

Mr. Nicholson very justly remarks in a footnote to p. 43, that since the publication of the "Tentamen," much has been done in the way of improvement in the classification of birds. In order to assist the student a few references are added to recent publications.

These do not seem to be very well chosen; for example, it is probably much better to arrange the *Turdidæ* in two sub-families, as has been suggested later, than to retain Sundevall's arrangement. But this seems a very trifling matter in comparison with such serious errors as we have referred to, about which there can be no question, and which are left altogether unnoticed by the translator.

F. E. B.

*The Flowering Plant: as illustrating the First Principles of Botany.* By J. R. Ainsworth Davis, B.A. (London: Charles Griffin and Co., 1890.)

DIFFERENT opinions may be held as to what constitutes an elementary science text-book dealing with first principles, and we are inclined to think that Mr. Davis has given the work before us too modest a title. This little book, of 160 pages, contains enough facts and "hard words" to fill a small Encyclopædia, although "no previous knowledge is assumed"; and we fear that any beginner who limited his studies to this work would run more danger of developing into a kind of living abridged botanical dictionary than of mastering the first principles of the science.

The introduction, which deals with "the scope and subdivisions of the subject," "differences between plants and animals," and "differences between living and non-living matter," is condensed into  $5\frac{1}{2}$  pages. The following 137 pages are devoted to morphological and physiological botany; these are succeeded by an appendix on practical work, in which directions for the description of flowering plants, a summary of the various classes and orders, and directions for the study of anatomy, histology, and physiology, are condensed into 15 pages. One cannot help being struck by the author's power of *précis*-writing.

We cannot, therefore, recommend Mr. Davis's book to beginners, for whom a judicious selection of facts from which main principles may be deduced is, in our opinion, necessary. It is no easy task to write a book on "first principles," and this can hardly be accomplished by anyone who has not devoted much time to actual observation in the subject in question.

In his preface the author states that "no attempt has been made to 'write up' (or 'down') to any syllabus;" but the title-page informs us that the book is "especially adapted for the London Matriculation, South Kensington, and University Local Examinations in Elementary Botany." This, we take it, explains the real object of the work, which is also indicated by an appendix, consisting of 153 questions selected from South Kensington and London University examination papers. The appearance of the present work is, in fact, a natural result of our present system of examinations.

Looked upon as a set of condensed notes, recapitulating what has been learnt in lectures which (as doubtless many at the present time *have* to be) are "specially adapted for the requirements" of various examinations, the book may certainly prove useful to many, and from this point of view much might be said in its favour. Moreover, as no specific types are taken, it will probably (for examining bodies do fortunately change their "types" occasionally) have a longer life than the author's "Text-book of Biology."

It is impossible here to criticize the work in detail, and we will only call attention to the insufficient account of growth contained in the introduction: such condensation cannot but result in inaccuracy.

Sixty figures are included in the text, most of which are very well known; some half-dozen are original, but most of these might have been omitted with advantage.

*Cycles of Drought and Good Seasons in South Africa.* By D. E. Hutchins, Conservator of Forests, Knysna. With Cyclical Diagrams. Pp. 137. (London: William Wesley and Son, 1889.)

MR. HUTCHINS'S little book consists of two lectures (subsequently amplified) which were delivered at King William's Town and Grahamstown in 1886 and 1887. Their subject-matter is fairly indicated in the title, and the author's views are succinctly set forth in the opening words of his second lecture:—"We know that the climate of South Africa varies in cycles, that the climates of other countries similarly placed, such as Australia, South America, and India, also vary in cycles. This cyclical variation is probably due to more causes than one."

Of these cycles, one only, that of the sun-spot period, is already familiar to meteorologists. The others are—a cycle of 9 or 10 years, or, more accurately, 9.43 years as a mean, which Mr. Hutchins terms the "storm cycle," and appears to have been suggested to him by the rainfall register of Cape Town Observatory, extending over 48 years; and one of 12 or 13 years, which he terms the "cyclical mitigation" of the droughts which otherwise prevail in the intervals of the maxima of the two previous cycles. The physical cause of this last is not indicated. Allowing for an occasional delay of a year in the occurrence of the sun-spot rainfall maximum, the vicissitudes of the Cape Town Observatory rainfall are thus fairly reduced to rule. For other stations some modifications are found necessary, and it appears that at certain inland stations and on the east coast a wet year occurs two or three years after that of maximum sun-spots, which Mr. Hutchins terms the "lag rain" of sun-spot maximum. In the register of the Karoo rainfall we also notice a year of "irregular mitigation," and another year of high rainfall not reducible to any cycle, but which is not so annotated.

Perhaps, indeed, we are wrong in assuming that some of the above cycles are new and unfamiliar, since Mr. H. C. Russell, in a paper communicated to the Royal Society of Sydney in 1876, tells us that cycles of 2, 3, 5 or 6, 7, 9, 10, 11, 12, 13, 17, 19, 30, and 56 years, have been advocated as regulating the rainfall of different places, and we might, of our own knowledge, add others to the list. But with the exception of the sun-spot cycle, all of them seem to be evolved from the rainfall statistics dealt with in each case, and to have no other physical meaning.

It does not seem to have occurred to Mr. Hutchins that, however ingenious as an arithmetical exercise, such analyses of a series of statistics have no more claim to rank as physical inquiry than the solving of acrostic puzzles. He has evidently no misgiving on this head, and is certainly not open to the reproof conveyed in Montrose's well-known lines. He does not fear the fate of his system too much to put it to the touch of a definite and detailed forecast; and under its guidance he has constructed tables showing year by year the occurrence of drought or of average or excessive rain, in some cases for the next half-century. Those therefore who may live to the year 1938 will be in a position to form a definitive judgment on the merits of the system.

H. F. B.

*Science in Plain Language.* By William Durham, F.R.S.E. (Edinburgh: A. and C. Black, 1890.)

MR. DURHAM thinks that there are many intelligent persons who have not time, and may not have the inclination, to read regular scientific works, but who would be glad to know the general results of scientific investigation if these results could be set forth in plain language without too much detail. For this class he has written the present volume, which consists of articles that were originally printed in the *Scotsman*. The subjects are divided into four groups—natural selection, protoplasm, colour, and movement. Under "Natural Selection" there are essays on the origin of species, evolution, the evolution of man, the origin of man's higher nature, the