article by Albert I. Bellin on recent work on non-linear differential equations of the second order.

G. F. Carrier gives an account of some boundary layer problems in oceanography, in heat transfer and in electrical relaxation oscillations. Zaldastani describes recent work which extends and generalizes the classical researches of Riemann on one-dimensional isotropic fluid flow. The problem of diffusion through a field of homogeneous turbulence is studied by F. N. Frenkiel. H. F. Ludloff deals with the aerodynamics of blasts and G. Guderley with the presence of shocks in mixed subsonic–supersonic flow patterns. A short and useful article by L. Rosenhead gives a critical summary of most of the theoretical and experimental papers which have been written about wakes for Reynolds numbers less than 2500.

There is no doubt that this series of reports has become indispensable to research workers in applied mechanics. Perhaps it is not out of place to take this opportunity of recording the gratitude which all readers must feel to one of the editors, Prof. Richard von Mises, who died a short time ago, and to whose scholarship and vision we owe so much.

G. Temple

The Great Palomar Telescope
By Helen Wright. Pp. 176+15 plates. (London : Faber and Faber, Ltd., 1953.) 12s. 6d. net.

AS an astronomer's account of the 200-in. telescope, written for the general reader, Miss Helen Wright's book is very satisfying. The instrument and its observatory are described fully, with many photographs and line drawings. There is an introductory chapter on the evolution of the telescope and the spectroscope, and an outline of the progress which had been made with the aid of the Mount Wilson 100-in. reflector up to about 1936. It is a book one would recommend strongly for inclusion in, say, a school library ; and it would certainly be appreciated by the young science student.

Miss Wright writes with a lively journalistic manner. Except during the hiatus of the war years, indeed, the progress of the telescope was news, often quite exciting news. The atmosphere of mounting public interest is recaptured here, for reporting was immediate and full. The technical problems that were faced are described clearly in less vivid terms. Dr. G. E. Hale, who lived to see the major difficulties surmounted but not the completion of the work, is the central character of the story. But the adventures of the telescope itself, starting with the financial crisis of 1929, beset by floods at the Corning Works during annealing, pursued during the last journey to the observatory by hazards of ice and blizzard, speak of the effort and determination contributed by all engaged in the work. The author's treatment of the human side of the enterprise adds greatly to one's enjoyment of the book.   G. R. Noakes

Linear Algebra and Projective Geometry
By Reinhold Baer. (Pure and Applied Mathematics Series, Vol. 2.) Pp. viii+318. (New York : Academic Press, Inc. ; London : Academic Books, Ltd., 1952.) 6.50 dollars.

TWENTIETH-CENTURY mathematics shows a change of trend away from the details of particular theorems towards abstraction and the analysis of structure. The object of the book under review is to prove the essential structural identity of projective geometry and linear algebra. The author

has gathered together much material difficult of access elsewhere and supplemented it by his own researches. To a geometer of the older type the result is by no means easy reading. He will find little or no opportunity to use his geometric intuition ; but a constant need for a good grasp of the concepts of abstract algebra. He may imagine that the author's object is not so much to prove the equality of projective geometry and linear algebra as to reduce the former to a satellite of the latter. However, to those who accept the abstract point of view the book has many merits. It deals with the representation of projective geometries by linear manifolds, of projectivities by semi-linear transformations, of collineations by linear transformations, and of dualities by semi-bilinear forms. Thus the geometry with which the discussion starts is reconstructed within such apparently purely algebraic structures as the endomorphism ring of the underlying linear manifold or the full linear group. The book contains seven chapters, and concludes with an appendix on the theory of sets, a bibliography, and an index.

H. T. H. Piaggio

Pages choisies d'analyse générale
Par Maurice Fréchet. (Collection de logique mathématique, Série A, No. 3.) Pp. 214. (Paris : Libr. Gauthier-Villars ; Louvain : E. Nauwelaerts, 1953.) 2000 francs.

'GENERAL ANALYSIS' is usually associated with the name of the American Prof. E. H. Moore, whose researches began in 1906, but actually those of Prof. M. Fréchet began two years earlier. Both sought to generalize the classical theory of functions of real variables and Cantor's theory of sets, but Moore was influenced by algebra and integral equations, while Fréchet was influenced by geometry. For several years these two authors developed the subject on somewhat different lines ; Moore pointed out that Fréchet's approach was more abstract and more general than his own. Prof. Fréchet intended to write a book on general analysis as a sequel to his book on abstract spaces, but his appointment as professor of the calculus of probabilities diverted his interests. Now, after many years, he has been persuaded to collect and republish the most important of his papers on general analysis, some of which, scattered among the periodicals of several countries, had become almost inaccessible. The papers have been arranged in logical (not chronological) order, sometimes shortened, and grouped into chapters, supplemented by references to later developments by other authors. This has produced something very much like the book for which his friends and pupils had waited so long. The first chapter gives a general outline of the subject, the second deals with functional spaces, and the third with functional analysis. The fourth chapter introduces abstract spaces ; the fifth and last, general analysis.   H. T. H. Piaggio

Foundations of Algebraic Topology
By Samuel Eilenberg and Norman Steenrod. (Princeton Mathematical Series.) Pp. xv+328. (Princeton, N.J.: Princeton University Press; London: Oxford University Press, 1952.) 48s. net.

THIS book presents, for the first time, an axiomatic treatment of the complete transition from topology to algebra. Chapter 1 gives the axioms for a homology theory, and a set of general theorems deducible from them. Chapter 2 deals with simplicial complexes and triangulable spaces. In Chapter 3, a