to be extended during next summer, and we shall probably soon have the satisfaction of knowing whether our climate is suitable to its tastes. If so, it will probably obey the mandate of increasing and multiplying; but its tendency will be towards deplenishing rather than replenishing the earth. The prospect is not exactly nice, but we may take some comfort from Prof. Riley's expressed opinion that the Hessian fly will not prove a very serious plague to British agriculturists.

Downton, December 10. JOHN WRIGHTSON.

THE REPRODUCTIVE ORGANS OF ALCYONIDIUM GELATINOSUM.

IN some specimens of the Polyzoon *Alcyonidium gelatinosum* dredged last summer, I noticed that the colony, in place of being nearly homogeneous in colour and semi-translucent, as is usually the case, had a blotched appearance, caused by the presence of a number of small rounded spots of an opaque grayish-white or pale yellow colour. These average about 0·5 mm. in diameter, and are scattered irregularly through the colony. On teasing up a small part in sea-water, and on making a few rough sections of the living colony, I found that the opaque spots were cavities filled with fully developed active spermatozoa. No ova were visible in the polypides of any of the parts examined, so these colonies were evidently in the condition of sexually mature males. It at once occurred to me that this species of *Alcyonidium* might be unisexual—some colonies male and others female—the males being distinguishable when mature by their spotted appearance. The specimens were preserved for future examination.

On returning to Liverpool, and looking up the literature of the subject, I find that Hincks states ("British Marine Polyzoa," introduction, p. lxxxvi.)that "*Alcyonidium gelatinosum*, according to Kölliker, is unisexual," and I gather from the context that it is the individual polypides that are unisexual, and not the whole colony. Hincks, however, does not give a reference to any paper by Kölliker, and I have not been able to find in the literature of the Polyzoa, or in the bibliographies I have consulted, any paper of Kölliker's which would be likely to contain observations on the reproduction of *Alcyonidium*; therefore I am still uncertain how far Kölliker's remark is intended to apply—to the whole colony, or only to the individual polypides. I know of no other investigations on the subject.

I have now examined a number of thin sections, of both the spotted colonies (including the one formerly dissected) and the usual translucent ones, and I find:—

(1) In the spotted colonies there are a number of greatly distended polypides, with their cœloms filled with fully developed spermatozoa. There are also a few ordinary large, but not distended, polypides, containing each a few young ova.

(2) In the ordinary clear colonies there are neither ova nor spermatozoa to be found.

It is evident, then, that the *colony* is hermaphrodite, whatever the polypide may be. But it is also evident that the spotted colonies are virtually males. Their spermatozoa are fully developed, while their ova are still quite immature. Probably, then, *Alcyonidium gelatinosum* is, like many of the Compound Ascidians, an hermaphrodite in which the reproductive systems arrive at maturity at different times in the life-history. Most of the Compound Ascidians in which I have found this the case are proterogynous (the female organs maturing first), but *Alcyonidium gelatinosum* appears to be proterandrous. If the polypides are unisexual, then the proterandry refers only to the colony as a whole, but it is possible that each polypide may be a proterandrous hermaphrodite, developing ova after it has got rid of the spermatozoa. I hope to investigate this matter further by keeping some colonies alive at the Puffin Island Biological Station, and examining their condition from time to time.

In *Alcyonidium gelatinosum* both the ova and the spermatozoa occur in ordinary polypides, and not, as Hincks states is the case in the closely related species *A. mytili*, in "gonœcia" (cells containing no polypides). In my sections the alimentary canal and tentacles are found cut across here and there in the masses of spermatozoa. The large cavities containing the spermatozoa are evidently ordinary polypides, with the cœlom greatly distended.

W. A. HERDMAN.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 15.—"Note on the Development of Feeble Currents by purely Physical Action, and on the Oxidation under Voltaic Influences of Metals not ordinarily regarded as spontaneously oxidizable." By Dr. C. R. Alder Wright, F.R.S., and C. Thompson, F.C.S.

The authors have noticed that if two or more different kinds of aëration plates be set up on the surface of the fluid contained in a shallow basin in which the oxidizable metal is immersed, and sufficient time be allowed to elapse to enable the films of air attracted to the aëration plates to attain a condition of equilibrium, different constant values are usually obtained for the E.M.F.'s generated by opposing to the oxidizable metal first one and then the other of any given pair of aëration plates, the currents generated being rendered throughout of too small density for "running down" to take place during the observations by interposing a large resistance in the circuit. If when this state of constancy has been attained the two aëration plates be opposed to each other with a considerable resistance in circuit, a current passes from the one giving the higher value when opposed to the oxidizable plate through the external circuit to the other; this current at first is of such magnitude as to correspond exactly with the E.M.F. due to the difference between the E.M.F.'s exhibited when the two plates respectively are opposed to the oxidizable metal; but after some time it gradually diminishes; even after several days, or even weeks, however, it is usually still measurable; and if a miniature silver voltameter be included in the circuit, in many cases an appreciable amount of crystalline silver is found to be slowly deposited on the negative electrode of the voltameter, which may conveniently be a thin gold wire immersed to a depth of a few millimetres in silver-nitrate solution, a silver plate or wire forming the positive electrode. Various experiments are described in illustration.

It is obvious that during the passage of a current the dilute sulphuric acid between the two plates must be electrolysed, so that hydrogen would tend to be liberated on the surface of the plate acquiring the higher potential, and oxygen on that of the other; the hydrogen whilst nascent would necessarily be more or less completely oxidized to water by the oxygen of the film of condensed air; so that on the whole the net chemical action in the cell itself would be either *nil* (if all hydrogen were so re-oxidized) or one *absorbing* heat (if some of the hydrogen escaped oxidation). The oxygen slowly evolved would escape as such, being dissolved by the surrounding fluid. The effect of this should accordingly be that the efficiency of the air-film on the first plate would be more or less depreciated, and that on the second exalted; in point of fact, if the two aëration plates in such an arrangement which has been generating a current for some time be (by means of an appropriate switch) disconnected from one another and successively opposed to a given oxidizable plate, the one does give a considerably lower and the other usually an appreciably higher value than the constant ones previously obtained (before the two aëration plates were directly opposed to one another) on opposing each severally to the oxidizable metal; whilst on allowing the cell to stand for some time generating no current, the lower value gradually rises and the raised one falls until sensibly the old constant values are again obtained.

When *silver* plates are used in conjunction with a fluid capable of dissolving silver oxide (such as dilute sulphuric or acetic acid or ammonia solution), distinctly larger amounts of current are usually developed than with platinum or gold plates, and simultaneously silver passes into solution, the plate acquiring the lower potential diminishing in weight, and, in short, behaving precisely as though it were an oxidizable metal, such as zinc or copper. Obviously this is due to the circumstance that with silver the ion liberated attacks the metal of the plate acquiring the lower potential; but the remarkable part of the action is that this attack is only partial, so that the amount of silver dissolved is invariably *less than that equivalent to the current passing, i.e.* less than that deposited in a silver voltameter included in the circuit.

Various illustrative experiments are described which show that the difference between the silver dissolved and that deposited by the current is relatively much larger with the weakest currents.

It is obvious that if silver will dissolve in acids, &c., under the comparatively feeble oxidizing influence of an aëration plate,