticæ* might well serve a beginner as introduction to the subject, and that along the principal lines worked out by Gauss, there was left possible for subsequent writers little more than to paraphrase and illustrate the results which he had reached, to carry out the suggestions which he had not elaborated, and to extend his methods into new fields wherever he had left this possible. We have for some time, therefore, been in possession of several works on the theory of numbers which are more or less close paraphrases of Gauss, and which give an excellent survey of the subject, and in addition, there have been begun within the past few years two treatises (those of Bachmann and Mathews) which set themselves the task, to outline, in connection with a presentation of Gauss's theory, what has been done since Gauss. In the theory of algebraic equations, on the other hand, the great abstractness of the subject itself, heightened by the form of presentation adopted by Galois and by some other workers in this field, notably Kronecker, have combined to make an introductory treatise presenting the theory of equations as it has taken