contained. But neither is ultimately physically self-contained, and this is particularly the case for quantum mechanics. Such a basic phenomenon as the dual particle-wave aspects of light and matter, treated in the first chapter, cannot be well understood without the introduction of systems with an infinite number of degrees of freedom. And it is generally believed that the nature of the interaction between light and matter can be comprehended successfully only in a relativistic theory, although as yet there is no wholly satisfactory mathematical treatment of the matter. In other terms, quantum mechanics is logically more indivisible than classical mechanics—which manifests itself in the circumstance that more of the physics is in the mathematics. But a book of reasonable size will probably never be able to go into all such matters with anything like the exceptional thoroughness and clarity with which this book illuminates the fundamentals of "classical" quantum mechanics, i.e. the part of quantum mechanics thought by most informed persons to be in fairly definitive form.

I. E. SEGAL

*Methods of algebraic geometry.* Vol. III. *Birational geometry.* By W. V. D. Hodge and D. Pedoe. Cambridge University Press, 1954. 10+336 pp. $7.50.

The book we are reviewing is the third volume of a series devoted to the methods of algebraic geometry. Since a common spirit animates these books, the present review would be incomplete without a glance at the three volumes.

The first part of Volume I (reviewed in this Bulletin vol. 55 (1949) pp. 315–316) contains various algebraic preliminaries, ranging from linear algebra, matrices and determinants to field-theory and the study of polynomials along classical lines. Its second part presents an account of the "linear geometry" in projective spaces, with a full analytic treatment of Grassmann coordinates, collineations and correlations, and with a long side-trip into synthetic projective geometry.

With the second volume (reviewed in this Bulletin vol. 58 (1952) pp. 678–679) begins algebraic geometry proper. Irreducibility, generic points, dimension and associated forms are discussed. A chapter on algebraic correspondences introduces a theory of intersection multiplicities which, without being as generally applicable as more sophisticated sister-theories, is however sufficient for most purposes. As an illustration we find two remarkably exhaustive chapters on quadrics and Grassmann varieties.

In the third volume the emphasis shifts from projective to affine space, from a study in the large to a local theory. After an introduc-