

recoil, like a rocket. From this it is easy to see that, in the mechanical imitation of flight, it would be advantageous to reduce the size of the beats, and to increase their frequency.—*Comptes Rendus*, Nov. 28, 1864, p. 907.

*On the Fumariæ with irregular Flowers, and on the Cause of their Irregularity.* By D. A. GODRON.

When the flowers of the Fumariæ are examined in their first stage of development, they are all perfectly regular, but flattened before and behind, as if they were compressed between the axis of the inflorescence and the bract that envelopes them. They retain this regularity in the genera *Dielytra*, *Adlumia*, and *Dactylicapnos*. In these three genera, the external or lateral petals undergo an important modification in the course of their development: the base of each of them is produced into a short, rounded spur, and these two nectariferous appendages are perfectly symmetrical. Why, then, in *Fumaria*, *Corydalis*, &c. (which have originally the same organization) is only a single spur developed, whilst the other spur is aborted, together with its nectary, in such a manner that the flower becomes very irregular, and this irregularity is of a special nature? Moreover the single spur which makes its appearance becomes extraordinarily developed, if we compare it with the two spurs of the Fumariæ with regular flowers, and especially the spurs of the flowers of *Corydalis*, which will be referred to hereafter.

To what is the abortion of one spur due? To discover the cause of this, I have observed the flowers of Fumariæ at different stages of development, and especially those of our indigenous species of *Corydalis*, which, from their size, are particularly favourable for observation. I have dug up specimens of *Corydalis solida* and *C. cava* before the stem has issued from the ground in January, and then in February and March. I have ascertained that the flowers are closely pressed against each other, and that even at the first of these periods the single spur is already apparent. If, then, we examine from above the bunch of flowers previously denuded of its bracts, we find that the spurless side of each flower is supported obliquely upon the posterior surface of an older flower. I may add that the two lower flowers are supported upon the base of two stem-leaves, which enter into the regular series of the floral spire. The same facts are observed in *Fumaria*.

From this arrangement, it appears that all the flowers are compressed at the base of one of their sides, which prevents the development of the nectary and of its sheath or spur; on the opposite side, on the contrary, the spur is not hindered in its evolution, and grows without any obstacle. It is to this circumstance, apparently, that we must attribute the abortion of one spur with its nectary, and, consequently, the irregularity of the flowers, in many genera of the family Fumariæ.

But why is not this irregularity of the flowers produced in *Dielytra* and *Adlumia*, as well as in *Corydalis* and *Fumaria*? The arrange-



ment of the raceme in the Fumariæ with regular flowers furnishes us with no explanation of this circumstance, although it is different. But I have ascertained that the development of the spurs commences late in these plants, when the elongation of the raceme has separated the flowers from each other; no lateral compression is then possible, and the two spurs are freely developed, perfectly equal, and regularly symmetrical.

Lastly, in support of these views, I may add an observation which appears to be still more demonstrative. The primitive, regular form of the flowers of Fumariæ, which subsequently become irregular, is sometimes persistent. In the arboretum of the Botanic Gardens at Nancy I have for three years observed eighteen plants of *Corydalis solida* with all the flowers peloriate; these have hitherto proved completely barren, although the pollen appears to be normal, and abundantly impregnates the two lips of the stigma.

These peloriate flowers are erect and a little spread out; in form, size, and coloration they resemble those of *Dielytra formosa*; so that this anomaly represents the normal type of a genus of the same family. The sepals are small and regular. The corolla presents two perfectly equal lateral spurs, which are conical, obtuse, slightly divergent, and 2 millim. in length—that is to say, much shorter than the single spur of the irregular flower of the same species; the nectaries are equal, short, and bent into a hook. The two outer petals, which bear them, are symmetrical; and this is also the case with the internal petals. The two bundles of stamina are arranged normally. The flowers persist for a longer period than in the type, as is also the case in sterile hybrids.

To what is this return to the regular type due? In order to investigate its causes, I dug up, on the 10th February, 1864, two specimens of these plants which were still buried in the soil, and compared them with other individuals of the same species, but with irregular flowers. The latter already presented their single spur pretty well developed; the peloriate flowers, on the contrary, presented no trace of a spur. On other plants, I have followed the gradual development of the flowers; and it was only on the 16th March, when the stem had issued from the earth, the raceme had become free from its spathiform envelope, and the perfectly free flowers could no longer undergo any compression, that the spurs began to be developed. Thus, in this peloriate flower, the same things take place as in the genera of Fumariæ with normally regular flowers.

Hence it appears to be evident that the lateral compression of the base of one of the margins of the flower at the moment of the development of the nectaries must be the cause of the abortion of one of those organs, and of the spur in which it is enclosed; from this arises the irregularity of the flower.—*Comptes Rendus*, December 19, 1864, p. 1039.

*Note on Sternotherus Adansonii from West Africa.*

By DR. J. E. GRAY, F.R.S., &c.

On the 26th of May last year I read a paper before this Society