much original material. The section on climate is inadequate; that which deals with fisheries is excellent in its scope and treatment, though it is difficult to understand why there should be no recorded landings of fish at Bideford, which in pre-war years was a favourite resort on market days of those who bought their fish fresh from the fishermen on the quayside.

Apart, however, from such minor criticisms, there can be nothing but praise for a volume which embraces such a wide field and which presents in small compass a collection of facts absolutely invaluable and essential for all planning work.

L. DUDLEY STAMP

ALGEBRAIC GEOMETRY

Foundations of Algebraic Geometry

By Prof. André Weil. (American Mathematical Society: Colloquium Publications, Vol. 29.) Pp. xix+288. (New York: American Mathematical Society, 1946.) 5.50 dollars.

ALGEBRAIC geometry, in spite of its beauty and importance, has long been reproached for lacking proper foundations. Great discoveries have been made, especially in Italy, by the intuition of a number of gifted workers, whose insight had been cultivated by a careful study of special cases. But the time for placing the subject on a firm foundation is long overdue, and the delay is seriously hampering progress. For the last twenty years a few geometers, such as Severi, van der Waerden and Zariski, have made important contributions towards this end. Now Prof. Weil has given a connected and comprehensive account of his own and other researches, sufficient to justify the use of intersection-multiplicities, which play such a large part in recent geometry, especially in Italian work. The book is not easy reading, especially for those to whom geometry is synonymous with space-intuition. At a first glance the reader might imagine that it is a treatise on something like abstract algebra. Indeed, the author warns the reader that it is necessary to have a good elementary knowledge of abstract fields and of other topics that will be found in van der Waerden's "Moderne Algebra". Apart from this the book is self-contained, and its subject is not abstract algebra, but what might be called abstract geometry.

The first three chapters are preliminary; they state and prove all the purely algebraic results required. In particular, Chapter 3 gives the crucial theorem on the multiplicity of a proper specialization. Geometric language is introduced in Chapter 4, which deals with algebraic varieties in affine spaces. Chapters 5 and 6 contain a careful and detailed treatment of intersection-multiplicities.

Chapter 7 extends the definitions and results of previous chapters to 'abstract varieties'. It also translates the main results of intersection theory into a new language, the 'calculus of cycles', which is particularly well adapted to applications. The author points out the confusion that has arisen by the use of ambiguous terms, and endeavours to do away with this by introducing new terms such as 'bunches of varieties' and 'cycles' instead of the single term 'reducible variety' used in two different senses. The term 'variety' is reserved for 'absolutely irreducible

algebraic varieties'. An algebraic calculus of cycles can then be developed, closely analogous to the algebra of homology-classes as used in modern topology.

Chapter 8 gives a detailed treatment of the theory of divisors on a variety. Chapter 9 contains general comments on the preceding work, formulates problems, some of considerable importance, and in some cases makes suggestions which may lead to their solution.

H. T. H. PIAGGIO

PRIVATE LIVES OF THE ALCHEMISTS

The Alchemist in Life, Literature and Art

By Prof. John Read. Pp. xii+100+30 plates. (London and Edinburgh: Thomas Nelson and Sons, Ltd., 1947.) 10s. 6d. net.

THE practical operations of the alchemists and their main theoretical beliefs are familiar, in outline at least, to every student of chemistry. The chemical historian may be as familiar with alchemical technique and ideas as the average chemist is with the modern technique of his science. Few, however, have any clear picture of the alchemist as a human being, an individual with a private as well as a professional life. This picture has been skilfully and entertainingly drawn by Prof. John Read in the book under notice, and there are not many, either men of science or laymen, who will not derive both pleasure and profit from reading this scholarly little work.

As the title indicates, Prof. Read draws his material from three main sources. First, there are alchemical biographies, unfortunately all too few, such as Thomas Norton's "Ordinall of Alchimy" and Simon Forman's personal diary. Second, there are the artists who sought inspiration in alchemical themes and have left us invaluable records of the appearance of alchemical laboratories and those who worked in them. Outstanding among these was David Teniers the Younger, to whom the author appropriately dedicates his book. Finally, there are the writers who introduce alchemists and their assistants as characters in their works. Few modern chemists would regard Chaucer's "Canon's Yeoman's Tale" as an important piece of alchemical literature without Prof. Read's skilful analysis and apt quotation. He shows that, in fact, this tale contains a vivid picture of both the charlatan alchemist—the mere puffer or bellows-blower—who will stoop to selling a fake formula to a credulous priest, and also of the genuine alchemist who, even if his ideas are coloured by the hope of discovering the Philosopher's Stone, is, in fact, a serious seeker after knowledge.

As we may expect, the alchemist in his private life conformed to no particular type in mind or body. We have the libertine Forman, for ever guiding his amorous ventures by reading special mystical meanings into the events of his daily life; the cheating Subtle, in whom Jonson holds up to shame and ridicule the alchemical charlatans of his time; the melancholy and frustrated beings portrayed by Dürer and Teniers; the fanatic in threadbare clothes with complexion of "wan and leden hewe" after long hours at the furnace, ignoring the pleas of his starving family; and that fantastic international adventurer Seton, the "martyr of alchemy".