Functional Analysis; Theory and Applications, by R.E. Edwards. Holt, Rinehart and Winston, 1965. xiii + 781 pages. $25.00.

Time was when functional analysts were mainly concerned with Banach and Hilbert spaces. The influence of the Bourbaki group and the successful development of the theory of distributions however, have led to the conclusion that the locally convex topological vector space is the proper setting for functional analysis. This change is fully apparent to the reader of the book under review.

After a chapter of preliminaries, the reader finds in Chapter 1, the basic ideas of topological vector spaces and their mappings. Chapter 2 deals with the Hahn-Banach theorem and gives interesting applications to potential theory, approximation principles and the theory of games. Next, Chapter 3 is a short discussion of fixed point theorems with standard applications. Chapter 4, on the other hand, is an extensive (123 pp.) development of measure theory in the spirit of Bourbaki "Intégration". Another lengthy (122 pp.) Chapter follows, treating distributions and partial differential equations. Chapter 6 deals with the open mapping and closed graph theorems, Chapter 7, uniform boundedness principles, in various spaces. Then another long (116 pp.) Chapter on duality theory, one on compact operators and a final chapter on the Krein-Milman theorem complete the text. Each chapter has exercises of varying difficulty; sometimes the exercises introduce new material; there are 286 in all. A lengthy bibliography of 685 entries, a list of special symbols and a good index complete the book.

The author's intention is stated in the preface: "to give an account of a few of the more recent developments in which abstract theory and applications share roughly equal roles". He also claims that his reader needs only a modest background of linear algebra, topology and analysis. However it quickly becomes clear that such a person would find the book formidable indeed. The intention cited above is a laudable one but the theory is so extensive that it tends, except in Chapter 6, to crowd out an adequate treatment of applications. This seems inherent in the nature of the subject when treated with such generality. But these criticisms do not vitiate the fact that the author has rendered the mathematical community a service comparable with that of Dunford and Schwarz and that this book should be available to every serious student of the subject.

[A final word: the book suffers from a host of minor blemishes and a few more serious errors. A list of these is available from the author].

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