of the delta. These facts are the property of the public, which has not failed to appreciate the heroic qualities exhibited, nor to observe that the disastrous result of this unfortunate expedition offers in great part its own explanation. If it teach the aspiring that mere uninstructed courage cannot take the place of science, De Long and his people will not have died in vain. That this lesson should be especially emphasized, from recent events in another part of the arctic regions, will occur to most of our readers. Perhaps it would be well to permit future candidates for such work to convince themselves by trial, that the most exalted bravery will not enable the inexperienced to milk a fractious cow; and that, if so simple a matter requires knowledge and experience, it may be well to hesitate before assuming the fearful responsibility of hazarding the lives of even willing subordinates, without reasonable preparation for the problems offered by all serious arctic work, whether of exploration or retreat. Tenderness toward the dead should not be for an instant permitted to befog this self-evident truth, the statement of which is a duty owed, not merely to those who may hereafter attempt arctic exploration, but on behalf of scientific training everywhere.

STEP'S PLANT-LIFE.

Plant-life: popular papers on the phenomena of botany. By Edward Step. With 148 illustrations drawn by the author, and engraved by W. M. R. Quick. New York, *Holt & Co.*, 1883. 12+218 p. 12°.

Year by year there is what may be termed a noticeable amelioration in the character of the botanical literature which appears in this country. By this we mean no discourtesy to the authors of the many excellent works which have appeared from time to time. In certain scientific lines, the botanical literature of the United States has been both voluminous and of a high order of excellence. In systematic botany, the publications of Torrey, Gray, Eaton, and Watson (to mention only a few of the later workers) have not been excelled anywhere. We may justly feel a national pride in such magnificent books as the two volumes of the Botany of California, the Botany of the Clarence King reports and of the Wheeler reports, the Ferns of North America, etc. Then, too, our school and college books have been worthy of their authors. What country was ever supplied with better field-manuals than Gray's or Wood's? and where can one find as good a treatise on the morphology of the phanerogams as Dr. Gray has given us in the latest edition of his Structural botany?

All these, however, are for students and botanists proper. They were not designed for the general reader, — the man who does not take botany in such dreadful earnest as do the botanists, but who asks of the gentle science that it shall please and amuse him. Our scientific botanists have been too busy with the serious matter of instructing their classes of young people in school and college, to turn aside and furnish entertaining reading for the unbotanical. We can scarcely blame them for thus neglecting the great outside world, when the small world of the classroom required all their time and strength; and yet we cannot help feeling that it would have been better for the botanists, as well as for botany itself, had they compelled themselves to find time for those lighter works which have, in other countries, been at once the recreation of the scientific man and the pleasure of the general reader.

In the work before us we have an example of what may be done in the way of putting the main facts of biological botany before the unbotanical in plain and easy English, and in such a way as to be attractive and interesting. We wish its English author were an American; but, that being an impossibility, it is most gratifying that the Messrs. Holt have brought out so neat an American edition.

It is, of course, to be expected that there is nothing new botanically in such a book; so that those who are fairly well equipped with a knowledge of recent botanical literature need not take it up in the hope of gleaning any new facts. It is only what its titlepage indicates, — an aggregation of popular papers on some of the phenomena of botany. They are not profound, nor are they so arranged as to present themselves as a series of connected lessons. They are rather like lightly drawn sketches, — now of this interesting view of a portion of the plant-world, and now of that. Thus we have a chapter on microscopic plants, another on plant structure and growth, one on the fertilization of flowers, followed by others on predatory plants, remarkable flowers and leaves, and about a fern. Then we have the folk-lore of plants, plants and animals, mosses and lichens, etc. So the chapters (fourteen in all) run on through the book, there being a delightful alternation of the structural with those which deal with sentimental or poetical considerations.

Considering the nature of the book, the errors are remarkably few. Here and there,

however, are statements which ought to be changed in a second edition. The Zygnemae are erroneously described as producing zoospores (p. 5), — a statement true enough of their relatives the Confervae, but not of any of the Zygnemae. Of roots it is said positively (in italics, p. 29) that 'they are never green,' which, to say the least, is a strong statement. On p. 34 we find that "in some plants the calyx or corolla is entirely wanting, in which case the floral covering is called the *perianth*," which is certainly not in accordance with ordinary usage. On the same page the stigma is curiously described as 'the surface of the style.' The Equiseta are not leafless, as they are said to be on p. 164. Their leaves are small, it is true; but certainly the whorls of united leaves at each joint are evident enough to even the casual observer. The formation of the zygospore in Mucor is not correctly given on p. 184, where it is described as resulting from the union of two aerial hyphae. On p. 192, in describing the fly fungus, the reader is given the impression that a mycelium upon a surface (as a window-pane) attacks its hapless victim, the fly, which, when dead, is said to be "standing upon a mat of delicate silk threads spread upon the glass."

Fig. 21 (repeated in fig. 143) is erroneous in showing the hyphae of the potato fungus to be septated. Fig. 104 is said to show the antheridia of a moss; but certainly no such organs are visible in the cut given.

In spite of the slips noted above, and others which we may well pass over, the little book is a pleasant one to read, and we feel sure that it will receive a hearty welcome from plant-lovers everywhere.

WEEKLY SUMMARY OF THE PROGRESS OF SCIENCE.

ASTRONOMY.

Saturn's rings. — Encke's division in the outer ring of Saturn has been examined by M. Schiaparelli, who finds that the position and lack of symmetry are the same as previously noticed, but the line is broader, and more diffused than in 1881. He thinks the phenomenon is variable, and accounts for it by supposing the middle of the ring to be thinner, and by the change of orbit of the particles composing it. He also examined carefully the region about the inner bright ring and the dark ring. At times O. Struve's division was seen very distinctly, and on other occasions very faintly. More observations are necessary to determine whether the phenomenon is variable. — (*Observ.*, Aug.; *Astr. nachr.*, 2,521.) M. MCN. [289

The great comet of 1882. — Mr. Maxwell Hall shows the possible identity of the great comet of 1882, the comets of 1880, 1843, and 1668, with a comet which appeared B.C. 370, and which was said to have separated into two parts. The orbits of all are nearly identical. Taking a period not greatly different from that given by Prof. Frisby for the comet of 1882, he identifies the comets of B.C. 370 and A.D. 1843 with one which was seen in 1106. No comet is recorded for A.D. 368. The comets of 1880 and 1882 may possibly be identical with two which appeared in 1131 and 1132, and with the second part of the comet of B.C. 370. If this is the case, this comet also probably separated into two parts at its unrecorded appearance in A.D. 381 or 382. We already have an instance of this separation in Biela's comet; and the comet of 1882 gave evidence, to a certain extent, that a process of disintegration was going on. — (*Observ.*, Aug.) M. MCN. [290

PHYSICS.

Electricity.

Atmospheric electricity. — Dr. L. J. Blake has found that no convection of electricity takes place by the rising vapor from a charged liquid surface, to which he gave a potential due to from four to five hundred Daniells cells. The plate placed in the track of the vapors was, in the different experiments, either colder than the vapor, or of the same temperature. By connecting the liquid with the electrometer, he finds a small negative charge, increasing during the fifteen minutes which each experiment lasted, but not sufficiently to justify the statement that electricity is generated by evaporation. In all the work, the lamp was removed before connecting with the electrometer; and the whole apparatus was within a metallic covering connected with the earth. Distilled water, sea-water from the North Sea, alcohol, dilute sulphuric acid, mercury, and solutions of a number of different salts, were tried. — (*Ann. phys. chem.*, xix. 518.) [291

ENGINEERING.

A new current-meter. — Mr. L. d'Auria proposes an apparatus for determining the mean velocity at any vertical in a stream, which apparatus consists of a scow, or pontoon, to be moored in the desired place; a pole with a pulley near each end, carrying an endless cord; a light ball; and a species of net, or grillage. The pole is thrust to the bottom alongside the scow, at the point where the velocity is to be gauged; and the ball is lightly attached to the cord by a string, so as to be disengaged by a moderate pull when it reaches the pulley at the bottom. The time of the disengaging pull is noted, and also the time of the appearance of the ball at the surface. As the