

door, by a disinterested party, thereby avoiding any responsibility himself, and, at the same time, to put it mildly, conveying an impression calculated to do me a serious injustice.

I will now conclude by throwing some light on this, to me, very important part of the Messrs. C. & D's. accusation. It is quite true I did hive a swarm of bees into one of my own hives, and why? Well, because a late friend of Mr. D's., but who now feels his position keenly, at unwittingly having been the cause of all this onus cast on me, called in great haste with a request that I should at once bring a hive, as Mr. D's. bees were swarming, with nothing at hand to put them in, and accordingly I did so, taking the only spare hive I had, (one of the new Heddon style) into which the swarm was placed, and left until I could no longer do without it, I of course returning the bees to the old colony from whence they issued. An examination of the present colony, which was in a chaff hive, there and then revealed queen cells, showing it did not swarm out on account of heat, but from purely natural causes, as also did two (2) others during Mr. D's. absence, notwithstanding his great care in preparing them so as to need no attention till his return. Moreover, I have proof that I offered the drawn out foundation to Mr. D. for the purpose of extracting the honey, but he positively refused to accept them, assigning as his reason, that we had trouble enough with this, as also the other colonies alluded to, and he was more than obliged to us for all that had been done. Does this look like downright robbery? Yes, we will leave it too, for the kind friends generally to judge.

To some this epistle may seem as *multum in parvo*, to others as "t'other end which." Be this as it may, I have done with it. Thanks.

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#### THE HIBERNATION OF THE HONEY BEE.

**W**HAT is hibernation? Marshall Hall says "sleep and hibernation are similar periodical phenomena leading to similar results and differing only in degree."

As Dr. Hall is probably the highest authority we have on the subject, and as his definition has been accepted by all investigators, it would seem to be well for smatterers in science to look up the standard definition and accept it rather than to coin another which shall be accurate only in measuring the want of knowledge of its author. The Germans recognize hibernation as a peculiarly deep sleep and their name for it is *winter-sleep*, (See Barlow's *Winter Schlaf*, Berlin.) Do

honey bees hibernate, or is the quiet of winter only a sleep, or has it passed beyond sleep into hibernation? Dr. Edward Smith says, a man in deep sleep expired 4.5 grains of carbonic acid per minute; on the treadmill 43.36 grains per minute. A waking hedgehog yielded 20.5 times more carbonic acid than one in state of hibernation. Thus, we have a ratio between sleep and waking of 1 to 10 nearly; between hibernation (not profound) and waking 1 to 20.5. If instead of the treadmill we take walking at three miles per hour (26 grains carbonic acid per minute) which exertion would correspond more nearly with that of the hedgehog, we have a ratio less than 1 to 6. Carpenter says of the bee, when breeding the evolution of heat and consumption of oxygen takes place at least twenty times as rapidly as when in a state of repose. This is the same ratio as exists between the hedgehog's hibernation and waking. But dropping these comparisons as illogical, we may note the number of inspirations and the amount of food taken during the winter, which proves, conclusively, that in its winter repose, the honey bee has passed far beyond the physiological limits of sleep into hibernation. You will notice by the definition that where sleep ends, hibernation begins—there is no "quiescence" between. The daily summer sleep of the bat and dormouse is a true hibernation. Dr. Hall says "the quantity of respiration is inversely as the degree of irritability of the muscular fibre, the former being marked by the quantity of oxygen consumed in a given time ascertained by the pneumatometer, the latter by the force of galvanism necessary to demonstrate its existence. The capability of passing into a state of hibernation depends upon the capability of taking on an increased muscular irritability. Were the respiration diminished without the increased muscular irritability, death would take place, from the torpor of slow asphyxia, and were the respiration increased without the diminution of the irritability, the animal would die from over stimulation, as in those suddenly aroused from the state of hibernation." As such trifling causes as walking over the floor, touching the operating table, etc., are sufficient to excite respiration, hibernating animals adopt various means of securing themselves from disturbance and when the temperature approaches 50° they seek out their out hibernacles in trees, caves and burrows in the earth. It was found that hibernating bats died when subjected to the motion of a stage coach for a couple of days. The same treatment would undoubtedly seriously injure a hibernating swarm of bees. It was that close