

## 5. The ovarian ovum of *Lepidosiren* (Protopterus).

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Some incidental observations on the structure of the ovary and ova of *Ceratodus* and *Lepidosiren* are to be found in a recent memoir on the visceral anatomy of these two genera by Dr. Howard Ayers<sup>1</sup>. There are several figures of ova given in the plates and the author remarks that structurally the ovary resembles the same organ in the Amphibia; there is however no detailed description of the origin and maturation of the ovarian ova. Having had the opportunity of preserving the viscera of a specimen of the African *Lepidosiren* (*Protopterus*) which lived for some months in the Zoological Society's Gardens, I have been able to study the ova; the following notes are upon the more interesting results arrived at.

In ova of the first stage the contents of the ovum were almost uniformly protoplasmic; there was hardly any appearance of yolk formation; the peripheral region in the larger ova was hardened into a distinct membrane radiately striate. The follicular epithelium surrounding the ova is composed of a single layer of flattened, nucleated cells. The germinal vesicle is large with numerous minute nucleoli ranged round its periphery.

In the next stage the follicular epithelium has undergone a remarkable change; the cells from being comparatively small and flattened have increased enormously in size, and rest directly upon the yolk, which now occupies the whole extent of the ovum. There is no trace of any membrane dividing the ovum from its follicular cells; in certain cases even the boundaries of the latter were indistinguishable and their nuclei alone were visible forming a peripheral layer round the ovum; these appearances may represent the real state of affairs, but as the limiting membrane of the follicular cells was obvious enough in other specimens it is more probable that they are due to defective preparation. In the connective tissue sheath which surrounds the follicle were numerous blood capillaries gorged with blood; these capillaries were pressed down among the follicular cells and are evidently hypertrophied in relation to the formation of the yolk going on in the substance of the ovum. The follicular cells were filled with small round highly refracting bodies which are indistinguishable from the yolk spherules filling the ovum. In the interior of the ovum as already remarked were innumerable yolk particles of small size which were spread uniformly throughout it there being no distinction between the peripheral and central regions;

<sup>1</sup> Jenaische Zeitschr. 1885. p. 479.

throughout the yolk were numerous rounded cells with large distinct nuclei containing more deeply stained nucleoli; these cells were in most cases limited by a distinct membrane and contained refracting particles exactly similar to the yolk spherules. These cells could be observed in process of division; some were evidently degenerating having lost the refracting particles in their interior; the nucleus of such cells was usually pale in colour (less deeply stained) and of a homogeneous appearance without any deeply stained granules in its interior; this seems to me also to be a sign of degeneration of the cell. These cellular structures in the interior of the ovum cannot be confounded with the white yolk spherules of birds<sup>2</sup> in as much as they are furnished with a clearly defined nucleus and a distinct limiting membrane. In every respect they resemble the follicular cells and the only conclusion I can come to is that they are derived from the follicular epithelium. The contents of these cells like the contents of the follicular cells consist of bodies which are indistinguishable from yolk spherules; hence their function is probably to assist in the formation of the yolk in the interior of the ovum while the follicular cells themselves elaborate the yolk from the blood and pass it on to these cells and directly to the more peripheral regions of the ovum; indeed these cells were so numerous that it appears doubtful whether they and the follicular cells do not form the entire mass of the yolk.

The fact that the cells of the follicle share in the formation of the yolk is known from the investigations of many naturalists; it has been shown to be the case in Elasmobranchs, Mammals and many invertebrate groups. In the Cephalopoda Lankester has described<sup>3</sup> a method of yolk formation which is analogous to that which has first been described for *Lepidosiren*; the follicular epithelium becomes folded and the folds project into the interior of the ovum; its cells proliferate and pass into the substance of the ovum discharging their contents.

I am not aware however that any method of yolk formation has been described which is precisely like that of *Lepidosiren* and in any case I believe I am right in saying that it is new to *Lepidosiren*.

In older ova the follicular epithelium has shrunk to its former limits and is now separated from the ovum by a distinct membrane which although extremely thin has an obvious double contour. The yolk is differentiated into a narrow peripheral layer of different appearance from a central mass. The germinal vesicle in transverse section shows an outer thick homogeneous layer, within this a row of deeply stained nuclear spots, within this again a central core of finely granu-

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<sup>2</sup> Foster and Balfour, Elements of Embryology. p. 15.

<sup>3</sup> Philosoph. Trans. Roy. Soc. Lond. 1875. p. 43. Pl. 12 fig. 23, 25.

lar protoplasm. I was unable to find the germinal vesicle in the intermediate stages and so cannot give an account of its changes during the maturation of the ovum.

London, April 15th 1886.

## 6. Documents ichthyologiques: Énumération des espèces rares de poissons capturées sur les côtes de Provence, durant les vingt dernières années.

Par le Prof. A. F. Marion, Marseille.

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Les côtes de Provence et en particulier le Golfe de Marseille possèdent une faune ichthyologique très-variée. Les espèces ordinaires de la Méditerranée s'y présentent avec une réelle abondance malgré une pêche intensive qu'il serait temps de réglementer. Ces types, pour ainsi dire vulgaires ont été signalés dans diverses publications et j'ai indiqué moi-même dans un travail spécial (Esquisse d'une topographie zoologique du Golfe de Marseille) comment ils sont distribués dans les différents fonds de notre littoral. Mais indépendamment de ces poissons communs on capture quelquefois, entre les Îles d'Hyères et les embouchures du Rhône, des espèces rares, erratiques ou seulement connues jusqu'ici dans les parages plus méridionaux, sur les côtes de l'Italie et de la Sicile. J'ai noté avec attention l'apparition ou la capture de ces animaux exceptionnels et j'ai pensé qu'il pouvait y avoir quelque intérêt pour l'étude de la géographie zoologique de publier ces documents en y ajoutant quelques remarques sur divers points de l'ichthyologie de notre région provençale. Je suivrai l'ordre méthodique habituel pour énumérer les espèces sur lesquelles quelques réflexions peuvent être utiles.

**Selaciens.** *Pristiurus melanostomus* Blainville. Ce squalé est indiqué comme assez commun dans la Méditerranée; on le voit en effet assez souvent au marché de Nice. Il est au contraire excessivement rare sur celui de Marseille. Cette différence tient peut-être principalement à la topographie sous-marine des deux régions. Le *Pristiurus melanostomus* habite les profondeurs, les fonds de sable-vaseux par 100, 150 et 200 mètres. Or tandis que la côte tombe brusquement à Nice de manière qu'il est facile aux pêcheurs, sans s'éloigner beaucoup de jeter les palangres dans des fonds de ce genre, les pêcheurs marseillais doivent aller jusqu'à 20 ou 25 milles du port pour les rencontrer. D'ailleurs même dans ces stations en dehors du Golfe de Marseille, au Sud de Planier, le *Pristiurus* est plus rare qu'à Nice.

*Zygaena malleus* Valenc. Le Marteau est très-rare sur nos côtes. On le capture dans les fonds vaseux au large des embouchures du

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