

thus be of some interest from the phylogenetic point of view and may throw more light on the alternation of generations, which in ferns is of such a stable and characteristic type.

Only a small number of sporangia with spermatozooids have been found among the usual sporangia with spores. Both occur in the same sorus and are equally well developed as to stalk, wall, sequence of divisions, etc. The only difference is that about sixty (in one case possibly only thirty-two) spermatozooids develop instead of the sixty-four spores. In

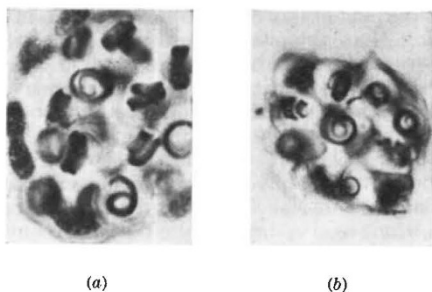


FIG. 2. Photomicrographs of spermatozooids in (a) sporangium, (b) antheridium.  $\times 4200$ .

one instance, spermatozooids were almost certainly formed when the cells were still joined in tetrads.

These exceptional sporangia have now been observed in fixed material of four normal, fully fertile hybrids between the so-called 'peculiar' and the normal type of *Scolopendrium vulgare*<sup>1</sup>. It is probable that the phenomenon has something to do with the curious life-cycle of the 'peculiar' type.

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<sup>1</sup> Andersson-Kottö, I., *Svensk Bot. Tidskr.*, 26, Hft. 1-2; 1932.

### Lunar Periodicity in Reproduction

IN view of the recent correspondence in NATURE<sup>1</sup> bearing on the question of reproductive periodicity in organisms, I should like to direct attention to some observations made by Miss S. M. Marshall and myself in Australia in 1928-29, which appear to indicate a type of such periodicity not previously recorded. In shallow pools on the Low Isles coral reef, one of the common corals is the branched species *Pocillopora bulbosa*. On some occasions, collections of branches of this coral will give off large numbers of planulae; at other times, large collections of branches will give off no planulae at all. During the period August 1928 to July 1929, about eighty collections of branches were made, representing hundreds of colonies. When the results of these collections were plotted, it was found that the production of planulae was discontinuous, periods of production alternating with periods of no production. In the months December to April the productive periods occurred at about the time of new moon; in July and August at about the time of full moon; and in May and June a transition period was demonstrable from new moon to full.

I do not wish to emphasise this result too much, since the number of data is smaller than is desirable;

but I am doubtful if it is possible to escape the conclusion that this coral breeds at Low Isles at about the time of new moon during part of the year, changing over to full moon for another part. There was a coincidence (but quite possibly no causal connexion) between this cycle and the behaviour of the tides, the lowest springs occurring during the winter months (May to October) at new moon and in daytime; during summer at full moon and at night.

If this interpretation of the records is correct, a change-over of the type described introduces yet another complication into the already difficult problem of finding any general explanation of the facts of lunar periodicity. A full account of the evidence here mentioned, together with information about the breeding of other corals and reef-animals, will be found in forthcoming reports of the Great Barrier Reef Expedition of 1928-29 (British Museum, Nat. History), vol. III, No. 8, and a subsequent report not as yet complete.

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<sup>1</sup> NATURE, 129, pp. 344, 473, 543, 612, 655, 868, 906; 1932. 130, pp. 23, 169, 243, 366; 1932.

### "The Case against Einstein"

NOTHING is more difficult than with good grace to protest against an unfavourable review of one's work, but again nothing is more characteristic of mawkish sentiment than to refrain on that account from asserting a point of interest to science.

In "The Case Against Einstein" I dealt with a phase of scientific thought that has received immense publicity, and that, if valid, would give for all time its own direction to physical research and mathematical investigations. This theory I have criticised in a close and minute discussion of the crucial questions in the psychological, physical, and mathematical domains, and I have advanced arguments which, true or false, are there expressed in lucidity and in rigorous form. If my reasoning is false, I have done nothing at all; if true, I have demolished the whole system of relativity and removed an incubus from the minds of students of physics all over the world. Incidentally, I have also indicated new forms of analysis which, applying to all sciences, have a direct bearing on this subject.

To this aspect of the exposition the reviewer of my book in NATURE of February 25, p. 260, has paid no attention whatever; he has devoted the very short notice accorded the book to a complaint against the "emotional" style of my writing. The emotion, consisting mainly of laughter, was directed against the tendency which I believe to prevail, even in high scientific circles, of judging a work of science, not on its intrinsic value in regard to science, but by influences, moral or immoral, which have nothing to do with the scientific merit. The "emotional" part of my book was necessary to combat the enormous popular prestige that Einstein's doctrine has acquired, so as to enable me then to focus on the essential issues involved.

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