"direct proportion of simple sets" (vectors) but this disagreement is after all a small one, being largely a question of terminology.

The beginner will find the book a valuable introduction and the expert an interesting review with a refreshing novelty of presentation.

F. D. MURNAGHAN

The Mathematical Groundwork of Economics: An Introductory Treatise. By A. L. Bowley. Oxford, Oxford University Press, 1924. vi + 98 pp. $2.35.

Professor Bowley's prefatory statement of the purpose and scope of his book is an adequate description of his accomplishment as well as of his aim. He says "Though the simple application of mathematics made by competent writers and lecturers can be appreciated by any intelligent readers and students, the more complicated analyses are only within the power of those who have mathematical aptitude, and it is for them that this book is arranged. . . . . . I have attempted to reduce to a uniform notation, and to present as a properly related whole, the main part of the mathematical methods used by Cournot, Jevons, Pareto, Edgeworth, Marshall, Pigou, and Johnson, so far as these are applied to the fundamental equations of exchange and to the elementary study of taxation. . . . I have not intended to advance any new theorems in economics, nor do I claim any originality in mathematical results."

The author points out that the science of wealth and welfare has two aspects, one subjective, the other objective. On the subjective side, satisfactions and desires are not arithmetically measurable, but, on the objective side, goods and services are measurable in terms of quantity and price. "At first sight," he continues, "it might appear that mathematical reasoning was confined to the objective aspect, but this is not the case." Mathematical methods may be applied to the subjective as well as the objective aspect of economics, for we can detect "equality and inequality, relationship, continuity, variation, and other properties" of satisfactions and desires. The mathematical treatment of economic concepts, therefore, embraces both incommensurable and measurable entities.

The chief contribution of the author in this book is to make available a uniform, orderly, and consistent treatment of the concepts of economics which lend themselves to mathematical analysis. The book will prove to be a valuable reference work for the economist with mathematical training. But it will have still greater value and influence if its applications of mathematics to economics are used as illustrative material by teachers of mathematics in their courses in analytic geometry and calculus.

W. M. PERSONS