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WITH PLATES AND TEXT ILLUSTRATIONS

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Two long chapters (iv. and v.) are devoted to a description of the mutation phenomena in *Œ. Lamarckiana* and other species, and a full account is also given (chapter vi.) of the cytological basis of the mutation phenomena. Assuming that every mutation is the result of a change in the constitution of a particular cell or cells, one may expect this change to be, in the great majority of mutations, either ultramicroscopic or chemical in character. The only instances known in which a visible alteration in cell-structure has taken place are those which involve a change in the size of a cell as a whole or in the chromosomes of the nucleus. It is these nuclear changes which have been a special object of Dr. Gates's study, and to him we owe the demonstration of their important bearing on the study of mutations.

In his final chapter on the evolutionary significance of mutations the author severely criticizes the "loss of factor" view adopted by Professor Bateson, which he describes as embodying a conception of evolution as crude and elementary in its way as was the *emboîtement* theory of embryology developed by Bonnet in the eighteenth century.

Enough has been said to show that Dr. Gates's book is full of interest to the biologist or botanist, and it remains to add that there is an excellent bibliography, and that the volume is remarkably clearly printed and otherwise produced in the manner which we associate with Messrs. Macmillan's handbooks.

A. B. R.

The Ascomycetes of Ohio. — 1. Preliminary Consideration of Classification. By BRUCE FINK.—2. The Collemaceæ. By B. FINK and C. AUDREY RICHARDS. The Ohio State University Bulletin. Vol. xix. No. 28. Pp. 70. 6 plates. 50 cents.

THE first contribution begins, "All classifications of Ascomycetes hitherto followed have been highly artificial, nor are the data for a satisfactory distribution at hand." Further, "Had it not been for clinging to erroneous tradition, the researches referred to above and others like them would have convinced all botanists that the lichen is a fungus living in some peculiar relation with an alga." The researches mentioned are the well-known ones on growing lichens in pure culture, researches which *have* convinced botanists that there is some peculiar relation between alga and fungus, that of symbiosis. The author's idea, however, is that a lichen is a fungus which lives in parasitic relationship with an alga during all or part of its life, and also sustains a relationship with an external substratum, organic or inorganic. There is much talk about clear thinking, but the discussion seems in many places quite illogical. Lichens and fungi are classed together, as many have previously suggested, on the plea that lichens are a physiological class: but on this reasoning what becomes of the fungi? The writer quotes the well-known cases of transition forms between fungi and algæ, forms which are at least as easily explained on the so-called dual-hypothesis as on any other, if the lichens be considered of polyphyletic origin, as all evidence leads us to hold. The cases of

sexuality are then considered and much is made to depend upon the much abused "trichogyne." Would that some wit would suggest the polyphyletic origin of this all-important structure!

In any consideration of the origin of Ascomycetes it would seem logical, no matter what theory of sexuality be held, to consider the case of *Eremascus*, *Dipodascus* and other "primitive" Ascomycetes. The author seems to be "clinging to erroneous tradition" when he says, regarding these, that "The Hemiascales (Hemiascineæ) of some authors have not been admitted, though *Eremascus* and some others of these plants may yet prove to be Ascomycetes rather than Phycomycetes"—but the Saccharomycetales are included! It is admittedly impossible to arrange any class satisfactorily in a linear series, but the order adopted here is open to much criticism:—Laboulbeniales, Pezizales, Lecanorales, Caliciales, Helvellales, Tuberales, Phacidiales, Hypocreales, Dothidiales, Sphæriales, Pyrenulales, Perisporiales, Aspergillales, Exoascales and Saccharomycetales. As this is a "provisional arrangement which is to serve as a basis for the study of various groups of Ohio Ascomycetes," a detailed criticism would be here out of place: but if the study be as intensive as is evidently proposed, there is no doubt that the arrangement will be radically altered. A full bibliography and two plates are added.

After the recent writings of the senior author, one turns with interest to the treatment of such a group as the Collemaceæ, where the alga is the predominant partner in giving morphological characters. "In order to dispose of typical lichens as fungi, no greater departure from the ordinary methods is required than to omit from the description all reference to the algal host." When, however, we turn to the generic and specific descriptions, we find that they commence "Transforming the algal-host colony . . ." and then is described the shape of the whole structure! The net result is that an ordinary description is given, excepting for some slight changes in terminology. The introduction gives a general account of the group. In the systematic account the four North American genera are dealt with: *Synechoblastus*, *Collema* and *Leptogium*, each with five species, and *Mallotium* with one species. One species of *Synechoblastus* and one of *Leptogium* are described as new. The sexual organs, so interesting in this group, are dealt with separately at the end: it may be pointed out that there is, throughout both papers, an irritating misspelling of "spermogonia." There is a short bibliography and four plates.

J. RAMSBOTTOM.

BOOK-NOTES, NEWS, &c.

THE London Manx Society has reprinted from the *Isle of Man Weekly Times*, as a shilling pamphlet (to be obtained from Mr. J. B. Shimmin, Canterbury Road, Leyton, N.E.), an account of the proceedings at the Edward Forbes Centenary Commemoration, held at Burlington House on Feb. 15th. An interesting summary of Forbes's botanical work was given by Prof. Bottomley.