XXIV. *On the production and formation of pearls.* By Sir EVERARD HOME, *Bart. V. P. R. S.*

Read May 11, 1826.

FOR the last four years I have been engaged, with the aid of Mr. BAUER's microscopical observations, in examining the mode of generation of the fresh water muscle and oyster; illustrating the changes that occur by Mr. BAUER's drawings in the same manner as has been done with respect to the egg of the pullet, the frog, the earth worm and barnacle. But as it will require another season to complete this investigation, I am desirous of preceding it with an account of the formation of pearls; the discovery of which was made in the early parts of my enquiry into the mode of generation of the fresh water muscle.

I am the more desirous of laying before the Society these new facts respecting pearls at this moment, when the public mind is directed to the improvement of the pearl fishery, and therefore every thing respecting them will be received with greater interest than at any other time.

In examining the organs of generation of the large fresh water muscle, I very frequently met with what are called seed pearls; and these were always found in the ovarium, or connected with the shell on which the ovarium lay. I at the same time accidentally discovered that all oriental pearls that are split into two halves have a brilliant cell in the centre;

this, however, where the pearl has been bored is destroyed, and upon comparing the size of the central cell with that of one of the ova, it is exactly large enough to contain it. The ova themselves are formed upon pedicles, in the same manner as the yelks of the pullet's eggs; and must, when completely formed, have a similar mode of being discharged.

From these facts I have been led to conclude, that a pearl is formed upon the external surface of an ovum; which having been blighted, does not pass with the others into the oviduct, but remains attached to its pedicle in the ovarium, and in the following season receives a coat of nacre at the same time that the internal surface of the shell receives its annual supply.

This conclusion is verified by some pearls being spherical, others having a pyramidal form, from the pedicle having received a coat of nacre as well as the ovum.

The best mode of rendering the central cell conspicuous, is setting one half of a split pearl in a ring with the divided surface outwards, and looking at the cell through a magnifying glass.

Mr. BANKS, the optician, in the Strand, has succeeded in contriving an apparatus for this purpose, from which the annexed magnified drawing is taken.

It is the nacral shining lining of the central cell that produces the lustre peculiar to the pearl, which cannot be given to artificial ones.

Pearls being composed of concentric layers of nacre which are annual, must be of slow growth, and those of large size can only be found in full grown oysters.

I have engaged an intelligent person, who is on board one

of the ships employed in the pearl fishery, furnished with a diving bell, to attend to every thing connected with the present enquiry; and also to go down in the bell whenever it is used, paying attention to the objects that are seen, and noting the latitude and longitude, so that he may make the first beginning of a sketch of a map of the land under the sea.

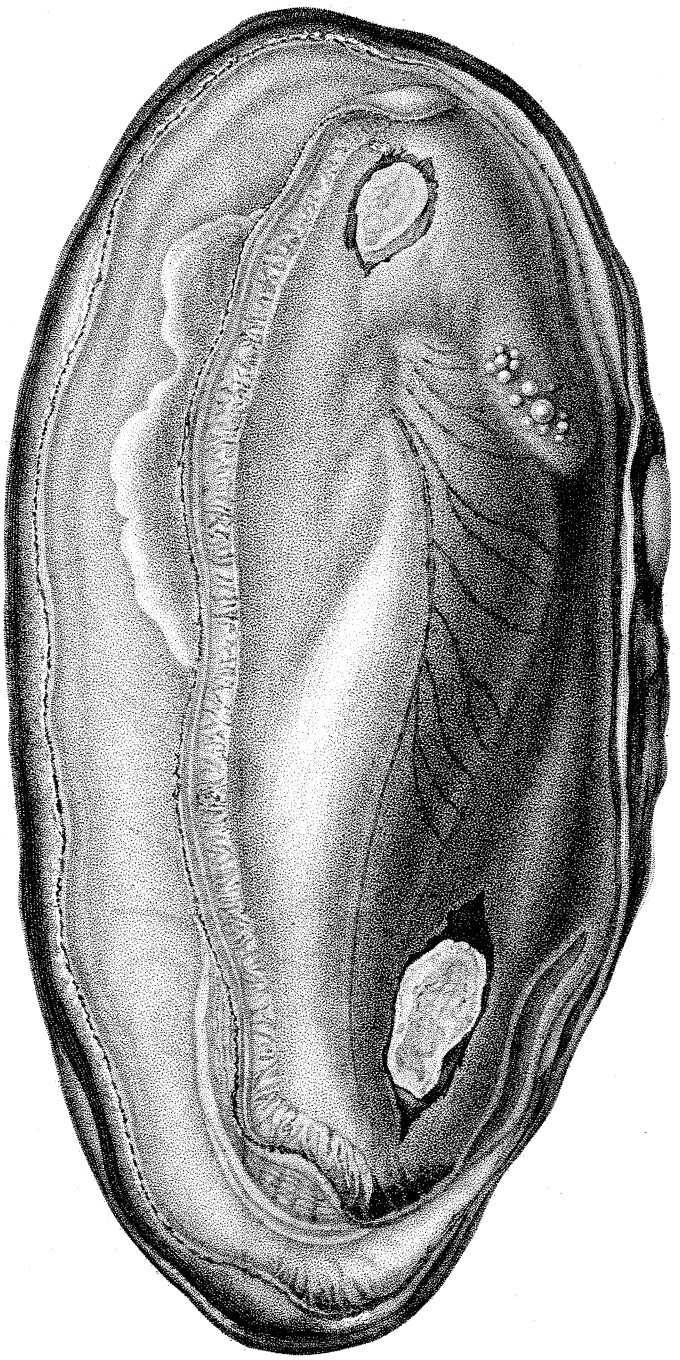
Upon stating to my friend, Mr. CHILDREN, of the British Museum, some of the above facts, he referred me to the ninth volume of the Philosophical Transactions for the following remarks, which accord in every thing with what I have stated.

Extract of a Letter from Hamburgh, by the learned CHRISTOPHORUS SANDIUS, *concerning the origin of pearls, Dec.* 1, 1673. *Translated into English.*

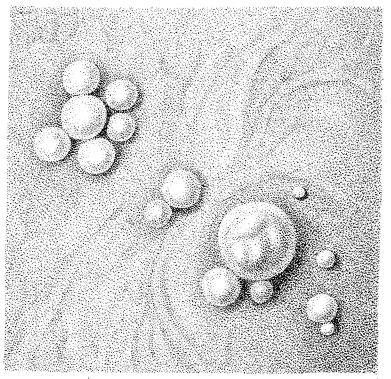
"The pearl shells in Norway do breed in sweet waters; their shells are like muscles, but larger. The fish is like an oyster, and it produceth a great cluster of eggs like those of crawfishes, some white, some black (which latter yet will become white, the outer black being taken off): these eggs when ripe are cast out; and being cast out, they grow and become like those that cast them: but sometimes it happens that one or two of these eggs stick fast to the sides of the matrix, and are not voided with the rest. These are fed by the oyster against her will, and they do grow according to the length of time into pearls of different bignesses, and imprint a mark both on the fish and the shell, by the situation conform to its figure."

In a second letter, Feb. 27th, 1674, in answer to one from

Fig. 1.

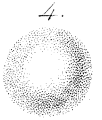


2.

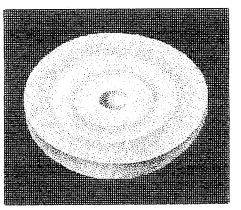


3.

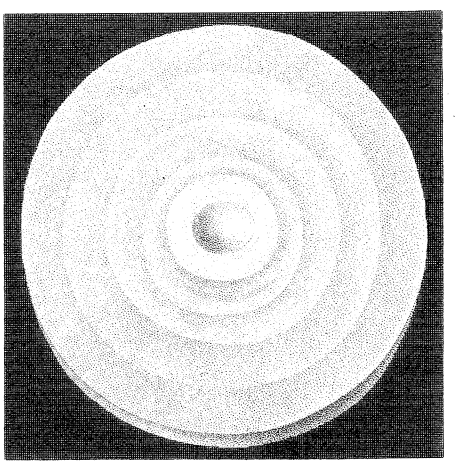
4.



5.



6.



Franz. Bauer del.

F. Basire sc.

the publisher, desiring to know the ground on which the author had made that assertion.

" As to the authority I have to assert such an origin of pearls, I here declare that a certain Dane, called HENRICUS ARNOLDI, an ingenious and veracious person, having by his own experience found it so in Christiana, in Norway, with great seriousness assured me of the truth thereof."

PLATE XIII.

No. 1. A fresh water muscle, one shell removed, of the natural size.

The lining, with its attachment to the shell on which it lies, also the loose fringe upon its edge.

A portion of the foot exposed between the linings of the two shells.

A portion of the oviduct also exposed.

The lining detached from the shell removed.

The two muscles cut through which united the shells.

A cluster of small pearls lying on the outer surface of the ovarium, close to the liver.

No. 2. The above pearls magnified three diameters, firmly attached to the membrane on which they lie.

No. 3. A pearl bursting the bag in which the ovum was formed; five diameters.

No. 4. A pearl escaped from the bag; five diameters.

No. 5. Section of No. 4; ten diameters.

No. 6. Section of oriental pearl; ten diameters.