## Foundations of Analysis

The Arithmetic of Whole, Rational, Irrational and Complex Numbers; a Supplement to Text-Books on the Differential and Integral Calculus. By Edmund Landau. Translated by F. Steinhardt. Pp. xiv+134. (New York: Chelsea Publishing Co., 1951.) 3.25 dollars.

THE late Prof. E. Landau, of Berlin, was shocked to find that his daughters, who were taking a university course in chemistry and had learned calculus at school, yet did not know why $xy$ was equal to $yx$. He accepted the fact that a rigorous treatment of algebra was too advanced for schools. He then examined the teaching in universities and found that they apparently often ignored the subject as being too elementary. He could not find a single text-book which dealt satisfactorily with the number system. The only thing left for him was to write such a book himself, and this he did in 1929. After a long delay, an English translation has now appeared.

Everything is based upon five axioms, due to Peano, concerning the natural numbers. The fifth of these asserts the principle of mathematical induction, which is used extensively in what follows. On this basis are established successively in five chapters the ordinary rules for the treatment of natural numbers, fractions, cuts, real numbers and complex numbers. The book is a model of elegance, precision and completeness. The author was perhaps over-optimistic in hoping that a normal student could read through it in two days. It is true that most of the proofs are very simple; but in Britain, at any rate, a normal student will be puzzled by the first words (p. 1): "We assume the following to be given: A set (i.e. totality) of objects called natural numbers, possessing the properties—called axioms—to be listed below". To appreciate this, a preliminary discussion of the nature of 'axioms', of the object of setting up axiomatic systems, and of the relation of such systems to ordinary computations and to physical science would have been helpful. On p. 43 the concise and abstract treatment of cuts may puzzle those who have not previously had a more elementary and concrete exposition of the idea. However, the book is so very good, as a whole, that it would be ungrateful to lay stress on the few points in which it might have been even better. H. T. H. PIAGGIO

## Papierchromatographie

Von Dr. Friedrich Cramer. (Monographien zu Angewandte Chemie und Chemie-Ingenieur-Technik, Nr. 64.) Zweite, neubearbeitete und erweiterte Auflage. Pp. 136. (Weinheim/Bergstr.: Verlag Chemie, GmbH, 1953.) 12.80 D. marks.

THIS revised edition of "Papierchromatographie" gives an excellent account of the literature up to the middle of 1952. It deals with apparatus, preparation and purification of solvents, and with both qualitative and quantitative analysis. All the variants of paper chromatography are included, the chromatopile, reversed-phase chromatograms, alumina and silica-gel treated papers, and papers containing free carboxyl groups. The analysis of amino-acids, sugars, purines, nucleotides, nucleosides and nucleic acids and of inorganic ions are dealt with in some detail. Alcohols, phosphoric esters, phenols, organic acids and bases, vitamins, antibiotics, porphyrins, sterols and synthetic dyestuffs are not considered at such length.

The arrangement of the book is pleasing and the diagrams and colour prints of chromatograms are clear and well presented. The comprehensive lists of $R_F$ values provided are useful, as is the transparent scale for the direct measurement of $R_F$ values on the chromatogram. The transparent map of amino-acid spots from a two-dimensional chromatogram is of restricted usefulness, as it does not cover all the amino-acids normally encountered. Though it is perhaps a pity that the detection and elimination of faults in chromatograms are not dealt with at sufficient length (a common fault of books on this subject), the book can be recommended to all those using the technique of paper chromatography.

## Through Movement to Life

The Economic Employment of the Disabled. By John Arthur. Pp. 93+6 plates. (London: Chapman and Hall, Ltd., 1952.) 7*s*. 6*d*. net.

A PROBLEM which causes great concern to employers and all who have social consciences —these two groups are not necessarily exclusive—is the employment of disabled people. In the United Kingdom there are tens of thousands of such unfortunates, including those who have lost a limb, epileptics, spastics, people suffering from rheumatism and arthritis, the deaf and the blind. Most of them are anxious to work, if only to maintain self-respect, and a nation needing labour should be able to make use of their services. In this little book, Mr. John Arthur describes an enterprise which he organized to show how the disabled could work for their own and the community's interests. The enterprise was a furniture factory which was 'sheltered' in the sense that the disabled employees did not have to compete with able-bodied workers and that the factory was not run primarily for profit. Although the venture lasted no more than three years, during that time Mr. Arthur, as managing director, learned a great deal about the means of helping the disabled. This he has set down in a book which is not always free from the ills attending enthusiasm, but which will be of value to all engaged on similar ventures.

T. H. HAWKINS

## The Genetics of Garden Plants

By M. B. Crane and W. J. C. Lawrence. Fourth edition. Pp. xvii+301. (London: Macmillan and Co., Ltd., 1952.) 20*s*. net.

THE fourth edition of this popular book, first published in 1934, is said to be amended and revised in accordance with recent research. The brief account of heterosis has been amplified and enlarged in a new Chapter 8 of ten pages, though the exposition of this still mysterious phenomenon follows a stereotyped pattern common to a large number of text-books and fails to mention the now widely current theory that heterosis is mainly due to the advantage of heterozygous phases of growth genes over the homozygous phases.

One gets the impression that the authors are now largely resting on their oars. The last edition was published in 1947, and in spite of the great progress which has been made during the past five years it is disappointing to find reference to eight publications only since that year. Some of these are of minor value, and others lack relevancy to the present state of our knowledge.

The book will no doubt continue to be largely read by horticulturists, and in spite of some obvious omissions it is both useful and valuable to have so much otherwise inaccessible material brought together between two covers. S. C. HARLAND