

found that to remove this immediately will usually prevent impregnation. I have removed it from some queens three or four times this season, and thus prevented impregnation. Every observing apiarian, if this subject ever attracted his attention, knows that the workers will remove this foreign substance from their queen, and it is common in a short time to see one of them coming out with it. This untimely removal, in my weak judgment, is the true cause of such queens mating with different drones—my experiments, at least, go far to establish this fact; and if my experiments prove this point, the theory that queens are often fertilized with several drones is erroneous, and this cannot be the reason why the progeny of a pure Italian queen contains some workers purely Italian, whilst others are as purely the common black bee."

The difference between Mrs. Tupper's method and the one described above is very slight—only a difference in the manipulation—the principle being the same. Mrs. Tupper confined the queen, five days after she issued from the cell, in a wire cage with the selected drones. The cage was then laid on the frames of the hive, and covered over and left there for 36, and in some cases 48 hours. The cage was about six inches square by eight inches long. Mrs. Tupper claims that in such a cage the queens were fertilized, though she admits that last year she had several failures, I also learn through private correspondence that J. E. Ponet tried a similar process last year, and believe he succeeded in getting several queens fertilized by selected drones. Rev. Mr. Truesdell, of Warwick, P. Q., was also experimenting last year, testing the process given by Mrs. Tupper. How he succeeded I have not yet learned. I hope he will give the results of his experiments in your journal for the benefit of your readers.

I fully intended to test the process last year, and did make one trial, in which I failed, but was prevented from giving it any further attention. I still have my doubts whether any queens have ever been fertilized in confinement. It is so contrary to their nature and habits that I should feel half inclined to doubt my own eyes if I saw it.

It has been already stated, and is a well known fact, that it is the natural habit of the queens to mate with the drones on the wing, and in no other way, if left to themselves. I am therefore inclined to receive with caution any statements that they have been fertilized in confinement. I have long thought that some process would be discovered whereby impregnation would be in a measure under the control of the apiarian, but cannot readily believe in a process so at variance with their natural habits. In corresponding with J. E. Pond, of Roxboro, Massachusetts, who fully believed that he had succeeded in getting several queens fertilized artificially in confinement, he admitted that he was, to use his own

words, "dead sure in only one case." Mr. Freeman Moore, in giving the results of his experiments which appeared in my last, states some things which are a little hazy, and cast a shadow of doubt over all. He does not believe the statement made by his friend Henry Atherton, that the queen stung the drone to death, but thinks that Mr. Atherton saw the queen impregnated by the drone, for he says a queen will not use her sting except on a rival queen. In this he is mistaken, for a queen will sometimes, when confined in a tumbler, sting to death a worker bee if introduced into the tumbler with her. Hence there is no reason to doubt that, in some cases, she would sting a drone to death if introduced to her, and it is altogether probable that Mr. Atherton was quite correct in saying that the drone was stung to death. I believe, however, it is not generally known that a queen will sometimes, when confined, sting other bees, as well as rival queens. Again, he says, "my mother informed me that the queen had just killed one of the drones, and to my joy and surprise I found a drone 'stone dead,' and evident signs of fertilization visible on the abdomen of the queen." Now, the drone does not die instantly after coition; therefore in that he was mistaken, and he may have been mistaken in thinking that the queen was fertilized. True, he says he removed her to a nucleus box, and in three days she laid eggs and did well. But she may have left the nucleus box on the first day after introduction, and mated with a drone on the wing. Indeed, it seems more reasonable to suppose that she did so, as a queen generally lays in 48 hours after impregnation, and 48 hours after the first day she commenced to lay, which would make it just three days after he introduced her into the nucleus box, at which time he said she commenced to lay. I fear the experiments have not been carefully conducted, and that after all it may turn out that the queens were fertilized in the usual manner. On the other hand, one can hardly believe that Mrs. Tupper and others have been mistaken in every instance. Doubtless, it will, this season, be settled beyond dispute.

I have already stated that, when coition takes place, the organ of the drone is left attached to the body of the queen. If, then, a queen is confined with drones, and during this confinement the organ of the drone is found attached to the body of the queen, the question is settled. Those who may desire to experiment will remember that the queen goes out to meet the drones from five to eight days after issuing from the cell, and the proper time to confine her with the drones will be during that time. It will also be absolutely necessary to keep the queen confined in the hive until the proper time, lest she go out earlier than usual. I would advise keeping her in the hive until the eighth day, and then introduce her to the drones.

#### FURTHER EVIDENCE OF THE SUCCESS OF MRS. TUPPER'S PROCESS.

Since writing the foregoing article, I have received additional evidence of the success of Mrs. Tupper's method. Some time in early spring, last year, A. Malone, Esq., of Garden Island, wrote to me to know if I had yet published Mrs. Tupper's process, as he had not seen it. I wrote to him, describing the process, but not knowing how he had succeeded with it, I made enquiries of him by letter a short time since, and I subjoin his reply. It is quite satisfactory. I hope Mr. Malone will give us notes of his success the coming season. I do not think it at all necessary to remove the queen from the stock on which the cages containing the drones and queen to be fertilized is placed. By removing the honey board, three cages could be placed on the top of one of my hives at the same time. Let others try it and report.

J. H. T.

"J. H. THOMAS, Esq. Brooklin, Ont

"DEAR SIR,—Your favour of the 14th inst., asking for information relative to the fertilization of queens by Mrs. Tupper's process, is before me, and in reply I would beg to say that I had queens fertilized in that way several times last season. I commenced early in the spring to try and raise a number of colonies from one, as described by Mr. Tallup. (I think in the January number of the *Bee Journal* for 1868), and having lost every queen I raised by letting them fly out for fertilization, I at last tried Mrs. Tupper's plan, and succeeded. I first made some small Nuclei hives, and inserted three frames in each (with brood and comb in them), and placed a queen cell in each in such a manner that by turning a button I could see the cell. As soon as the queen was hatched I caught her and placed her in a cage made six inches square by eight inches long, two sides of the cage being wood, the rest wire, and placed a good number of worker bees in with her, and put the cage on top of the frames in one of your hives containing a good swarm of bees, having first removed their queen. When the queen was five days old, that is, on the fifth day, I took out all the worker bees, and placed seven nice large drones in with the queen. I have a door in one of the wooden sides of my cages, which makes it handy to put in, and also to catch the queens. I left the queen and drones together forty-eight hours in the cage, having placed them back again on top of the frames, and replaced the cover and plugged up the ventilators which are in the sides of the cover, to keep out the light. Of course I put some honey in the cage, out of the reach of the bees below in the hive, to keep the queen and drones from starving. Each time on examination, I found (with one exception) a dead drone, having all the end of his abdomen burst open, and twice I noticed evidences of copulation on the queens. To make myself doubly sure that they were fertilized by this method, I introduced the queens into new swarms, and closed the slide, so that nothing but a worker bee could go in and out, and all the queens, (with one exception, as mentioned above) in a few days commenced laying, and reared nicely marked Italian workers. The reason those that flew out for fertilization were lost is, I think, that on account of my living on an island, and having very few drones, the queens attempted to cross the river and were lost.

"Yours, etc.

"A. MALONE."