

hardly like to engage duly to describe the *omne scibile* of a solitary little red campion. Yet the very sense of this vastness makes it ridiculous presumption for any man to dispose of the red campion altogether at a single sitting. I must stop to look again at my pretty flower, and to decide upon the meaning of at least the most salient points in its structure and arrangement.

The campions are pinks by family, and of course share all the main peculiarities of the pinks generally. But the habit of the family as regards its method of fertilization differs greatly from plant to plant, and has impressed itself markedly upon their forms. There is one great group of pinks which lays itself open to all the small flies and beetles of the world, who come and eat its pollen freely to their hearts' content. Of these, the common chickweed and the white stitchwort are familiar examples. Most of them are petty, mean looking, inconspicuous, weedy plants, because they lay themselves out for mixed small deer of uncertain and undecided tastes, and do not attempt specially to attract the color-loving bees and butterflies, the æsthetic aristocrats of the insect world. Hence their petals are small, ragged, and mostly white, and their calyx consists of five separate spreading pieces. They keep open house, as it were, for all comers without inquiry, displaying their pollen unprotected to whoever wants it, on the chance of a stray grain or two being carried by the insects from head to head. But the campions belong to a higher and more specialized department of the pink tribe. They and their ancestors have devoted themselves to bees, butterflies, and other developed flower-hunters, whose long proboscis is peculiarly intended to aid them in extracting the honey from deep tubular blossoms. Thus they have slowly acquired, by long selection, a structure exactly adapted to a surer and less wasteful mode of fertilization by means of these higher insect allies.

The outer covering of this campion here does not consist of separate green sepals, like those of the stitchwort, which I have picked for comparison with it; its five pieces are welded together into a swollen bell-shaped tube—a campanular calyx, as the systematists call it. Within the tube, five large pink petals rise on long claws, kept together in shape by the pressure of the calyx. Inside the inner passage formed by the petals lie the pollen-bearing stamens or the ovary with its embryo seeds, each in a separate flower, whereof "more anon." Thus the pollen and the honey are concealed out of sight of the useless small insects, and they can only be reached by the long proboscis of the bee or the butterfly. To prevent ants, small beetles, and other honey-eating intruders from creeping up the stalk, and so rifling the nectaries without doing any good to the plant in return, the stem of the campion is covered with hairs, and it exudes a sticky, viscid gum, both of which peculiarities aid it in baffling the unwelcome wingless visitors; while the inflated calyx and long tube effectually keep out all flying insects, except the few for whose visits the plants specially lays itself out. Nay, as if so many precautions were not enough, the mouth of the tube, above the stamens, is furthermore obstructed by five little valves or scales, one being attached to the claw of each petal; and these scales can easily be craned over, like tiny walls, by the large and long proboscis of the bees or moths, but not by the little thieving flies against whose incursions the flowers are so anxious to guard themselves. Given the red campion, it is easy enough to evolve the white from it; but who can say how many geological ages have gone to the evolution of that parent form itself from a single open blossom like the white stitchwort?

All these precautions for due cross-fertilization are now actually in course of being followed up by another precaution yet more efficacious than any.