

May 11, 1876.

Dr. GÜNTHER, M.A., Vice-President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read :—

- I. "On some Thallophytes parasitic within recent Madreporaria." By P. M. DUNCAN, M.B., F.R.S., President of the Geological Society. Received March 17, 1876.

(Abstract.)

After noticing the works of Quekett, J. P. Rose, Wedl, and Kölliker on the filament-shaped parasites within recent and fossil molluscan shells and scales, and his own researches into and descriptions of corresponding growths in Madreporaria from the Silurian and Tertiary rocks, the author proceeds to explain the method of investigation employed in the examination of recent corals. The range of the parasites is then stated to be, in corals from the littoral zone down to 1095 fathoms, and from Davis Straits to the tropical coral seas, and their lowest known temperature habitat is that of 31°·5 Fahr.

A list of species examined is given, and then the long slender canals with their included filamentous organisms are described. Then the method of entry of the growth is stated, and its relation to the organic basis of the coral sclerenchyma is explained. The reproduction by conidia and oospores is also explained. After noticing that the direction, branching, and size of the parasites depend upon the special peculiarities

tion of the brain anodic closure is more effective than cathodic. This, of course, is precisely the reverse of what I find to be true of muscle; and as the fact of such a difference existing between the two cases is very remarkable, I may observe that it appears to confirm Hitzig's views concerning the reversed relations that subsist between central and peripheral galvanic stimulation.

I may also observe that I have repeatedly tried whether there is any difference to be detected between anodic and cathodic closure in the case of motor nerves, but hitherto without success. Yet, as it seemed to me very improbable that there should be any difference between nerve and muscle in this respect, I had intended to investigate the matter still further before publishing any thing with regard to nerve. I now find, however, that Hitzig's results with regard to brain had induced Engesser (Pflüg. Arch. x. p. 157 &c.) carefully to investigate the question with regard to motor nerves; and the conclusion he arrives at is that no difference can in their case be detected between the effects of anodic and of cathodic closure. Therefore, as this result agrees with my own, it seems desirable that I should here acknowledge the agreement. No one, so far as I am ascertain, has as yet published any thing in this connexion with regard to muscle.—G. J. R., May 5th, 1876.

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of certain corals, the author discusses the classificatory position of the vegetable form. Naming it *Achlya penetrans*, he suggests that it belongs to a group whose life-cycle is complicated by marine and subaerial conditions, and infers that *Achlya*, *Saprolegnia*, *Botrytis*, *Peronospora*, *Empusina*, and possibly *Bryopsis* are so many names of the same organism under these different conditions. Believing in the necessity of an arbitrary name, he prefers that of *Achlya*. Finally an instance of a parasite resembling what is called *Saprolegnia ferax*, Ktz., in a littoral coral is given.

II. "On the Calculation of the Trajectories of Shot." By W. D. NIVEN, M.A., F.R.A.S. Communicated by J. CLERK MAXWELL, F.R.S., Professor of Experimental Physics in the University of Cambridge. Received March 24, 1876.

(Abstract.)

The solution of the equations of motion of a shot is necessarily approximate, because the resistance cannot be expressed by a single exact formula, and, moreover, there are very few formulæ which are capable of affording an easy solution. The results which Hutton obtained by means of the ballistic pendulum were exhibited in the shape of a simple formula; and in like manner Piobert and Didion, who also used the ballistic pendulum, reduced their results, and were able to give simple formulæ. No one can doubt, however, that, in point of accuracy and extent of information, their results are inferior to those which Mr. Bashforth obtained by means of his chronograph and screens. Now the formulæ which Hutton and Didion gave apply only to spherical shot; and even for that kind of shot they do not agree with Mr. Bashforth's results except for a limited range of velocities. Mr. Bashforth makes no attempt to formulate his results, but produces them in the shape of two Tables, one for spherical shot, the other for cylindrical. The nature of the reductions of his experiments, and the fortunate circumstance that for a large range of values of the velocity the resistance varies nearly as the cube of the velocity, render it convenient to express the resistance in the form μv^3 , where v is the velocity and μ a variable coefficient. In fact, if d is the diameter of the cross section of the shot in inches, and W its weight in lbs., the retardation due to resistance is

$$\frac{d^2}{W} K \left(\frac{v}{1000} \right)^3,$$

where K is a number which is tabulated for every 10 feet of velocity. The question, then, is to solve the problem of the motion of a shot in conjunction and agreement with the Tables for K . The problem is a very important one, not only to the gunner but the gun-maker, there being many practical questions, for example, connected with the dimen-