

gives a valuable summary of the explorations and surveys made in 1895, and the museum and other work carried on under his direction. The separate reports contained in the volume are as follows:—

“The Country between Athabasca Lake and Churchill River,” by J. Burr Tyrrell and D. B. Dowling.

“The Geology of a Portion of the Laurentian Area lying to the North of the Island of Montreal,” by Frank D. Adams.

“Explorations in the Labrador Peninsula, along the East Main, Koksoak, Hamilton, Manicouagan, and portions of other Rivers, in 1892-93-94-95,” by A. P. Low.

“Report of the Section of Chemistry and Mineralogy,” by G. C. Hoffman.

“Report of the Section of Mineral Statistics and Mines,” by E. D. Ingall.

These reports are published separately, and several of them have already been referred to in our columns of “Notes.”

A Bibliography of Science. By William Swan Sonnenschein. (London: Swan Sonnenschein and Co., Ltd., 1897.)

THIS classified list of scientific books, extracted from two useful bibliographies prepared by the author a few years ago, will be valuable to readers who are outside the living stream of scientific thought. It is in no sense complete, and it does not pretend to be so; nevertheless, it will serve a useful purpose. Some of the remarks of the editor may be resented by the authors of the books referred to. Thus, one book is described as “a somewhat slovenly and unscientific performance” (p. 384). If the criticism is a just one, the title of the book might have been omitted.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Zeeman's Phenomenon.

IN Section A at the Toronto meeting of the British Association, Dr. Lodge raised the question as to whether we should expect on a simple theory that the spectral lines should be simply widened or be doubled by magnetic force. The simple theory depends on the acceleration or retardation of electrons performing circular orbits under the action of a magnetic force normal to the plane of the orbit. If the plane of the orbit be not normal to the magnetic force, it might appear that the acceleration or retardation would be only that due to the component of the force normal to the plane of the orbit. From this it would follow that the lines would be *widened* and not *doubled*, because every intermediate acceleration or retardation would occur between the extreme cases of orbits perpendicular to the magnetic force. This suggested theory, however, overlooks the effect of the magnetic force in altering plane of the orbit. The complete theory can be very much more simply obtained by another method of attack. The motions being assumed simply periodic in the undisturbed motion, can be resolved for each electron into three linear vibrations, two at right angles to the magnetic force and one parallel to it. This latter is undisturbed and gives no light in the direction of the magnetic force. Each of the other linear vibrations is disturbed, and we can easily see how by considering that a linear vibration may be considered as due to two circularly polarised vibrations. Each of these component circular vibrations will be altered by the magnetic force normal to its plane, one being simply accelerated and the other retarded. We can consequently see that this more complete theory leads to the conclusion that the lines would be *doubled* and not *widened*, though, of course, they may be also widened owing to other disturbances of the motion. There would be no difficulty in writing down the equations of the resulting motion

of the electron, but it seems hardly necessary to do so, as this geometrical analysis leads to the kind of vibration emitted, which is all that we can observe.

GEO. FRAS. FITZGERALD.
Fort William, Ontario, August 28.

Coccoliths in our Coastal Waters.

ALTHOUGH much has been written about the problematical coccoliths, the presence of these bodies in our coastal waters does not appear to have been recorded. Our observations on the minute marine organisms off this coast (South County Dublin) show that they abound both near the shore and outwards to the limits we have hitherto investigated—some three miles into the Irish Channel.

The following preliminary account of their mode of occurrence, and some features of their structure may be of interest.

Our first finds were effected by means of a cone-shaped, metal, surface dredge; the wide end guarded with wire gauze—about fifty meshes to the linear inch—and the narrow truncated end closed with fine brass gauze, having about 350 meshes to the linear inch. The dredge is floated horizontally by pine-wood wings, and when in operation is trailed behind a boat, the wide end forwards. At intervals the dredge is lifted, the finer gauze removed and washed in a little sea water.

Examination of the fine particles so gathered reveals many varieties of foraminifera, diatoms, a great abundance of peridinae, sponge spicules, &c., and an amœboid body resembling

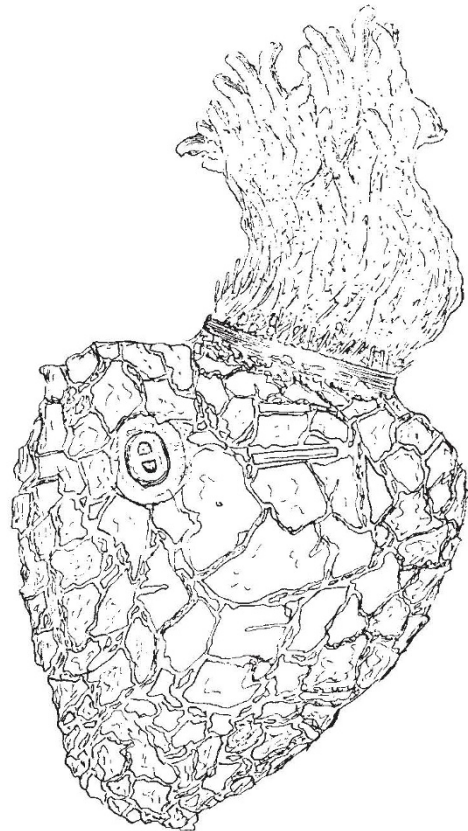


FIG. 1.—*Diffugia*, sp. (?), bearing a Coccolith $\times 900$ diams.

Diffugia pyriformis in appearance. This last body, magnified about 900 diameters, is shown in Fig. 1. The drawing shows the organism as freshly dredged and extending finger-shaped pseudopodia from the open collar, which terminates one extremity of its urn-shaped case. Most usually it is observed with the pseudopodia retracted.

The case enclosing the protoplasm is composed of minute grains of quartz sand (resist acids and alkalis), adhering in random fashion to the protoplasmic contents within. Also there will be seen in the figure (which is from a camera-lucida drawing) one small oval body, occurring among the sand grains.