

because it *was new to them*, is that any logical reason that it was *new* to me? When you first made your "late invention" public, you wrote to me concerning it, and I replied to you in substance that my shallow tiering cases were practically the same as what you claim as an invention of your own. From that time you have treated me as your enemy, and have spared no pains in your efforts to injure my good name by means of your direct attacks, and by setting a parcel of inexperienced "students" to barking at me. But I am here yet, with the courage to speak the truth as it is "written in the land mark." You are simply mistaken when you suppose that I want to injure you, I am not a supply dealer and I have nothing to lose or gain whether your "patent bee gum" succeeds or fails. Your charge of "unchristian" conduct on my part, if true, would be a rebuke, the more keenly felt because of the source from whence it came. I wish I was able to thank Mr. Heddon for calling my attention to this matter of "christianlike" conduct. At any rate I shall try to profit by it in the future.

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For the Canadian Bee Journal.

DRONES.

AT WHAT AGE ARE DRONE BEES DISPOSED TO MATE.

ON page of this journal for 1885, I published some observations showing that under conditions apparently quite favorable a drone crept out of its cell in about 24 days and 8½ hours after the queen had laid an egg there. After nearly two years of prostration from severe head trouble, grateful to Him who has restored my health, and with kind greetings to the bee-keeping fraternity, I continue the record of observations then made:

August 13, 1885—Drones fully two days old can only make short, flying leaps.

August 14—When three days old, if tossed up into the air, they fly well. One of this age kept out of the hive half an hour, eagerly licked up some thin honey.

August 27—I gave some drones just hatched in a good colony to a strong nucleus.

August 30—At two p.m., with the thermometer indicating 80°, four drones took wing. One coming just outside, discharged a whitish, cream-like mass, quite unlike the faeces of the common bee, which was eagerly licked up by the workers! Another, caught before it took wing, discharged a clot of a somewhat yellower color. Evidently drones cannot retain their faeces as long as workers. Some provision would there-

fore seem to be needed against a colony taking harm, when the cleansing flight of the drones is unreasonably delayed. As no drone was gone more than five minutes, none had left to mate.

September 1 and 2—The weather was unfavorable, and only a few drones took wing, but not to mate.

September 3—The temperature was 76° at 2 p.m., and the weather fair, with a gentle breeze. Of the many drones that flew, some returned in less than five minutes, most in ten minutes, and a few in fifteen minutes. I think that not one sought to mate, for a drone, unsuccessful in finding a queen, will not come home until his honey-sac is nearly empty, which usually happens in about half an hour.

From all the observations made at this time, I conclude that drones cannot be relied upon for sexual duty, until they are at least eight days old and that most of them are not serviceable quite so young. The drone having no special office inside the hive, it is wisely ordained that it should seek to mate at about half the age a worker seeks for outside duties.

September 15—The temperature was 60° to 67°, and the weather was cloudless. At 1 p.m. drones were in full flight. I put a Jones' perforated zinc guard on that strong nucleus, to be able more easily to catch the returning drones. The most of them evidently flew to mate; the last two were gone 51 minutes. I caught them all; they filled two large queen cages. After most of them had been confined over half an hour, I placed the open cages more than a foot from the hive-entrance. To my surprise many of them unable to take wing, crawled to "the flight hole," a truly woe-begone set of beggars—impatient, nay importunate to be fed; and the workers were all eagerness to supply their wants! One, too far gone to crawl or even to beg, on having his proboscis wetted with thin syrup, though at first barely able to take it, soon grew strong enough to fly. From numerous experiments made at this time, it seems that if drones are kept from feeding only half an hour after returning from a wedding-trip, they become too weak to fly.

Catching, on the same day, some drones which were being worried by a strong colony, their honey-sacs were found to be well-filled. It is easy to see how soon a drone must succumb, if the bees merely prevent it from eating. I believe that more perish in this way than by any actual violence done them by the workers.

I hope to be able to continue this subject in a future number.

REV. L. L. LANGSTROTH.

Dayton, O., Jan. 10, 1888.