

reached by the pollen tube, an interchange of elements takes place, the ovule is fertilised and at once changes begin which end in the complete development of a seed.

The question naturally arises, How do the pollen grains get to the pistil? This effected, fertilisation will in all likelihood take place.

Observation shows that this may be done in several ways.

1. *By the wind.* Where this is the usual way we find the plants are rich in pollen, have no nectar, grow crowded together, in some cases bloom before the leaves appear and are seldom attractive in appearance. The grasses, willows and some maples afford examples of plants largely dependent upon the wind for the transport of the pollen to the pistil.

2. *By artificial means.* Man can effect the same result by simply taking the pollen and placing it upon the pistil. This has enabled him to cross-breed and hybridise to such an extent that he has developed innumerable varieties of plants of great economic value, as is exemplified in our beautiful flowers and luscious fruits.

3. *By birds,* which to some extent aid in carrying pollen from plant to plant, especially such as the humming birds.

4. *By insects.* This probably is by far the most common method in nature, and may be viewed as the chief use of insects.

Plants fertilised by insects present an attractive appearance, are rich in perfume, and above all supply nectar to the insects which frequent them. It can be readily seen how insects moving about in a flower will become loaded with the dust-like pollen, and in passing to other flowers aid much in transferring the pollen from one plant to another, and thus bring about a cross-fertilisation, or in other words, cross-breeding, which seems as essential to the production of vigorous and fertile plants as it does in animal life.

Among insects which aid largely in this interesting process no class is more useful than bees. Where imperfect fertilisation has taken place fruit is incompletely developed in size and form, so that the quantity and quality are affected. Careful investigation has shown that the fruitfulness of many plants is largely influenced by bees and such insects as search for the nectar and pollen of flowers.

Although many flowers have both stamens and pistils in the same flower, still scientific observation has shown that even in these cross-fertilisation is favored by the structure of the flower. From observations made it is claimed that orchards with bee-hives in them have been more fruitful than those without hives. In some cases bees have been given access to greenhouses so that the flowers might be fertilised and thus develop more and better fruit under such conditions. Flowers have been covered so as to prevent insects reaching them, but light and air admitted. Side by side were others to which bees had access. An examination of the seed showed those of the