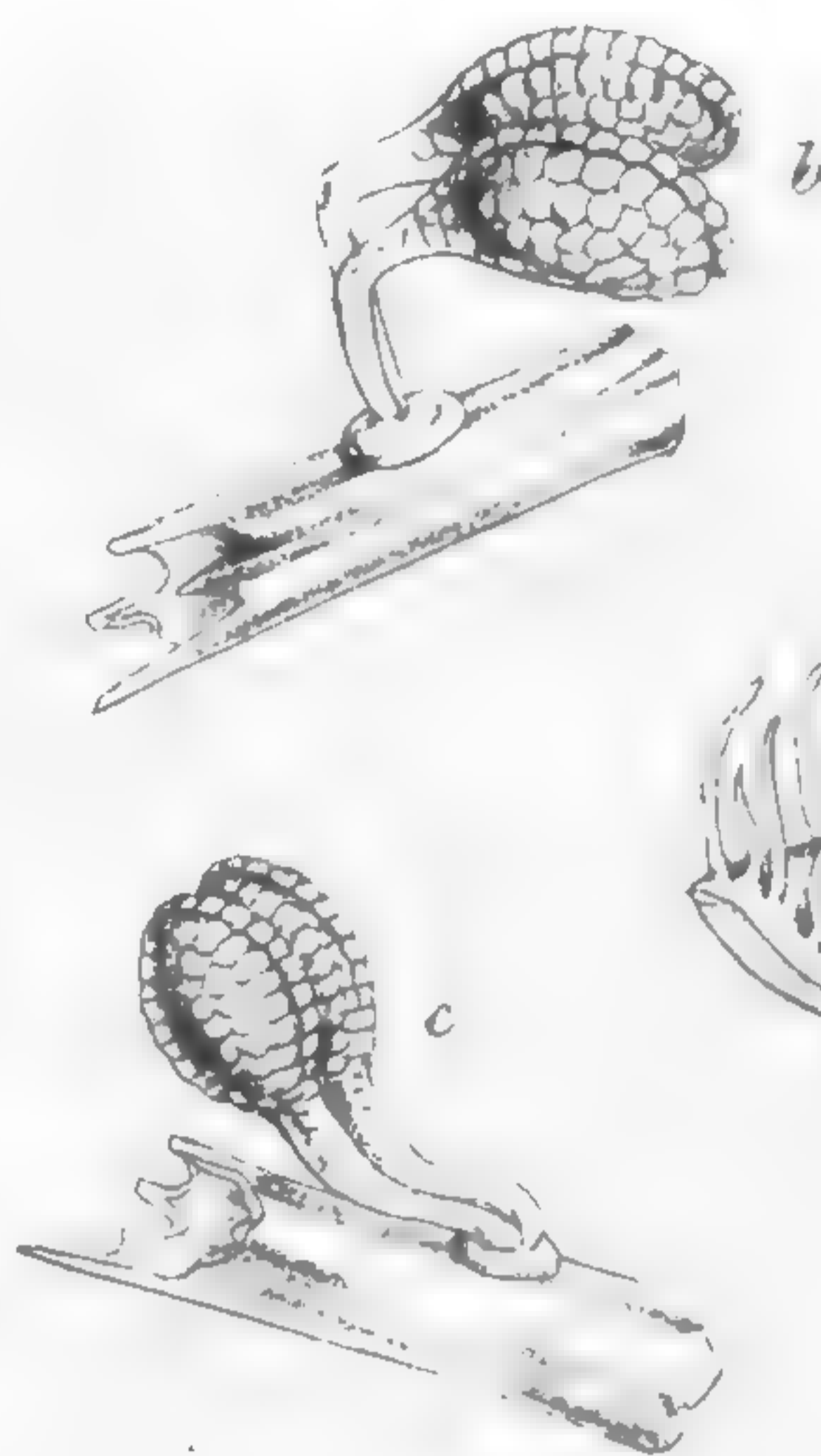
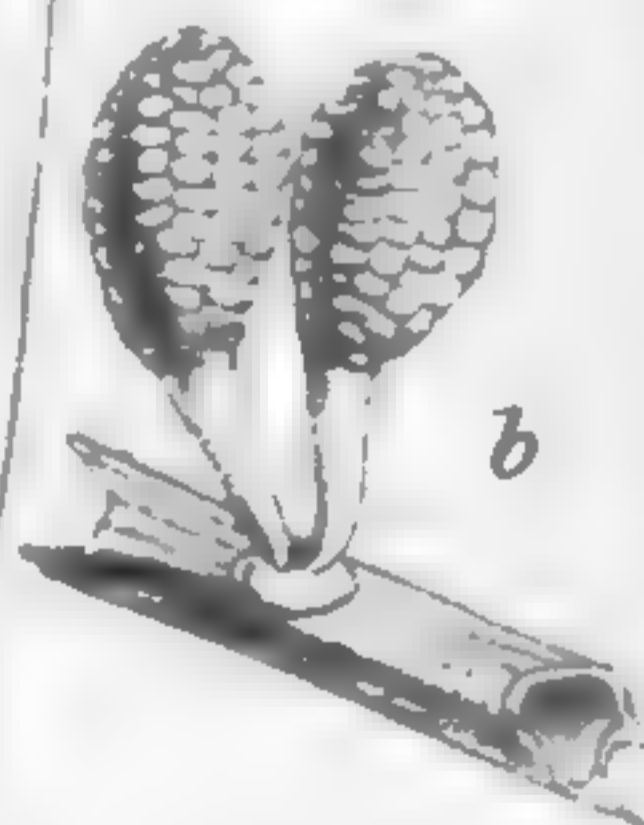
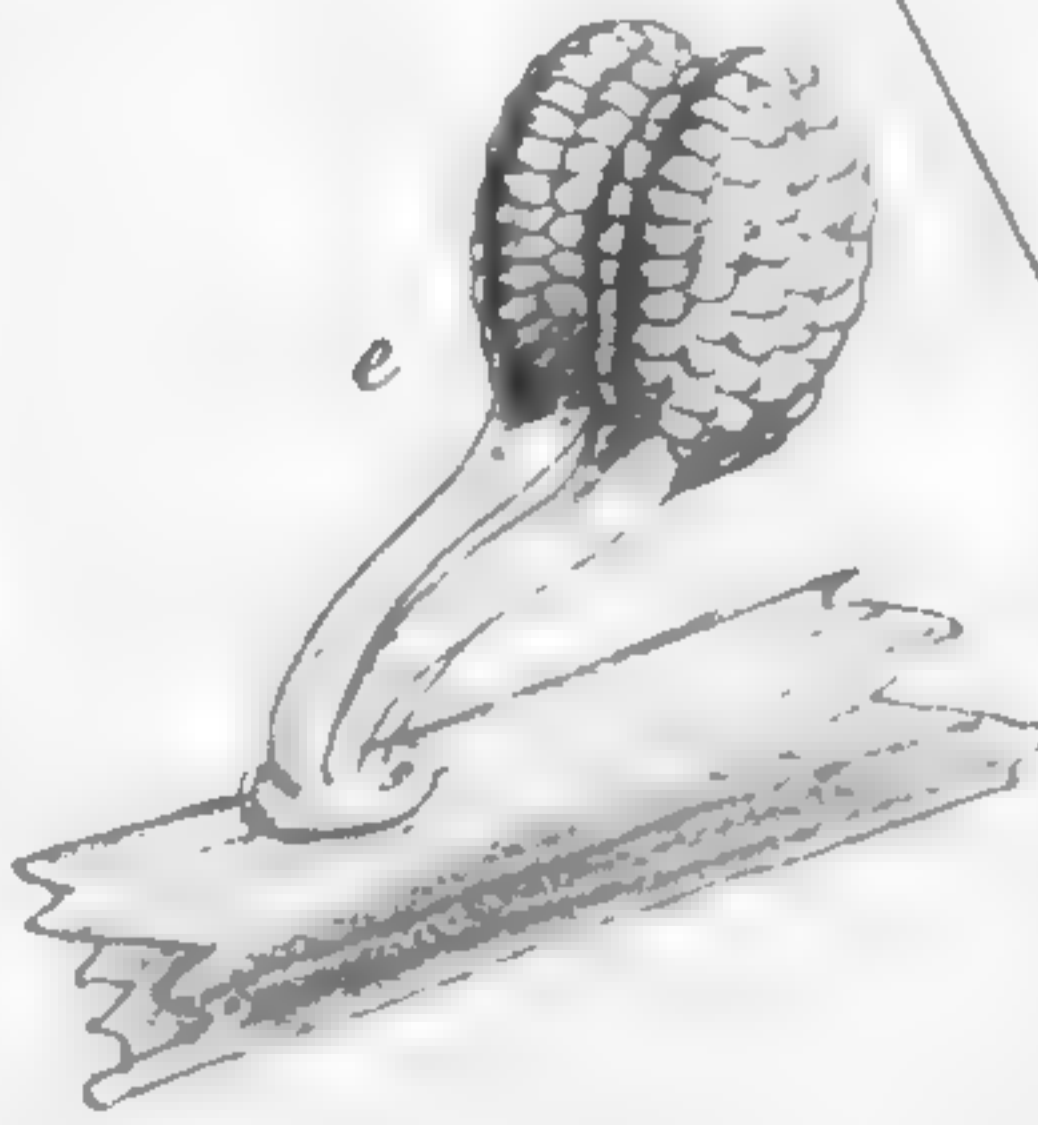
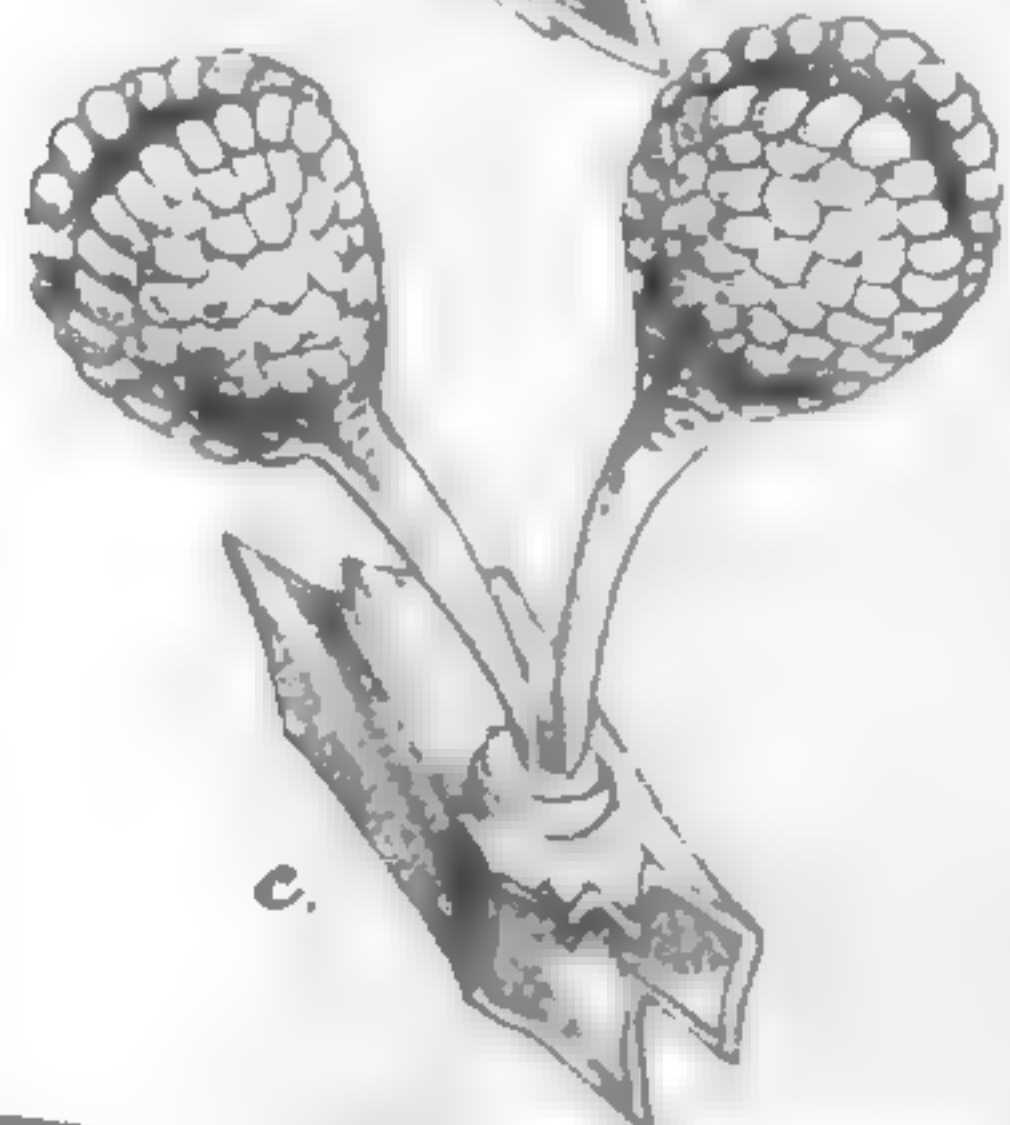
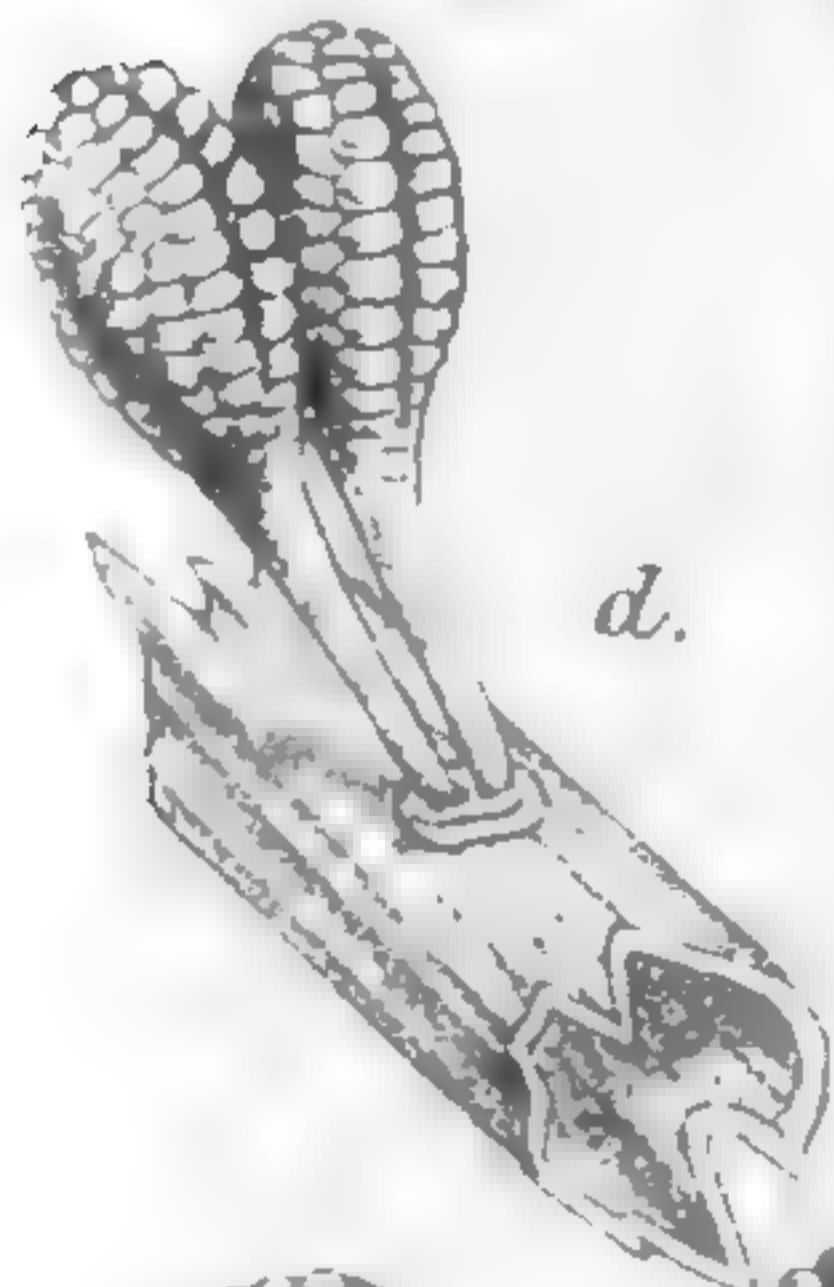
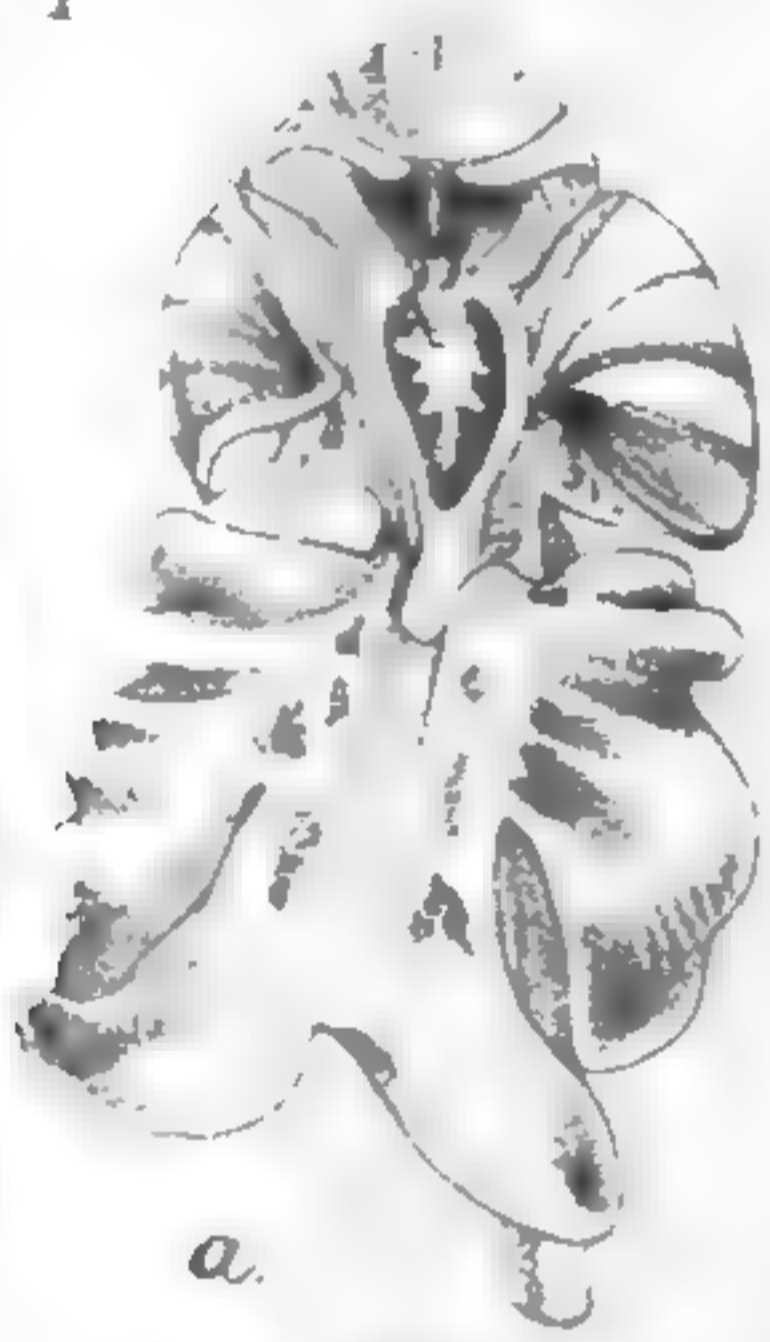
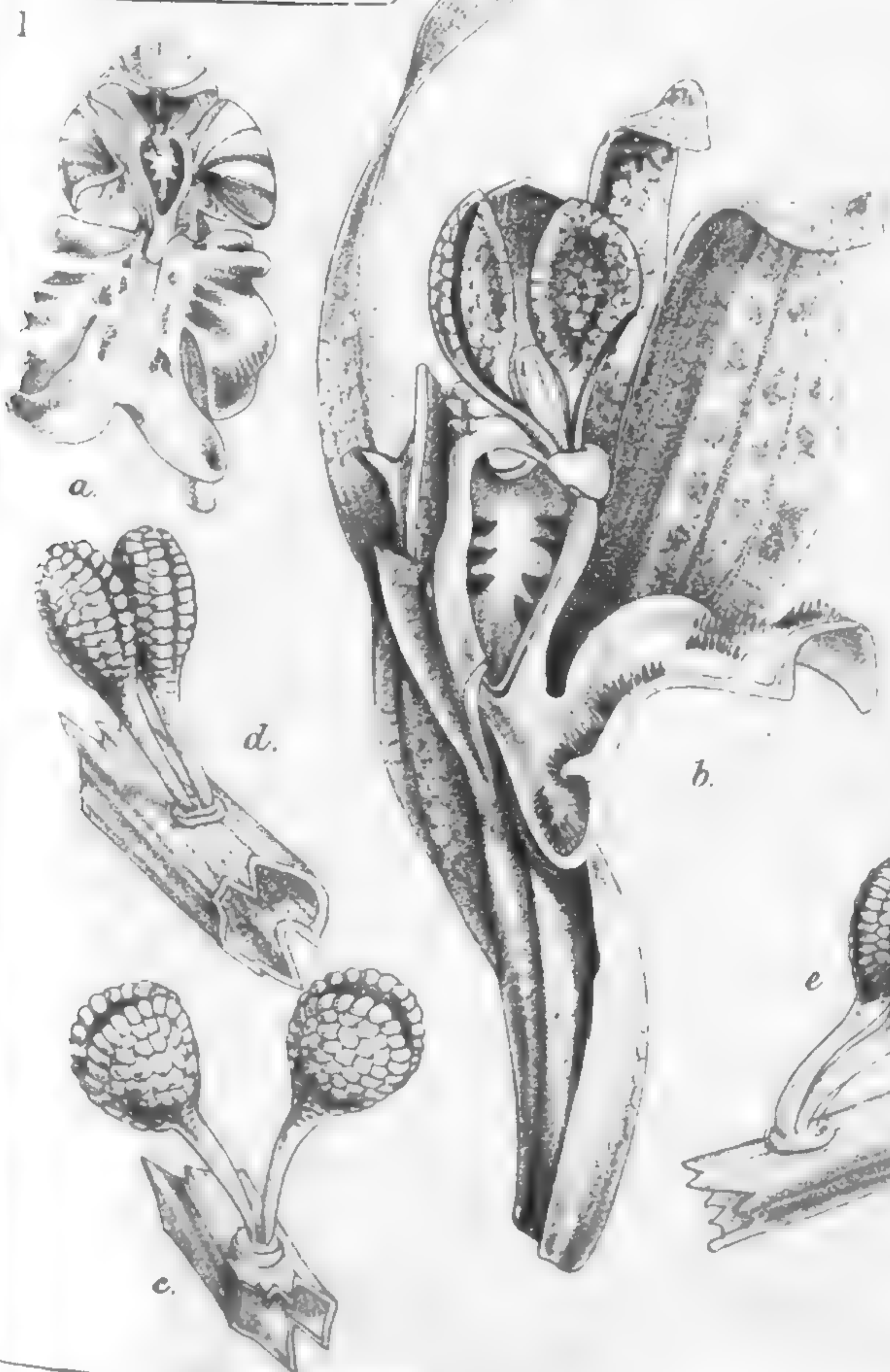


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Observations on some Orchids of the South of France. By JOHN TREHERNE MOGGRIDGE, Esq. Communicated by the President.

[Read Nov. 3, 1864.]

[PLATE XVI.]

DURING the past winter and spring spent in the South, I had some opportunities of observing the Orchidaceæ of those parts, and noting down what seemed to me strange and new about them. The 'Fertilization of Orchids,' by Charles Darwin, Esq., was of course the base upon which I worked, and which thus opened out for me a fresh and most delightful source of occupation.

Orchis longibracteata, Bivona (*Aceras longibracteata*, Grenier and Godron), is the first orchid which comes into flower; and as it commences blossoming on or before New Year's day, a long period is allowed over which to extend one's investigation. I propose, therefore, to show first how that plant is adapted for fertilization, and what insect is an agent in the matter. The caudicles of the pollinia are united on to one common gland (as in *Orchis pyramidalis*), and placed in a pouch, which stands higher with reference to the surface of the labellum than in any *Orchis* I have examined. This elevation admits of the interference of a larger and stronger insect—of just such a one, in fact, as *Xylocopa violacea*, a specimen of which I had the good fortune to see taken, bearing the pollinia of this species fastened on its forehead. By reference to Pl. XVI. fig. 1*a*, the relative positions of the large pear-shaped stigmatic cavity of the pouch, and the labellum will be seen. In the dissection of this (*b*) the greater part of the labellum has been removed, leaving one of the small guiding-plates on the further side. When first taken the pollinia are widely separated and upright (*c*); but by convergence the masses are soon drawn together (*d*), and then prostrated (*e*). The motion in either plane is, in unmutilated specimens, distinct, the prostration always setting in after convergence. For comparison, I have drawn (fig. 3) a similar view of *Orchis hircina*, with a foreign specimen of which I have been favoured since my return to England. *Orchis hircina* has the pouch very low in the flower; and the structure will be seen to vary in several other details. Its pollinia, judging from those furnished by that spike alone, accomplish their convergence during their prostration, and not by separate motions.

I have myself seen *Orchis longibracteata* visited by several species of Hymenopterous and Dipterous insects; and I feel sure that

many of the more minute Ephemerae are attracted by this and some other Orchidaceae, as a small spider of a colour wonderfully matched to the flowers or bracts constantly spins his web round the spike, the threads passing in front of the stigmatic chamber. On one occasion I had a close view of a Dipterous insect at work on the labellum of a flower of *Orchis longibracteata*; the plant, being in a pot on a balcony, was raised to the level of my eye. I saw that the proboscis was dipped into each of the open cells of honeycomb texture, and instantly withdrawn; but, judging from the lengthy stay of the insect on the flower, it found in these tiny glistening cavities some liquid worth its search. Being anxious to ascertain whether the spikes were more attractive to the agents of fertilization at any definite stage of the blossoming, I made the following notes. I must premise that, by the average number of blossoms, those on any one spike may be taken as about 30, but they range from 15 to 50.

Date of gathering.		Number of expanded flowers.	Number of stigmas touched.	Number of pairs of pollinia taken.
March 1.	Spike No. I.	18	4	0
	" " II.	7	2	0
	" " III.	11	1	0
" 7	Spike No. I.	12	1	4
	" " II.	10	5	0
	" " III.	5	3	2
	" " IV.	10	0	0
	" " V.	16	2	0
	" " VI.	8	1	0
	" " VII.	11	3	3
	" " VIII. ...	12	2	3
" 8.	Spike No. I.	10	1	3
	" " II.	23	4	5
	" " III.	34	7	7
	" " IV.	36	10	9
	" " V.	24	0	0
" 10.	Spike No. I.	46	13	22

A plant of this *Orchis* placed by me in the shade had no pollinia removed or stigmas fertilized; and I notice that this is frequently the case in places where the sun does not strike. When I found that the blossoms on this spike were beginning to fade (which was not till the 59th day after the expansion of the first flower), I remarked that all the stigmatic tissue was quite dried up, with the exception of part of the surface of one quite at the top. I then touched the pouch of the flower 59 days old, and the gland immediately adhered; and though the caudicles were weak,

the movements were effected in about 3 minutes. The pollinia of succeeding flowers became gradually more and more efficient, and fertilized a fresh spike in the ordinary way. This shows that the pollinia may be removeable and useful after the spike on which they are is incapable of fertilization.

Fig. 2 represents a spike of *Serapias cordigera* (Linn.), a plant which has two pollinia united on one gland, as in the preceding, but possesses a complex and most interesting fertilization. On their withdrawal the masses are bent back away from the stigma (*b*), but quickly reverse and accomplish their depression and contraction as in *Orchis hircina*. The stigmatic cavity is exceedingly narrow and obscure; so that, though the column is enclosed in a somewhat tubular chamber formed by the upright anterior lobes of the labellum and the hood-shaped coherent segments of the flower, the pollen-masses on an insect's head would be very apt to miss coming in contact with its viscid surface at all. To remedy this, the guiding-plates (*a*, fig. 2) are raised into a two-walled glabrous trough, in which the masses slide without fail against the stigma. I secured a specimen of an insect (*Ceratina albilabris*) in the act of touching the stigma of this plant with the yellow pollen of *Serapias lingua*, two pairs of pollinia of which were fastened on its head; the gland of one pair partially covered the right eye.

In the case of *Xylocopa violacea* and *Ceratina albilabris*, therefore, we find the glands attached to their heads, not their proboscides; and it seems probable, as the height at which the pouch stands is most accurately in relation to that of the insect fertilizer, and as the flat glands are not easily removed by any narrow object or slight degree of pressure, that the elevation of the pouch is a feature of very great importance to the plants. My last observation concerns *Ophrys Scolopax* (Cavanilles), a plant very analogous to *O. Arachnites*. This plant appears under two forms in the two localities where I have obtained specimens. At Mentone I never saw any tendency to self-fertilization, but all the spikes of a large bundle sent me at Cannes were so without exception. This material difference between the two is accomplished by a very slight bend in the anther-cells, which are prolonged into a beak of variable length, in the case of the self-fertilizing blossoms. It is a remarkable coincidence, that at Mentone the Bee *Ophrys* is scarce, and at Cannes very abundant. So, within thirty miles of one another, we have one spot where self-fertilization is in full action, and another where it is, as far as I am aware, unknown.