

baselloides, and of the Clematites, which is wide open in flowering, becomes still more widely spread after fecundation.

3. REFLEXED (*postfl. reflexa*), presented by the *Begoniæ*, especially *B. semperflorens*, and by *Crassulæ spathulata* and *cotyledon*.

4. SHRIVELLED (*postfl. crispa*).—The petals retain their position and form, but become shrivelled in drying. Ex.: *Pavia*, *Delphinium*, *Lythrum*, and the corolla of the *Campanulæ*, *Linariæ*, &c. Sometimes the perianths in shrivelling become twisted irregularly: this modification of the shrivelled postfloration is presented by *Clerodendron*.

5. PULPY (*postfl. pulposa*).—In *Tradescantia virginica* the petals lose their membranous aspect and become pulpy.

6. CURLED or CIRCINATE (*postfl. circinata*).—The petals of the Capparideæ (*Capparis*, *Cleome*, *Gynandropsis*), which are twisted in æstivation, become rolled into a crook after anthesis. This is also the case with the corolla of the Peruvian Heliotrope and of *Verbena Melindres*, *chamædrifolia*, and *tenera*.

7. RECIRCINATE (*postfl. recircinata*).—In *Mesembryanthemum* and *Cryptostemma calendulaceum* the petals and ligulæ become rolled into a crook, but from within outwards, or in an opposite direction to the circinate form.

8. CONDUPLICATE (*postfl. conduplicata*), one of the lateral halves of the inner surface of the petal applying itself to the other. Ex. *Ornithogalum Eckloni*.

Postfloration may render some service to classification, especially in the limitation of genera. Authors are not agreed as to the generic denomination of the *Agrostemma Cæli-rosa* of Linné. Desrousseaux has placed it in *Lychnis*; it is a *Silene* with MM. Grenier and Godron, and a *Viscaria* with others. It is distinguished from *Silene* by the postfloration of its petals, the two borders of which roll inwards, whilst that of *Silene* is shrivelled and contorted.

A Plumbagineous plant has been alternately described under the names of *Plumbago Larpentæ* and *Valoradia plumbaginoides*. It presents the same postfloration as *Plumbago*, namely the rumpled arrangement of the limb of the corolla, which is in favour of its being united with that genus.

The postfloration of the stamens deserves a special study. It is remarkable in the genus *Aloë*, in which the filaments become undulato-crispate in consequence of an unequal shrinking of the tracheal system and of the long cells which surround it. The three first-formed stamens become shrivelled before the others.—*Comptes Rendus*, 26th Dec. 1865, pp. 1177–1179.

Observations on the part played by the Nucleus in Animal Cells.

By M. BALBIANI.

In 1864 the author detected in the ovules of several animals certain transparent cavities or vacuoles seated in the germinal spots,

and endowed with alternate movements of contraction and expansion. He has since succeeded in observing the contractions of the spot in the living animal. Notwithstanding the analogy which these phenomena present to those observed in the Infusoria and Rhizopoda, their signification remained obscure until the acquisition of a better notion of the morphological condition of cells. Thus the movements of the germinal spot could not be assimilated to those of which the contractile vesicle of the animals just mentioned is the seat, as in the ovules and other cells of animals we were unacquainted with any canals comparable to those connected with the contractile vesicle of the Infusoria. These the author now professes to have discovered, from which he considers we are justified in assuming the existence of a true circulation in these elementary parts of the organism.

The animal on the ovule of which the author's observations were made is *Geophilus longicornis*. When the fresh ovary of this Myriopod is placed under the microscope, and the ovules are examined through its walls, an organ is detected which possesses more brilliancy than the surrounding vitellus, and appears like a prolongation of the germinal vesicle. With slightly acidulated water this appears distinctly as an infundibuliform canal, more or less recurved, of which the wider orifice is continuous with the membrane of the vesicle, whilst the opposite extremity reaches the surface of the vitellus. Generally the canal seems to terminate suddenly at this point, opening by a circular orifice under the envelope of the ovule; but sometimes it appears to be continued into a delicate prolongation, emitting ramifications which spread more or less over the surface of the vitellus. In certain positions the axis of the canal is seen to be occupied by a much narrower interior canal, proceeding from the germinal spot and narrowing rapidly after penetrating into the outer canal.

The germinal spot is occupied by a greater or less number of vacuoles, capable of alternate contraction and expansion. At the moment of the extreme expansion of one of these vacuoles its walls appear to be directly continuous with those of the canal which terminates at the spot, the vacuole then looking like the enlarged ampulliform end of the latter. When less dilated and seen in profile, it appears only to communicate with the canal by a narrow aperture like a pore.

The width and apparent length of the two canals are in relation to the degree of development of the ovules; but they are to be seen in the youngest. In older ovules they continue visible as long as their transparency is not obscured by vitelline elements; and they probably persist as long as the germinal vesicle and spot.

In seeking for similar structures in other ovules, the author arrived at the following results:—In the ovules of the Bitch the vesicle and spot each present a canal, as in *Geophilus*. In the Skate, the ovules of which usually contain from one to four small germinal corpuscles with a central vacuole, each of these emits a variable number

of small canals (usually two to four), which traverse the cavity of the vesicle in different directions, pierce its wall, and lose themselves in the surrounding vitellus.

In the bony fishes and Batrachia, in which there are a great number of germinal spots adherent to the inner wall of the vesicle, and the latter is surrounded by a system of canals radiating towards the surface of the ovum. Each canal is connected with one of the spots.

Multiple canals are generally met with in all ova which present more or less numerous germinal spots. Sometimes, as in some Crustacea (Crayfish, Shore-crab), these multiple spots appear also to be united to each other in the interior of the vesicle by canals.

In many Annelides, Turbellaria, Mollusca, and Acalephs the ova contain only a simple germinal spot, often of considerable size, connected with a single canal, which is enclosed in a second canal, starting from the vesicle. The germinal spot also very commonly contains one or more large vacuoles possessing a very manifest contractile power (*Helix*, *Prostomum*, *Vortex*, &c.).—*Comptes Rendus*, December 26, 1865, pp. 1173–1177.

On the Lateral Canal of Lota.

By Professor HYRTL.

The lateral canal-system of this animal possesses no orifices in the skin on the lateral line, but forms a closed subcutaneous tube, supported by cartilage throughout its whole course, and which acquires a moniliform appearance in consequence of the presence of alternate wider and narrower spaces. The absence of lateral orifices enables us to inject this canal. By this means its cephalic ramifications are also demonstrable, and these have not yet been detected in their perfect connexion in any Teleostean fish. The canal reaches the occipital region of the head above the *suprascapula*, and is there connected by a wide anastomosis with that of the opposite side; it then runs above the eye to the nose, where it becomes suddenly narrowed, and opens externally upon a capillary papilla in front of the nasal aperture. During its course to this point it emits, behind the eye, a large branch downwards; this passes forward round the orbit, emits three cæcal diverticula upon the suspensorium and to the articulation of the lower jaw, and terminates cæcally beneath the nasal pit, forming a series of ampulliform dilatations. In front of the eyes the two lateral canals are united by a short transverse duct, which forms a spherical dilatation (*alveus communis*) in its middle, and close to this emits a blind diverticulum upon the anterior frontal bone. When the canal is injected in a backward direction, we discover that it has also a posterior terminal aperture, which, like the anterior one, is to be seen upon a minute cutaneous papilla, about an inch from the caudal fin. The canal-system of both sides of the body has consequently only four cutaneous apertures.—*Anzeiger der Akad. der Wiss. in Wien*, May 11, 1866, p. 119.



Balbani, M. 1866. "Observations on the part played by the nucleus in animals cells." *The Annals and magazine of natural history; zoology, botany, and geology* 18, 262–264.

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