

not take up ventilation in connection with temperature. He gave us a most excellent article on temperature, so we shall look forward with interest to see what he has to offer on ventilation. When Mr. Heddon built his bee-cellar two or three years ago he went to considerable trouble, by way of correspondence, to learn if anybody knew positively that sub-earth ventilation was necessary, if it was worth the expense. His cellar was built without sub-earth ventilation. When first built our own cellar had no ventilation. There was so much talk about sub-earth ventilation that we finally put down 100 feet of six-inch tile, and had a pipe extend from near the cellar bottom up through the floor and connect with the kitchen stove-pipe. As a result the air in the cellar had a fresher, more wholesome smell, but the bees wintered no better, neither did they winter any worse. In very cold weather we were obliged to close the openings and stop ventilation, or the temperature would run down too low. If the sub-earth ventilator had been long enough this probably would have been unnecessary. There is one form of ventilation, however, that has given excellent results. Perhaps it does not come strictly under the head of ventilation. We have reference to raising the hive from the bottom board. It allows the dead bees to drop away from the cluster where they dry up instead of becoming moist and mouldy from contact with the living cluster. The bees have room and hang in a cluster beneath the combs, while the ventilation, so far as the inside of the hive is concerned, is perfect. Perhaps ventilation has nothing to do with it, and perhaps it has, but we do know that colonies so treated came through very nice, dry and clean with clean combs and hives. As being in this line we might mention that A. G. Hill, of the *Guide*, has been very successful in wintering bees out of doors and attributes his success, in a measure, to an opening four inches square cut in the bottom of each hive. Dr. C. C. Miller, we believe, approves of sub-earth ventilation, especially does he find it valuable in keeping the bees quiet as spring approaches. Mr. Cheshire says that the air in a bee-hive must be changed 2,400 times during the consumption of one and one-half pounds of honey. This amount of food would last a well protected colony about six weeks, and the air in the hive would require a complete change every thirty minutes. It is evident that Mr. Cheshire has made a mistake somewhere. Bees have been successfully wintered in clamps, buried two feet deep under frozen soil, while Professor Cook even went so far as to hermetically seal up two colonies by throwing water over the hives and allowing it to freeze,

thus forming a coating of ice over the hives. The bees survived this treatment. Mr. Heddon tells of some man who, wishing to "take up" some of his colonies, plastered up the entrances with blue clay, hoping to kill the bees by suffocation. Upon opening the hive a few days later, imagine the discomfiture of their owner at seeing the bees fly right merrily. Unless our memory is at fault, D. L. Adair, a number of years ago, removed a box of surplus honey from a hive, and leaving the bees in possession, pasted several layers of paper over the entrance to the box. As all the cracks and crevices were sealed with propolis, the box was practically air tight. The bees were kept confined several days, and did not, apparently, suffer for want of air. There is a time, however, when bees must have air, and that is when under excitement, as when they swarm or are being confined for shipment. It would certainly seem that an abundance of pure air could do no harm at any time, although Mr. C. J. Robinson, of N. Y., has advanced the idea that a lessened quantity of oxygen may be beneficial in that bees will live slower, so to speak; that the hibernation will be all the more perfect because of the lack of oxygen.

After winter has set in and the bees are in winter quarters, it is difficult to make changes in regard to ventilation, hence we have taken up this topic now in order to determine, if possible, to what extent ventilation has a bearing upon the wintering of bees, and that we may be in readiness to work understandingly when winter approaches. We know, of course, that bees must have some air, and we wish correspondents would tell us what ventilation is needed in regard to the hives themselves, whether in doors or out. Next, we would like to have it decided whether bee-cellars need any special ventilation, and, if so, in what manner can this ventilation be secured. We should also like to know if the size of the cellar or the number of colonies it contains has any bearing upon the question, and if so, what.

From the British Bee Journal.

LESSONS OF 1888.

DOUTBLESS very many will firmly resolve to have nothing further to do with bee-keeping, because at present they find the cash balance on the wrong side. To most of these faint-hearted ones we expect we must say farewell. It is far from pleasant to part with any who have at any time belonged to our ranks, and would impress upon such that nothing makes success so sweet or so well deserved as a previous repulse.

To those who, more constant to their old love, are determined to bid for success in future years, we would offer a few hints which may assist them onwards. The great variation between 1887 and 1888 has shown up most effectually any structural defects in hives. Bad work now stands self-condemned, and honest manufacturers must rejoice thereat. No doubt in the early days of the present era, very high prices were charged for appliances, but then it must be remembered that the demand was comparatively small. Recently the rage has been for cheapness, and we would not deprecate this craving so long as there is a fair margin of profit left for