

authorities, a small number of the figures being original. The object seems to be quite as much to attract the eye by brilliant coloring as to furnish the student with accurately drawn microscopic details. The quality of the plates varies considerably: for, while those of *Volvox* and *Mucor* are effective, the same cannot be said of those of some of the lower forms, — as *Nostoc*, *Oscillaria*, *Gloeocapsa*, etc., — where a mass of color takes the place of clearness of outline, and important details are not well brought out. This may, however, be the fault of the lithographer, rather than of the original drawings. Considering their biological importance, better and more numerous figures of *Myxomycetes* might have been given. The plates of *Fucus* and *Cetraria* are unnecessarily bad, considering that there are several works from which excellent figures could have been copied; and the same may be said of the plate of *Florideae*, where no good figure of the procarp or cystocarp is given, and that of the mosses, where the peristome is badly drawn. The antherozoid of a fern is represented not only without the usual bladder-like appendage, but also without cilia.

The text consists of brief descriptions of the figures, with directions for studying the objects themselves in the laboratory; the whole forming a skeleton to be filled out by the instructor. It seems to us that the use of the term 'gonidium' in the sense of non-sexual spore is hardly warranted. The word has a technical meaning in lichens, and its use in other orders has been superseded by better terms; and it is certainly undesirable to speak of the gonidia of *Penicillium*, for instance.

The work is likely to have a large sale among amateurs who wish a hasty glance at the subject; but it would be better for students to purchase some of the text-books, like Sachs or Luerssen, where they will find the same figures, and a full text as well.

ECONOMIC ENTOMOLOGY.

Injurious insects of the orchard, vineyard, etc. Illustrated with over seven hundred and fifty woodcuts and twenty-five pages of classified illustrations. By MATTHEW COOKE. Sacramento, Crocker, 1883. 472 p., illustr. 8°.

DURING the last few years, there has been a great growth in the popular appreciation of the importance of economic entomology. As a result of this growth, the demand for popular works on this subject has increased. To supply this demand, numerous publications have appeared in rapid succession. Of especial

interest among these publications are the manuals of Miss Ormerod, Mrs. Treat, Mr. Saunders, and Mr. Cooke.

The work of the last-named author resembles in many respects the works of the others. Like them, it is largely a compilation; its chief merit being that it gives, in an easily accessible form, descriptions and figures which were scattered through many works. There is, however, some original matter. This consists of notes respecting various Californian species, which were studied by the author while serving in the capacity of chief executive horticultural officer of that state. The insects are discussed under the head of the plants they infest. The descriptions are written in a clear and popular style; but in some cases they are too brief, and in others they bear the marks of hasty compilation. A peculiar and excellent feature of the work is the bringing-together into one part descriptions of all the remedies suggested. These are referred to throughout the work by numbers. In this way unnecessary repetition is avoided. In the introduction a history of the legislation to prevent the spread of injurious insects in California is given. The work is profusely illustrated; but the good figures are not new, the new ones are not good, and all are poorly printed. Still the book will be found to be a very useful one, especially to the fruit-growers of California.

Twelfth report of the state entomologist on the noxious and beneficial insects of the state of Illinois. First annual report of S. A. Forbes, for the year 1882. Springfield, Ill., 1883. 10+154 p., illustr. 8°.

In this work we have the results of the first half-year of Professor Forbes's administration as state entomologist. In studying the report we are deeply impressed, both by the amount that has been accomplished and by the thoroughness with which the work is being done. Several of the articles in the report have been published separately during the past year, and have been noticed already in these columns. Of the other articles, the notes of experiments in the destruction of the European cabbage-worm, the account of a new plant-louse infesting cucurbitaceous plants, and studies on the chinch-bug, are the most important. The observations on *Micrococcus insectorum* Burrill, a bacterium parasite of the chinch-bug, are especially interesting.

We are glad to see that Professor Forbes has adopted the plan of intrusting some of the more special investigations to his assistants, and publishing the results they have

obtained in their own words, over their own signatures. One can hardly over-estimate the value of the added enthusiasm which assistants will bring to their work under this method. Not only will they do more work, but it will be of a much higher quality; and the office in which they are engaged will be able at an early day to command the services of a corps of specialists instead of mere day-laborers. At the same time a large part of the work of each individual in an office of this kind must be merged into what shall go out as the work of the office. And it is not the assistants alone who suffer from this; for the chief must devote much attention to executive duties, which shorten greatly his time for study.

In this report there are two papers by Professor Forbes's assistants. The first is an important article on the gall-mites, by Mr. H. Garman. It deals with the general characteristics of structure and habits of the Phytophaga, and includes descriptions of seven new species, and the cecidii of several species for which names are not proposed. Previous to this, but three species have been indicated by name in the United States. The second paper

is by Mr. F. M. Webster, and is an excellent account of the angoumois grain-moth and its parasites. There is also an account by Prof. T. J. Burrill, of the habits of *Agrilus granulatus*, which he has found to be a destructive borer of the Lombardy poplar.

First annual report on the injurious and other insects of the state of New York. By J. A. LINTNER, state entomologist. Albany, 1882. Senate doc. No. 93. (Issued October, 1883.) 381 p., 84 cuts. 8°.

AFTER an interval of eleven years, we are again favored with a report of a state entomologist of New York. This first report by Mr. Lintner is a large one, and evidently represents a great amount of work. The first eighty pages are devoted to a history of American economic entomology, and a discussion of the more important insecticides now in use. Then follow accounts of thirty species of insects. Of especial interest among these are those of *Polype laricis*, *Crambus vulgivagellus*, and some species of *Anthomyiidae*. In an appendix there is a very complete account of the writings of Dr. Fitch.

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

GOVERNMENT ORGANIZATIONS.

Geological survey.

Paleontology.—During the field-season of 1883, Prof. W. W. Fontaine was detailed to collect and study fossil plants in Virginia. Late in July he began an examination of the tertiary strata in the vicinity of Richmond. Throughout the remainder of the season his field-work was continued on the mesozoic and tertiary of eastern Virginia, after which he was occupied in the preparation of drawings of the specimens collected.

Prof. L. C. Johnson, who has been working in the South Atlantic district, principally in Alabama, has returned to Washington after a most successful season. He is now engaged in unpacking and arranging the large collections that he secured during the summer and autumn. Several barrelsful of material from the Claiborne group in Alabama were obtained; and the sorting of the extremely interesting collection included in them has kept him busy since his return from the field.

Mr. J. B. Marcou (assistant to Dr. C. A. White, in charge of the department of mesozoic paleontology) reports that a collection of very interesting fossils has been sent to the National museum from Skonum Point, British Columbia, by Mr. James G. Swan of Port Townsend, W. T. These fossils are being examined by Mr. Marcou, who says some of them are

new, and that others are evidently identical with specimens from the coal-bearing rocks of Queen Charlotte Island, described for the Canada geological survey by Dr. J. F. Whiteaves in his 'Mesozoic fossils of Queen Charlotte Island.' Mr. Marcou says that the collection presents quite an oolitic facies.

Miscellaneous.—Mr. F. M. Pearson, topographer, who has been working in eastern Tennessee, says that the waste of valuable timber in that region, which has only recently ceased, is almost inconceivable. The finest specimens of walnut and cherry timber are found, and are used by the inhabitants for fence-rails, fire-wood, and other wasteful purposes. Since the survey has been working in the country, it has been instrumental in working a change in this respect, and the people are beginning to appreciate the value of their timber resources. Another result is, that the mineral resources are becoming known, and investments both in timber and in mineral properties are now being made where but a short time ago they would have been considered unprofitable.

Dr. Thomas M. Chatard of Baltimore has been appointed assistant chemist on the survey, and will be in the laboratory at Washington with Prof. F. W. Clarke.

Educational rock suites.—The survey proposes to collect suites of about one hundred representative rocks, to be used in teaching the elements of lithology. Two hundred specimens of each kind of rock will be