

properly adjusted, there is more passage-way than any colony can use and that fact is probably one reason why the bees are not slow to plug up many of the holes, when everything is favorable for so doing.

Now, there is a serious objection to using two rows of holes. There has, of late, been discussion enough to convince the greatest novice in apiculture, that to avoid brace-combs and glue, the bee-spaces much be exactly the right measurement.

Now, then, if the measurement is right between the upper and lower-surfaces of the slats, and the brood frames below and the surplus sections above, that space will be too large between the brood-frames and sections and the surface of the zinc, because zinc is so very much thinner than the slats.

Owing to this well-known law, the closer the slats come together (that is, the narrower the space between the edges of the slats), by all odds, the less will be the likelihood of brace-combs being built to either side of the honey-board.

There must be some play, or allowance, in the practical construction of honey-boards and before I would put the slats far enough apart to take in a zinc strip with two parallel rows of holes, I would, by all means, make the honey-board entirely of metal, such as I described in *Gleanings* something over two years ago.

In that honey-board either one or two rows of holes can be used over each top-bar, and the break-joint and bee-space principles both be preserved. The bee-space can be made by turning up the edges of the zinc, or by tacking on a wood border as I made them in the first place, when Mr. Jones first announced the queen-excluding idea.

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We have made a great many experiments with this queen excluding perforated metal. At one time we thought we could make the full sheets of metal answer the purpose, but found the changing temperatures of the hive, seemed to spring it, so that we could not keep it from bulging. We did not find quite as satisfactory results as when we used the perforated metal in the bee-spaces, between the wooden bars of the wood and metal honey boards. One row of holes for each comb in the hive, will give four times the access to the sections, that is necessary for a colony. The break joint honey board, with the zinc in bee space will give satisfaction, we believe to everybody, and as Mr.

Heddon says, too many holes are sometimes plugged up with the bees, and too broad space, between the wooden bars, which support the zinc, induces brace combs. But when you want clean honey boards, free from brace combs, and perforated metal, without a speck of propolis or comb built on it, or in the perforations, just give them a little soaking of petroleum cerate or vaseline and you will soon reap the benefit to be derived from it.

#### Advantage of Using Comb-Foundation.

W. Z. HUTCHINSON.

If the securing of perfect worker-combs is not the chief advantage to be obtained by the use of comb-foundation, it certainly stands second in the list. To be able to hive swarm after swarm, year after year, as bees are ordinarily managed, and know that each and every comb will be a perfect worker-comb, is a comfort.

To have each comb in the apiary perfect and straight—so exact a counterpart of all others that there will be no difficulty in interchanging—is a great convenience.

To have such combs that no honey, nor labor of the bees, will be wasted in the rearing and maintenance of a horde of useless consumers, may be a factor that will throw the balance upon the right side of the ledger.

If it were necessary, in order to secure such brood-combs as these, it will be advisable to buy and use foundation, even though the use of starters only in the broodynest does result in a greater surplus.

I presume that to some of you—those who have read my little book, "The Production of Comb-Honey"—it will be a surprise to hear me express such views. I know it is not customary for authors or editors to acknowledge their errors; but let me be author, editor or orator, I shall always proclaim what I believe to be the truth, even if it does contradict my former published conclusions.

Do not imagine that I am ready to "take back" all I wrote in that little book. Far from it. But I wish to make this explanation. When I wrote the book I had practiced, for several years, the plan of hiving swarms on starters only.

With the exception of the last year I had used only the Langstroth hive, contracting it to five frames when hiving swarms. This gave the bees but small space in which to build combs. They could start only a few—five and all were