

In other words, the allusions to the frog and chimpanzee, true or otherwise, are not particularly illuminating in a discussion of Mendelism because there is involved no feature of dominance nor alternation of characters.

In Mr. Punnett's original statement of what is known as the Cuénot theory:<sup>2</sup>

There are but two relations into which the unsplitable unit character can enter with the individual. It may be present or it may be absent and no third relation can be conceived. From this we are led to ask whether the hypothesis can be brought into any simple relation with the phenomenon of dominance. Is dominance the outcome of the presence of the given factor, and recessiveness the condition implied by its absence? At present we can only say that such a point of view is not at variance with the great majority of cases hitherto worked out. Whether the few instances which now seem contradictory will ultimately fall into line, future work alone can decide.

Nothing very cryptic or very dogmatic about that. In speaking of "roseness," "peaness," etc., Mr. Punnett has merely framed a convenient and probably temporary handle to grasp a difficult subject in order the better to inspect it. We owe him a vote of thanks, that, instead of christening his conceptions with newly coined words dug from the dusty depths of the Greek lexicon, he has rather chosen to emphasize their temporary character by Englishing them, lest others should read into his statements a concreteness he manifestly wishes to avoid.

The writer is of those who believe that the dangerous facility with which the facts of Mendelism fall into categories and A-B-C notations is illusory and that the matter is more complicated than those would have us think who have allowed themselves to be entangled in all-explaining formulæ. Yet working hypotheses we must have in order to advance, and none suggested so far is any more usable, certainly none more lucid, than the one Professor Ritter finds so contaminated with metaphysics.

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September 29, 1909

<sup>2</sup>R. C. Punnett, "Mendelism," 1907.

#### HYDROGEN POLYSULPHIDE AS A REDUCING AGENT

I SHOULD like to correct a clerical error in the account I gave a few months ago<sup>1</sup> of my investigation of the reducing action of hydrogen polysulphide. The statement "it may be used at the ordinary temperature, dissolved in ionizing solvents, such as water or alcohol, or in non-ionizing media, such as carbon bisulphide" should read "it may be used at the ordinary temperature, *for the reduction of substances* dissolved in, etc."

As is well known, the polysulphide is practically insoluble in water and alcohol.

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#### SCIENTIFIC BOOKS

*Landmarks of Botanical History.* By EDWARD LEE GREENE. Smithsonian Miscellaneous Collections (Vol. 54), 1909.

We have had many histories of botany, each of which has added somewhat to our knowledge of the growth of the science and of the men who have been its chief workers, or they have given us a new point of view so that we have been able to see how botany has grown and developed from its crude beginnings to the present. In Dr. Greene's book we have another attempt to set forth the matter in a new light, and at the outset it may be said that few men could bring to the task better ability, training and preparation. Nor are there many men who can command equal library facilities, for Dr. Greene's unrivaled private library of the earlier botanical works is supplemented by the Congressional Library, to which as an attaché of the Smithsonian Institution he has had the freest access. This happy coincidence with the unusual freedom from official duties afforded by his position, and a persevering industry, have conspired to favor the production of a monumental work.

In choosing for his title the word "landmarks" the author indicated something as to

<sup>1</sup>SCIENCE, XXX., 158 (July 30, 1909).

what his treatment of the problem was to be. He has chosen to bring before his readers the lives and teachings of botanists, and necessarily he must choose those who have contributed to the upbuilding of the science. This treatment is in sharp contrast with the chronological method in which each botanist is taken up in his proper place, and his various publications cited, much as they are in a publisher's descriptive book list. It is also quite different from the treatment made familiar to us by the well-known history of botany written by the late Professor Sachs, in which the development of each department of botany is traced consecutively and consistently. In the latter treatment the subject is so emphasized that the men themselves fall somewhat into the shadow; we think of how this or that part of the science developed, but largely overlook the personal element as represented by the men by whose labors the development took place. By the one method we have a work on botany in which the present condition of each part of the science is accurately given, and we are shown by what steps this condition was reached. In this treatment the botanists are but the workmen who have helped to build the edifice of science; they are important only as they have added stones to its structure, and while the historian mentions their names, these are wholly secondary, and may be forgotten in our admiration of the aggregate result of their work. By the other method we are brought to consider the workmen who have labored upon the edifice; how they worked; how they succeeded in their endeavors; how they failed here and there, and why they failed, as well as why they succeeded. By this treatment we learn not only what progress was made in the upbuilding of the science, but also *how* it was made. For the botanist who wishes merely to know the material of the edifice, the method of Sachs is preferred, but for the investigator who desires to know the conditions under which his predecessors did their work the other method is indispensable.

As indicated above, Dr. Greene has chosen to write his history so as to place the emphasis first upon the men who have worked in botany.

It is thus a very human book, and as one reads the biographies of the men he has selected a vivid picture is presented of their lives and their labors, as well as their environment. As one reads he gets some idea of the atmosphere in which men lived, and he appreciates all the more the difficulties they encountered, and the meaning of success in their particular environment.

It is understood that this history—"Landmarks"—will cover several volumes, and certainly if one may judge of the succeeding volumes by the first there can be no question as to the desirability of continuing the work as it has been begun. It opens with a most readable and suggestive preface, in which the author gives his definition of botany—as that science "that occupies itself with the contemplation of plant as related to plant, and with the whole vegetable kingdom as viewed philosophically—not economically or commercially—in its relation to the mineral on the one hand, and to the animal on the other." It is, however, distinctly set forth that to the botanist all matters relating to plants must be of interest, and he has clearly no sympathy with those who would close their eyes to the industrial relations of the science. He goes so far, even, as to include as "essentially botanical" those philosophic ideas, though crude or erroneous, about the vegetable kingdom as a whole or in part which may occur to "the farmer, the woodsman and the primitive pharmacist" and others who have much to do with plants industrially. With this liberal interpretation no broadly trained botanist will find fault, nor should the workers in agriculture, forestry and other allied subjects object to this inclusion of the philosophical aspects of these phases of plant study.

The introduction, covering about thirty pages and devoted to *The Philosophy of Botanical History*, is well worth reading, since it is full of suggestions, some of which we should like to quote if there were space to do so. The root-gatherers ("Rhizotomi") "mostly illiterate men and quacks," who preceded Aristotle and Theophrastus, receive liberal treatment in a short chapter. This is followed (chapter

II.) by nearly a hundred pages devoted to Theophrastus of Eresos, one of the most instructive parts of the book. The treatment here illustrates the author's method, who says (p. 60): "In our study of this maker of the first Landmark in the History of Botany the main object must be that of discovering in what ways, under what limitations, and yet how well, he accomplished the placing knowledge of plant life and form upon the list of the sciences." Accordingly, a dozen pages are given to a discussion of his method, which is in fact continued through nearly thirty pages more under the subtitles Organography and Anthology. After this Phytography (5 pages) leads to Taxonomy (20 pages) and Dendrology (8 pages). The chapter closes with a recapitulation in which the author shows that Theophrastus "is the father of the Science as we now have and hold it."

The short chapter on the Greeks and Romans after Theophrastus (enumerating Nicander, Cato, Varro, Virgil, Columella, Dioscorides, Pliny and Galen) leads to a still shorter one on the botany of the middle ages, the author remarking in passing that "the period has no apparent landmarks of botanical history."

Otho Brunfels (chapter V.), who is characterized as "first in point of time among the German botanical reformers of the sixteenth century," leads the way to Leonhardus Fuchs and Hieronymus Tragus, to each of whom a chapter is assigned. The short chapter (VIII.) devoted to Euricius Cordus leads naturally to the following (IX.) on Valerius Cordus, the son, "hitherto almost unknown except by name." This closing chapter of the volume will be read with keen interest by every botanist, who will learn here for the first time, perhaps, of this brilliant botanist whose death when but twenty-nine years of age closed a life of much achievement and still greater promise. To have rescued the name of Cordus and his work from oblivion was a worthy labor, and most zealously has Dr. Greene carried it out. He shows that Cordus formulated plans for his plant descriptions, and that with these he redescribed "some of the best known

and best described plants of Dioscorides," which is characterized as "the boldest innovation that was made by any botanist of the whole sixteenth century."

The "Landmarks of Botanical History" will certainly be of the greatest value to botanists the world over, since it presents the subject in a new light and from a different point of view. We shall all pray for the continued health and strength of the author, and that opportunity may be afforded him of completing the work to which he has set his hand.

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*The Moon in Modern Astronomy.* By PH. FAUTH. With an introduction by J. E. GORE, F.R.A.S. Pp. 160 with 66 illustrations. New York, D. Van Nostrand Company. 1909.

This attractive book gives a very interesting account of the principal features visible on the moon's surface and it embodies the results of over twenty years of careful study with small telescopes. The subject is treated in an historical manner, especial attention being given to the early maps of Lohrmann, Mädler and Schmidt. M. Fauth shows that photographic processes have not materially added to our knowledge of lunar conditions. In fixing the relative positions of the larger surface features photographs are more accurate than maps made from eye observations, but for the study of minute detail visual observations, even if made with relatively small telescopes, are superior to the best photographs.

The most conspicuous features of the moon's surface are the so-called "craters." These have heretofore been described as "cup-shaped" mountains and as resembling but greatly exceeding the great volcanic craters of the earth. M. Fauth shows that this conception of the lunar "craters" is erroneous, that they are more like shallow dishes, and could more appropriately be called "walled-plains." He shows by figures and by diagrams that in many cases the crater is "so incredibly shallow that the eye of an observer on the crest would hardly be able to see the crest on