

while we consider the most probable method (as it seems to us) by which our bees know each other as friendly members of one community, or the reverse, by which they recognize their queen and their home.

It is a truism, about which there is now no argument whatever, that the sense of smell in insects is acute to an intense degree; so extremely attenuated is this faculty that some have classed it as a separate sense from that of smelling as we know it. Night and dusk flying insects are guided about in search of food (and each other) by this sense alone, until their organs of sight are brought near the white flowers, which arrest their vision after having attracted them by their perfumed nectar. So probably do colored flowers in daylight *exactly* treat our honey-bees. We are told of the now common practice of carrying the female of the Lepidoptera, thus ensuring the early and near presence of the male insect, guided to the insect-hunter by its acute sense of smell. So probably in the daytime, in the heights of air beyond the ken of worker bee, do the drones and queens of a district dart about at rapid rates, in a selective chase, which seems intended to be almost perfectly preventive of that very in-and-in breeding which was recently under controversy in our columns; but guided about are the drones by their acute olfactory organs. Within the hive much the same condition prevails we think, that is, in the darkness of the house the sense of smell is the most important factor. We find little or no extra attention paid by the workers to a *virgin* queen, and when they are presided over by such a one, or even are queenless, the robber bee or wasp, the mouse or earwig, finds little resistance made by the disheartened insects who are without a ready and rapid means of telling foe from friend. Immediately, however, our queen begins laying or receives stimulating food and attention from the workers all is changed, and a busy, prosperous community jealously guards the portals of the house.

What is it, then, which produces the *volte face*? Simply, in our opinion, the queen herself provides the workers with the means of recognizing each other and herself in a manner not unlike that adopted by other insects and by other animals. Solid *faces* are only dust-like from the egg-layer, but with the ovaries in great activity and prepared liquid food (ready at the top of the tongue of every worker) in large consumption, it is the fact, as is to be expected, that liquid *dejecta* are profuse, the flooring of the hive receiving the greater portion of this kind of *faces* from the queen, who descends to the lower edge of the comb for defecation.

This, and this only, in our opinion, gives the honey bee the distinctive and characteristic odor or perfume (for such it is) which enables it to recognize the house and every member of its family. Alter the smell of this dejection by phenol, peppermint, or what not, and we are able to unite strangers. Is not this the magnificent *smell of bees* (not nectar nor pollen) noticeable when all is prosperity in a good stock? Let there be no false delicacy about this matter, or let the collector of Oriental perfumes silence the prudish by narrating the sources of his wares. Many people can bear witness to the scent left on the hands after handling a queen, an aroma which attracts workers, and which is a silent, yet sure, means of enabling a swarm in a dazzling blaze of sunlight to keep together, and to gather round the queens as the nucleus of the new home. In case of robbery we spray the hive with carbolic solution, so that the thieves returning home may have lost their scent; we use scent in uniting, to destroy, for a time, the distinctive "home-scent," until the hive is again charged with it; and, believing each hive to have a distinctive smell, by the conduct of sentinels towards wanderers or thieves, surely we may inquire what is the cause of this power of recognition hitherto considered wonderful! It may be urged that formic acid (plentiful in every hive) gives the distinctive odor we speak of, but we find this present with queenless bees; and, if this were the case, every bee would have a *separate characteristic smell*, which would vary by the food it fed on; besides, the ejection of formic acid by angry bees, or the odor of it from a crushed bee, seems to so alter the "home-smell" that there is a rush of bees to the rescue. The smell of poison, therefore, is of such an unusual and exceptional character in a hive, varying in every bee, and producing war instead of peace, that we must look in some other direction for the common cause of bee-recognition—the direction we have indicated. There is no question that bees communicate by tapping on the framework of the head, immediately above the brain, with the antennæ, and also by crossing, rubbing, and touching together these sensitive rods, containing, as they do, the ends of the smelling, hearing, and feeling nerves; yet we have only to watch the behavior of sentinels towards returning bees, in a busy time, to know that they smell without having time to touch the returning inmates of home. True, a satisfactory aroma of incoming honey may be a passport into the hive, as it often is, but bees after a cleansing flight, drones, and young bees, are passed into the lodge with only such examination as could be made by sound, sight or smell, the latter