

wing to prevent the likelihood of impregnation with a drone of her own blood. Again, we know in the reproduction of stock on the farm, in and in breeding cannot be followed to a great extent or the progeny lacks in vigor and is otherwise defective; this rule applies equally well to plant life. It is desirable that the pollen from one flower be taken to the stigma of another, instead of the stigma and pollen from one flower coming in contact. There are very many varieties in which we find the anthers and pistils maturing at different times.

The garden nasturtium (Fig. 548 and Fig. 549) is an excellent example.

Here the nectar is contained in a long spur. When the flower first opens the style is short and the stigma immature and unreceptive, the anthers also are quite unripe, but soon one or two, as seen in Fig. 549, begin to rise from their

first position beneath the flower until they stand just over the stigma, so that a bee entering could not fail to get dusted in the breast with pollen (now beginning to be shed), as the tongue is stretched out and the head pushed forward to reach the sweet secretion in the spur.

The anthers continuing to reach maturity, follow their leaders, one by one, and during the time that their pollen is being liberated by gaping of the pollen pouches, they stand in front of or close to the stigma. This process occupies from three to seven days, after which the anthers begin to drop off, and the filaments to shrivel and droop.

But the style meanwhile has grown longer, and the pistil now adhesive and receptive, assumes the position in relation to the rest of the blossom, which the anthers before occupied (see Fig. 551). A bee flitting from flower to flower, loading her legs with pollen and her honey sac with nectar, passes, with a well-powdered breast, from the younger condition (Fig. 549) to the older, (Fig. 550), and of necessity presses the pollen grains she carries on to the stigma, and cross fertilization is accomplished, the only possible fertilization since

the two genders do not co-exist, the blossom during the latter period being only female.

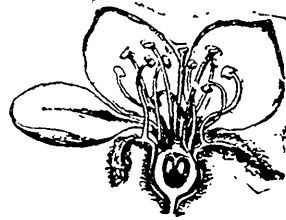


FIG. 552.

narrow slips which are turned so as to stand nearly upright. These refuse contact with water, and perfectly protect the nectar from dilution by rain, as may be easily seen by sprinkling water heavily upon one of the flowers: they also compel the visiting insect to keep the thorax sufficiently up to rub off its load of pollen upon the stigma.

Looking at the blossom now in front, we see the lines on the several petals, according to a beautiful and general law in the floral world, point to the cavity in which the nectar lies, so that these beautiful lines are guides to the insect visitor.

The order of development noticed in the blossom just passed is sometimes, though far less commonly, reversed, as in figwort (Figs. 550, 551 and 553), which is a great honey plant. The flower is both male and female, but as before, the two genders are never actually co-existent. In this case the stigma is first mature.

When the corolla opens the stigma already adherent and receptive, presents itself immediately over the front lip (Fig. 550), and bees—having been dusted by pollen in their visits to older flowers, and in a manner we shall presently see—as they reach in after the abundant nectar, transfer this pollen from their hairy breasts to the sticky surface of the stigma. Cross fertilization having been secured, the stigma shrinks and dries, and the style droops, while the anthers, which previously had been hiding in the pouch-like form given to the front of the corolla cup for their accommodation (see Fig. 550), now rise in view (Figs. 551 and 553), take the place whence the stigma has retired, and begin to shed their pollen.

The anthers completely occupy the space over the lip, arranging themselves in two



FIG. 551.



FIG. 553.