

class of variations are those *according to height*, that is to say, those shown by corresponding sections of *different* segments of the stem. Fourthly, and lastly, we have variations *according to the biological conditions*.

The first chapter contains a detailed account of the structure of "segment 1" of the principal stem, *i.e.* the segment including the node next above the cotyledons. In the succeeding chapters the anatomy of the segments superior to segment 1, and the development of an apex of large diameter are treated of. The fourth chapter deals with the hypocotyledonary axis, under which term the radicle of the embryo is included.

The second part treats in a corresponding manner of the leaf, only here the cotyledons first receive attention, then the leaves next above them, and so on. The increasing complication of structure along the sub-aërial stems, and the converse degradation along those which are subterranean, form the subject of a special chapter.

In the third part the variations in the structure of the root according to age and height are considered, the subject of apical development having a chapter to itself.

The method of successive transverse sections was used throughout the investigation.

The author compares the constantly increasing complexity of the successive segments of the principal stem to an accelerated movement, the amount of the acceleration varying according to the biological conditions. This strikes us as a neat mode of expression.

The author's account of the progress of secondary thickening in the stem is interesting, especially the observation that in the lower segments cauline plates of vascular tissue of secondary origin occupy the same position as that assumed by additional primary bundles in the more complicated segments above them. This and similar facts lead the author to a generalisation which he expresses in a phraseology adapted from Haeckel's famous law, namely, that "the organogeny of the stem repeats its ontogeny."

We must enter a protest against the use of the word "cambiform" for cambium which gives rise to secondary fundamental tissue. The word cambiform has long been used for certain cells of the phloëm-parenchyma, and we already have quite ambiguities enough in the use of the word cambium and its derivatives.

The work concludes with the expression of the author's conviction that vegetable comparative anatomy demands a knowledge of the structure throughout the whole extent, and at all ages of the plant. A formidable task is thus imposed on the anatomists of the future. D. H. S.

OUR BOOK SHELF

Magnetism. By Willoughby Smith. (London: November, 1885.)

A PECULIAR pamphlet, said to be compiled for the instruction of the electrical staff of the Telegraph Construction and Maintenance Company, but issued gratis by the author, and devoid of any publisher. It commences with a novel version of the story of the shepherd of Mount Ida, who is given not only a local habitation, but a name, and it ends with a material notion of lines of force which will startle some of our readers. Moreover, electrical discharges, magnetic clicks, &c., are "caused by the lines of force adjusting themselves to each other." It contains nothing new of magnetism, but it promulgates some strange

notions. "The Great Architect of the universe employs no rectilinear motions or angles." "Each atom of matter possesses in itself all the properties of a magnet, and emits its own lines of force." "All particles of matter, solid, liquid, or gaseous, are in a polarised state, and consequently emit lines of force." "The (electrical) conducting properties are the result of forced polarisation." "Each atom composing our atmosphere is in a state of polarisation, and is influenced by the magnetic force emanating from the earth." "The force which is called gravity is the effect of such an universal system of polarisation, with which God has endowed all matter." "Iron is very susceptible of polarisation from the effects of what is called terrestrial magnetism (the polarised atoms of the air)."

These extracts are enough to show the tenor of the paper, which will not enhance Mr. Smith's reputation. He has evidently not read Airy's "Treatise on Magnetism," where it is laid down that terrestrial magnetism is not produced in any important degree by magnetic forces external to the earth, and it does not even reside on the earth's surface. Its source must lie deep. The apparatus and experiment given at p. 29 are detailed more fully and clearly in Thompson's "Dynamo-Machinery," and that at p. 41 would be more elegantly obtained by Hughes's induction-balance. It is curious that no reference should be made to the labours of Sturgeon, Scoresby, W. Thomson, and Hughes, and that the laws of Lenz, Jacobi, Dub, Müller, and others are ignored. It is not a pamphlet on magnetism, but a vehicle for the promulgation of certain individual ideas, which it is to be hoped will not take root among those who have been favoured with the gift of this well-printed *brochure*. Indeed, its *raison d'être* is shrouded in mystery.

An Introduction to the Osteology of the Mammalia. By Wm. H. Flower, LL.D. Revised with the assistance of Hans Gadow, Ph.D. Third Edition. (London: Macmillan and Co., 1885.)

WHEN Prof. Flower published, in 1870, the first edition of his "Introduction to the Osteology of the Mammalia," the student at once recognised that he had been supplied with a text-book of convenient size and form, which furnished him with an admirable introduction to Mammalian osteology. The appearance of a second edition of this book in 1876, and of a third edition at the end of last year, are renewed evidence of the usefulness of the work, and that it continues to be appreciated by those who are engaged in the study of the anatomy of the Mammalia.

This edition has been revised throughout, and we notice in it many alterations and additions. The most important change is in the chapter "On the Classification of the Mammalia," which appropriately precedes the purely descriptive part of the book. This chapter has practically been rewritten, and embodies the introductory observations which the author has given to his important article "Mammalia," in the ninth edition of the "Encyclopædia Britannica." A very useful table has also been introduced in connection with the chapters on the vertebræ, which the author has compiled from his Catalogue of the Mammalia in the Museum of the Royal College of Surgeons of England. This table gives the number of the vertebræ situated in each region of the spine in the skeletons of about 350 mammals, and is the most complete record of the kind which has yet been prepared.

In this, as in the preceding editions, the dog's skull has been taken as that from which the general description of the Mammalian skull has been written, and with which the study of the skull may appropriately be commenced, and its description has not been changed; but in addition a useful abstract of our present knowledge of the development of the skull has been drawn up from Balfour's "Treatise on Comparative Embryology."