

OUT-DOOR WINTERING OF BEES.

(By W. Z. Hutchinson.)

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I have never seen any ill-effects from dampness, but I have always given abundant ventilation above the packing. When the warm air from the cluster passes up through the packing and is met by the cold, outer air, some condensation of moisture takes place. This moistens the surface of the packing, but it remains comparatively dry underneath. With a good strong colony of bees, and ventilation above the packing, I have never known trouble from moisture.

In the giving of protection, chaff hives have the advantage of always being ready for winter, and of doing away with the labor and untidiness of packing and unpacking; but they are expensive and cumbersome. It is some work to pack bees in the fall, and to unpack them again in the spring, but light, single wall, readily movable hives during the working season, are managed with enough less labor to more than compensate for that of packing and unpacking. Then there is another point: The work of packing and unpacking comes when there is comparative leisure, while the extra work caused by great unwieldy hives comes at a time when the bee-keeper is working on the keen jump.

For packing material I have used wheat chaff, forest leaves, planer shavings and dry sawdust. I have never used cork-dust, but it is probably the best packing material. Its non-conductivity is nearly twice that of chaff, while it never becomes damp. The only objection is that it is not readily obtainable, and usually costs something, while the other substances mentioned cost nothing. What they lack in non-conductivity can be made up in quantity. And this brings up the point of the proper thickness for pack-

ing. I have often thrust my hand into the packing surrounding a populous colony of bees and found the warmth perceptible at a distance of four inches from the side and six inches from the top. This would seem to indicate the thickness when sawdust or chaff are used. I presume that packing has been condemned when it was not more than half done — that is when not enough material was used. I don't appreciate the arguments of those who advocate the use of thin packing. I don't believe that the benefit of the heat from the sun during an occasional bright day can compensate for the lack of protection during months of extreme cold.

Hollow walls with no packing, have had their advocates; and it has been asked if these dead (?) air spaces were not equally as good non-conductors of heat as those filled with chaff. They are not. In the first place the air is not "dead"; it is constantly moving. The air next the inside wall becomes warm and rises; that next the outer wall cools and settles; thus there is a constant circulation that robs the inner wall of its heat.

If chaff hives are not used, how shall the packing be kept in place? I know of nothing better than boxes made of cheap lumber. If there is a lack of room for storing them in summer, they can be made so as to be easily "knocked down," and stacked up when not in use. Of course bees can be packed more cheaply by setting the hives in long rows, building a long box around them and filling it with material used for packing. With this method the packing ought to be postponed till it is so late that the bees are not likely to fly again until they have forgotten their old locations; else some of the bees will be lost, or some of the colonies get more than their share of bees. When they have a "cleansing flight" in winter, there is also a likelihood of a