BOOKS RECEIVED.

AMERICAN SCIENCE SERIES—BOTANY—FOR HIGH SCHOOLS AND COLLEGES. By Charles E. BESSEY, M.Sc. Ph.D., Professor of Botany in the Iowa Agricultural College. Henry Holt & Company, New York, Large 12mo. 1880.

Circumstances, ever varied in their nature, daily remind us of the progress of science, but the production of a really valuable manual devoted to some special line of research not only gives direct evidence of progress already achieved, but hopefully suggests future advancement. For these reasons, we welcome a new manual of botany, written by Professor Charles E. Bessey, of the Iowa Agricultural College, which presents many advantages over previous publications having the same object in view, and must prove one of the most valuable aids to a true knowledge of the vegetable kingdom which the advanced student can possess.

Although modestly styled by the author "*An Introduction to the Study of Plants*," the work appears to leave little unexplained which is requisite for a comprehension of the anatomy and physiology of the vegetable. It is not claimed that the material is new, but the original arrangement of the matter to secure a more logical presentation of the subject, is apparent throughout the work.

Professor Bessey directs attention to two innovations which he has made, consisting of the "recognition of seven quite well marked kinds of tissue," and that of "raising the Protophyta, Zygosporeæ, Oosporeæ and Carposporeæ to the dignity of Primary Divisions of the Vegetable Kingdom, co-ordinate with the Bryophyta, Pteridophyta and Phanerogamia," in the hope that they may serve to give a clearer and more accurate notion of the structure of plants.

To those unacquainted with the German language, and to whom, therefore, the works of the German botanists are as sealed books, the present manual will prove particularly valuable, as free use has been made of the works of Sachs, DeBary, Hofmeister, Strasburger, Nägeli, Schwendener and others, while many of the cuts in Sachs' "Lehrbuch" have been reproduced.

One of the greatest charms of Professor Bessey's manual consists of a great number of excellent illustrations, which have been selected with great judgment, presenting over five hundred and fifty forms of vegetable life.

Professor Bessey divides his manual into two Parts, the First of which is based on Sachs' "Lehrbuch," the general plan of which is closely followed. The first chapter appropriately opens with a description of the "active and vital" principles of all vegetable organisms, "*Protoplasm*." Following the plant cell, is discussed the cell wall, the formation of new cells the product of the cell, tissues, inter-cellular spaces, and secretion reservoirs, and so on until the plant body is gradually built up. The last three chapters of this portion of the work relate to the chemical constituents of plants, the chemical processes in the plant, and the relations of plants to external agents.

The student having thus become familiarized with the anatomy and general structure of plants, the author, in Part Two, presents his plan of classification, which, as we have stated, is based on that made use of by Sachs for the lower orders of plants, while that for the higher plants conforms more nearly to the system of classification recognized in this country and in England. Professor Bessey divides the vegetable kingdom into six divisions, as follows:

I. Protophyta.
II. Zygosporeæ.
III. Oosporeæ.
IV. Carposporeæ.
V. Bryophyta.
VI. Pteridophyta.
VII. Phanerogamia.

This is a departure from the classification which has so long been followed in the English works on botany, the familiar groups of Algæ and Fungi are not recognized, the terms being retained only when general reference is made to the Chlorophyll-bearing and the Chlorophyll-free Thallophytes, Professor Bessey stating that, under his arrangement, the term Algæ implies a Thallophyte which contains Chlorophyll, and that by a Fungus is understood one which is Saprophytic or Parasitic in habit, and which is, in consequence, free from Chlorophyll.

In the classification of the Diatomaceæ, that proposed by Professor H. L. Smith, one of the best authorities on the subject, has been wisely followed, which divides the order into three tribes, each containing several families.

As the classification of the Diatomaceæ is as yet largely artificial, we presume the one adopted by Professor Smith is provisional.

We have probably indicated sufficiently in this outline the leading characteristics of this last, and, in our opinion, the best Manual of Botany. Its merits are apparent throughout the work, and it is evident that Professor Bessey has spared no pains to render his work perfect and worthy of the great subject treated.

We trust it will receive the attention it deserves, and we commend it to every student of botany.

In connection with the above Manual of Botany by Professor Bessey, we would direct attention to a series of twenty-four botanical microscopical slides offered by Messrs. James W. Queen & Co., of Philadelphia.

Although Professor Bessey's work is abundantly illustrated, there can be no question respecting the value of having at hand the natural specimens, so that, with the descriptions still fresh in the memory, we may go direct to nature, and there not only verify the author's statements, but make independent observations of physiological facts.

While we strongly advise all engaged in such studies to make their own sections and preparations, few possess the requisite knowledge and manipulative skill to produce perfect specimens. We, therefore, with pleasure, suggest to students, and especially to instructors, that they obtain the twenty-four vegetable preparations offered by Messrs. Queen & Co. They are the most perfect microscopical slides we have seen, and the specimens are all either single or double stained, thus demonstrating the presence of protoplasm and structure, essential to a comprehension of anatomical and physiological botany.

They will also serve as excellent models for the student to imitate, in learning to prepare his own slides.

NOTES AND QUERIES.

[3.] I have not yet succeeded in obtaining the pure white crystals of Iodide of Potassium by Liebig's method. Where is the difficulty, and do the following equations represent the reactions?

(1.) $2\,P + H_2O + 2\,I + 2\,Ba\,Co_3 + 2\,Ba\,H_2O =$
$Ba_3\,(PO_4)_2 + Ba\,I_2 + 2\,Co_2 + 2H_2O.$

(2.) $Ba\,I_2 + K_2\,So_4 = 2KI + Ba\,So_4.$

X.

[4.] MOUNTING FRESH BLOOD.—In mounting slides of fresh blood, I occasionally find the corpucles subsequently vanish. Will some reader of SCIENCE state the cause, and give a remedy. J. R. B.