clearly stated on page 206, where is ascribed to him the first explicit record of a change in the variation (declination). "While Columbus," writes the author, "may not hence be said to have *discovered* the variation, he must be credited with having been the first to make it known, as well as the first to discover a line of no-variation." The author might have added that this agonic line lay a little to the west of the island of Fayal, one of the Azores; and he might also have informed the reader that the variation of the compass was not generally accepted as a fact until the middle of the sixteenth century—Gilbert's time—being supposed to be due to the mechanical defects of the compass itself.

The explanation of the earth-couple acting on the compass needle, given on page 383, is rather involved. The matter would be greatly simplified by discussing the usual expression, viz., $Hml \sin \theta$ deduced from a diagram on page 295. We notice that the author here resolves H at right angles to the length of the magnet, still the force acting at each end of the needle parallel to the magnetic meridian is not H but Hm; and the arm of the couple is $l \sin \theta$ so that the twisting moment is $Hml \sin \theta$.

It is necessary, when studying the distribution of free magnetism in a bar magnet, by the method given on page 181, to point out that the bar must be so placed that the axis of the compass-needle when at rest will lie in the magnetic meridian, with its north-seeking pole pointing magnetic north.

We are told on page 152 that a small magnetized bar will place itself equatorially when suspended between the poles of a horse-shoe magnet of nearly equal strength. This surely is a *lapsus calami*, for the bar will set, not equatorially, but axially.

A very important feature of this treatise is to be found in the diagrams and illustrations distributed throughout every one of its twelve chapters. Many of them are original, and are excellent efforts at representing graphically some difficult points in what we may term the physics of the ether. Teachers and students alike will find them very useful.

The author's object in the first part of his treatise is to give such information about the principal phenomena of magnetism and correlated subjects as will prepare the way for an intelligent grasp of the matter to be discussed in the second volume; and in this he has well succeeded. The work is full of up-to-date information set forth in a clear and frequently impressive manner. It makes one eager for the appearance of the concluding volume, which will treat of such practical matters as the compass, the ship considered as a magnet, swinging the ship, compensation of the deviations and the mathematical theory of these deviations.

Part I. extends to 556 pages and contains 368 figures, the whole put forth in the publisher's well-known excellent style.

M. F. O'REILLY.

Animal Life: a First Book of Zoology. By DAVID STARR JORDAN and VERNON L. KELLOGG. New York, D. Appleton & Co. 12mo. Pp. 329; frontispiece and 180 plates and figures in the text. Cloth, $1.20.

This handy, beautifully printed and illustrated book is a distinct attempt to introduce to the reader the subject of zoology from the standpoint of the life of the animal rather than from the purely systematic or comparative anatomy side. It is a book to read and enjoy in the fields and woods or at home rather than a manual to study in the laboratory. Its scope is well stated in the general headings of its sixteen chapters: (I.) The Life of the Simplest Animals; (II.) The Life of the Slightly Complex Animals; (III.) The Multiplication of Animals and Sex; (IV.) Function and Structure; (V.) The Life Cycle; (VI.) The Primary Conditions of Animal Life; (VII.) The Crowd of Animals and the Struggle for Existence; (VIII.) Adaptations; (IX.) Animal Communities and Social Life; (X.) Commensalism and Symbiosis; (XI.) Parasitism and Degeneration; (XII.) Protective Resemblances and Mimicry; (XIII.) The Special Senses; (XIV.) Instinct and Reason; (XV.) Homes and Domestic Habits; (XVI.) Geographical Distribution of Animals. Following the text proper are a table of the systematic position of the animals mentioned, a glossary and finally an excellent index.

In the subject matter of the volume one can-

not help feeling the advantage of a combined authorship, the senior author being primarily a student of vertebrate, and the junior author of invertebrate, life. This has insured a fairly balanced discussion of the phases of animal life in the two great divisions.

While, as stated above, this book is upon the life of the animal world rather than upon the anatomy, it is to be remarked that wherever the life processes are illuminated by the structure or development, these are freely introduced according to the guiding principle laid down by the authors: "Function and structure are always associated in nature and should always be associated in our study of nature."

It is gratifying to read such a book as this from cover to cover and find it free from vagaries. The authors, from personal knowledge and from the rich stores of the knowledge of others, have selected with great skill the facts illustrating each chapter, and have impressed these facts by excellent pictures, many of which are of their own production. In the discussion of the various topics, beyond the mere statement of facts, one constantly feels the certain hand of a master, a hand trained by personal knowledge and reflection and not dependent on the opinion of others. The book is very free from infelicities of expression and also from what seem to the reviewer doubtful statements. If two of the few observed might be mentioned, it is with the hope that future editions will modify the statements concerning the plate of embryos taken from Haeckel (p. 86), and also the statement on p. 107, that bones are not really living, etc. Taken in their setting these and a few other doubtful statements are true in spirit, but not quite in the letter. They can easily be made to conform with the vast majority of illustrations and be true both in spirit and in letter.

As a conclusion of this review a quotation from the chapter on geographical distribution will give an idea of the spirit and method of the authors:

"In California numerous anomalies [in distribution] have been noted, as the occurrence of Tahoe trout in Feather River, and in the Blue Lakes of Amador, which are on the other side of the main crest of the Sierra Nevada from Lake Tahoe, and the occurrence of the Whitney golden trout in Lone Pine Creek. In each case naturalists have found the man who actually carried the species across the divide. If this matter had been investigated a generation later, these cases would have been unexplainable anomalies in geographical distribution. Real causes are almost always simple when they are once known" (p. 288).

S. H. G.

GENERAL.

M. Octave Doin, Paris, has begun the publication of an elaborate 'Bibliothèque internationale de psychologie experimentale.' The subject-matter of psychology has been divided among fifty volumes, each of which is being prepared by a different author. France is, of course, fully represented, though the absence of certain names might be unexpected to those unacquainted with the personal conditions. Italy and Russia are well represented and there is one volume from England, 'Metaphysics,' by Mr. G. F. Stout, of Oxford; and two from America, 'Judgment and Knowledge,' by Professor J. Mark Baldwin, of Princeton University,' and 'Movement,' by Dr. R. S. Woodworth, of University and Bellevue Hospital Medical College. It is somewhat curious that the name of no German should appear on the list. The volumes, which will be on the average 300 to 400 pages in length, will be sold at the uniform price of 4 fr. Together they will form one of the most important encyclopedias that has been published in any science.

The Syndics of the Cambridge University Press have undertaken the publication of the first part of the 'Index Animalium' to the preparation of which Mr. C. Davies Sherborn has devoted so many years. The object of the Index is to provide zoologists with a complete list of all generic and specific names given by authors to animals both recent and fossil since January 1, 1758, the date of the 10th edition of Linnæus' 'Systema Naturæ.' With each name will be given an exact date and a reference intelligible to the layman as well as to the specialist. The British Association appointed a special committee to watch over the incep-