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III. *Observations on a Metamorphosed variety of Antirrhinum Majus.* By HERBERT GIRAUD, M.D., *Member of the Council of the Botanical Society.*

READ 12TH DECEMBER 1839.

IN September last, my attention was arrested by the singular appearance of a plant of *Antirrhinum majus*, which had sprung up spontaneously in my garden, and upon closer examination, I found that it afforded some appearances of monstrosity, which might prove sufficiently interesting to repay a careful investigation of them.

The general growth and habit of this plant corresponded with its normal condition, and the stems, leaves, and sepals, answered to their specific characters. But the petals, with the other parts of fructification, existed in a state of very singular transformation,—affording a striking illustration of the great doctrine of morphology,—that the organs of reproduction, with their appendages, are but metamorphosed leaves.

The following is a description of the modified organs :—

Corolla monophylla, in laciniis quinque æqualibus, ovato-lanceolatis profundè divisa, hisceque calyce longioribus, sepalis latioribus, cum quibus alternant; lacinia ejus pistillum circumplexæ, foliaceæ, et coloris viridis sunt; et, pariter ac sepala, pilis glandulosis vestitæ sunt. Stamina deficientia. Ovarium calyce superius, ovatum, obliquum, sulcatum, loculis quinque laciniis corollæ alternantibus. Placentæ quinque, centrales. Ovula numerosa, sessilia. Stylus longa, quinque sulcata, erecta, tubulata. Stigma tumidum, excavatum, quinque fissum, apice latè patefacto. Capsula supernè compressa, quinque locularis, loculis polyspermis, poris quinque apice dehiscentibus. Semina sacculis membranaceis similia.

The points in which this plant departed from its normal condition, appear to be these :—The corolla, instead of being petaloid, irregular, five-cleft, and brightly-coloured, was leafy, regular, in five deep segments, of a green colour. The sta-

mens, which should have been didynamous, were here absent. The ovarium, from being two-celled, became five-celled; the stigma five-cleft, instead of bifid; and the style hollow, instead of being solid.

The quinary condition of the ovarium, and the alternation of its carpels with the divisions of the corolla, is a state which would be expected to follow any alteration in the number of its cells, with an accompanying tendency to assume regularity in its development; as the quinary arrangement is that which prevails in dicotyledons. The supernumerary carpellary leaves, of which the ovarium is composed, are obviously those which, under the normal condition of the plant, would have gone to the formation of stamens. That they are developed from the next whorl of leaves to the corolla is plain, from their alternating with its divisions. Now, in the normal condition, the stamens would be so situated; one leaf, however, in the whorl is altogether abortive,—forming neither a stamen nor a carpel; for the carpellary development of this would produce a six-celled ovarium. The abortion of stamens in the natural family *Scrophularineæ* (to which this plant belongs) is by no means unfrequent. From the total absence of stamens, the impregnation of the ovules could not take place, and the capsule, with its contents, were, therefore, but imperfectly developed; and the ovules soon lost their substance, and withered up.

I scattered some pollen, from a perfect plant, upon the stigmas, with the expectation of perfecting some seeds, but to no purpose: the structure of the stigma and style appeared wholly unfitted for the conduction of the pollen tubes.

The condition of this plant appears to disprove, in some degree, an opinion entertained by Professor Lindley regarding transformations of the reproductive organs, and thus expressed: “I have, in a paper read before the Horticultural Society, endeavoured to shew that these changes *always* take place in the order of development, or from circumference to centre; that is to say, that the calyx is transformed into petals, the petals into stamens, &c., but that *the converse does*

not occur; the inevitable consequence of a reversed order of transformation would be, that the rich, or delicate colour of the petals, upon which all flowers depend for their beauty, would be converted into the uniform green of the calyx." Now, in this *Antirrhinum*, we have a change occurring in the petals from centre to circumference, and the bright and goodly aspect of the corolla is converted into the dull and sombre colour of the calyx, to which it is also assimilated in its proportions, and by the glandular hairs which clothe it. It is remarkable that we have also, in this case, a change occurring from circumference to centre, in the conversion of stamens into carpels.

I may here notice, that any instances of the converse of this, or of the separation of the carpellary leaves from the axis, and of their metamorphosis into stamens, would be extremely valuable, as bearing upon a litigated point, which requires well ascertained facts for its determination, namely, as to whether the ovules are ever axile formations.