Stomatopoda. Stanley Gardiner on the Madreporaria and on the Ecology of Solitary Corals. Foxon on Stomatopod Larvae. H. L. Clark (Harvard University) on Ophiuroidea.

Published November, 1939. E. F. Thompson on Chemical and Physical Investigations. Stubbings on Stratification of Biological Remains in Marine Deposits (attempt to determine the warm and cold periods of the past by the foraminifera). Norman on the Fishes. (With a synopsis of the oceanic genera of Brotulidae.)

Published February, 1940. S. J. Hickson on the Gorgonacea, with notes on two species of Pennatulacea.

Published March, 1940. Stubbings on the Cirripedia. Wiseman and Bennett on the Distribution of Organic Carbon and Nitrogen in Sediments from the Arabian Sea. Seymour Sewell on the Copepods, Harpacticoida (a large report, with much interesting discussion).

T. D. A. COCKERELL

AQUATIC PLANTS

A Manual of Aquatic Plants. By NORMAN C. FASSETT. vi + 382 pp. New York: McGraw-Hill Book Company, Inc. 1940. $4.00.

THE aim of this book is to aid in the identification of aquatic plants, whether in sterile or in flowering condition. The forms included are those obvious to the unaided eye and which under normal conditions germinate and grow with at least the base of the plant in water. This interpretation eliminates most of the algae but permits the liberal inclusion of terrestrial forms normally found in moist habitats, thereby greatly increasing the usefulness of the book for general purposes. The region covered includes Minnesota, Iowa and Missouri, then broadens eastward to the Gulf of St. Lawrence and Virginia. A few helpful references are included with each group, and there is a bibliography on the uses of aquatic plants by wildlife.

The volume consists mainly of keys and figures. The former, which include most of the descriptive material, cover more than one hundred pages, while the latter fill considerably over two hundred pages. This liberality of illustration is especially helpful. The figures are original drawings supplemented by a limited number of habitat photographs. In general, the figures are excellent, both in outline and in sampling of detail; a feature of value is the inclusion of the major venation of leaves illustrated. The plate including *Vallisneria* might well be modified, since one drawing involves figures of unequal scale. On the preceding page, in connection with the illustrations of *Anacharis,* terms relating to the elongated portions of the pistillate and staminate flowers appear reversed. A brief appendix dealing with the uses of water plants by animals is both a useful summary and a model of compactness. The portion devoted to fish perhaps merits extension, but this would have involved greater emphasis on algae.

This book is a welcome addition to the literature of aquatic biology. Because of its organization it may be used by the layman, since the author adheres to the plan of aiding the practical worker, but it will be welcomed as well by the experienced botanist. Convenience of the user is greatly facilitated by having keys and figures closely associated. Brevity of treatment is achieved by leaving much to the manuals to which necessary references are made. But the volume is not a crutch to help to bigger books, for its treatment usually affords a satisfying definiteness without supporting references.

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REPORTS

THE COTTON ROOT-ROT TOUR AND CONFERENCE OF 1940

WORKERS on the cotton root-rot disease, caused by *Phymatotrichum omnivorum,* assembled for a tour and series of conferences, extending from Greenville to College Station, Texas, August 6–9, 1940. Call for this meeting was issued by Dr. A. A. Dunlap, chairman of the root-rot committee of the Cotton Disease Council. Periodic meetings of this kind, at which research workers on the problem have met to exchange ideas, viewpoints and results, have played a part in the rapid advance of knowledge about this very serious disease. The geographic limitation of the work to Southwest United States has made it possible for a majority of those engaged in studies on the problem to attend some if not all of the conferences. Group discussion of the results and of points to be attacked has doubtless avoided some needless duplication of work, aided in encouraging a wider range of attack on the problem, and has obviously facilitated rapid confirmation of new findings.

The root-rot conferences were at first winter meetings with more or less formal reports of progress. The series began with a meeting at College Station on December 13–15, 1927. Accounts of the meetings and abstracts of papers presented at the second to fifth conferences (1929–32, respectively at College Station, Temple, College Station, and Austin) were published in *Phytopathology.* The sixth conference, held at

College Station on December 4, 1934, was informal and abstracts of results were not published. After an interval of three years, the seventh conference, September 21–24, 1937, took the form of a tour of field experiments from Greenville to College Station, with informal meetings along the line of travel. The 1940 conference, making the eighth of the series, took place again after an interval of three years and was also a tour of field stations and plot experiments with sessions at points along the route for discussion of field and laboratory results.

The tour began with inspection of work at the U. S. Cotton Field Station at Greenville, during the morning of August 6. The party then proceeded to Temple, via Rosebud, where soil fertility plot experiments were seen. The morning of August 7 was devoted to a rapid examination of extensive root-rot work at Substation No. 5 of the Texas Agricultural Experiment Station, near Temple. Field plots of the Clayton Foundation of the University of Texas were seen that afternoon in the vicinity of Austin, and laboratories at the university were visited during the evening. On August 8, soil fertility plots were visited at Kimbro and Elgin; and plot experiments at Brenham were viewed en route to College Station. The program concluded with an informal session at College Station on August 9, during which experimental work not visited on the tour was briefly summarized and discussed.

As usual, attendance at this meeting included most of the workers engaged in study of cotton root-rot, along with the heads of the organizations concerned. Omitting visitors, the 41 attending may be classified as: plant pathologists 9, agronomists 7, plant physiologists 4, soil bacteriologists 4, agricultural aides 4, chemists 3, geneticists 3, substation superintendents 3, soil technologists 2, entomologists 1 and botanists 1. Research groups represented were the University of Arizona Agricultural Experiment Station; the U. S. Department of Agriculture Cotton Field Stations at Sacaton, Arizona, and at Greenville, Texas; the U. S. D. A. Divisions of Cotton and Other Fiber Crops and Diseases, Soil Microbiology, and Cereal Crops and Diseases; the U. S. D. A. Soil Fertility Laboratory at Austin; the Clayton Foundation of the University of Texas; the A. and M. College of Texas; and the Texas Agricultural Experiment Station at College Station and Substations No. 5 at Temple and No. 15 at Weslaco.

No prepared papers were presented at the sessions of this meeting and results of the work were given informally. Publication of abstracts of these results is therefore not contemplated.

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SPECIAL ARTICLES

A QUANTITATIVE, ABSOLUTE METHOD FOR THE ESTIMATION OF COMPLEMENT (ALEXIN)

THE quantitative absolute methods introduced by this laboratory[1] for the study of specific immune precipitation and agglutination have now been extended to the estimation of complement (alexin). If, as defined by Muir,[2] complement is "that labile substance of normal serum which is taken up by the combination of an antigen and its anti-substance (immune body)," then complement may be measured in milligrams of nitrogen per milliliter as outlined below.

Quantitative precipitin estimations were run with proportions of antigen and rabbit antisera such that not quite all of the antibody was precipitated. In this way disc-like precipitates were avoided, as these are difficult to disintegrate and wash thoroughly. All guinea-pig serum used was neutralized to phenol red in the hope of reducing the solubility of the specific precipitates. The rabbit sera (inactivated) contained sufficient antibody nitrogen for quantitative estimations at dilutions which were not anticomplementary. 1.0 ml portions of antiserum dilution were added, each in triplicate, to 5.0 ml of 0.9 per cent. saline, 5.0 ml of heat-inactivated guinea-pig serum and 5.0 ml samples of an unheated portion of the same guinea-pig serum pool. The tube contents were mixed and 1.0 ml of antigen dilution was added to each tube and mixed. Blank tubes were also set up with active and inactivated complement to which antigen or antiserum alone was added. After 1 hour at room temperature the tubes were centrifuged in the cold and the analyses were completed in the usual way,[3] except that in order to assure maximum accuracy all supernatants were recentrifuged as in the agglutination procedure[4] and all tubes were washed three times with chilled saline instead of twice, owing to the large amounts of guinea-pig serum used. Washings were tested and found free from complement. The hemolytic unit of complement activity was measured in the usual way with 0.2 ml of minimally sensitized sheep red-cell suspension (2 to 2.5

[1] Reviewed in *Chem. Revs.*, 24: 323, 1939; *Bact. Revs.*, 3: 49, 1939.

[2] R. Muir, "Studies on Immunity," Oxford University Press, London, 1909.

[3] M. Heidelberger and F. E. Kendall, *Jour. Exp. Med.*, 61: 559, 1935; 62: 697.

[4] M. Heidelberger and E. A. Kabat, *Jour. Exp. Med.*, 67: 545, 1938.