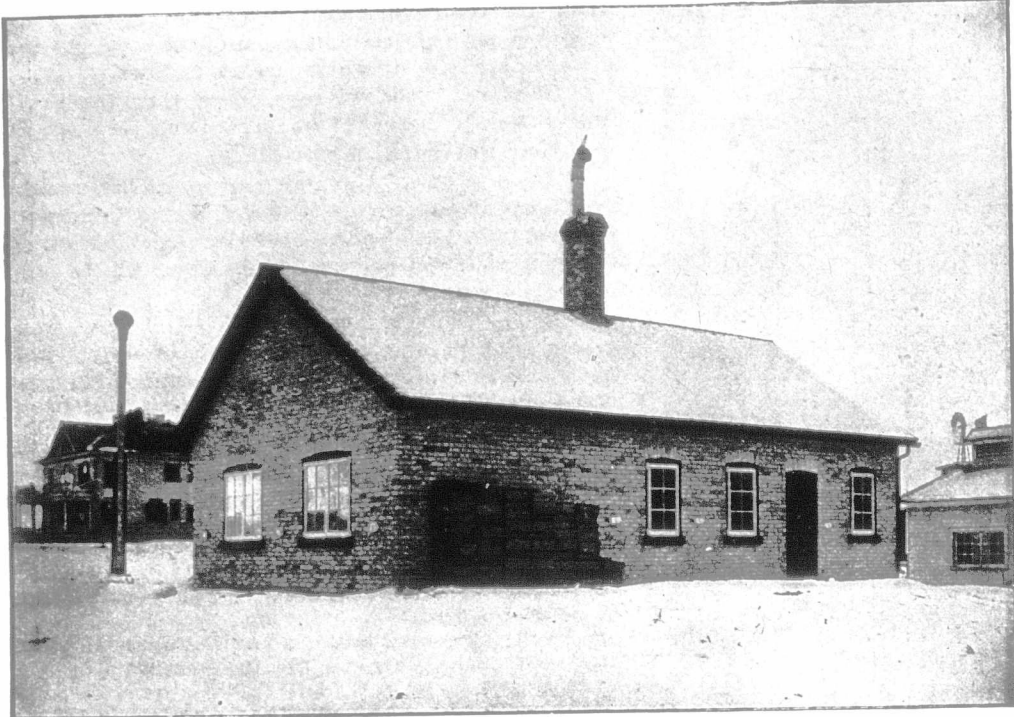




EXTERIOR VIEW OF CELLAR.

APIARY.

A Model Bee Cellar.

BY R. F. HOLTERMANN.

In cellar wintering, one says, "Use a sub-earth ventilator"; another one says, "Use a ventilator"; the third says, "No ventilation is required." Again, one says, "Have a temperature of 60°"; another, 52°; another, 42°; while another says that just above freezing (32°) is best. One says outside wintering is better; another, cellar. Let us suppose that conditions are quite alike, and one man says his bees come out all right with a temperature of 52°; the other says his bees will not winter well at that temperature, but he wants 42°. Under these circumstances both can not be correct. The trouble simply is, that one man is satisfied with poorer results than the other.

The proper wintering of bees, and bringing every colony out strong in spring, not only in bees, but vitality, is necessary to success, and the very foundation of successful beekeeping. The sooner we recognize this the better, the more the cost of producing honey will decrease, and the less frequent will be the seasons when we do not obtain surplus honey.

A man asked me, "Are any of your bees dead yet?" Having charge of something like 200 colonies, I answered, "Yes, if you mean bees. There are bees dying continually." He said, "Oh! I mean colonies." I answered no, and I should consider it a very serious matter if any colonies were dead.

What I want to bring out is this: Many are satisfied if they bring the hives out with live bees in every one. No good beekeeper should be content with this. What every one should aim at is to bring them out of winter quarters with the least consumption of honey, and the least possible loss of bees and loss of vitality in the bees. Nothing less should satisfy.

We read grave discussions as to whether bees require the cellar in which they are wintered to be ventilated. When we understand the nature of the honey-bee, its delicate breathing-cells, its abhorrence of impurities, it seems to me a waste of time to discuss such a question. We know how restless we become and how injuriously we are affected when the air becomes foul in the room we are in. Again, the bees consume honey. This turns the saccharine matter in the honey into heat and energy. It expels the water, and if the atmosphere is not changed it must become damp and abnormal. Moisture about the bees, we know to be injurious.

Again, as to the temperature, if a floor has been scrubbed in the kitchen, and we sit down in the kitchen at a temperature of 70, those liable to catch cold run great risk; but raise the temperature and the evil from the dampness is largely overcome. Again, I can be comfortable with an overcoat on when I would catch cold without it. When the temperature of a cellar is discussed, would it not be well to know whether the wooden covers or cushions are on the hive or not? A lower temperature will answer if the cushions are on the hives to prevent heat from passing off. Again, where the humidity is great the temperature must be higher.

I can understand that the more perfect the conditions, the less movement and activity of the bees and the less atmosphere is consumed, and the less stores are consumed. But if there is no supply of fresh air, in time the air must become damp and vitiated, and then the bees become restless and active, and rapidly consume more stores, use more air, and wear themselves out.

etc. They also make pickles, having about 45 acres in cucumbers alone. The blossoms of these, last year, were much appreciated by the bees. They have about 150 acres in alfalfa, and will have a large area in alsike clover. These people having the capital, I proposed going extensively into the bee business, they to furnish the capital, and I to manage, and share in the proceeds. They consented.

Our first step was to plan a bee-cellar—one in which a large number of colonies could be wintered, and wintered well. With the best cellar wintering, and the best outside wintering, the beekeeper can save 7 lbs. of honey by cellar wintering. The bees do not require to generate as much heat, and the temperature does not vary as greatly. Variations of temperature disturb the bees; increased consumption of stores causes increased loss of vitality. The loss in this direction can be estimated only very broadly. Again, an outer case suitable for this climate costs 50 cents, or more. It is our intention to establish out-apiaries until at least 500 colonies are run. A saving of 7 lbs. per colony on 500 colonies would be 3,500 lbs. In wintering, cases would cost at least \$250. During prolonged and steady cold, wintering becomes uncertain, and we considered, in view of this fact, that a honey house, workshop and storeroom were required—that is, it would pay us to build a first-class cellar, and the house above. The cellar is intended to hold the 500 colonies.

The size is 40x24, and 7 feet in height in the clear. The entire cellar is below the level of the ground. It is built in a sand-bank, is double walled, with a 9-inch wall outside, a 3½-inch wall inside, and a 2-inch space between. The ceiling above is a double floor. The first floor is matched lumber, then a heavy felt paper, then ½-inch strips and a tongue-and-grooved floor above. The cellar floor is cement; and, laid in the cement, is a board floor. There is one stairway coming from outside. This is for summer use, and is the stairway down which the bees are carried for winter, and out of which they are taken for spring. Another stairway goes down from the shop above, and is for winter use. The object of this

Again, weak colonies can stand a higher temperature. The strong generate more heat. These are all questions that require consideration. If the cellar is poorly constructed the air gets in and out here and there, and an uncertain quantity is supplied in this way.

At Brantford, or within two miles and a half of it, there is a wealthy stock company—The Bow Park Company, Limited. They have over 1,000 acres of land, often over 1,000 hogs, several hundred head of fattening steers, sheep,

construction was to secure thorough isolation and no ventilation through the wall. If ventilation comes here, there and everywhere through the walls, the beekeeper has no control over it, and it may come in when he least requires it. By having a proper ventilator, one which can be regulated, he has something like a businesslike arrangement.

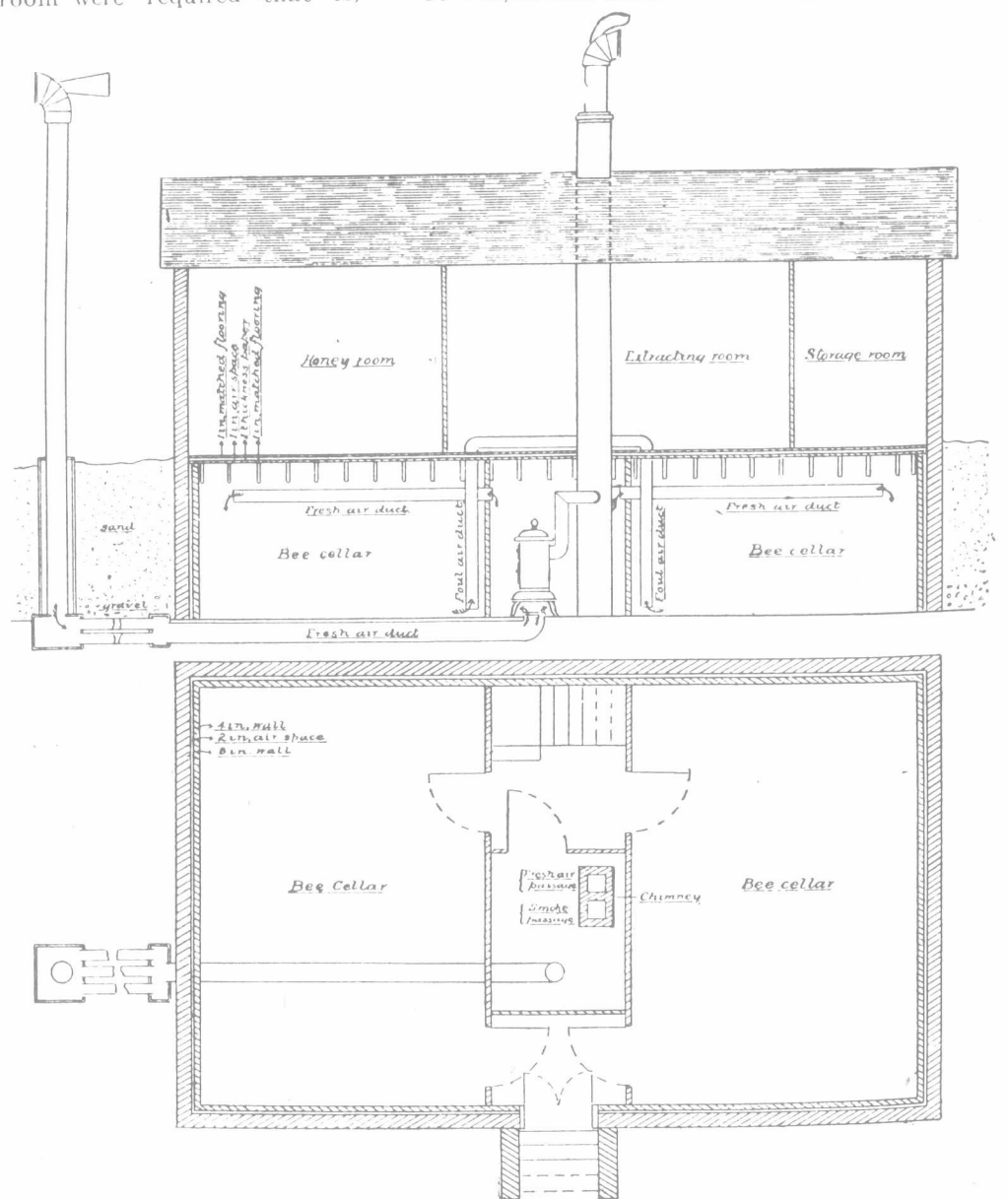
The air comes in at the center of the cellar floor. It is connected with a sub-earth ventilator of three 30-foot lengths of 8-inch glazed tile joined with cement, making it water-tight. It is laid eight feet below the ground, and connects with an upright pipe 25 feet high, and on top of it is a cowl always facing the breeze. The air passes through the sub-earth ducts, and they, being water-tight, can not get any moisture from them—a defect that many sub-earth ducts have. But the temperature is raised by passing through the warm earth, as the temperature of the air entering it rises and becomes more capable of taking up moisture.

In the plan two partitions run crosswise of the cellar, and two, again, join these. In this center compartment stands a self-feeding coal stove, and it stands right over (but two feet from) the floor where the cold air comes in. This stove regulates the temperature, and, after being warmed to the required temperature, it passes into the bee cellars through wooden pipes at the top, which discharge in the far upper and outer corners of the cellars. The stovepipe enters a double chimney, one part for the stove, the other for a foul-air vent. At the opposite side (but nearest to the two wooden partitions) is a foul-air pipe which, by means of vents and stops, can be made to draw the air from either the top or bottom of the cellar. These pipes draw off the foul air, and at the top of the chimney is another cowl, just the opposite of the previous one, which has its back always to the wind, and thus becomes a suction cowl.

In this way temperature and current of air can be controlled. The cellar is new, and 70 of these colonies never had a flight after being two days closed up on the cars, yet all appear to be wintering well—certainly a very severe strain on its qualities for wintering. I find that when cold walls are exposed to the atmosphere, the moisture condenses there; but here not a particle of moisture is apparent anywhere. It is carried to its proper place—outside. A candle (I never take an oil lamp) held close to the cluster shows it dry. The bees just lie there quiet as in sleep. Occasionally a cluster appears slightly active, but the next time this is quiet.

The hives stand on benches 20 inches high in front, 22 at the back. Four hives can rest on each bench, side by side, and four hives can rest one on top of the other.

It will be seen from the bench (p. 217) that the



ELEVATION AND GROUND PLAN OF THE CELLAR.