

process. No intermediate form comes into the cycle; the yolk becomes the larva, and this latter becomes the young Echinoderm; and this larva is, according to A. Agassiz, an Acalephian larva, reminding one somewhat of the twin individuals of free Hydroids as Diphyes, though adapted to the mode of development of the Echinoderms. The Echinoderm plutean form, with its mouth-stomach intestine, and with its water system originally forming a part of the digestive cavity, bearing as it would seem, about the same relation to the Ctenophoræ, which the Hydroid Polyps hold to the true Polyps. Therefore Agassiz cannot admit that the views so frequently urged and so generally admitted as to the separation of the Acalephs and Polyps as a distinct type (Cœlenterata) from the Echinoderms have any foundation in nature. He would therefore still retain the Radiate sub-kingdom with its three equivalent classes—Echinoderms, Acalephs, and Polyps.

Agassiz thinks G. O. Sars' idea that Brisinga is the living representative of the palæozoic starfishes rather too far-fetched, and he sees no very radical difference between Brisinga and such ordinary starfishes as Solaster and Crossaster, and he considers that if there has been a single ancestral Echinoderm, his primordial descendants early assumed different lines of development diverging to a great degree, and retaining their characteristics from the earliest-known geological period. E. P. W.

VOGEL'S "SPECTRUM ANALYSIS"

Practische Spectralanalyse iräischer Stoffe. Von Dr. Hermann W. Vogel (Nördlingen: C. H. Beck.)

THE aim of the author in writing this book may best be described in his own words. He says in the introduction:—

"The many excellent popular books on spectrum analysis confine themselves chiefly to descriptions of the great discoveries made by means of it; the chemical books only give short descriptions of flame reactions of alkalis and alkaline earths; they contain seldom a detailed account of the methods of observation, and still less a description of absorption spectra. The present work is intended to fill up this want, and to be a text-book to the student, and a reference book to the initiated."

Prof. Vogel is an authority on the absorption spectra of liquids and solids. Nearly half the book is given up to them, and we must add the better half. Here we find for the first time a connected account of all that has been done on the subject. Such an account is exceedingly valuable, and it brings prominently forward the gaps which have yet to be filled up. Prof. Vogel treats the subject chiefly from the chemical point of view, but those who take greater interest in the theoretical part will also find excellent information. So, for instance, the effect of the solvent on the absorption spectra of solutions is discussed. The spectra of colouring matters are given in detail, and the account of the effect of chemical reagents on them will be found exceedingly interesting. There is no doubt that this part of the book will be of great use to every worker on the subject.

We wish we could say as much of the chapter on emission spectra. As long as the author treats of the spectra of alkalis and alkaline earths, he is on safe ground, but when he comes to discuss the question of

double spectra and the spectra of gases, he is confused and unintelligible. Led away apparently by a desire to do justice to every writer, he quotes approvingly the most divergent opinions, as if they could be consistently held at the same time. He is very fond of saying that a body has been proved to have two spectra but that one of them belongs to the oxide or to an impurity, which is the same as saying that he possesses two watches but that one of them belongs to his brother.

The author is throughout the book careless in his expressions, and this comes prominently forward in this chapter. What, for instance, can the student make of the following paragraph (p. 170)?—

"A strong electric spark passing through air gives the spectrum of oxygen together with that of nitrogen. Both together form the so-called spectrum of air. Only one spectrum of oxygen is known. In dry pure air the spark only generates the spectrum of nitrogen."

The two statements in italics contradict each other as they stand. One of them is true for higher pressures, the other for lower pressures, but this the author has forgotten to add.

It must be said that the subject is a complicated one, and even those who are practically acquainted with all the experimental details would find it difficult to give a connected and clear account of it.

The first part of the book which treats of the optical principles involved in the spectroscopy is apparently well written, and the student will find in it elementary proofs of some important theorems. ¹ ARTHUR SCHUSTER

OUR BOOK SHELF

Nyassa; a Journal of Adventures whilst Exploring Lake Nyassa, Central Africa, and Establishing the Settlement of "Livingstonia." By E. D. Young, R.N. Revised by Rev. Horace Waller. With Maps. (London: John Murray, 1877.)

THIS is a thoroughly interesting narrative, brisk, fresh, and instructive. Mr. Young tells the story of the planting of a missionary station under the united auspices of the Presbyterian churches of Scotland, at Cape Maclear, on the south-west corner of Lake Nyassa. Mr. Young for the most part takes us over classic ground, by the Zambesi and Shiré, over ground familiar to readers of Livingstone's earlier and his latest travels. Mr. Young in his hardy little steamer the *Itala*, surveyed the north end of Lake Nyassa for the first time, discovering on its north-east shore a magnificent range of mountains, rising to from 8,000 to 12,000 feet above the level of the lake, and which he named after his old friend Livingstone. On the opposite shore is a range of less elevation. The lake is marshy at the north end, subject to quite oceanic storms, its shores being marked by varied and most attractive scenery. The steamer caused tremendous consternation among the slave-trading Arabs, who seemed to feel that with the advent of a British steamer on the lake their occupation was gone. The settlement was successfully planted and is likely to be of service both as a centre of civilisation and of more minute exploration.

Britannia: A Collection of the Principal Passages in Latin Authors that Refer to this Island. With Vocabulary and Notes. By Thos. S. Cayzer, Head-Master of Queen Elizabeth's Hospital, Bristol. Illustrated with a Map and twenty-nine Woodcuts. (London: Griffith and Farran, 1878.)

THE title-page sufficiently describes the contents of this

¹ As a personal question I may add that the remark attributed to me on page 198 was made by Mr. Stoney and only quoted by me.—A. S.