ON A

MONSTROSITY

OF THE

COMMON MIGNIONETTE.

FROM THE TRANSACTIONS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY.

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IV. *On a Monstrosity of the Common Mignionette.* By Rev. J. S. Henslow, M.A. *Professor of Botany in the University of Cambridge, and Secretary to the Cambridge Philosophical Society.*

[Read *May* 21, 1832.]

Having met with a very interesting monstrosity of the common Mignionette (*Reseda odorata,*) in the course of last summer (1831), I made several drawings of the peculiarities which it exhibited. I beg to present the Society with a selection from these, as I think they may both serve to throw considerable light upon the true structure of the flowers of this genus, which is at present a matter of dispute among our most eminent Botanists, and also tend to illustrate the manner in which the reproductive organs of plants generally, may be considered as resulting from a modification of the leaf.

It is well known to every Botanist, that Professor Lindley has proposed a new and highly ingenious theory, in which he considers the flowers of a Reseda to be compounded of an aggregate of florets, very analogous to the inflorescence of a Euphorbia. Mr Brown, on the other hand, maintains the ordinary opinion of each flower being simple, and possessed of calyx, corolla, stamens, and pistil. I shall not here enter upon any examination of the arguments by which these gentlemen have supported their respective views, but will refer those who are desirous of seeing them to the "Introduction to the Natural System of Botany, by Prof. Lindley," and to the "Appendix to Major Denham's Narrative, by Mr Brown." My present object will be little more than to describe the several appearances figured in plates 1 and 2.

Fig. 1. is one of the slightest deviations that was noticed from the ordinary state of the flower. It consists in an elongation of the pistil (*a*), and a general enlargement of its parts, indicating a tendency in them to pass into leaves. This is accompanied by a slight diminution in the size of the central disk. The number of the sepals was either six or seven.

Fig. 2. is a portion of the ovarium of the same flower opened, in which three of the ovules are somewhat distorted.

Fig. 3. Here the three valves of the ovarium have assumed a distinctly foliaceous character (*a*); the same has happened to some of the stamens (*b*), and to the petals (*c*); but the sepals are unaltered. The central disk has entirely disappeared.

Fig. 4. This is a still closer approximation to the ordinary state of a proliferous flower bud, when developed. Those parts which would have formed the pistil, if the flower had been completed, are no longer distinguishable, and only a few of the stamens are to be seen, disguised in the form of foliaceous filaments crowned by distorted anthers (*b*).

Fig. 5. A slight deviation in one of the petals from the usual character. The fleshy unguis is somewhat diminished, and the fimbriæ are becoming green and leaf-like. These are aggregated into three distinct bundles, the middle one being composed of a single strap, and the two outer ones of five straps each, blended together at the base.

Fig. 6. The line of demarcation between the unguis and the fimbriæ has completely disappeared, and the number of the latter is considerably reduced. The whole is more green and leaf-like than fig. 5.

Fig. 7. The fimbriæ reduced to a single strap; the position of the lateral bundles being indicated by slight projections only. Other instances occurred in which the petal appeared as a single undivided uniform green strap.

Fig. 8. The two exterior whorls of a flower, consisting of seven regularly formed sepals, and eight petals. The latter deviate more or less from the forms represented in fig. 6 and 7. The whole of a green tint, and leaf-like.

Figs. 9, 10. These are parts of one and the same flower dissected to shew the several whorls more distinctly. The whole has assumed a regular appearance, and is composed of seven sepals, alternating with seven green strap-shaped petals, which are succeeded by about twenty stamens without any fleshy disk; the pistil is somewhat metamorphosed. This is perhaps the most remarkable deviation that was noticed from the ordinary state of the flower, and as several examples of it occurred, it is not likely that there is any error in this account of it. It appears to lead us in a very decided manner to the plan on which the flowers of the genus may be considered to be constructed, and to shew us that they are really simple and not compound.

Fig. 11 to 15, represent the appearances assumed by some of the stamens, indicating various degrees of deviation from the perfect state towards a foliaceous structure.

There were other circumstances, besides the appearances in figs. 9. and 10, which may lead us to conclude the structure of the flowers of the genus to be simple and not compound. A compound flower arises from the development of several buds in the axillæ of certain foliaceous appendages more or less degenerated from the character of leaves, and consequently these buds and the florets which they develop are always seated nearer to the axis than the foliaceous appendages themselves. If we suppose a raceme of the mignionette to degenerate into the condition of a compound flower, we must allow for the abortion of the stem on which the several flowers are seated, so that these may become condensed into a capitulum, each floret of which will be accompanied by a bractea, more or less developed, at its base. Let us compare this supposition with the diagrams represented in figs. 16, 17, 18.

Fig. 16. is an imaginary section of the flower in its ordinary state, (*a*) the pistil, (*b*) the stamens on the fleshy disk, (*c*) the petals, (*d*) the sepals alternating with them.

Fig. 17. represents the position of the several buds (*e*) which compose the florets of the flower on the supposition of its being compound. Here it will be noticed that these buds alternate with the

sepals instead of being placed in their axils where we might rather expect to find them.

Fig. 18. represents a fact which was observed in the present case, where some of the latent buds in the axils of the altered petals were partially developed. This development might perhaps be considered as indicating the construction of a compound flower, and those buds which in ordinary cases compose the outer and abortive florets, it might be said, are here manifesting themselves. But the axes of these buds lie nearer to the axis of the whole flower than the petals in whose axils they are developed; whereas it appears by fig. 17, that they ought to be further from it, since the centres of the five outer circles marked (*e*) would represent the axes of the several buds, whose partial development must be supposed to be on the side next the axis, if we allow any weight to the analogy between the position of the abortive stamens on the supposed calyx, and the fertile stamens on the central disk.

These figures are all that I have thought it necessary to give for the purpose of illustrating the structure of the flower; but as there were several interesting appearances noticed upon dissecting the pistil, I have selected some of them for the second plate, as they may possibly serve to throw some light upon the relationship which the several parts of the ovarium bear to the leaf, and to support the theory of their being all of them merely modifications of that important organ.

Fig. 19. is a pistil in which the three ovules have become foliaceous, and the central, or terminal bud of the flower-stalk is developing in the proliferous form represented in fig. 4.

Fig. 20. The central bud is not developing; but the three axillary buds in the bases of the transformed valves of the pistil are here assuming the form of branches on which one or two pair of leaves are expanded.

Fig. 21. 22. unite the appearances in fig. 19 and 20, with the addition of a glandular body seated between the leaves at their

junction. This apparently originates in the union of the two glandular stipules seated at the base of the leaves of this genus, and which may also be seen to accompany the scale-like leaves on the central bud within.

Figs. 23. to 25. Interior views of metamorphosed pistils, in which the ovules are seen transformed to leaves, and the glandular stipules are all that remain of the leaves which should compose the central bud, their limbs having entirely disappeared.

Fig. 26. The appearance of these stipules on a leaf-bud, developing under ordinary circumstances.

Fig. 27. One of them more highly magnified.

Figs. 28. 29. Their appearance on the small scale-like leaves of the central buds in fig. 21, 22.

Fig. 30. Similar to fig. 23, but without any appearance of the transformed ovules; the glandular stipules are seen in the bottom of the ovarium.

These glandular bodies assume a very prominent character in the anatomy of the metamorphosed pistils, and I was for some time puzzled to account for them, thinking that they might represent an altered condition of the ovules. I believe however that I have rightly considered them as the only representatives of the various leaves which would have made their appearance on the branch if the bud had developed in the ordinary way. They do not appear to diminish in size though the limb of the leaf has disappeared.

Fig. 31. Four pedicillated semitransformed ovules, seated on a placenta of a pistil metamorphosed similarly to that in fig. 9.

Figs. 32. to 35. Other appearances of a similar kind, all representing various approaches of the ovules to a foliaceous character. The little theca-shaped appendages are hollow, with a perforation at their apex, representing the foramen.

Fig. 36. One of these dissected, exhibiting a free clavate cellular body within, resembling the columella in the theca of a moss, and here probably representing the nucleus of the ovule.

Fig. 37. In this case the theca-shaped body was partially open exposing the included nucleus.

Fig. 38. This nucleus more highly magnified.

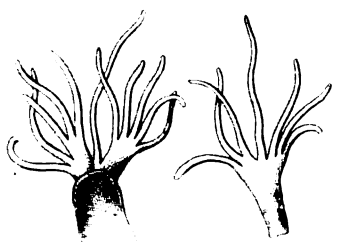
These appearances surely indicate a development of the investing coats of the nucleus into leaves; but how far these developments might be extended, and whether the nucleus itself is capable of being further separated into a series of investing coats does not appear from these specimens.

J. S. HENSLOW.

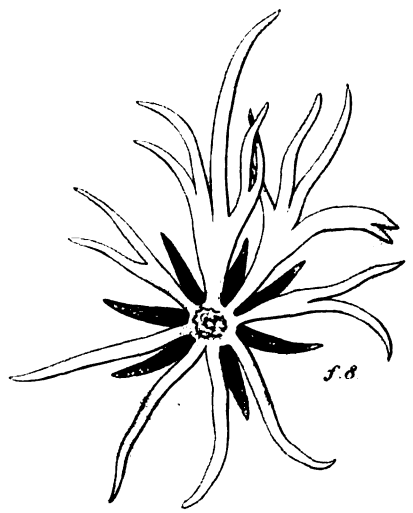
f. 2. f. 1.

f. 3.

f. 4.



f. 5 f. 6 f. 7.



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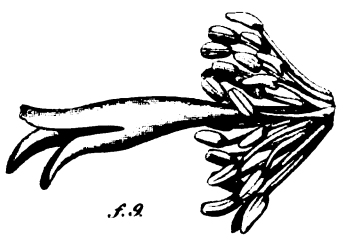
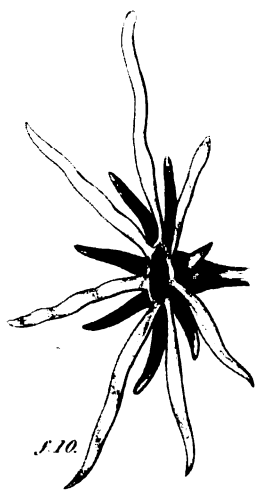


f. 9.



f. 10.

f. 11.

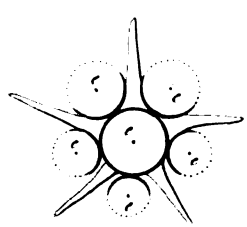
f. 12.

f. 13.

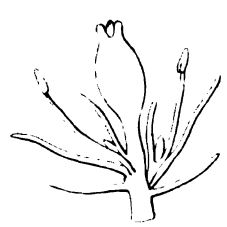
f. 14.

f. 15.

f. 16.



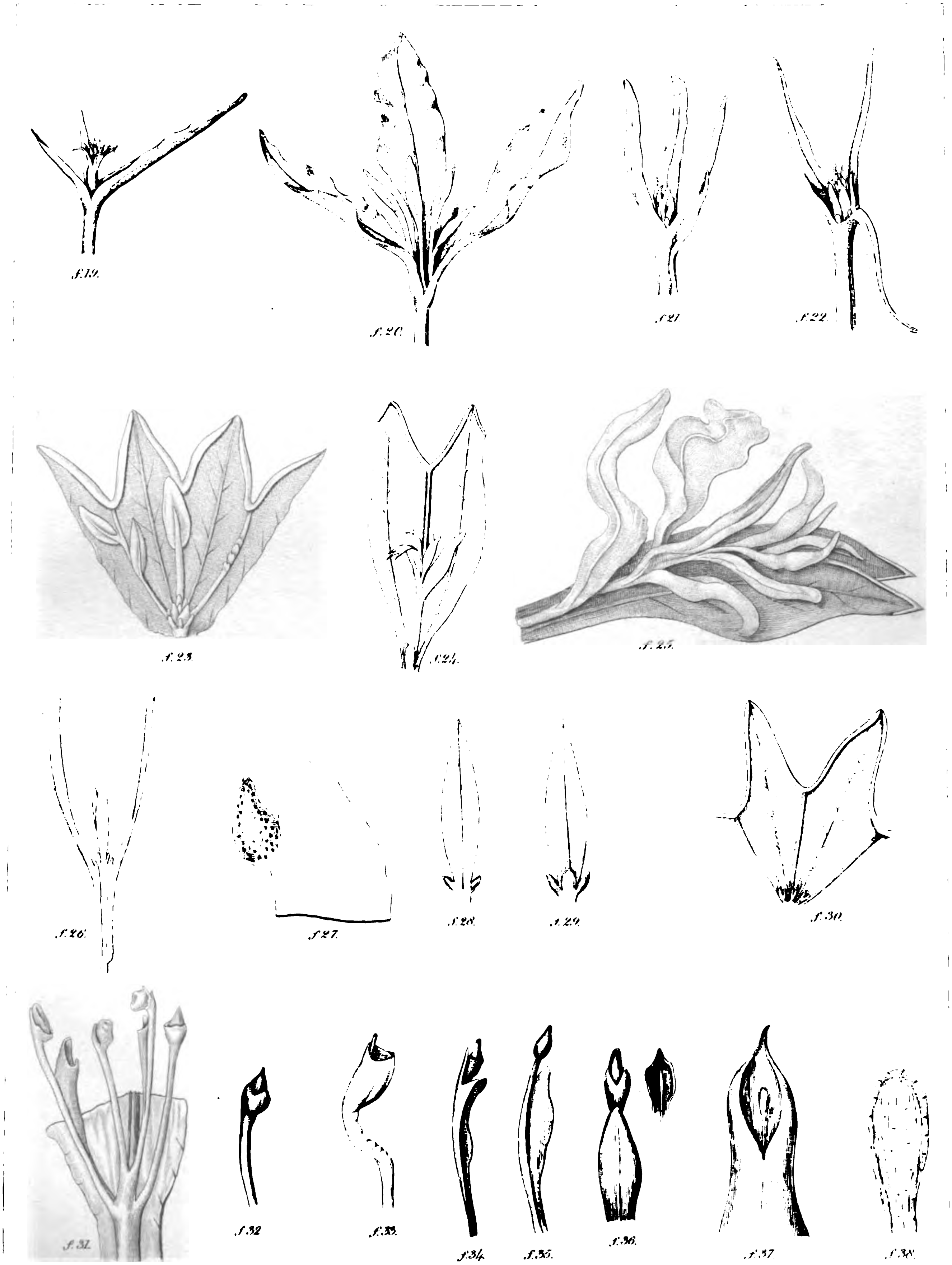
f. 17.



f. 18.

J. S. Henslow del.

J. D. C. Sowerby, Sculp.



J. S. Henslow del.

J. D. C. Sowerby sculp.