

### Some Experiments in Wintering.

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During last fall and winter I made such efforts as I could under existing circumstances to get some light on the problems growing out of the matter of wintering bees. My bee-cellar is under my honey-house and is fifteen by thirty feet with a cistern in one end. I have wintered bees in this cellar for seven or eight years with almost uniformly excellent success, and yet it now seems certain from my experiments with a hygrometer, to be a very damp one, there being a difference, at a temperature of from 40° to 50°, between the wet bulb and the dry bulb, of only one-half a degree, which indicates that the percentage of moisture is about 98—almost complete saturation.

It is claimed by many prominent beekeepers that moisture is one of the principal causes, if not the principal cause, of the winter disease of bees known as dysentery, but if this were true I should have expected to find it prevailing largely among my bees during the last winter, but such did not prove to be the case. In fact, though I suffered a larger percentage of loss than I ever did before in this cellar—about 20 per cent—yet only a small proportion of those that perished showed even a little evidence of that disorder. I discovered only two cases that could be called really bad, in one of which the colony died and in the other the colony had regained its health and was in good order and of good strength when removed from the cellar, and still remains so. This case was a peculiar one. The hive was an eight-framed L. hive and the bottom board was left on in the wintering. Such a forbidding receptacle for bees as this was when taken from the cellar about the tenth of April, I have seldom seen. The bottom board was covered with a mass of sticky ordure to such an extent that only now and then would a bee venture upon it to gain the outside of the hive. The cover was well sealed on and when pried off it ran with the almost incredible amount of water and the honey board and combs outside the cluster were wet and white with mould. When the bottom board was removed and a clean one substituted, the bees came out to fly as clean, healthy and strong as one would care to see.

I cannot reconcile this case, as well as many others I have examined recently, with the theory that moisture is the cause of dysentery. Yet I think I have good

evidence that moisture under certain circumstances is harmful. When the strength of the colony is sufficient to enable it to keep its immediate neighborhood dry, it appears not to suffer from moisture, but if it is so deficient in numbers and vigor, one or both, that it is unable to do that, it seems reasonable to suppose that it must perish, being either chilled to death in the cluster or else driven to desperation by the misery of the situation, scattering and leaving the hive tenantless. The slight spotting of the combs which often occur under such circumstances should not, I think, be taken as a sign of the trouble known as dysentery. It is rather the result of the weakness of approaching dissolution than the cause of it.

Last season after the failure of clover and basswood there was very little nectar to be gathered in this locality either during the remainder of the summer or during the fall, from which fact it resulted that at the beginning of winter a large portion of the colonies were not only weak in bees but especially so in young bees. It was not difficult to foresee the probable consequence of this state of things, so I was not surprised at the loss I have incurred. Apparently the old bees died off during the early part of the winter, for more than the usual number left the hives during that time, thus reducing the cluster to a size too small to enable it to successfully combat the unfriendly influences of moisture combined with a cellar temperature. Perhaps in many cases the cellar temperature alone would prove sufficient to create such a feeling of discomfort as to make the bees restless and so cause them one by one to leave the cluster and wander out of the hive and be lost, but I have no doubt that in other cases the added influence of moisture was necessary to accomplish total ruin. That the decline of these colonies came about in the way I have indicated seems substantiated by the fact that in almost all these cases very few dead bees were left in the hives and in only now and then one had the bee last to perish preserved the form of a cluster to the last.

Quite a strong effort was made to determine if possible whether sealed covers were, in cellar wintering, a disadvantage and a large number of hives with such covers as well as of those with loose covers were set apart and carefully examined with the result that where the colonies were of fairly normal strength there was no apparent difference—almost every one of that class wintering very satisfactorily. About the only advantage of the loose covers was that the combs were preserved dry and clean. It was also observed that the entire removal of the