

### What is Atomic Energy ?

By Dr. K. Mendelssohn. (Sigma Introductions to Science, No. 3.) Pp. 180 + 12 plates. (London: Sigma Books, Ltd., 1946.) 6s. net.

HE who writes for the general public about scientific matters has all the responsibility of an interpreter. He must explain facts and theories and opinions to people who may not know the words that are a vital part of the science he describes. He needs the gifts of easy writing and apt analogy, but he must also show the devotion to accuracy that is due not only to his subject but also to his readers, who may be misled by a slip of phrase or printing that the expert would instantly recognize as such. Popular scientific writing is a task not to be undertaken lightly, and should be judged by the highest standards.

On these standards, Dr. K. Mendelssohn's "What is Atomic Energy?" comes near to success; it shows fertility in illustration and analogy, and the ability to make a point clear by a neat sentence or a striking diagram. Dr. Mendelssohn chooses to discuss principles more than experimental methods, and in surveying the changes of energy that can occur in the electronic and nuclear structure of atoms he ranges from diffraction patterns to nebulae and from the principle of indeterminacy to the theory of the atomic bomb. The text and the diagrams are always interesting and often fascinating. Yet all this scarcely achieves the object of giving "a broad outline of the problems of nuclear energy from the point of view of the physicist"; the average physicist has a more practical and more quantitative point of view than is found in this book. The statement that "a kilowatt-hour can bring 65 kettles to the boil" will shock both physicists and the Ministry of Fuel and Power!

Misprints are rather numerous; these, and the other lapses from accuracy, could easily be corrected in a second printing, and we should then have a very good book on the matters of physical principle that, even if only a part of the story of atomic energy, are a fundamentally important part. P. B. MOON

### A Chapter in the Theory of Numbers

An Inaugural Lecture. By Prof. L. J. Mordell. Pp. 31. (Cambridge: At the University Press, 1947.) 1s. 6d. net.

THIS is a report of the inaugural lecture delivered by Prof. L. J. Mordell, the new occupant of the Sadleirian chair of pure mathematics at Cambridge. It shows his characteristic power of giving a simple account of research work and of awakening interest in problems still unsolved.

Most of the mathematical problems of the seventeenth century now appear to us to be quite elementary and to leave nothing open for further investigation. But this does not apply to questions in the theory of numbers. It is well known that Fermat's last theorem has not yet been proved in the general case, although for nearly three hundred years attempts have been made, and all the evidence seems to point to its truth. Since 1908 the Wolfskehl Prize of 100,000 marks has been waiting to reward a sound proof, but none has yet appeared. However, Prof. Mordell touches only lightly on this theorem, and devotes most of his attention to the Diophantine equation  $y^2 = x^3 + k$ . Some progress was made by Bachet in 1621. Soon after, Fermat declared that he had discovered "an exceedingly beautiful and subtle method which enables me to solve such questions".

What this method was has never been ascertained, and Prof. Mordell believes that Fermat was mistaken in his claims. Much later, in 1738, Euler took up Fermat's challenge. His solution was universally accepted for more than a century, but in time it became clear that the reasoning was unsound. Among later work we note that of Mordell himself in 1912. This paper was much more valuable than anyone realized at the time, as it contained the seeds of a fundamental theorem on the rational points of a cubic curve. Even now the paper offers opportunities for further research. H. T. H. P.

### Physical Science in Art and Industry

By Dr. E. G. Richardson. Second edition. Pp. xi + 299 + 7 plates. (London: English Universities Press, Ltd., 1946.) 15s. net.

THAT there is little change to notice in the second edition of this valuable book is perhaps an indication of how well it has fulfilled its purpose. Originally produced in the darkest days of the War, it invited attention mainly to the conquests already made by physics in various branches of industry and craftsmanship, with here and there the suggestion of greater things to come. At the moment, it seems that we stand poised, ready for advance rather than experiencing it, but it is just here that Dr. Richardson's skill in explanation is most noteworthy. Locomotion, mining, pottery, archæology, paintings, and the rest, all receive their share of attention, and a description of what physical methods can achieve for them. For clarity, these pages could scarcely be bettered: one hopes that readers will not find practice unduly harder than precept. They may, if they are not very careful. The references might with advantage be extended: they are admittedly little more than minimal, but in some cases they seem scarcely the best finger-post to select. It is difficult to strike the happy mean, but the author might consider their enrichment if, as may be hoped, he is called upon for a third edition. F. IAN G. RAWLINS

Vom Ursprung und von den Grenzen der Freiheit  
Eine Deutung des Spiels bei Tier und Mensch. Von  
Gustav Bally. Pp. 140. (Basel: Benno Schwabe  
und Co., 1945.) n.p.

IN this book Dr. Bally tries to gain insight into human conduct by comparing it with animal behaviour. He undertakes a re-definition of play and examines its aspects in animals and humans. The investigation starts with a description of instinctive behaviour in animals where he traces the origin of play. He shows how this begins only after a certain relaxation in instinctive drives which is achieved by maternal care and protection. Play continues to be found in older animals only if man provides protection from hunger and the enemy's threat, as in domestic animals. Even adult chimpanzees lose the joy of play. The organisation of human society provides a protection which enables man to retain an interest in play during his whole life. It is demonstrated how this comparative satisfaction of instinctive urges leads to the development of freedom. The problem of freedom is then discussed, and the reasons for its success or failure in human society clarified.

The book is most stimulating and deserves to be widely read, for it tries to explain some of the present-day upheavals in the life of human society from a biological and psychological point of view.