

the *Linum*, in the proportion of narcotin to morphine in the poppy, in gluten to starch in wheat, when these plants are cultivated on the plains and on the mountains of India; nevertheless, they all remain fully fertile.

Contabescence.—Gärtner has designated by this term a peculiar condition of the anthers in certain plants, in which they are shrivelled, or become brown and tough, and contain no good pollen. When in this state they exactly resemble the anthers of the most sterile hybrids. Gärtner,⁸⁸ in his discussion on this subject, has shown that plants of many orders are occasionally thus affected; but the *Caryophyllaceæ* and *Liliaceæ* suffer most, and to these orders, I think, the *Ericaceæ* may be added. Contabescence varies in degree, but on the same plant all the flowers are generally affected to nearly the same extent. The anthers are affected at a very early period in the flower-bud, and remain in the same state (with one recorded exception) during the life of the plant. The affection cannot be cured by any change of treatment, and is propagated by layers, cuttings, &c., and perhaps even by seed. In contabescent plants the female organs are seldom affected, or merely become precocious in their development. The cause of this affection is doubtful, and is different in different cases. Until I read Gärtner's discussion I attributed it, as apparently did Herbert, to the unnatural treatment of the plants; but its permanence under changed conditions, and the female organs not being affected, seem incompatible with this view. The fact of several endemic plants becoming contabescent in our gardens seems, at first sight, equally incompatible with this view; but Kölreuter believes that this is the result of their transplantation. The contabescent plants of *Dianthus* and *Verbascum*, found wild by Wiegmann, grew on a dry and sterile bank. The fact that exotic plants are eminently liable to this affection also seems to show that it is in some manner caused by their unnatural treatment. In some instances, as with *Silene*, Gärtner's view seems the most probable, namely, that it is caused by an inherent tendency in the species to become dioecious. I can add another cause, namely, the illegitimate unions of heterostyled plants, for I have observed seedlings of three species of *Primula* and of *Lythrum salicaria*, which had been raised from plants illegitimately fertilised by their own-form pollen, with some or all their anthers in a contabescent state. There is perhaps an additional cause, namely, self-fertilisation; for many plants of *Dianthus* and *Lobelia*, which had been raised from self-fertilised seeds, had their anthers in this state; but these instances are not conclusive, as both genera are liable from other causes to this affection.

Cases of an opposite nature likewise occur, namely, plants with

⁸⁸ 'Beiträge zur Kenntniss,' &c., s. 117 *et seq.*; Kölreuter, 'Zweite Fortsetzung,' s. 10, 121; 'Dritte Fort-

setzung,' s. 57. Herbert, 'Amaryllidaceæ,' p. 355. Wiegmann, 'Ueber die Bastarderzeugung,' s. 27.