Address communications to Agronomist, 73 Adelaide St. West, Toronto

HOW AND WHY OF ARTIFICIAL HATCHING.

Incubators are classed as "mammoth" and "small" machines. The former run in sizes ranging from 1,200 up to 20,000 capacity, and one has even reached a capacity of 40,000 eggs. Usually these large machines are sectional in construction, are heated by hot water, and use one coal-burning stove for the source of heat. In some types gas or oil is used. There are various distinctive features peculiar to the kind or make of incubator in question. Mammoth machines are used practically only on the large poultry plants, or those making a specialty of hatching chicks in very large quantities.

The so-called "small" incubators are made in sizes of from 30 to 800-egg capacity, and are known as the hot-air or the hot-water type, referring to the manner in which the egg chamber receives its heat. The hot-water kinds depend upon the principle of radiation to distribute the heat, somewhat on the order of the hot-water heating systems in homes. A metal tank or pipe system, usually made of copper, is built in fixed position into the incubator and is filled with water heated by a lamp attached to the machine. The heat radiates to the eggs on the tray in the egg chamber, keeping them at the required temperature during the hatch.

In the "hot-air" type there are some variations in the exact principle of heating. In some makes warm air is introduced into the egg chamber and diffused over the eggs. In others, the heated air does not enter directly into the egg chamber but is confined first to a metal tank from which heat radiates to the eggs; and in still others there is a combination of both.

READ MAKERS' CLAIMS.

The advantages claimed by each manufacturer are carefully described in their catalogues, and it is advisable to closely study the literature sent out in order to make an intelligent choice. The source of heat is commonly an oil-burning lamp, although some electric incubators are on the market that are giving satisfaction when used according to the manufacturers' directions.

Now as to size: Two 150-egg capacity machines are preferred to one 300-egg size, unless the larger one can be filled with eggs not more than a week old at the time of placing them in the machine. The fresher the eggs, the more even and satisfactory will be the hatch.

Where to put the incubator is next in importance. A well-ventilated cellar or basement where the temperature stays from 50 deg. to 60 deg. F., is an ideal place. Some cellars are poorly ventilated. They are too deep in the ground and consequently are likely to be too damp; others may be too dry.

After the machine is set level, so there will be no high or low spots, the adjusting nut on the regulator should be screwed down to guard against overheating at the start. Too many operators make the mistake of turning the adjusting nut up or down if there is a slight variation in temperature. Successful operators never touch the regulator, but if the temperature is too high or too low, they endeavor to correct it by turning the wick up or down, in the case of lamp-heated incubators, or making corresponding changes in the amount of fire, where other kinds of heat are employed.

NEW WICK FOR EACH HATCH.

A new wick should be used for each hatch, on lamp-heated incubators, and the oil reservoir should be filled daily (preferably in the afternoon) so as to have enough oil to last until morning. The lamp bowl, however, should not be filled full, as expansion of the oil when warmed will make the bowl overflow. All lamp fixtures should be wiped clean and dry every day. Begin with a medium-size fire or lamp flame, and make adjustments with such. The heat control can then be more easily handled from start to finish.

After running the incubator for about 24 hours after all necessary adjustments have been made, it is ready for the eggs. When the eggs are put in, the temperature will drop and not return to the prescribed heat for several hours while the eggs are warming up. To adjust the regulator at this time to hurry up the heat would be a serious mistake; don't do it if you want to get a good hatch.

THE CRITICAL TIME.

The first week of the hatch is the most critical in the whole process, and greater care must be given than at any other time. There is no cause for alarm if the temperature should vary a degree, or even two, either way, from time to time. If the average temperature is maintained the results will be the same as though the thermometer showed no variation whatever. Some operators prefer slight variations. The thermometer placed on or near an infertile or dead-germ egg will not give correct registration. Therefore, eggs must be tested twice during the hatch to remove all that do not have a live chick embryo.

The amount of moisture required during incubation is a difference of opinion. Successful hatches have been made without the addition of moisture, under certain conditions; again, some machines require more moisture than others. But it is safe to say more poor hatches are the result of not enough moisture than from too much.

HOW TO SUPPLY MOISTURE.

A good way, and at the same time an easy way, to supply moisture is to keep the floor of the incubator room well sprinkled, thus allowing the air to become more moist before it enters the egg chamber. Another way is to set pails or pans of water near the machine. Some operators sprinkle the eggs with warm water, and others place a shallow pan of water in the incubator beneath the egg tray.

The necessity for moisture is not to add water to the eggs, but to prevent too rapid evaporation of their normal water content. After the first ten days the eggs should not normally dry down so that the air-cell in the large end of the egg is larger than the size of a silver quarter-dollar. This may be determined by testing the eggs.

TURNING THE EGGS.

Up until the third or fourth day the door of the machine should not be opened. But from then on up until the eighteenth day the eggs should be turned at least twice daily. The length of time in cooling depends upon the temperature of the room, and the condition and the advance the eggs have made in incubation. All this and other important advice is given in the instructions sent out by the manufacturers.

The growing chick inside the shell requires much less fresh air during the first half of incubation than it does the last half. After the tenth day the amount of ventilation can be increased gradually, but quite rapidly, until it is time for the hatch to be taken out of the incubator.

Chicks should not be removed from the incubator until the hatch is completed and the last-hatched chicks are dry. Up to then the door must not be opened.

Research in Applied Science.

The research work of the Dept. of Physics of the Ontario Agricultural College has during the past year been confined to the following branches of Applied Science.

1. Initial experiments to determine the reason for certain types of trees being more often struck by lightning than others.

2. (a) Tests of anti-siphon traps for use in farm plumbing to eliminate as far as possible back venting.

(b) Simplified joints for farm plumbing systems.

3. Completion of experiments made to determine the correct methods of testing resistances of "lightning rod grounds" with a view to suggesting changes in rules and regulations governing these.

A circular on Farm Plumbing is being prepared.

The difference between a motor and a man is that one knocks going up hill and the other one on the down grade. If you can't boost, don't knock. That is not a new saying, but it's worth while repeating.

ONTARIO BREED BETTER $ STOCK LIVESTOCK Improvement Committee

John, living over on the 4th, told this story.
Just five years ago I took account of myself. Then I started to weigh the milk from my herd of nondescript cows. In four months I had sold seven and in twelve months I only had two of my original herd, but had bought four more. My herd was reduced to six, but I was getting as much milk as from the 18. Now I have 15 cows, some pure bred and others good grade and a *real good bull*.
"Am I making any money?"
"Well you can bet your hat I'm not losing any."
What John did others can do.

USE BETTER BULLS

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Perennial Phlox.

Without the perennial phlox many a garden would present a dull show after midsummer. This plant is one of the most hardy perennials as it multiplies rapidly, blooms freely, and makes a great display in the border. To get the best results they should have an abundant supply of moisture and a damp situation should be chosen for them when possible. Their worst enemy is a tiny insect called the red spider, which, however, is not very troublesome except in dry seasons. Where the red spiders are abundant the leaves become yellowish where they are working and their presence may be known by these lighter patches. As they are feeding on the under side of the leaves, any spray which is used must be applied there. To do this effectively, one person should hold back the foliage with a stick or rake handle and another do the spraying. Cold water frequently and forcibly applied will be found effective and any of the contact sprays such as nicotine sulphate, whale oil soap, or kerosene emulsion, will control it if used frequently. A little flowers of sulphur mixed with these will make them more effective.

Many varieties of perennial phlox have been tested at the Experimental Farms. A careful examination from year to year has led the Dominion Horticulturist to recommend the following, covering the various colors:

Antonin Mercie—Bright violet suffused with white, large white centre.

Consul H. Trost—Pure red with French purple centre.

Eclaireur—Bright rosy magenta shading lighter. One of the earliest.

Elizabeth Campbell—Salmon pink, shading lighter. A very pleasing color.

Etna, or Mounet Sully—Bright crimson red with darker centre. Both very good.

Wm. Robinson—Salmon, large flowers.

Widar, or Lamartine—Bright violet with large white centre.

Pantheen—Crimson pink suffused with white about centre.

Pyramide, or Financee—Flowers pure white. Both very good.

Selma—Lilac rose with conspicuous crimson eye.

Europe—Pure white wtih crimson carmine centre.

Miss Lingard—White with a lilac centre, is an early free blooming variety which should be in every collection.

Tapis blanc—One of the best whites. Dwarf.

George A. Strohlein—Orange scarlet.

Mme. M. Carvalho—Mottled white and pink.

To secure continuous fine bloom and healthy plants that retain their foliage during the whole season, it is necessary to lift the plants about once in three years and plant back small divisions of them after fertilizing the soil. The pieces to be replanted should be taken from the outside of the clump.—Canadian Horticultural Council.

Pigeons Mate for Life.

Pigeons mate for life. Unlike other species of the feathered tribe, they are ever faithful to each other. Infidelity with them is virtually unknown; they are models of propriety and faithful to their nest and young. That is the rule, and the exceptions are very few considering the thousands of pairs mated in a large plant.

From time immemorial, the pigeon has been classed as the emblem of innocence. Of all the feathered race, it is the most gentle and affectionate. The devotion and affection shown by mated pairs is something that can not be adequately described. The watchfulness and care the birds display over their young the moment they are hatched, tiny, helpless things, is something wonderful. So great is their love and care for their young, that should one of them die at an early age and not be removed, the parents will continue hovering the dead one, even until it becomes offensive.

When pigeons are "married" they not only remain as true as steel, but they divide labor, are ever in each other's company, are not attracted by "new faces," do not bother about their neighbor's business, and are always busy at their own work.

The male bird carries the stems of hay, or whatever material he can gather, to the nest, and the hen arranges it in order. The older a male pigeon grows the more fatherly he becomes. There is in fowls no affection so near the human being in its finer nature as that of pigeons. Owing to this intense affection, more birds are grieved to death by isolation than die from disease.

Should two young cocks be in love with the same hen, the jealousy becomes so intense that a deadly fight is the result. They fight with their beaks and wings—catching hold of the skin of the head with their beaks and striking each other vigorously with their strong wings.

Once in a great while a pigeon may tire of his mate and seek another, but then he courts trouble. The companion of the bird he covets at once makes a vigorous protest. If this does not conquer the intruder, he is often attacked by the entire male element in the loft, and either driven from his home or killed.

The male selects the nest and then endeavors to persuade his mate to join him. Should she refuse he drives and scolds her, every now and then hitting her with his bill.

THE CHILDREN'S HOUR

HOW TO STUDY BIRDS.

1. Treat all birds with the utmost kindness.

2. Never destroy the birds' eggs or nests if you wish to learn about bird life.

3. One of the best ways to know birds is by their songs and musical notes.

4. Remember that birds sing when they are happy and are enjoying life, but not when they feel that they are in danger.

5. When watching and studying birds keep as still as possible, move quietly and avoid all loud noises or talk.

6. Keep a diary and write down all new facts that you discover about birds.

7. Learn to take pictures of birds; make sketches of nests and eggs and observe carefully the parent birds feeding the young ones.

8. Do not try to approach birds too closely when they are feeding, nesting or nest-building. Watch them through a field-glass if you can.

9. Set up a "Bird Table" in winter when the birds are hungry. Feed them crumbs, crusts, grain, scraps, etc., and watch them at close range.

10. Fountains or water-basins and houses placed where all is safe for the birds in summer will attract and hold the birds and make a constant study of them possible.

Dehorning Cattle.

The best time to dehorn is when the calf is but a few days old. A slight scraping of the button with a knife until the blood oozes, then the application of a little caustic potash, first being careful to rub a bit of vaseline around the base of the horn to prevent burning the flesh, will do the trick. This simple, humane, practical way is good only on small calves. When it comes to older animals sawing or clipping off the horns must be resorted to.

Cattle feeders frequently buy horned cattle because of price attraction. Almost always it will pay to dehorn such animals, especially calves or yearlings. When one is properly equipped the job is not difficult.

A good dehorning chute is the first and prime requisite.

Our chute stands at the end of a narrow passage which opens off of the assorting pens. It is built of two-inch oak and is V-shaped. The bottom of the chute is eighteen inches wide, flaring to three feet at the top. It is six feet long and six high. At the front end are two pieces of two-by-six-inch oak which pivot at the bottom on bolts, one bolt through each piece. At the top of these pieces is a half-inch rope tied securely to one piece and running through a pulley which is fastened to the top of the other. Since these pieces work freely on the bolts below they may be adjusted to accommodate the size of the animal.

When driven into the chute the animal sticks its head through the opening between these pieces, an attendant pulls the rope and the pieces come together, holding the animal securely. In front of the chute projects a swinging table; another rope working through a pulley comes up loop fashion through this table from beneath. This rope is placed over the head back of the ears and a pull on this rope draws the head down on the table and holds it there while the horns are being removed.

We find shears faster than the saw, and quite satisfactory, although a greater flow of blood follows due to the method of severing the veins. Immediately the horns are sheared off we insert a toothpick into the larger veins to the depth of a quarter to a half inch, breaking off the pick. A bit of oakum is then stuffed in the horn cavity and the animal released. The entire operation is accomplished within two or three minutes.

In warm weather or when flies are apt to bother we smear pine tar thinned with turpentine around the base of the horn before the horn is removed. Some folks apply the tar after the horn is removed. This is not good practice, because the blood under the tar prevents the tar from penetrating through the hair down to the skin, where the fly deposits her eggs; hence tar thus applied is not so effective as when thinned and applied so that it will penetrate. However, it is best to avoid dehorning in warm weather when flies are apt to bother and cause a lot of trouble. Late fall or early spring is the best time.

"I hear Clara married Jack for better or for worse."
"No—for more or less."

YOUR FRIENDLY KITCHEN

BY CLEMENTINE PADDLEFORD.

Have you ever seen a kitchen smile? Sometimes they do.

I have been in kitchens that beamed with friendliness. And all the credit for their cheeriness didn't belong to scouring powders and soapsuds. Cleanliness was only a part of their charm; color did the rest.

Decoration for the kitchen? Why not? Farm women spend on the average of six hours a day in this room of the stove and the sink—about ninety-one days of the year. That's reason enough why the kitchen should be pleasant to the eyes as well as to back and feet.

The world's best cooks have come out of colorful kitchens. Swedish kitchens are a riot of brightness with their painted walls and chairs and rows of decorated plates. In Holland the blue and white tiles of the kitchen dance with the reflections of copper pots and pans. Our own ancestors believed in kitchen beauty. Early Colonial kitchens were of a friendly sort, their wide hearth fires, sending slim bright shadows across the brass and pewter, created a sunshine of their own.

Kitchens aren't like that to-day. Kitchens have advanced. They have become scientific laboratories for preparing meals with the least possible effort. But somehow, in our eagerness to eliminate steps and stoops, we have forgotten that this most humble room of the home may contain the greatest charm.

Winter is the kitchen's gloomiest time. It seems to turn down the corners of its mouth and scowl—a dull, bored scowl that is reflected in the dish water and the soup; that is transmitted into the dining-room and the living-room. It infects the cook herself. All the warm water and elbow grease in the world count for less than nothing in restoring the kitchen beam.

It is too early yet to begin painting. One doesn't get the housecleaning fever till the first fly buzzes in. Maybe, too, this is the year when you are going to economize on new household expenses. You will start on the kitchen. One always does. There is to be no new paint and no new curtains—a dreary outlook.

Take a tip from fifty years ago and buy oilcloth. Yes, just the ordinary kind like Mother, and Grandmother before her, used on the kitchen table.

We have used percale, calico, pongee, ginghams, muslin, nets, scrim, and cheesecloth; we have advanced from ginghams to chintz, frogetting oilcloth, the cheapest, most durable, kitchen material of them all. In color it is diverting, permanent, even in sunlight. This spring the new colors in blue, apple-green, rose, battleship-gray, and gold are to be had in the inexpensive oilcloths, as well as in the more expensive damasks with their felt-lined backs.

Let's do your kitchen over. First choose a color scheme. Some people just naturally think in the conventional terms of dark brown and dull tan as a universal accompaniment to the gentle art of cooking. Let's choose something gay for your kitchen, yet something that contrasts pleasantly with the walls and woodwork. Buy a few yards of oilcloth with the egg money; you can get it at any crossroads general store.

Suppose your curtains are of plain blue gingham or chambray and the woodwork either dark or white. A valance made of a straight piece of yellow oilcloth edged in the blue material of the curtain would be effective. To save work, 12-inch picot-edged shelving, which costs about 15 cents a yard, can be used. The only sewing required in the making is the stitching of a hem for the rod. The curtains can be drawn back and held by oilcloth bands edged in blue like the valance.

Chairbacks of oilcloth, with flat chair seats upholsterel firmly, will change dilapidated kitchen chairs into attractive pieces of furniture. One bright-colored cushion can raise the whole tone of a room. A small round oilcloth pillow for the work stool, with oilcloth strings to tie it in place, can be made in a few minutes at the sewing machine. If the kitchen has an indoor covered woodbox a long upholstered oilcloth pillow fastened to the lid with brass thumb tacks gives it the appearance of a cozy-corner seat.

Perhaps you breakfast in the kitchen. Most of us do. A breakfast set made of oilcloth is both gay and practical. There is no washday for this breakfast set. It can be trimmed with flowers cut from contrasting colors, and appliqued. The outer edge of the cloth or doilies may be finished with a band of color to match the bowers. If this is too much work leave the set with the edges untrimmed, or merely scalloped with the scissors.

A screen is a welcome addition in the kitchen where breakfast is served. The screen frame, which any man can make in a couple of hours, may be covered with oilcloth decorated with a little applique flower design. Open shelves in the kitchen add their charm to the room if they are dressed in oilcloth to match the valances. Consistency is the secret of artistic decorating.

Designs painted on oilcloth are always pretty, but this takes a little more work. Enamel oil paint should be used, but if this can't be had in your local store the ordinary tube paint mixed with hard auto varnish instead of oil or turpentine will answer. This will give a finish that will withstand constant washing.

Oilcloth is easy to clean; wiping with a damp cloth restores its original brightness. The oilcloth kitchen smiles its way late into the summer, its trimmings as gay as the day you carried them home with the groceries.

A mare of ours used to keep us and the neighborhood awake nights kicking in the stall. Forty times between sundown and sunrise she pounded her partition, first on one side, then on the other. We got some traps one day, set them in the barn, and kept setting them till we had captured 23 rats. That ended the kicking in the barn.

Dont put lye in your drains to clear them. A friend writes that it was tried and the drains had to be dug up, as they were full of soft soap. It's very reasonable, as our grandparents made soft soap from grease and lye. So don't use lye in your drains.

Farm Profits

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302. Insecticides and Fungicides.
303. Mushrooms.
304. Contagious Abortions of Cattle.
305. Diseases of Poultry.
306. Cold Storage on the Farm.
307. Selection, Care and Management of the Bear.
— Circular on Corn Borer.

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