

so if the season be damp. Young turkeys are most susceptible, although the disease attacks turkeys of all ages. With drooping wings and head, and tottering gait, the sick bird previous to death presents a truly pitiable appearance.

No cure has yet been discovered, according to Mr. Gilbert. Some means of checking the disease have been found, but nothing has been discovered so far which could be positively stated to be a sure preventive. Too much stress cannot possibly be laid upon cleanliness. Disease may be prevented by rigid methods of cleanliness, but, in spite of all that, this particular disease is so widespread that we have every reason to believe that it is not confined to turkeys, but some authorities say that it is also found in fowls and chickens. Preventive measures:

1. Careful inspection of all new stock. The new stock should be purchased where the disease has never made its appearance.
2. The turkeys should be kept, if at all possible, by themselves. Give them fresh ground every two years.
3. Every bird should be kept under strict observation. A bird showing the slightest sign of sickness should at once be isolated and closely watched.
4. Yards and premises should be kept free as possible from English sparrows, and the poultry house from rats and mice. It has been shown at the Rhode Island Station that these rodents carry the parasite.
5. Fatten birds slowly. Heavy feeding does not cause blackhead, but it does frequently cause the sudden death of a bird in which the disease is present.
6. If a bird dies of blackhead, it should be promptly burned or buried; better to be burned.

Some Recommended Remedies.—As previously stated, advanced cases of blackhead are considered incurable, and it is only waste of time and effort to attempt to cure a badly-affected bird. John Baynes, of the Agricultural College, Truro, N. S., recommends the following remedies:

1. Sulphur 5 grains, sulphate of iron 1 grain, and sulphate of quinine 3 grains.
2. Sulphate of iron $\frac{1}{2}$ grain, salicylate of soda 3 grains.
3. Benzö-naphthol 1 grain, salicylate of soda 1 grain.

Another remedy is 1 teaspoonful of muriatic acid to a pint of drinking water.

In each of the three former cases the dose should be administered at night, or, in acute cases, night and morning.

It is necessary that the owner or attendant pay particular attention to the turkeys from time to time, and, in case any suspicion of the presence of the disease is aroused, such birds should be immediately isolated from the flock and treated, and the poultry houses should be disinfected, and everything possible done to promote the health of the flock.

Getting Ready for the Big Prices.

The wide-awake poultryman is busy getting his hens ready for winter laying, and making preparations for his hatching eggs for next season. For one thing, he has separated the pullets from the cockerels. The best cockerels, from which he hopes to make his selections for breeders are in a pen by themselves, reserved for further culling. The obviously inferior cockerels that have already manifested their unfitness for breeding are being fattened, either in the fattening coop or in some cool, dark, well-ventilated quarters, where they remain practically undisturbed. The old hens are similarly situated, for old hens are not paying winter layers. The pullets are being fed all they can stand of a good ration composed largely of oats, either whole or ground. Plenty of pure water and grit and oyster-shell are well within reach. Shade is to be had in abundance. Plenty of road dust is being laid away for the winter. Dust-bath, and, as important a thing as anything, the house is being thoroughly cleaned and sprayed with a mixture of good whitewash, carbolic acid and coal oil. It will pay to take down nests, roosts, feed boxes, dust boxes, and everything else movable, and spray and wash; twice, at least, with an interval of a week between sprayings, has this thorough spraying been done. The droppings board has been thoroughly repaired, and every leak in the roof has been repaired. The ventilators have been seen to, and every precaution taken to make the hens clean and dry and vermin-proof, as dampness and vermin are the sworn foes of profitable poultry raising.

The hens for next season's breeding are given as easy a time as possible. They are recommended to go to the dressmaker any time. Their diet consists mainly of what they can pick up and of rolled oats. For a few months they will serve their owner best by resting and building up for their approaching busy season. The Biddy who in the hatching season gives plenty of strong-germed eggs, does well enough without laying the rest of the year.

Again, the Easter chicken market must be pro-

vided for. This is being done by hatching chickens late in August or in September, keeping them hardy till snow flies, then keeping them in a cool, dry house till March, and then, when they have built up a vigorous, large frame, putting them into the coop, and rushing them forward as quickly as possible. These are the days to get ready for profits in poultry. J. K.

Electrical Incubation.

Our Australian correspondent writes that some very interesting experiments are being conducted at Hawkesbury Agricultural College, N. S. W., regarding the application of electricity to egg incubation. It is proved conclusively that the chicks so hatched are much stronger than those produced by lamp incubation. The heat in the incubator is generated by allowing the current to pass through a great length of fine wire, which offers considerable resistance to the flow of electricity. This wire is passed through the incubator or brooder. As there is only a slight warming, there is no danger of fire. The wire can be so arranged as to give both top and bottom heat. It was found that in the electric machine the chicks chipped and left the shell in from one-half to one-third the time occupied in the lamp incubator. The college had no cases of chicks chipping and being unable to leave the shell, nor any cases of the shell sticking to the chicks, in the electric machine. The chicks left the machine and dried quickly, and were lively and strong from the moment of birth. This was so much in evidence, in comparison with the lamp incubator that during the second test it was decided to examine all eggs thrown out by the fertility test. An examination of these eggs showed that only two—one from each machine—were really infertile. In all other cases the germ had started. The average age of the embryo with the electrically-treated eggs was three to five days; with the lamp eggs, not above two days. The expert in charge thinks that if the electric machines will carry the embryo further than the lamp, that it is quite possible a slight modification will bring them to maturity, and thus greatly increase the percentage of the hatch. Trials will, therefore, be made in that direction. He is inclined to think that the quality of the air used in the ventilation will prove the most important factor in the results, not that the electricity in itself has any really direct effect. In this year's experiments the college will (1) run an oil engine, an electric machine, and broody hens, in comparison; the growth of the chicks will be watched up to six months; (2) test the value of a fluctuating temperature in the incubator; (3) test the value of air drawn from outside the incubator room for ventilation; and (4) test the effect of minute traces of kerosene and lamp fumes on the chick-embryo during the first six days of its development.

[Note.—Electric incubation has been tried at the Dominion Experimental Farms, where A. G. Gilbert, the Poultry Manager, reports it a success. It has never been tried at the Poultry Department of the Ontario Agricultural College, because of the uncertain electric current there. Prof. Elford, of Macdonald College, tried electrical incubators for several years, but the results were not encouraging, and the same results were obtained at Montana Agricultural College. The results, on the whole, seem to be rather varied, and, considering that farmers as a rule do not have electricity—and if they did, very few of them are mechanical enough to manipulate one of these machines—electrical incubation, if satisfactory, cannot come into general use for some time yet. However, further experiments in this direction will be watched with some interest by poultrymen.—Editor.]

Production of Winter Eggs.

It will be well for poultrymen to realize sooner, rather than later, that in the artificial treatment of their fowls during the winter season they must imitate, as nearly as possible, natural conditions. The hen, when running abroad during the summer season, supplies herself with material to make the yolk and white of the egg, lime to make shell, grit to grind up the food in her gizzard and to keep herself in robust health. In picking up this variety of diet, she has to make some effort, which means exercise. She keeps her body almost free from lice by vigorously dusting in dry and fine earth, preferably road dust. She exhibits a decided preference for roosting in the branches of trees, where she can have plenty of fresh air, rather than going into a stuffy poultry house, and the foregoing should be a lesson as to the proper feeding treatment and housing of birds. The nearer the natural condition is approached in the feeding of our fowls, the greater will be the success. If it were easy to get eggs in winter, they would not be so high-priced; but, because skill is required, few eggs are produced.

The following rations have been found effective in the winter production of eggs. For hopper or dry feeding in unheated houses: Hens—2 parts

bran, 1 part ground oats, 10 per cent. charcoal; and for pullets add 1 part of corn meal. A distinction is made between the feed of hens and that of pullets, because feed that agrees well with the pullet may make hens between 18 months and 2 years old too fat. A whole-grain ration which has been found to be a good egg producer is one-third wheat, one-third buckwheat, and one-third oats, fed in conjunction with roots, cut bone and grit, at the rate of 3 to 5 pounds per day to 24 hens.

Another good ration is wheat or buckwheat scattered in the litter on the floor of the poultry house or scratching-shed in the morning, eight to ten pounds to 100 hens. At noon feed steamed lawn clippings or clover hay three or four times per week; and, if thought necessary, give, in addition, 5 pounds of oats to 100 hens. This should also be scattered in the litter. Mash composed of such ground grains as are most abundant, with waste of kitchen and table. Mix these with hot water, and feed when cool two or three ounces to each hen. Shorts 2 parts, ground oats 1 part, and corn meal 1 part, ground and mixed with one part of meat meal, have been found effective.

The following points are indispensable in the winter production of eggs:

1. Rations should be varied, and fed regularly.
2. The flock should be built up by breeding from the best egg-layers of a prolific, egg-laying strain of fowls.
3. The poultry house should be wholesome and dry, kept scrupulously clean, free from vermin, with the hens cleanly fed, and the nests equally clean.

In all cases, grain should be scattered in the litter on the floor in small quantity morning and evening, to incite to exercise in scratching for it. Pullets can be given cracked corn at one of the daily grain rations. Cut green bone in proportion of 1 pound to 15 or 16 hens every second day, should not be omitted. With a good, generous ration, no stimulant, as pepper, is required. The great aim and object should be to keep the fowls in robust condition, and, to do this, grit, fresh air, exercise, good clean feed, and clean buildings, are necessary.—[Notes from A. G. Gilbert's bulletin on "The Production of Eggs in Winter."

Saving Money on Farm Eggs.

Improper and antiquated methods of handling eggs in the United States result in losses that reach an estimated total of \$45,000,000 annually. This is 17 per cent. of the estimated total value of the entire crop. Practically all this loss is borne by farmers and other producers, and a large part of it can be prevented. How the Department of Agriculture, through its Bureau of Animal Industry, is solving this problem, is told in Bulletin 141, just issued, entitled, "The Improvement of the Farm Egg."

In order to show how this loss might be prevented, the Bureau of Animal Industry last year sent experts into Kansas to conduct investigations. The results of the first season's work are given in detail in the bulletin, with suggestions for improvement that might be applied anywhere. "Although but one season has been spent by the Bureau in this work," says the bulletin, "several much-desired changes have been brought about. The most important of these was the adoption by the shippers of the 'loss-off' system of buying and selling eggs."

Previous to the work of the Bureau, Kansas eggs were not very popular in the markets outside the State. Quantity, rather than quality, was a handicap the shippers encountered. The immediate effect of buying on a "loss-off" system produced such a marked change in the quality of the eggs reaching the market that outside buyers now manifest a preference for eggs bought in this manner.

Copies of the bulletin may be procured by addressing a request to the Secretary of Agriculture, Washington, D. C.

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