attention to the determination of the form of the free surface. This is supplemented in a later section by descriptions of the ingenious devices used for creating tides and waves. The major part of Eisner's article is, however, devoted to a detailed description of experimental results covering a wide range of subjects, and particular mention may be made of his excellent account of wave motion.

The third article, by Dr. S. Erk, deals with the measurement of viscosity. Numerous types of viscometer, suitable for different fluids and different experimental conditions, are fully described, and the experimental results for a large variety of gases and liquids are then tabulated and discussed in the light of existing theories. The article concludes with a brief account of the methods of measuring the viscosity of solid bodies. The treatment of the subject is throughout clear and comprehensive, but there are unfortunately several incorrect references to tables and figures.

A Treatise on Coordinate Geometry

Elements of Coordinate Geometry. By J. M. Child. Pp. xiii+468. (London: Macmillan and Co., Ltd., 1933.) 12*s.* 6*d.* net.

THE outstanding feature of this substantial treatise on coordinate geometry of two dimensions is the full and elaborate account which it gives of the theory of the subject. In consequence, the volume should prove a useful manual for students preparing for scholarship and honours degree examinations.

The first chapter contains a discussion of the representation of real numbers by points on a directed line; and this, naturally, raises the problem of the irrational number, which Mr. Child defines by means of sequences of rational numbers. Curiously enough, he does not point out that the number so defined may be rational. It must be confessed that his phraseology in dealing with limits is somewhat loose.

Before introducing the equation of the straight line, Mr. Child devotes a chapter to the plotting of statistics. He defines the positive direction of the straight line as that in which x increases. It is doubtful if anything is gained in coordinate geometry by giving direction to the straight line. The direction makes no difference to the gradient formula, on which the theory of the straight line can most simply be based.

Useful features of the book are the very full discussions of the general equation of the second degree and the sections on polar coordinates. The treatment of tangents, based on the theory of monotonic sequences, is interesting, though it scarcely seems necessary to bring in the idea of 'time'.

Later chapters deal with conics, cross-ratios, the "line at infinity" and homogeneous coordinates. The book is intended to stress the advantage of coordinate geometry as "a powerful analytical weapon of attack" and consequently the pure geometry of conics is only dealt with incidentally. Here and there interesting historical notes are given, and there are plentiful collections of examples, of varied difficulty, with answers supplied. T. M. M.

Short Reviews

The Life Histories of New Zealand Birds. By Edgar F. Stead. Pp. xvi+162+93 plates. (London: The Search Publishing Co., Ltd., 1932.) 30*s.* net.

IN this book we have Mr. Edgar F. Stead doing for New Zealand birds what Mr. Arthur C. Bent is doing for American birds. Each is an expert and the result is a great gain to knowledge.

In New Zealand we find the evil of man's introduction of the stoats and weasels. The birds, which never before had this enemy, now find life made hard for them. Amongst the waders we find a detailed account of the double-banded dotterel, so common in New Zealand and Australia, but breeding only in the former country. Its migration, north to Norfolk and Lord Howe Islands then to the east coast of Australia and so on to south-west Australia, is one of the extraordinary movements amongst birds.

We find now that the black fan-tail is only a variant of the pied one; mated birds produce the pure black bird and in the same nest, pied birds, as many workers have contended.

Under the shags we find the old superstition that these birds are the fisherman's enemy and destroy fish that he should catch. New Zealand has many shags, most of them very common indeed, yet more fish are caught each year than in the previous one. The skua, with its bad reputation, here as elsewhere, is given an autobiography in spite of its depredations on the delightful mottled petrel.

The splendid plates add greatly to the charm of the book, and the author's pleasant style of writing