

ascend mountains beyond the height at which they can produce seed.¹¹⁰ Certain species of *Poa* and *Festuca*, when growing on mountain-pastures, propagate themselves, as I hear from Mr. Bentham, almost exclusively by bulblets. Kalm gives a more curious instance¹¹¹ of several American trees, which grow so plentifully in marshes or in thick woods, that they are certainly well adapted for these stations, yet scarcely ever produce seeds; but when accidentally growing on the outside of the marsh or wood, are loaded with seed. The common ivy is found in Northern Sweden and Russia, but flowers and fruits only in the southern provinces. The *Acorus calamus* extends over a large portion of the globe, but so rarely perfects fruit that this has been seen only by a few botanists; according to Caspary, all its pollen-grains are in a worthless condition.¹¹² The *Hypericum calycinum*, which propagates itself so freely in our shrubberies by rhizomes, and is naturalised in Ireland, blossoms profusely, but rarely sets any seed, and this only during certain years; nor did it set any when fertilised in my garden by pollen from plants growing at a distance. The *Lysimachia nummularia*, which is furnished with long runners, so seldom produces seed-capsules, that Prof. Decaisne,¹¹³ who has especially attended to this plant, has never seen it in fruit. The *Carex rigida* often fails to perfect its seed in Scotland, Lapland, Greenland, Germany, and New Hampshire in the United States.¹¹⁴ The periwinkle (*Vinca minor*), which spreads largely by runners, is said scarcely ever to produce fruit in England;¹¹⁵ but this plant requires insect-aid for its fertilisation, and the proper insects may be absent or rare. The *Jussiaea grandiflora* has become naturalised in Southern France, and has spread by its rhizomes so extensively as to impede the navigation of the waters, but never produces fertile seed.¹¹⁶ The horseradish (*Cochlearia armoracia*) spreads pertinaciously and is naturalised in various parts of Europe; though it bears flowers, these rarely produce capsules: Professor Caspary informs me that he has watched this plant since 1851, but has never seen its fruit; 65 per cent. of its pollen-grains are bad. The common *Ranunculus ficaria* rarely bears seed in England, France, or Switzerland; but in 1863 I observed seeds on several plants growing near my house.¹¹⁷ Other

¹¹⁰ Wahlenberg specifies eight species in this state on the Lapland Alps: see Appendix to Linnæus' 'Tour in Lapland,' translated by Sir J. E. Smith, vol. ii. pp. 274-280.

¹¹¹ 'Travels in North America,' Eng. transl., vol. iii. p. 175.

¹¹² With respect to the ivy and *Acorus*, see Dr. Bromfield in the 'Phytologist,' vol. iii. p. 376. Also Lindley and Vaucher on the *Acorus*, and see Caspary as below.

¹¹³ 'Annal. des Sc. Nat.,' 3rd series,

Zool., tom. iv. p. 280. Prof. Decaisne refers also to analogous cases with mosses and lichens near Paris.

¹¹⁴ Mr. Tuckermann, in Silliman's 'American Journal of Science,' vol. xiv. p. 1.

¹¹⁵ Sir J. E. Smith, 'English Flora,' vol. i. p. 339.

¹¹⁶ G. Planchon, 'Flora de Montpellier,' 1864, p. 20.

¹¹⁷ On the non-production of seeds in England, see Mr. Crocker, in 'Gardener's Weekly Magazine,' 1852, p.