

## Apiary

### Does Pollen Cause Bee-Diarrhoea?

BY J. E. POND, JR.

The advocates of the "pollen theory" make out a fair case for themselves, but they are met at the outset by a few facts that militate directly against their idea. These facts are: first, pollen is a natural food of the honey bee, and nature makes no mistakes; second, bees do live in confinement for protracted periods, using at the same time large quantities of pollen as food, without being troubled with bee-diarrhoea. It is not enough, when setting out a cause of this disease, to say that certain colonies were supplied with sugar syrup alone, and were free from it, while others were not fed on natural stores; we must go still further and show that the presence of pollen in the hive is always followed by the disease, and that the disease never occurred when it was absent. Now what are the facts?

Friend Fradenburgh says in *American Bee Journal*, June 11, "we want the proofs," and he proceeds to say in substance, "that fifty-nine living witnesses prove to him that pollen causes bee-diarrhoea." His proofs are, that certain colonies that had pollen in their hives had this disease, while others that were allowed sugar syrup alone showed no signs thereof. All this, however, proves nothing, except in the instance he mentions, bee-diarrhoea followed the presence of pollen among the stores fed to the colony. *Per contra*; this last winter I packed nine colonies on their summer stadds, allowing them all the pollen unused during the prior season; not one of these nine colonies showed a sign of diarrhoea, and as our editor well knows, from personal observation, were as strong as colonies are ever found just before fruit bloom, one of them gathering, in fact, seventy-two lbs. of surplus honey in four days from apple bloom. I do not make this statement as proof that pollen does not cause diarrhoea, but simply as an offset to the proof of friend Fradenburgh.

Pure honey and pollen are the natural foods of the honey-bee. But we are told that eating pollen causes distension of the bowels to such an extent that the bee is forced to void the feces, and that this is diarrhoea. I do not believe it. Nature is ever in harmony with herself. Obey her laws and health is the result; break them and disease follows. The honey-bee is provided with the means of withstanding long terms of confinement, without its bowels becoming clogged or distended. When in its normal condition, it voids its feces in a dry state, and no harm arises therefrom, whether honey, pollen or sugar syrup is used as food. When, however, it partakes of impure

food, such as fermented honey or pollen, then the bowels become slightly irritated, a watery secretion is formed in the endeavor of nature to get rid of the irritating substance, and the bee-diarrhoea results. Imperfect ventilation will cause excess of moisture; excess of moisture will cause fermentation, and diarrhoea follows from eating fermented stores. Brother Heddon hit it pretty nearly right when he started the bacteria idea; if he had followed it up a little more closely he would have been nearer the mark. Fermentation is bacteria; and taking that view of it, bacteria is the cause of bee-diarrhoea. A discussion of this question will bring out opinions, and as a consequence, good results must follow. *American Agriculturist*.

### Bee Recognition.

About a year ago there appeared in *Gleanings in Bee Culture* quite a curious extract, translated from a German author, "How do bees recognize each other?"

It is surely a striking phenomenon that so many thousands of bees that live in the same hive, and under one queen, and whose period of life in summer time does not exceed six weeks on the average, can recognize each other so quickly and surely as to be able to detect a stranger bee, scarcely differing from themselves in shape, size and color, that is unhesitatingly attacked by a sentinel and forced out of the entrance in a fierce encounter. The bees seem to make an exception to this rule (of making strange bees keep their distance), only in the case of very young bees; that is, those taking their initial flight, and happening to alight at the wrong entrance, and of those which, coming to the hive laden with honey or pollen, miss their own home because of exhaustion, inclement weather, etc., and are compelled to seek one elsewhere. This is readily granted them, and henceforth they become true members of the family which has adopted them; and should they, in their turn, become sentinels, they would undoubtedly attack their own sisters, in case the latter tried to force an entrance into the hive.

A personal acquaintance of the bees with each other we must deny absolutely, because of the enormous number belonging to a single stock, their short life in summer, and because all are rarely in the hive at the same time. Neither can color be a sign of mutual recognition; for bees to whom a queen of a differently colored race has been introduced do not molest the progeny of this new queen, this progeny having a color differing greatly from that of the first queen. We therefore have remaining, speech and the sense of touch and smell, which may serve them as a

means of recognition.

For a long time bee-keepers were of the opinion that a kind of speech existed among the bees, and that, accordingly, a certain watchword (so to speak) enabled them to distinguish strangers from those belonging to their own hive. Of course, bees have certain sounds by which they express emotions, and cause themselves to be understood outside the hive; for instance, the vehement shrill cry produced by an angry bee that wishes to drive us from the vicinity of the hive soon attracts a number of sister-bees from neighboring hives, whose combined attack finally compels us to beat a hasty retreat. Similarly does the swarm know how to call its thousands of members together in a few minutes, by the well-known joyous call-note. But all these sounds, of which the human ear has been able to detect nearly thirty, and judge of the meaning, are such as are common to all bees, and by which, it is true, they can express the most diverse emotions, but which can never serve as the watchword of a stock.

Others thought that bees recognize each other by the sense of touch, for they have often been observed to cross their antennae in the hive, as if in the act of communicating something to each other. This view has a strong claim to probability, with this modification, that the sense of smell also has its seat in the antennae, so that not the sense of touch, but that of smell, forms the means of mutual recognition. Now, if this same sense serves such a purpose, there must be in every hive a being that is capable of giving to all its inmates a peculiar and distinct odor. Without doubt we can consider the queen to possess this function, which, in passing hither and thither through the hive, gives to each and every bee the same odor, which act, as has been observed, takes place by the queen ejecting a fine fluid. This explains the fact that those bees, coming home honey laden, and whose odor is rendered less intense by flying through the air, and by coming in contact with so many flowers, can gain admittance even into strange hives, without being hindered thereat. The fact of their being loaded with honey is not the reason why the sentinel bees allow them to pass, but it is the neutralized odor which prevents the sentinels from distinguishing them from the bees of their own hive.

If we take bees that have, in consequence of fear, annoyance, or similar causes, filled themselves with honey in the hive and put them in the entrance of another hive, they will, in spite of their being loaded with honey, be attacked and pulled out without much ado; a proof that it is not the honey

carried by the bees, but some other factor which determines the acceptance or repulsion of a bee. The young bees which are generally readily accepted by neighboring stocks seem not to be infected by the odor of the queen as much as the older ones, which accounts for their immunity from attack. In the case of other beings, also, youth enjoys a certain indulgence. Why, then, should bees be so cruel to their young? Robber bees that enter a strange hive to carry its stores to their own are at first violently attacked and energetically repelled, but if they are successful several times, they can thereafter enter and leave the hive, untouched. They have, in all likelihood, been infected by the odor of the queen during their stay in the hive, and therefore can not be distinguished by the sentinel bees, which have probably soon accustomed themselves to the smell of the robber bees, because the latter generally enters a hive in large numbers.

The following, also, in itself a very striking fact, is easily explained if we accept the above supposition; namely, that bees from hives containing impregnated queens unite neither among themselves nor with swarms having unimpregnated queens; whereas the latter kind of swarms unite with each other most readily, and their queens quietly engage in the decisive struggle. It is probable that the unimpregnated queen ejects none, or very little, of the above-mentioned fluid, so that the odor of the bees which are with her is less marked.

Far from the hive, while gathering stores, bees are outspoken cosmopolitans, neither troubling themselves about their foraging neighbors, nor knowing envy; but they are impelled solely by their instinct to make the most of nature's treasures. At home they are jealous of every stranger; in the field, they magnanimously give way to each other.

A. H. STIEBELING, M. D.  
New York, N. Y., June 6, 1883.

On which Mr. Root comments as follows:

Many thanks to you, friend S., for your translation. Although you bring out several new and wonderful facts in this strange matter, I hope you will excuse me for saying that I can not as yet accept all the conclusions arrived at, in all cases. One fact in particular struck me the moment you mentioned it, as being true; and that is, that the bees of a hive can not possibly have a personal acquaintance with all the rest of the bees of that hive; they do not know each other by their countenances, if I may be allowed the expression, as we do. Neither do they know each other by the sound of their voices, because the bees of any one hive have