

GARDEN PEAS.

The flowers of garden peas (*Pisum sativum*) are entirely self-fertile, and usually behave as though cleistogamic (uncrossable), which they certainly are not. Fertilization is effected before the flowers open, and this precludes the possibility of crossing by wind-borne pollen. Notwithstanding these statements—and there is abundant proof that they are true—the flowers are obviously adapted to cross-fertilization. Darwin observes that it is remarkable that they are not often crossed, yet it only very rarely happens. He mentions cases of varieties that have remained pure for sixty years, though each year several varieties were grown together. Hive-bees can have no effect on the fertilization of these flowers, as they are not heavy enough to open them, consequently they cannot gather pollen from them except from old and already fertilized flowers, which they sometimes do, but not to any great extent. For my own part, I have frequently watched my garden peas this season and have not seen a bee on them. Darwin states that he had peas under observation for thirty years, and only thrice during that period did he see bees of the proper kind at work. These were *Bombus muscarum*, a humble-bee. These, he is sure, must have crossed some flowers.

SWEET-PEAS.

The flowers of the sweet-pea (*Lathyrus odoratus*) are entirely self-fertile, and can rarely be crossed by insects and never by wind-borne pollen. I have examined a large number of flowers and proved that fertilization takes place long before the flowers open. However young a flower may be a pod will be found in it, and the smallest pod I could divide with a sharp knife exhibited peas quite distinctly.

BEES AND SEED-GROWING.

It has previously been stated that bees confine their attention as long as possible to one species. It is also known that when gathering pollen bees will not wander far if they can get their load nearby. The knowledge of these facts, and, further, that different orders of plants will not cross, guides seed-growers in planning their plots. All the different species of brassica, which include cabbages, cauliflowers, &c., will cross each other. The seed-grower plans his field so that no two varieties of the same species are close to each other. But this would not ensure safety from crossing unless a considerable number of plants of each variety were grown, for bees will fly quite a considerable distance in search of flowers of a species. Safety is found in growing a good block of each variety. The bees then load up from the one block and the risks of crossing are very small.

Waterproofing Concrete.—Concrete can be made fairly waterproof by mixing in approximately 8 per cent. of clay in powdered form. The strength of the concrete is not materially lessened, though its setting is likely to be lengthened considerably. The result of a great many experiments, however, has been to show that good workmanship, a well-graded aggregate, and plenty of cement is the best way to render concrete waterproof.