not to make use of materials hardened in alcohol; under such conditions, in fact, it becomes difficult to distinguish the protoplasm from the nucleus. In certain cases, at any rate, I think I may ascribe the mistakes of some authors to the use of materials hardened in alcohol. Treatment with hypochlorite of soda in very dilute solution has furnished good results.

To sum up: the antherozoids of the Hepaticæ are formed at the same time by the nucleus and the protoplasm of the mother-cell. The body of the antherozoid, therefore, not corresponding solely to the nucleus of the mother-cell, but to the nucleus and protoplasm together, there is not only a change of form of the elements of the cell, but there is at the same time a change of properties and of structure. The body of the antherozoid, which is more refractive and more homogeneous than the protoplasm or the nucleus, is also more difficult to stain with reagents, especially at the commencement of its formation. A complete transformation of the elements of the cell has taken place; we may therefore say that in becoming converted into an antherozoid the mother-cell has undergone a total renovation.—*Comptes Rendus*, March 19, 1888, p. 876.

On the Gemmules of some Marine Siliceous Sponges.
By M. E. Topsent.

As in the Spongillæ, multiplication by means of gemmules is observed in adddition to sexual reproduction in many siliceous sponges common on the shores of the Channel and belonging to different families, such as *Chalina oculata*, *C. gracilenta*, *Cliona vastifica*, and *Suberites ficus*.

The asexual germs which originate in the deeper parts of these various sponges consist essentially (1) of rather large elements, darkened by a great accumulation in their protoplasm of large shining granules, which conceal the cell-nucleus; and (2) of a keratode envelope. In none of the marine species here in question do the gemmules attain the same degree of complication as those of the Spongillæ; their envelope is not pierced by a foramen, and the spicules with which it is often armed are not special ones.

The gemmules of *Chalina oculata* are, however, still rather complex. They are developed in small numbers (not more than thirty) in the lower region of the hard and apparently lifeless peduncle of this branching sponge. Attached to the yellowish fibres of the skeleton they appear as ovoid bodies of a milk-white colour, three or four times the size of the gemmules of *Spongilla fluviatilis* for example. Their keratodic envelope is supported throughout its whole extent by acerate spicules arranged parallel to each other; further, some horny fibrils, also containing spicules, intercross in the middle of the internal cellular mass.

Bowerbank, without knowing it, had discovered these gemmules in a very short piece of peduncle which he took for a new sponge (Shetland Islands) and named *Diplodemia vesicula*. From the description of this species and its *ovaries*, O. Schmidt in 1870 thought he recognized a fragment or a young form of a Chalinean. Now it seems no longer doubtful that the unique *Diplodemia* is the broken foot of a *Chalina oculata*.

Chalina gracilenta spreads over stones and shells, and its gemmules, always in considerable number, become organized directly against its support; they are rounded, whitish, and generally measure hardly more than 0·25 millim. in diameter; they are found disseminated or pressed against each other, and in the latter case the envelope of each of them remains independent of that of its neighbours; here again the capsule is armed with spicules, but no skeletal production traverses the cavity of the corpuscle, its small dimensions rendering quite unnecessary the formation of an internal framework.

It is also in contact with the support, that is to say adherent to the walls of the perforated galleries, that the gemmules of *Cliona vastifica* are developed. They vary much in form and dimensions, but they are distinguished at the first glance by the bright red colour of their cells. They have only an incomplete envelope to separate them from the mass of the sponge; the calcareous substance, riddled with little pits, upon which they are moulded, protects them on the other side. The capsule contains no spicules in its substance, but in general it is lined with a layer of these organites arranged tangentially to the mass and parallel to each other; generally also a few spicules are found scattered in the interior cellular mass. The three kinds of spicules of the sponge may be combined in these various positions, or one of them may occur to the exclusion of the others. More rarely the gemmules are absolutely devoid of spicules.

Lastly, what Carter called "the ovigerous layer of *Suberites domuncula*" is by the last evidence a layer of true gemmules. We know the part contributed by the English author to the knowledge of the gemmules of the Spongillæ, and yet in his note (Ann. & Mag. Nat. Hist. 1883, xii. p. 30) he has not made the least allusion to these asexual germs.

The gemmules of *Suberites domuncula* (of the Mediterranean) and those of its near relative, *S. ficus* (of the Channel), have the same structure and occupy the same position. They are reduced to the essential elements, a capsule and cells. Always in juxtaposition, they cover with a continuous layer the shell or stone to which the sponge is attached.

Carter very well describes these reproductive bodies; but having observed that their capsule became thinner in contact with the support, he regarded them as ova incapable of development until such time as, this support being destroyed, it becomes possible for the embryo to make a passage through the thin portion of the envelope. It is true that from what he says he had observed our *Suberites ficus* only on 6th January, 1870, and 4th September, 1877, at periods when the gemmules in repose appeared to him like ova all in the same stage of development; now these germs are formed at the end of summer and emit their contents in the spring by rupture of their capsule; and if Carter had had the opportunity of examining *Suberites* in May and June, he would have seen the capsules in position, but empty, and ruptured on their convex side.

At present *Cliona vastifica* is the only known sponge of which the gemmules do not all arrive at maturity in the spring; they may be found all the year round in its lobes, even at the time when sexual reproduction takes place.—*Comptes Rendus*, April 30, 1888, p. 1298.