book is unfortunate in this respect. The technique suggested in many cases, doubtless, will not be received with favor by experienced laboratory workers.

Claim to originality is made by the author with respect to the presentation of the subject only. On the whole, the book is written in a style which is clear and concise. Some of the unqualified statements should be modified to meet the prevailing opinion of to-day. To aid in a future edition we should call attention also to the lettering of the diagrams to represent optical phenomena of the microscope, which we believe to be inadequate and confusing.

A book compiled on the plan of this one will do good service in the place to which the author in the preface modestly assigns it: 'It is to the beginner in microscopy, and particularly to him who must work without the personal guidance of a teacher, that the book may prove of value.'

G. FRANKLIN WHITE.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Journal of Mathematics for October contains the following articles: 'The Plane Geometry of the Point in Point-Space of Four Dimensions,' by C. J. Keyser; 'On the Functions Representing Distances and Analogous Functions,' by H. F. Blichfeldt; 'Surfaces whose Lines of Curvature in One System are Represented on the Sphere by Great Circles,' by L. P. Eisenhart; 'On the Invariants of a Homogeneous Quadratic Differential Equation of the Second Order,' by D. R. Curtiss; 'Surfaces of Constant Mean Curvature,' by L. P. Eisenhart.

SOCIETIES AND ACADEMIES.

MICHIGAN ORNITHOLOGICAL CLUB.

AFTER a few years of apparent sleep, the Michigan Ornithological Club was reorganized at Detroit on February 13, 1903. The officers elected for the current year are: *President,* Adolphe B. Covert, Ann Arbor; *Vice-President,* Dr. Phillip E. Moody, Detroit; *Secretary-Treasurer,* Bradshaw H. Swales, Detroit. Two permanent committees were created. The committee on Geographical Distribution consists of Dr. Charles C. Adams (chairman), Ann Arbor; Professor Walter B. Barrows, Agricultural College; Bryant Walker and B. H. Swales, of Detroit. The Bird Protection Committee consists of Edward Arnold (chairman), Battle Creek; Professor Walter B. Barrows, Agricultural College; James B. Purdy, Plymouth, to act in conjunction with Wm. Dutcher, chairman of the Protection Committee of the American Ornithologists' Union.

It was decided to continue the former club journal styled the *Bulletin of the Michigan Ornithological Club,* three numbers of which (Vol. IV.) have appeared so far. Alexander W. Blain, Jr., was made editor and business manager, and later J. Claire Wood, of Detroit, and Adolphe B. Covert, of Ann Arbor, were elected associates. The *Bulletin* is published by the club at Detroit as an illustrated quarterly devoted to the ornithology of the Great Lake region.

The prospects for the Ornithological Club in the Wolverine state seem most bright, and the society already has over one hundred members enrolled. Monthly meetings are held on the first Friday of each month at the Detroit Museum of Art and annual meetings will be held at the same time and place as the annual meeting of the Michigan Academy of Science.

ALEX. W. BLAIN, JR.
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DISCUSSION AND CORRESPONDENCE.

MICHIGAN PLANT SOCIETIES AGAIN.

THE thorough remodeling which my paper on the upland plant societies of Kent County, Mich.,* received at the hands of Mr. Francis Daniels in SCIENCE for August 14, 1903, makes this note by the author seem necessary. In the first place, I hasten to acknowledge with thanks the two very bad blunders which the reviewer has pointed out. *Quercus ilicifolia* should read *Q. prinoides,* and *Vitis cordifolia* should be replaced by *V. riparia.*

In the original paper the author expressly

* Annual Report State Board of Geol. Survey, Mich., 1901, pp. 81–103. *Botanical Gazette,* **35**: 36–55. 1903.

denied all pretense to finality of conclusions; it was to get light on just those subtile changes of soil, etc., to which Mr. Daniels alludes, that the work was undertaken. Thus the criticism that we can not point out any single cause for any difference in vegetation is hardly to the point. My critic deals only with the societies, he is willing to leave the description of soils as it was published.

That the societies used are not of equal rank was pointed out by the author. Increased complexity would doubtless be accompanied in some measure by increased accuracy, but the main points would thus be almost surely lost sight of in the maze of classification. The systematist born and bred can seldom understand the horribly slipshod ways of the ecologist! The fact that Mr. Daniels puts the beech-maple and the maple-elm-agrimony societies together shows clearly that he has failed to study the southern townships. Farther north these types do tend to merge, but southward, into Indiana and Illinois, they are still distinct, as more recent studies by the author show. Likewise, the combining of the oak-hickory with the oak-hazel society indicates failure to study well the condition of things in the northern part of the county. The presence or absence of hickory in this region involves one of the most important ecological questions, one which we can not interpret clearly as yet, but one which it can do no good to slur over. On the whole, my critic's description agrees fairly well with the conditions in the central townships, but fails altogether to express the facts throughout the county as a whole. This is one of the dangers which he might be warned against, namely, that of generalizing from too small an area, no matter how many years he has botanized in it. The author must admit that he, too, is a native of Kent County, and that he has studied its flora for many years.

Bidens frondosa and *Solanum nigrum* are 'frequent everywhere' only in the moister soils of the Grand River valley. *Nepeta, Phytolacca* and *Euphorbia corrallata* are, throughout the area, among the most constant and characteristic members of their societies; they are not weeds excepting in areas where they originally occurred. *Echinospermum* occurs in the lowlands, a fact which may have misled Mr. Daniels, but on the uplands it is a truly characteristic plant of the most mesophytic society. Regarding the distribution of *Cenchrus* there is need of more study than either Mr. Daniels or myself has yet accomplished. Wherever it comes from, it certainly occurs only on the worst sands, *i. e.,* only in the most xerophytic group. Occasional plants of *Dracocephalum* are to be found in the beech and maple forests south of the Grand River valley.

The societies are based on forms which are evident the year round, not on summer forms nor spring forms. Of the 140 forms listed, no less than 40 are spring-flowering. There doubtless are well-marked societies of Thallophytes and Bryophytes, but those of the two higher groups are the ones chosen for study. An adequate study of the distribution of grasses and sedges will be a work by itself when the right student undertakes it. These plants were purposely omitted from the paper under discussion.

Burton Edward Livingston.
The New York Botanical Garden,
September 15, 1903.

SHORTER ARTICLES.

FOUR NEW SPECIES OF THE CENTRAL AMERICAN RUBBER TREE.

Though still in the initial and experimental stage, the cultivation of rubber-producing trees is now attracting more general attention than any other branch of tropical agriculture. Large amounts of American capital are being invested in Mexico and Central America, and the practicability of rubber culture in the tropical islands of the United States is receiving the attention of the Department of Agriculture. The first studies have been directed to the Central American rubber tree (*Castilla*), and one of the facts established is the existence of several different local types, instead of a single species extending from Mexico to Bolivia, as hitherto supposed. The species of Castilla are among