

East Anglia for a century—on a high tree, as is commonly the case inland in Ireland and on the Continent.

Other chapters in the book deal with birds which range from comparatively uncommon species, such as the stone-curlew and the bearded tit, to familiar birds which may be found in marshlands throughout the country. About all of them we are told something of interest, but we are at the same time warned against hasty generalisation from the behaviour of a few individuals, because close observation reveals great differences in behaviour between one and another of the same species.

The writer has not always restricted her stay in Norfolk to the nesting season, but has also spent the autumn and winter in her house-boat. In late summer she has seen migrating swifts arriving from the north-east, appearing first at dawn as a faint cloud in the zenith which rapidly drops earthwards and resolves itself into a great host of birds. In autumn she has seen the vast concourse of millions of starlings which roost in the reed-beds and perform aerial evolutions on such a scale that the line may "stretch from Potter Heigham Church on the south to Hickling Hill on the north-west, a distance of five miles." In mid-winter, with the broads nearly ice-bound, she has seen such things as fifty-four swans, in strict chevron formation, passing across the face of the moon.

Miss Turner apparently began as a bird photographer, but she has become much more than that. Her book would indeed have been well worth reading, as a record of observations, even without the excellent photographs with which it is illustrated, although naturally they add much to its charm. Many of them are of value in depicting action instead of being portraits only.

Our Bookshelf.

La Géochimie. Par Prof. W. Vernadsky. (Nouvelle Collection scientifique.) Pp. vi + 404. (Paris : Félix Alcan, 1924.) 12 francs.

THIS book of four chapters is a reprint, with some amplification, of lectures given by Prof. Vernadsky at the Sorbonne during 1922-23. The first chapter, which opens with the questionable statement that geochemistry is a science new to the twentieth century, is devoted to general considerations, including the subdivision of the earth's outer layers or envelopes according to their physical, chemical and biological characteristics. Apart from the atmospheric layers, Vernadsky's various groupings of these envelopes may be indicated roughly as follows :

Superficial	$\left\{ \begin{array}{l} \text{Water and} \\ \text{superficial} \\ \text{crust} \end{array} \right\}$	Biosphere.
Metamorphic		$\left\{ \begin{array}{l} \text{Sedimentary} \\ \text{and} \\ \text{granitic} \end{array} \right\}$
Magmatic	Basaltic	

Minerals stable in the superficial envelope are termed *vadose*, those in the metamorphic envelope *phreatic*, and those in the magmatic envelope *juvenile*. Cycles of change in the chemical composition of minerals are distinguished as *primary cycles* if their completion is effected in two or more envelopes, and *secondary cycles* if they are completed within the limits of a single envelope. The application of these notions is illustrated by a detailed account of the geochemical history of manganese, which furnishes an example of a primary cycle involving juvenile, phreatic and vadose changes. Chap. ii. deals with silica and the silicates, Chap. iii. with carbon and living matter, and Chap. iv. with the radioactive elements.

A notable feature of the book is the large place allotted by the author to biochemical agencies in mineral transformations. His account of the dynamic equilibrium between carbon dioxide and living matter, or what he calls the *vital cycle*, is of special interest from this point of view. His discussion of biochemical evidence, however, shows that he is an enthusiastic supporter rather than a critical examiner of the claims made for biochemical factors in geochemical changes. An example of this is provided by his reference to the process of laterisation, and his easy conviction that the process is clearly a biochemical one.

In a general way, Prof. Vernadsky's views are less likely to be challenged by chemists and physicists than by geologists ; but it will be admitted by all that his book is full of interest on account of its largeness of outlook and its ample recognition of the many-sided character of geochemical problems. T. C.

Physics in Industry: Lectures delivered before the Institute of Physics. Vol. 2. By Dr. J. W. Mellor, Dr. A. E. Oxley, Prof. C. H. Desch. Pp. 48+6 plates. (London : Oxford University Press, 1924.) 3s. net.

THE appearance of a second volume of these valuable lectures on physics in industry evokes the thought—and the fear—that before long we may have a special society and a special journal devoted to this subject. But for the fact that engineering has hitherto been regarded as the one and only field of applied physics that matters, these would probably have seen the light many years ago. Industrial chemistry has long been in the public eye ; industrial physics, apart from engineering, has yet to come into its own.

In his absorbing lecture on the applications of physics to the ceramic industries, Dr. Mellor was compelled by the tyranny of time to confine his remarks to applications that are not common to other industries, such as the drying of clay and clay wares, thermal and contraction strains in ceramic goods, and the electrical and thermal expansion of glazes. He deals lucidly and suggestively with these topics, and his general remarks on applied physics and physicists, if not entirely novel, are very sound. Dr. Oxley, as physicist to the British Cotton Research Association, has found, contrary to expectation, a vast field for research in the textile industries, and particularly in bringing scientific method into the testing-room. He points out that the distinguishing feature of physical research in this field is that, owing to great variability in the raw materials, series of observations sometimes involving many