

whole case has been attributed by some authors to bud-variation; but considering the wide difference between *C. laburnum* and *purpureus*, both of which are natural species, and considering the sterility of the intermediate form, this view may be summarily rejected. We shall presently see that, with hybrid plants, two embryos differing in their characters may be developed within the same seed and cohere; and it has been supposed that *C. adami* thus originated. Many botanists maintain that *C. adami* is a hybrid produced in the common way by seed, and that it has reverted by buds to its two parent-forms. Negative results are not of much value; but Reisseck, Caspary, and myself, tried in vain to cross *C. laburnum* and *purpureus*; when I fertilised the former with pollen of the latter, I had the nearest approach to success, for pods were formed, but in sixteen days after the withering of the flowers, they fell off. Nevertheless, the belief that *C. adami* is a spontaneously produced hybrid between these two species is supported by the fact that such hybrids have arisen in this genus. In a bed of seedlings from *C. elongatus*, which grew near to *C. purpureus*, and was probably fertilised by it through the agency of insects (for these, as I know by experiment, play an important part in the fertilisation of the laburnum), the sterile hybrid *C. purpureo-elongatus* appeared.⁹⁶ Thus, also, Waterer's laburnum, the *C. alpino-laburnum*,⁹⁷ spontaneously appeared, as I am informed by Mr. Waterer, in a bed of seedlings.

On the other hand, we have a clear and distinct account given to Poiteau,⁹⁸ by M. Adam, who raised the plant, showing that *C. adami* is not an ordinary hybrid; but is what may be called a graft-hybrid, that is, one produced from the united cellular tissue of two distinct species. M. Adam inserted in the usual manner a shield of the bark of *C. purpureus* into a stock of *C. laburnum*; and the bud lay dormant, as often happens, for a year; the shield then produced many buds and shoots, one of which grew more upright and vigorous with larger leaves than the shoots of *C. purpureus*, and

⁹⁶ Braun, in 'Bot. Mem. Ray. Soc.,' 1853, p. xxiii.

⁹⁷ This hybrid has never been described. It is exactly intermediate in foliage, time of flowering, dark striæ at the base of the standard petal, hairiness of the ovary, and in almost every other character, between *C. laburnum* and *alpinus*; but it approaches the former species more nearly in colour, and exceeds it in the length of the racemes. We have before seen that 20·3 per cent. of its pollen-grains are ill-formed and worthless. My plant, though growing not above thirty or forty yards

from both parent-species, during some seasons yielded no good seeds; but in 1866 it was unusually fertile, and its long racemes produced from one to occasionally even four pods. Many of the pods contained no good seeds, but generally they contained a single apparently good seed, sometimes two, and in one case three seeds. Some of these seeds germinated, and I raised two trees from them; one resembles the present form; the other has a remarkable dwarf character with small leaves, but has not yet flowered.

⁹⁸ 'Annales de la Soc. de l'Hort. de Paris,' tom. vii., 1830, p. 93.