

The last chapters of volume I deal with equations of third and fourth degree and other special equations. In volume II the ordinary fundamental theorem of algebra is proved. Then the Galois theory for all polynomials of the first class is very extensively developed and additional considerations solve the difficulties for polynomials of the second class. This volume contains various subjects new to textbooks. I will only mention the mutual reduction of polynomials and the determination of equations without *affect*. In an addendum Krull studies the Galois theory of algebraic fields of infinite rank, generalized Abelian groups, and their application to the theory of matrices and elementary divisors.

The author assumes that the book should be used for a first textbook in advanced algebra. It seems to me, however, that such a book can only be appreciated by students who already have a rather thorough knowledge of algebra; for a beginner in the subject many of the considerations might look like unnecessary complications and formalities. In general, an axiomatic theory very often has a depressing influence on a reader who is not familiar with the general plan of the building he is going to cooperate on. By taking this attitude the author could have omitted some of the more elementary parts of the book and saved space for other items like, for example, divisibility and the theory of rings. This is, however, no serious reproach to this remarkable book.

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*Mathematical and Physical Papers.* By Sir Joseph Larmor. 2 volumes. Cambridge, University Press, 1929. Vol. 1, xii+679 pp., vol. 2, xxxii+831 pp.

The purely mathematical papers form but a small part of the author's work; they were written mostly in the eighties and deal with the geometry of quadric surfaces, transformations of integrals, and the formal aspects of various methods in mathematical physics.

Foremost among the author's contributions to physics are the three, now classical, papers on *A dynamical theory of the electric and luminiferous medium*. Adopting for the electric energy function the form first used by MacCullagh in optics, the author develops the most complete ether theory of electromagnetism ever devised, and correlates it with thermodynamics, kinetic gas theory and other branches of theoretical physics. Much space is given to the theory of the electron, and there are many results in common with the investigations pursued by Lorentz about the same time by different methods. One of the best known of Larmor's results, which has recently acquired added significance in quantum mechanics, is the "Larmor precession" of the orbit of an electron in a constant magnetic field.

Next in importance to the electromagnetic papers are those on general thermodynamics and the theory of gases. There are also a number of papers on geophysical questions, and various reports and addresses.

Larmor handles his mathematics with elegance, but the outstanding features of his work are the clarity and power of his physical reasoning, and the definiteness and comparative simplicity of his mechanical models. A valuable feature of the present edition is the extensive series of historical and critical