

specified, there are many plants in which the reproductive system has been seriously affected by the altered conditions of life to which they have been subjected.

It would be tedious to enter on many details. Linnæus long ago observed<sup>78</sup> that Alpine plants, although naturally loaded with seed, produce either few or none when cultivated in gardens. But exceptions often occur: the *Draba sylvestris*, one of our most thoroughly Alpine plants, multiplies itself by seed in Mr. H. C. Watson's garden, near London; and Kerner, who has particularly attended to the cultivation of Alpine plants, found that various kinds, when cultivated, spontaneously sowed themselves.<sup>79</sup> Many plants which naturally grow in peat-earth are entirely sterile in our gardens. I have noticed the same fact with several liliaceous plants, which nevertheless grew vigorously.

Too much manure renders some kinds utterly sterile, as I have myself observed. The tendency to sterility from this cause runs in families; thus, according to Gärtner,<sup>80</sup> it is hardly possible to give too much manure to most Gramineæ, Cruciferæ, and Leguminosæ, whilst succulent and bulbous-rooted plants are easily affected. Extreme poverty of soil is less apt to induce sterility; but dwarfed plants of *Trifolium minus* and *repens*, growing on a lawn often mown and never manured, were found by me not to produce any seed. The temperature of the soil, and the season at which plants are watered, often have a marked effect on their fertility, as was observed by Kölreuter in the case of *Mirabilis*.<sup>81</sup> Mr. Scott, in the Botanic Gardens of Edinburgh, observed that *Oncidium divaricatum* would not set seed when grown in a basket in which it thrived, but was capable of fertilisation in a pot where it was a little damper. *Pelargonium fulgidum*, for many years after its introduction, seeded freely; it then became sterile; now it is fertile<sup>82</sup> if kept in a dry stove during the winter. Other varieties of pelargonium are sterile and others fertile without our being able to assign any cause. Very slight changes in the position of a plant, whether planted on a bank or at its base, sometimes make all the difference in its producing seed. Temperature apparently has a much more powerful influence on the fertility of plants than on that of animals. Nevertheless it is wonderful what changes some few plants will withstand with undiminished fertility: thus the *Zephyranthes candida*, a native of the moderately warm banks of the Plata, sows itself in the hot dry country near Lima, and in Yorkshire

<sup>78</sup> 'Swedish Acts,' vol. i., 1739, p. 3. Pallas makes the same remark in his 'Travels' (Eng. transl.), vol. i. p. 292.

<sup>79</sup> A. Kerner, 'Die Cultur der Alpenpflanzen,' 1864, s. 139; Watson's 'Cybele Britannica,' vol. i. p. 131; Mr. D. Cameron, also, has written on the culture of Alpine plants in 'Gard.

Chronicle,' 1848, pp. 253, 268, and mentions a few which seed.

<sup>80</sup> 'Beiträge zur Kenntniss der Befruchtung,' 1844, s. 333.

<sup>81</sup> 'Nova Acta Petrop.,' 1793, p. 391.

<sup>82</sup> 'Cottage Gardener,' 1856, pp. 44, 109.