The pertinence of this simple consideration cannot be better illustrated than by putting it in practice, as D. J. Struik has done in his *Concise History of Mathematics*; although the modest compass of this book prevented the author from giving full scope to the discussion of the social aspects, he managed, by including them in the picture, to convey the impression of active thinking and human endeavour that is so painfully lacking in the traditional expositions.

The author of the present volume is not one of those who would regard any allusion to social implications of the queen of sciences as irrelevant, if not irreverent; but he is not too keen either to follow Struik's example. In fact, the brief discussions he inserts here and there of the impact of political events upon the development of mathematics are rather half-hearted and, as a result, muddled. When he gives biographical details about the heroes of his tale, they do not rise above the anecdotic; when he enquires into the social station of mathematicians and the organization of their activity at different periods and among different nations, he does declare that the question is "interesting", but he does not say why. This is all the more regrettable as he writes for students of mathematics, for whom such a course may be the only opportunity of becoming aware of these important historical issues. However much we may deplore it, we have to take this textbook for what it is: a refined product of the conventional brand, in which history is conceived in the narrative manner of Herodotus, rather than in the searching spirit of Thucydides.

From this narrower point of view, the book deserves high praise. It is written in a simple, pleasant style; the mathematical arguments are presented with great elegance and clear emphasis on the essential points. The author's mastery of the mathematical side of the subject is as deep as his information is all-embracing and up to date. Each chapter is provided with an excellent bibliography, more detailed than one would expect to find in a textbook; scholars will be happy to make use of it. Students are offered a large choice of exercises, which may tend to confirm them in the belief that their history course is just an entertaining diversion; even so, they will be fortunate to have accomplished their sightseeing tour into the past under such authoritative guidance.

L. ROSENFELD

ARTIN'S NOTES

Algebraic Numbers and Algebraic Functions

By Emil Artin. (Notes on Mathematics and its Applications.) Pp. xiii+349. (Nelson: London, July 1968.) 90*s*.

THIS book reproduces, without any essential changes, a set of mimeographed notes of a course of lectures given by Emil Artin in 1950 and 1951. In their original format, these notes have been familiar for many years to specialists in algebraic number theory. They provide an efficient and elegant account of the theory of local fields (including local class field theory) and of function fields in one variable.

In a little more detail, the contents are as follows. Part one (chapters 1 to 5) deals with valuation theory: valuations of a field, completion with respect to a valuation, complete fields, ramification and residue class degrees, ramification groups and the different. Part two (chapters 6 to 10), which includes a preliminary chapter on Galois theory for infinite field extensions and Galois cohomology, covers local class field theory and its applications. In the third part (chapters 11 to 17) the global fields of number theory (that is, algebraic number fields and function fields in one variable) are characterized by means of the product formula for valuations: up to a point, this allows the two types of global field to be treated simultaneously on the same footing. The remaining chapters of the third part are devoted to topics which are peculiar to the function field case: the Riemann–Roch theorem and its applications, the effect of constant field extensions, and differentials.

In principle, anything that Artin did is worth having, and some at least of the material here is not available in other texts. By making these notes generally available, the publishers have performed a useful service to the mathematical community.

I. G. MACDONALD

MECHANICS OF PARTICLES

Theoretical Mechanics

By T. C. Bradbury. Pp. xiii+641. (Wiley: New York and London, April 1968.) 114*s*.

THE theory of the classical mechanics of particles and rigid bodies is nowadays perhaps not the most glamorous branch of physics, and it is not easy to bring a fresh approach to it. The great merits of Professor Bradbury's book are that it is very readable and that it presents mechanics as a live subject which forms an important part of modern physics. The book is a textbook on rigid body and particle dynamics suitable for undergraduates in their final two years, although many postgraduate students and others will read parts of it with profit. It is directed to the needs of physicists rather than of applied mathematicians or engineers, and this bias is reflected in the illustrative examples and problems for solution by the student. The author has not hesitated, however, to draw his examples from many fields, and there are excursions, for instance, into electrical network theory, the theory of heat conduction, and electromagnetic theory.

Almost a third of the book consists of material which would normally be dealt with in mathematics courses. The first three chapters on vector and tensor calculus and matrix algebra treat these subjects fully and clearly. Towards the end of the book there is a chapter on the calculus of variations, and substantial sections of other chapters are concerned with differential equations, Fourier series, and elliptic functions. The inclusion of such material makes the book long but self-contained. There is little in the treatment of the mathematical topics with which a mathematician would quarrel. The mechanics is developed in a conventional order; it proceeds from one-dimensional motion of a particle to motion of a particle in two and three dimensions, and thence to many particle systems. The bias towards physics is illustrated by the presence of chapters on motion of a charged particle in an electromagnetic field and on scattering theory. Rigid body mechanics follows these and the final two chapters, each of about fifty pages, treat vibrating systems and special relativity respectively. The mechanics of deformable continuous media does not come within the scope of the book, although there is some discussion of vibrating elastic strings, rods and membranes in chapter 12. The emphasis throughout is on principles rather than on techniques of solution of difficult problems, and there is a wealth of illuminating illustrative examples.

Welcome features are the early and clearly explained introduction of Lagrange's equations, the free use of vector and tensor notation, and the stress placed on invariance principles from as early as page seven. The one feature I would wish to change is the treatment of continuous media, both rigid and deformable, as assemblages of particles, even though the ground has been well prepared, mathematically and conceptually, for a treatment more in keeping with modern continuum mechanics. This, however, is a small criticism of a large book, which forms a welcome addition to the literature on mechanics.

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