fixed to a piece of thin platinum wire, should then be placed in one of these flat phials (previously filled with weak spirit), so as to reach about half-way down. When several of these are thus arranged, they should be placed in a glass cylinder and removed to the air-pump. On pumping out the air, a copious ebullition of bubbles will take place, and many of the tentacula, previously concealed, will emerge from the cells. After being left *in vacuo* for a few hours the bottles should be filled up, closely corked, and tied over, like common anatomical preparations. I find that, for all examinations with a one or two-inch object-glass, these bottles are most excellent, and afford cheap and easy substitutes for the more expensive and difficultly managed cells. In this manner specimens of the genera *Cycloum*, *Membranipora*, *Alcyonidium*, and *Crisia*, exhibit their structure most beautifully.

A few dozen of these little bottles hardly occupy any room, and would form a useful accompaniment of the microscopist by the sea-side. Any one who would visit the caverns in St. Catherine's Island, at Tenby, could reap a harvest which would afford instruction and amusement for weeks. In these caverns, so rich in zoophytes and sponges that they are really roofed with the *Laomedææ*, *Grantiæ*, and their allies, whilst the elegant *Tubulariæ* afford a garden-like ornament to the shallow pools on the floor, the walls abounding with the pink, yellow, green, and purple *Actiniæ*, days may be spent with instruction and amusement of the most interesting kind. I have, indeed, been informed by my friend Mr. Dyster, of Tenby, who has devoted himself to the investigation of the inhabitants of these caverns with great zeal and success, that no locality affords, in the same space, such an abundant treat for the zoophytologist. I cannot too strongly recommend a visit to them, to all who have a few days leisure in the summer.

On the Embryogeny of ORCHIS MASCULA. By T. SPENCER COBBOLD, M.D., formerly Senior President of the Royal Medical Society of Edinburgh.

AFTER the elaborate memoir of M. Tulasne on the vegetable embryo in the 'Annales des Sciences Naturelles' for 1849, containing not only the results of his own extended investigations, but embodying a complete analysis of all that has been previously written on this subject, it is with diffidence that I offer the following details, which are chiefly confirmatory of facts already elicited. The reviewer of Professor Quekett's Lectures on Histology in the first Number of this Journal, page 44, hints that "the question of the entrance of

the pollen tube into the sac of the embryo" is *still* one of interest to vegetable physiologists; this remark has suggested the present communication.

Of all the natural orders hitherto examined by the embryologist, few have been more closely studied or yielded more satisfactory results than the *Orchidaceæ:* the researches of Brown, Amici, Mohl, Muller, Hofmeister, and many others, are too well known to require recapitulation; our own inquiries have extended over a large number of *genera*, but the selection of a single species sufficiently demonstrates the question under consideration.

Referring at once to the illustrations, fig. 1. will be recognized as a floret of *Orchis mascula*, with the peduncle (*p*) and bract (*b*) attached. Before fertilization is accomplished, the peduncle (which encloses the ovarium) begins to enlarge, consequent upon the growth of the contained ovula. Plate II., figs. 2, 3, 4, and 5, indicate the successive stages of development of the ovula; their first appearance is only recognised by a slight bulging outward of the cellular parietes (placentæ) of the ovarian chamber, in the form of papillæ, which are the representatives of the nucleus of the perfect ovulum (marked *n* in all the figures). The mode in which the *primine* (*pr.*) and *secundine* (*se.*) are developed, and subsequently enclose the nucleus, is also well shown. Some time after impregnation has been effected, the condition of the ovary assumes the appearance seen in fig. 6, a section of which, slightly magnified, is given in fig. 7. Bundles of pollen-tubes (*pt.*) run along the inner side of the placentæ and terminate by short curves, entering the micropyles of the ovula (*ov.*); on the left side of the figure their distribution is well exhibited, the ovula being detached, and the pollen-tubes left pendant.

Examining the ovules at this stage, we now perceive a cavity in the centre of each nucleus; this is surrounded by a cell-wall, and constitutes the *embryo sac* (fig. 8, *es.*). In the interior of the *sac* granular matter exists in more or less abundance, being generally found thicker near the apex; but, whether or not distinct cytoblasts or embryonic vesicles exist prior to the contact of the pollen-tube with the embryo sac (as is indubitably the case in numerous other phanerogamia), is a point not fully determined. In those instances where we have witnessed the union of the pollen-tube with the embryo sac, the granular matter has usually been found collected together opposite the point of application (figs. 9 and 10), and, in one instance, three embryonic vesicles (*ev.*) were visible at the apex of the sac, the pollen-tube remaining firmly adherent (fig. 11). This latter observation, agreeing as it does with what we have ourselves observed in *Gesnerea*,

and being also in accordance with the views advocated by all later authorities, we think we cannot better close this short paper than by drawing the following conclusions, which may be regarded as embracing the leading facts and particulars hitherto promulgated on this interesting subject:—

1st. That prior to impregnation the ovule contains an embryo sac. 2nd. That the embryo sac is commonly formed at the apex of the nucleus. 3rd. That in the interior of the embryo sac there exists a granular fluid or formative blastema. 4th. That the sac frequently protrudes beyond the exostome (ovule tube; Griffith, Dickie). 5th. That in the interior of the sac, prior to impregnation, one or more cytoblasts, or embryonic vesicles, are formed. 6th. That their formation takes place by the aggregation of molecules. (Amici, Meyen, Hofmeister.) 7th. That the cytoblasts, or embryonic vesicles, also contain a fluid more or less granular. (*Globulo-cellular cambium;* Mirbel.) 8th. That the pollen is always necessary for fertilization (apparent exception given by Smith in *Cœlobegyne ilicifolia*). 9th. That the pollen, when applied to the stigma, sends out one or more tubes (prolongations of the intine), which contain granular matter (fovilla). 10th. That in most cases the union of the pollen tube with the apex of the embryo sac constitutes the very act of impregnation. 11th. That the result of this union is the formation of an embryo. 12th. That this formation takes place either by the metamorphosis of one of the pre-existing germinal or embryonic vesicles, under the dynamic influence of the fovilla (acting catalytically?); or, as is more probable, by the union of the contents of the pollen-tube with that of a germinal vesicle, similar to what occurs in the conjugation of *Confervæ*.

On the Importance of recognising Substances of extraneous Origin when they occur in Urine, and of distinguishing them from those Bodies which enter into the Composition of Urinary Sediments. By Lionel Beale, M.B.

In the microscopical examination of urinary deposits, the observer often meets with substances whose nature and origin cannot readily be determined. This is due in many instances to the presence of bodies which have fallen in accidentally, or which have been placed in the urine for the express purpose of deceiving the practitioner. The importance of recognising matters of an extraneous origin can scarcely be sufficiently dwelt upon, for until the eye becomes familiar with the characters of these substances, it will be obviously quite impossible to derive such information from a