

heat, and therefore use less packing (say two or three inches) on the south side.

Indoor Wintering.—While outdoor wintering is successfully practiced in all parts of Ontario, many bee-keepers in the coldest portions use the cellars almost entirely. Economy of food is one of the chief advantages. But two-thirds as much, or about twenty to twenty-five pounds per hive, are needed to bring a colony through if other conditions are favorable. The colonies, prepared, as regards bees, queens, character of stores, etc., the same as for outdoor wintering, are carried into the cellar or repository just before the first snows come or severe freezing occurs. Caps are removed or lifted up and cushions or mats laid on the frames. Light is excluded and all other disturbing influences, in so far as possible, the effort being made to keep the temperature at about 42° Fahr. during the earlier part of the winter. Later, especially after brood-rearing may have commenced, 45 to 48 degrees may be allowed. No definite rule can be given. As long as the bees remain quiet, the temperature is not too high and is preferably to be maintained. Frank Benton, in his Bee Manual, says: "Should the bees become exceedingly restless, and the opportunity occur during a winter thaw to give them a cleansing flight, they may be returned for a few hours or a day to their summer stands, and when they have flown and quieted down, replace them in the cellar or repository." This should only be done in a very favorable time, because if the bees get chilled while on the wing they will drop and never return to the hive.

Regarding ventilation, the same points as for outdoor wintering must be observed. The cellar should have ventilation pipes which can be closed in windy weather. The top being sealed, bottom ventilation can be secured by tilting the hive three inches higher at the back than the front. The hive should be free from the bottom board and raised at

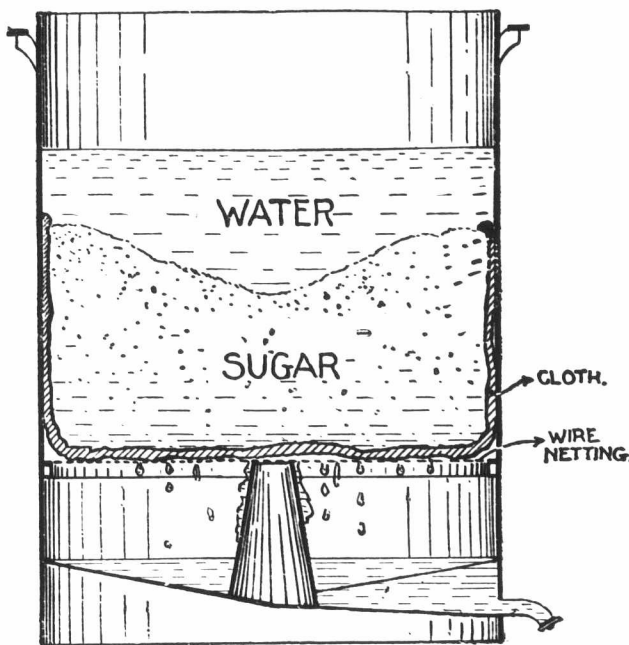


FIG. II.—PERCOLATOR FOR PREPARATION OF WINTER FOOD.

the back three-eighths of an inch higher than the front. This will allow automatic ventilation, and keep the bees, other conditions being right, as near a state of hibernation as possible, which is desirable. The hives should be set in tiers, commencing fifteen inches from the floor.

Winter Stores.—When natural stores are found lacking in the brood chamber, the best substitute is a syrup made of granulated sugar, which should be fed in the autumn as rapidly as the bees can manipulate it and store it away. If several pounds be given at a time—placed in a shallow vessel, with straw or silver floats, in the top story of the colony to be fed, just at nightfall—it will be stored away quickly, so that in a week at most the full winter stores will be completed. The bees will seal it over better if fed slowly at last—that is, after the main feeding. Syrup made by percolation of cold water through a mass of sugar and then through some porous material, as cotton, is what is called a completely saturated solution. Fig. 2 shows a good sort of percolator, taken from Benton's Manual, issued by the American Department of Agriculture. Buckwheat honey is now much used for feeding, as it answers as well as white honey and is worth only about two-thirds as much per pound.

The World's Wheat Crop.

U. S. Consul-General Karel, at St. Petersburg, has supplied the State Department with statistics of the world's wheat harvest of 1896. His figures show that in general the harvest of this year decreased 185,485,542 bushels as compared with the harvest of 1895. The harvest in the United States, Canada, Argentina, Uruguay, Chili, Australia and the East Indies shows a decrease of 165,322,959 bushels. Of the European producing countries, Russia only shows a large decrease of 56,575,467 bushels. The rye harvest shows a still greater decrease proportionately, it being estimated at 151,765,714 bushels. A slight decrease in oats and barley is also noticeable.

POULTRY.

Winter Management of Poultry.

BY M. MAW, WINNIPEG.

Many a fine flock of poultry is spoiled by the neglect of the owner to provide proper quarters and a suitable supply of food for the winter months. During the spring and summer many get quite enthusiastic over their poultry prospects, but fail to carry out their plans, and a miserable failure is the result. At this season it is necessary to cull out all birds not intended for use next spring, and the culling should be thorough. Dispose of all the cockerels; they are very annoying to the hens during the moulting process and often destroy the plumage, putting the hens back from laying by having to make new feathers. If any of your neighbors have a good variety that you think would be advisable to cross with your flock, trade for one or two of his best cockerels, even if you have to give two for one, or purchase a first-class bird to mate with your best pullets and young hens. It is fatal to inbreed, and now is the proper time to prepare your flock for next season's crop. All early hatched pullets should have comfortable quarters provided; they will soon commence laying and pay well for any extra attention. Old hens, as a rule, do not lay much before spring, especially those that are late moulting, and it is well to dispose of most of them, keeping only those that you know to be good layers. If possible, provide a separate house for the poultry, well sheltered, with windows low down, facing the south and east; see that all cracks are closed, especially in the roof, and have a ventilator in the center (old stovepipes will answer well), commencing near the floor and penetrating the roof. Hens give out a considerable amount of heat; and if there are no drafts and the ceiling is perfectly close, the atmosphere will always keep above freezing. Give every part of the house a good coat of whitewash; it gives increased light and destroys vermin. Put a good depth of light, dry dust for a floor and provide plenty of sharp gravel; let the water vessels be distributed around the house. A good plan is to get large-sized vegetable tins and hang them to nails; they are easily cleansed, and in case of freezing can be put on the stove and thawed out. A few degrees of frost will not hurt the chickens, and I prefer frost to a raw damp, just above freezing, atmosphere. I object strongly to a stove in the poultry house; it is unnecessary and makes the birds very delicate and liable to roup. If you can manage to maintain a good, healthy atmosphere, there are lots of warm sunny days during winter when you can open the door, clear a space of snow, and your birds will enjoy a sun bath and fresh air that will invigorate and give them a healthy relish for their food. Do not overcrowd. A great many advocate two square feet floor space for each hen, but varieties differ in their requirements. The best plan is to use your own judgment, seeing that they have plenty of room to scratch and exercise. Roosts should be square on top and about four inches wide, with plenty of space for the number of hens. Set the roosts about two feet from the ground and place a wide board underneath to catch the droppings; it will save cleaning. The droppings should be saved for garden use; they are very valuable for forcing early vegetables. Nest boxes should be placed in the darkest part of the house, the entrance facing the wall, and lower than the roosts, to prevent chickens roosting in them; put a China egg in each nest. Egg-eating is a bad habit and almost incurable. Always collect the eggs at least twice a day during extreme cold weather, and give plenty of shell-making material, such as lime, grit, ashes, charcoal, etc. My plan of feeding is to make the hens work for the bulk of their food. In the morning, when their crops are empty, give a moderate supply of food that is easily digested. If you have plenty of table scraps cook them up and thicken with bran or shorts, letting it stand over night, and feed warm in the morning. A little grain scattered in straw or dug in the dry earth will keep them scratching, and always have a cabbage hanging from a string; they will eat it to the stump. At night, give all the wheat they can eat up clean. Vary their food to suit what you have on hand or can obtain easiest, but don't feed musty or smutty grain; it won't pay. Screenings are all right, and hens will succeed on almost any kind of good food. What they want to keep them healthy, and be a source of pleasure and profit, is good, clean, light, comfortable quarters, plenty of clean water, sharp grit, and make them work for their food. If you keep ducks and geese, make a pen for them in the stable or cow house, away from the chickens, and give them plenty of litter; don't feed with hard grain. Oats in a bucket of water and nice early cut hay and cabbage will suit the geese. Ducks do better with some soft food. Turkeys must never be kept in the chicken house; they want a dry, cold building and plenty of fresh air. They are very hardy and will winter best in a loft. Feed them wheat, plenty of sharp grit (they must have it), cabbage, and snow will do all right for drink. A good plan is to save all the unfurrowed cabbage; place them in a loft or outbuilding, with roots and outer leaves attached; let them freeze, and feed as required.

Raising Ducks.

BY MRS. IDA E. TILSON, WISCONSIN.

As ducks are called rather careless sitters and mothers, their eggs are generally set under hens. The nest should be roomy and well-packed, and six or seven eggs are enough, or some little ducky will get crowded and killed. Since the ducklings have bodies which seem decidedly heavy for their underpinning, and are not very steady on their legs, nor swift of motion at first, they need a tame, quiet hen that will bear confinement in a small yard for a while. During these early days the ducklings need to be watched a little, as they are prone to get on their backs, unable to rise unless turned over. The only one troubling me thus this year was ambitious to perch on its foster mother's back when the latter sat down. As the hen usually arose without notification, Miss Ducky went off, head over heels, like some luckless performers on toboggan slides. I began by letting them range two hours a day, then longer and longer, till when two weeks they roam nearly all day.

Nothing is more sensitive to dampness than very little ducklings. They are marines, not aquatics—that is, sailor-like, not fish-like—hence, whenever a shower loomed up I immediately drove my flock to their yard, and if possible, into the coop itself, till at least three weeks old. A drinking-dish should not be large enough for them to get into at first, but deep enough for washing out nostrils and eyes. I have seen cups sunken in the ground, but I use what I call a "double-decked" sardine can, or one of those about 1½ or 2 inches deep. On the bottom of this gravel is kept.

Ducklings, like pullets, are rather slow to learn eating. I taught mine this summer by sprinkling rolled oatmeal on top of water in the above dish. After a day or so they tired of oatmeal and were ready for bread and milk, cottage cheese, lean meat, boiled egg, and, eventually, pudding. The food is like that for chicks, except more eggs and meat are needed and less pudding. A tender grass run, green peas or chopped onions seem a necessity. When at an Institute I was telling how little harm fowls had done our garden produce, and how many worms they had eaten, one gentleman gravely asked me, Yankee fashion, whether I would turn ducks into my bed of peas? At first, I fed two hours, gradually lengthening intervals.

I spoke of driving them into the coop before showers, but more truly might I say I called them. They are somewhat like pigs to drive, but early learn to follow a call and their feeder. Unwillingness to be driven does not apparently proceed from obstinacy so much as from bewilderment. My mother declares ducks "the lambs of the poultry yard," and they so soon teach themselves to eat out of one's hand and are so easily caught and handled they bear out her name. They are always happy and good-natured, and have next to no ailments nor parasites. Occasionally a sore eye appears, doubtless from mud splattered in it, and I saw one duck gape this summer, but never saw it repeat such operation.

By the way, a feather may tickle or louse bite any fowl under the throat, and cause a gape which is not at all the persistent disease called "gapes," much commoner, too, East than West. In true "gapes" a fowl describes a sort of double curve of neck when gaping, and often makes hard work of swallowing. But this hard swallowing is a symptom of roup, and also of congested crop. The point is, "One swallow does not make a summer," nor one gape the "gapes."

When my ducklings were about three weeks old, their foster mother wished to lodge in the hen-house, which I permitted, but soon had to take the ducklings out again for a week or so, because the old hens were cross to them. "Ducks like hens better than hens like ducks."

In due course of time we filled a tank with water, caught two of the young ducks and put them in, expecting their thanks, but such was their ignorance and dread of water that one, hurrying to get out, tumbled head over heels. We caught and put them in two or three more times, with no avail, and we think it was during this melee that two wings got strained, so they each stand out from body. I have read of bands sewed around body over wing to hold it back, but never tried such a plan, thinking it would irritate a fowl. Repeated trimming of wings, as close as possible and not bleed, has lightened their weight, and one is nearly restored. I have often thus cured defective chicken wings. These ducklings are out of blooded eggs from Missouri, and mother says she had as lief have a china duck as one that will not swim and even runs under a shed during a heavy shower. A Pittsburg gentleman, with large grounds and a pond, bought some ducks for ornamental purposes. He was nonplused at their non-swimming, and wrote for an explanation. The reply was that swimming had been bred out of them. A duck raised for profit, not amusement, is easiest cared for on dry land. Ours are incessant paddlers, however, in every pool, puddle or water-dish. As I renew the water twice a day, to make it cool for summer and warm for winter, the chickens do not get particularly disgusted.

Ducks will take coarser food than chickens, and proved excellent to devour the army worm this year. Every morning early they started for their pasture, as we called that part of the yard where worms were advancing.

Ducks must have plenty of shade, as they are inclined to fall over in a sort of faint or stupor if exposed too long to a hot sun.