ROBERTSON, A. P. AND ROBERTSON, W. J., *Topological Vector Spaces* (Cambridge Tracts in Mathematics and Mathematical Physics no. 53, Cambridge University Press, 1964), viii + 158, 30s.

The theory of Topological Vector Spaces has developed during the last 25 years, as a generalisation of the theory of Hilbert Space and of Banach Spaces, because these particular types of linear spaces were not sufficiently general for many applications; and the theory has led to important advances in the theory of differential equations and other branches of mathematics, notably in the theory of distributions.

The book under review offers an excellent account of the theory in a short space and with what would seem to be the minimum demand for prerequisites in the reader; it should be accessible to anyone with the knowledge of analysis available in an honours course and with some preliminary ideas in general topology; though the ideas used from this subject are explained as they occur.

The first chapter gives an account of linear spaces, metric spaces and general topological spaces, and begins the study of the proper subject of the book by an account of convex sets and norms. The crucial extension theorem of Hahn-Banach, its consequences regarding the existence of continuous linear functions and the idea of duality of linear spaces is the subject of the second chapter. The third chapter studies duality relations more deeply, leading up to the important theorem of Mackey-Arens concerning the topologies in which a space has a given dual. Chapter IV deals with theorems which are associated with the category theorems: the Banach-Steinhaus theorem and the theory of barrelled spaces, which are the widest class of spaces for which such a theorem is valid, are discussed, as are spaces of linear maps. Chapter V deals with inductive and projective limits and with various properties of spaces which are constructed as such limits. Chapter VI gives an excellent account of the closed graph theorem and the open mapping theorem and their relations to various types of completeness which a linear topological space may have. Chapter VII deals briefly with strict inductive limits and with tensor products. Chapter VIII discusses the extension of the classical Riesz-Schauder theory of eigenvalues of compact operators to general convex linear spaces.

The book is written very clearly and accurately (I have noted one misprint, at the foot of p. 85, E' in place of o). Its text is supplemented by references to further extensions of the subject and examples of its applications. It will be very widely welcomed as a most helpful survey of an important part of functional analysis.

J. L. B. COOPER

MAMELAK, JOSEPH S., *A Textbook on Analytical Geometry* (Pergamon Press, 1964), viii + 247 pp., 35s.

Many textbooks on this subject, of sixth form standard, suffer through confining themselves mainly to conic sections, while giving no adequate treatment either of polar coordinates or of parametric representation of curves. The author of the book under review has set out to remedy such drawbacks and in less than 250 pages has covered a commendable amount of ground in plane analytical geometry.

The directed line segment forms the basis of the cartesian coordinate system, set notation is introduced, and functionality discussed. Various forms of the linear equation are investigated, treatment of length of perpendicular from point to line being particularly full. Non-degenerate conics are given 52 pages of condensed information, with ample examples. There is a useful short chapter on parametric equations. Tangents and normals to conics are treated via curtailed limit theory in Chapter 10, but standard British procedures are preferable for these. There are chapters on curve tracing for algebraic, trigonometric and simpler transcendental functions, including as an exercise the hyperbolic functions but not their inverses.