

to be incubated from the wild birds of the jungle. These were the early days of domestication before man had been interfering with the breeds. From these birds were developed in different stages the breeds that we have to-day. The first breeds that we have under domestication are Game and the Malays. These breeds can be traced along the southern portion of Asia to Ceylon and along the east coast as far north as Japan. Here we find breeds as distinct to-day as they were hundreds of years ago. In the southern and central part of Asia were developed what are known to-day as our Asiatic breeds, originally the Cochins, Chinas, Brahma Pootras, Chittagongs and the Langshans.

I have been unable to connect the feathered legs of the Asiatic breeds directly with the jungle fowl. This might be accounted for by the crossing of some birds with feathered legs such as our prairie chicken of to-day.

So much for Asia, we will now follow along the north shore of the Mediterranean and here we find Javas, Minorcas, Leghorns, Dorkings, Hamburgs, Andalusians, Spanish and French breeds. Each of these breeds have been bred to certain ideals of the people in the various districts until they have become established. You will notice that I have classed the Dorking as a Mediterranean breed. While it is generally spoken of as an English breed the idea is a mistaken one as the Dorking was introduced into England during the Roman conquest.

In 1847 a sea captain at Shanghai loading his vessel for England took with him a number of the Cochins China fowl, which were exhibited at a poultry show in Birmingham, England, in 1850. This new and wonderful breed caused considerable excitement among the poultry fanciers of England.

The first introduction of the Asiatic breeds in America was by some sailors from India bringing birds from the shores of the Brahma-Pootra River to New York in 1846.

Without going further into the history of the breeds, I may simply say that the various utility breeds of to-day are the result of the crossing of the Asiatic and European varieties. As a result of this crossing and recrossing we have to-day some 86 varieties in our standard of perfection.

In our made breeds reversion is taking place continually, and where we are failing in our incubation is that we are not keeping our breeds up to the standard. We find that the Leghorns, for instance, hatch more readily than our made breeds. They have been bred generation after generation to line blood so that their characteristics have become so fixed that they have power to reproduce their kind.

The law of reversion, natural selection and the survival of the fittest are matters that seriously affect incubation, and which are given little or no attention by the average breeder.

We have to-day the great question of "why so many chicks die in the shell." To students of Darwin, Henry, Bailey, Burbank and such men, the reason is apparent. It is simply the law of natural selection and the survival of the fittest. Twice in each generation of birds this natural law is protecting itself. First during its developments in incubation and again during the first two weeks of the chick's existence, called the danger period. Nature herself selects that the unfit may not survive.

Another matter is that of food. We have to consider that the contents of the egg under artificial heat has to produce a chick. The egg has in itself everything that is necessary to produce a chick complete. If, for instance, you do not feed sufficient phosphate of lime to your birds to transmit to the egg the necessary phosphate of lime to build up the bones of the chick, how can you expect that egg to produce a normal chick? The chick draws into its life the different elements from the egg and if the egg is lacking in any respect the chick will lack to the same extent.

Incubation starts to take place the very minute the egg is fertilized and incubation is retarded just so long as elapses from the time the egg is laid until it is placed in the incubator. You may put the eggs away where it is too cold or where it is too hot. You may have put the eggs in a place where there are foul gases which are absorbed through the shell and poison the chick. In order to secure the greatest possible success in artificial incubation the eggs should be placed in the incubator warm from the nest. I feel safe in saying that all the incubators on the market to-day are capable of giving satisfactory results if sufficient care has been given to building up the flock.

Address given by A. W. Foley at poultry meeting in Alberta.

Unusual Experience with Leghorns

EDITOR FARMER'S ADVOCATE:

I am writing to tell you of a very strange experience I had with my brown rose-comb Leghorns this summer. I have an incubator and have used it for three seasons, sometimes twice in one season, and sometimes three times. We buy new roosters each spring from good stock, and we only keep the pure-bred kinds and guinea fowl. This year I had had nine hens steal their nest and hatch out young chicks. Leghorns are famous mothers, but few will believe they would make good sitters, especially the pure-bred, but these ones did.

Now the query is does the use of an incubator cause this? My constant wish has been for

WHAT ANIMAL FOOD DO YOU USE?

The attention of poultry keepers is directed to the subject to be discussed in our issue of December 1. What animal food do you use in winter? See "Topics for Discussion," page 1465. Contributions should reach us before November 24.

only hens that would set, and, lo, here was my last year's incubator chicks stealing their nests! Some had 17 and 18 eggs in them and none less than 12, and they were such small hens too. How they ever covered the eggs is a mystery. I have always heard people say that Leghorns would not set, but I have proof positive they will and do by numerous chicks running around here. It was such a strange experience I thought it good enough to forward to you. The last few cold nights and days have killed a few of my guinea chicks, but I have a few pairs yet left and am taking care of them myself; their parents are moulting and cannot cover them to keep them as warm as the wee things require in our cold climate. They are very cute and tamed easily. I have one two-months-old that comes at my call. It follows me everywhere, and I have to watch so carefully to prevent stepping upon him.

Alta.

EXPERIENCE.

HORTICULTURE

Of the 35,000,000 acres of forest in the German empire, 31.9 per cent. belongs to the state. That country long ago applied business economy to forestry. The problem was worked out successfully of securing an increasing forest output and increasing profits at the same time starting with forests which were in bad shape, Germany raised the average yield of wood per acre from twenty cubic feet in 1830 to seventy-five cubic feet in 1908. During the same period it trebled the proportion of saw timber secured from the average cut.

Professor Craig on Fruit Growing

While a judge at the National Apple Show in Spokane last December Prof. Craig, of Cornell University, was very much interested in the quality and appearance of British Columbia exhibits and expressed his intention of visiting the fruit growing sections of Canada's Pacific province at an early date. Hearing of his intention the British Columbia Department of Agriculture entered into arrangements with him to deliver a series of addresses throughout the province, under the auspices of the Farmer's Institutes.

He delivered a very practical address at Nelson, and after complimenting the growers present upon the scenic beauty of the locality, said that the successful fruit grower must have a real love for his work. With this as a foundation the more technical problems would be easily solved.

He had looked over several specimens of Kootenay fruit and had generally found it to be of excellent quality, but it had brought a few suggestions to his mind which he proposed to deal with. As in all mountainous districts there was a great deal of difference in soil, some being very

rich and some quite gravelly. On the gravelly benches he considered that the most vital problem was that of vegetation. Fertility of soil was one of the most complicated problems to deal with. The only way in which continuous cropping would be possible was by proper fertilization. The whole question of maintaining the fertility of the soil was associated with its original make up. The wise fruit grower would attempt to keep the natural substance in the soil.

He thought that the ranchers of the Kootenay district could make good use of water for irrigation purposes at certain seasons and for certain crops. He, however, warned against allowing the soil to become water-logged. At the same time a proper amount of moisture was absolutely necessary, as the plants took all food in the form of liquid except the gases taken from the leaves.

Speaking of winter killing he said that no section was immune from the possibility of a severe winter. He urged the growers to be prepared, although he understood the winters were very mild compared with the winters in the East. There was a danger of the snow leaving before the frosts were over. A good covering of vegetation would greatly assist in preventing damage to trees by frost as frost would penetrate twice as far in the bare soil as it would where there was a covering.

This introduced the question of cover crops. He had noted that it was very easy to get a good catch of clover in the Kootenay and he knew of no better cover crop than clover. Winter vetch, although not as good, made a very good substitute. One of the growers present intimated that one of the principal objections to winter vetch was that the seed was very expensive. Prof. Craig thought the growers should begin to grow their own seed.

Another grower remarked that through sowing clover as a cover crop, the mice had located in the clover and girdled about two hundred of his trees, making it necessary for him to graft, and as the trees were four years old, the loss was very serious. Prof. Craig agreed and intimated that although mice were liable to locate in the clover, possibility of damage to the trees could be prevented by wrapping wire or tar paper around the bottom of the trees. A mound around the bottom of the tree was also a good preventive, as the mice would not come out in the open. He admitted that by using clover as a cover crop the growers were using inducements to this pest and as a consequence they must adopt preventive measures as well.

Referring again to the winter killing he said that the killing of the tops of the trees was in most instances due to the immature condition of the tree. If winter came before the tree was properly matured the liquid matter of the tree transformed into crystals of ice. The cultivation of the trees should be stopped early in the autumn in order to allow of the tree ripening.

Summer scalding was prevented by shading the trees. In Minnesota the climate was such as to necessitate the trees being boxed. Replying to a question he said that it was both unwise to allow the roots of the trees to become dry in the fall, or on the other hand to have too much water. Roots were as easily killed with too little moisture as too much.

Referring to insect pests he stated that in this paradise of British Columbia there were no serious insect pests which affected other regions. Making a definite reference there was no pear blight, San Jose scale or apple spot.

He sought to emphasize upon the growers the ennobleness of their position and asserted that the fruit growers of the New England States spend twenty per cent. of their gross receipts in fighting these three pests alone. They consider themselves very lucky if they get sixty or seventy per cent. first grade fruit and free from worms. He urged that every effort be made to keep the pests out, as he considered it would be a disgrace to the growers of the province if they allowed them to obtain a foothold.

A great future for the fruit industry was predicted. There was no need to fear over-production. This had been proven in the case of the United States. The population was increasing faster than the production of apples. In 1906 the total production of apples in the land across the line was 65,000,000 barrels. This, however, was a record. The average for the last ten years had been 38,000,000 barrels. Apples had constantly gone up in price. With regard to British Columbia they had a great home market. The prairie provinces of Canada would always be heavy importers of fruit.

E. W. D.