A Nestful of Nuggets from the Poultry Institute at Guelph.

The second annual Poultry Institute, held at the Ontario Agricultural College, opened on Tuesday, February 5th, under very auspicious circumstances. There was a goodly number in attendance, composed of Short-course students and interested poultrymen from far and near. The meetings were addressed by a number of very able men—experts in their own particular lines—among whom were Charles A. Cyphers, Buffalo, N. Y.; J. L. Nix, Homer City, Pa.; Prof. J. E. Rice, Ithaca, N. Y.; L. H. Baldwin, Toronto; Prof. W. H. Day and Prof. W. R. Graham, of the O. A. C., and a number of other well-known poultrymen. Throughout the entire session the keenest interest was evinced by the audience, as of men who were there to learn, and truly great opportunities were at hand for the gaining of knowledge along the various phases of poultry-keeping. It is regrettable that this Conference is not more widely advertised, in order that people might know just what is going on, and that even more might take advantage of this great source of practical information.

SELECTING, FEEDING AND HOUSING OF LAYERS.

In the opening session of Tuesday afternoon, Prof. Graham dealt with "The Selecting, Feeding and Housing of Laying Hens." He stated that egg-production was the best end of the poultry business; if we could increase this, we were doing a great stroke of business. The average hen throughout Ontario did not produce over 80 eggs in twelve months. Even in the average experiment stations he did not think it would be more than 100 eggs per year. The only sure method of advance was by the use of trap-nests; by finding out what each individual hen was doing, and breeding only from the heavy producers. He was much surprised when he started to use trap-nests at the very small percentage of really good layers that existed among his own flock, and of the large percentage of drones he possessed—some that never laid an egg, and never would. The only absolutely sure way to locate and eliminate these non-producers was by means of the trap-nest. Other systems had been advanced for their identification, but all had failed to a greater or less extent. The chief drawback to the trap-nest was the amount of labor it involved, but breeders would have to use it sooner or later, or be forced to the wall by those who were using it. The hen with a large crop could usually be counted on to be a good producer. Like the dairy cow, she must be able to consume feed in order to produce. This could easily be determined after feeding time and the hens had gone to roost by feeling of the individual crops. One should select cockerels that crow early. Constitution was the strong point to be considered. Early-maturing birds usually proved to be the best producers, but in following this up one must guard against lack of size and bone. The male is at least half the flock, therefore one could not be too careful in his selection. As to the matter of housing, there was a great diversity of opinion, but the majority at the present time stood for the so-called cool house, dry, and comparatively free from drafts in the roosting compartment. His hens laid better in cold houses than in warm houses. He wanted a dry house in which there was no smell of hens. There was nothing equal to a straw loft for keeping the house dry in winter time and cool in the summer. The feeding of laying hens was not a difficult problem, if the breeding and housing were right. The breeding was the largest problem; we should pay more attention to it. In feeding, a great deal depended on the attendant. There were three points to bear in mind in feeding: Feed vegetables, meat and grain, and give exercise.

Mr. W. A. Brown, of the third year at the College, was the second speaker of the afternoon. He interested the audience by a graphic description of the work of the West Virginia Poultry Experiment Station, after which an interesting discussion took place on hopper-feeding and trap-nesting.

IMPORTANCE OF VITALITY IN EGGS.

The evening session was addressed by President Creelman, who dealt with the general conditions of Ontario and the work of the College.

Mr. Nix, of Homer City, was the second speaker. He laid great emphasis unon "Vitality," claiming that everything in the poultry business was involved in this word. If eggs were strong in vitality, any machine would hatch them. Poor vitality in eggs was a great source of disappointment to the poultry-raiser. He stated as his belief that the dry method of feeding (hopper-feeding) had done more to increase vitality than wet feeding had ever done. In order to keep up this vitality, we must resort to the colony-house plan, with the open range and hopper-feeding. He never knew but one poultry plant on the extensive plan to last more than four years. At least, the colony-house plan was the best for the beginner.

Mr. F. C. Elford, of Ste. Anne de Bellevue, Que., was then called upon. He briefly outlined the work of the Poultry Department at the new Macdonald College.

A SCIENTIFIC STUDY OF INCUBATION PRINCIPLES.

On Wednesday morning Prof. W. H. Day very clearly outlined the scientific research he had made in connection with artificial incubation during the past summer. Several factors were concerned, among which were temperature, evaporation, and the question of carbon dioxide. He believed the hen to be our best teacher, and we must find out the conditions which prevail under her. When we know the proper conditions for the best results in artificial incubation, little difficulty will be experienced in making the mechanical contrivances to supply these conditions. All that had previously been done in connection with this problem had been mere guesswork. They were endeavoring to find out the real facts of the case by scientific study.

HEAT AS A FACTOR OF INCUBATION.

Mr. Chas. A. Cyphers in the afternoon took up the discussion on artificial incubation. He considered heat to be the common principle and the great factor in incubation. A certain number of heat units were necessary to ripen the egg for hatching. It was a question of applying the heat to the egg. The more one could cool the eggs, and still get the chick out on time, the better the hatch he would have, and the more vigor he will get in the chicks. The question of balancing up the heat with the cold solves the problem of artificial incubation in his estimation. Losing sight of this was the cause of imperfectly-hatched chicks and of chicks sticking in the shell.

Mr. Nix then took up the discussion. He said the work that Prof. Day had accomplished during the past season was the only scientific work that had ever been done on artificial incubation; all the rest had merely been guesswork. The problem at hand was a difficult and intricate one. There was little difference between hens and incubators up to the seventh day of incubation. The great difference was at time of exclusion from the shells. More chicks die in incubators than under hens. There were no absolute facts in artificial incubation. He believes the "old hen" is onto her job; that is, the normal hen in which the natural instincts have full play. We must find out the unknown factors, such as the amount of carbon dioxide, which exist under the hen, and apply them to our machines. This, Prof. Day was endeavoring to do, and he deserved great credit for his work.

ARTIFICIAL BROODING.

On Thursday morning Chas. A. Cyphers again occupied the platform, this time discussing artificial brooding. Different brooders required different manipulation; no rules would apply to all alike. Chicks must be kept warm enough for the first week or two, should not become chilled, or white diarrhœa would result. A board floor, with a cut-clover litter, he found to be the best for them. Leg-weakness he considered due to lack of fresh air and exercise. The hopper system of feeding was all right for outdoor work, but chicks could not stand it inside. Of course, chicks must be kept dry; a man who would rather let his chicks get wet than get wet himself, had better keep out of the poultry business.

Mr. Nix followed on the same subject. Successful artificial brooding was a matter of vitality, which was difficult to obtain out of the natural season. We must have good eggs well incubated before brooding could be a success. The best results were obtained from an individual lamp brooder with a regulator on it. The first ten days was the critical period in a chick's life. The temperature and ventilation must be right. A uniform temperature was necessary, the heat being applied from the top, and using forced ventilation (not accidental, as was too commonly practiced), these being the essentials of a successful brooder. The brooder temperature should be regulated by the appearance of the chicks. A good nursery brooder should be good enough to hatch eggs in; the conditions should approach those of the incubator for the first few days. A sheet of coarse paper, used in the house, as in a canary cage, made it easily cleaned. The lamp should be left going constantly, no matter how warm the day, as the chicks were easily chilled and then trouble would set in. A brooder chick will eat anything it can swallow during the first few days, therefore care must be exercised in that which is placed in its way. The hopper system was unsafe before the ninth or tenth day. Anemia was the great ailment of brooder chicks; one hundred per cent. of them were more or less affected by it. A hen hatches a normal egg into a normal chick; the incubator does not. Only about 80 per cent. of the conditions are right in the best incubators. The best brooder made would not reproduce the conditions found in nature; therefore, here, again, we have vitality impaired, the extent of which is dependent upon the care and experience of the operator.

EXPERIMENTS AT CORNELL ON FORCED MOULTING.

Prof. J. E. Rice gave the results of some recent experiments conducted in the Poultry Department of Cornell University. The first was an experiment to prove if the hens could be forced to moult. Six pens of hens were used in this experiment. Part of them were starved for a time in order to induce moulting; the others were fed in the ordinary way. In the starved lot, a great lowering in the production of eggs took place; the moult was started earlier, but both lots finished their moult at the same time, and from the lot fed in the normal way a much greater production of eggs was obtained. The conclusion drawn was, better to let a hen lay when she wants to lay, and not stop her and take chances on getting her laying again. Just twice as many eggs were produced by the normally-fed lot.

HEAVIEST LAYERS THE LAST TO MOULT.

Some observations during the experiment were: The heaviest producers were the last to moult; the poorest layers moult first. Thus, a farmer who followed this method of selection, and killed the hens that moulted last, would do away with his best-laying stock. A normal hen when she stops production will moult; a healthy, normal moult takes place—a few feathers at a time, without being noticeable. He had discovered where the first feathers came from: The down on the chick's body forms into the first quills—i. e., the down grows into feathers—just as the down on a youth's upper lip would grow into a moustache.

UNDERFEEDING PULLETS DID NOT LESSEN MOULTING.

The next was an experiment in the treatment of early-hatched pullets to keep them from moulting the first fall. One lot of pullets were restricted in their nitrogenous feed at the time they began to shoot the red, in order to retard egg-production. The other lot were fed normally on egg-producing foods. The results were: The pullets that had been doing the heaviest laying—those which were fed to produce eggs—moulted the least. Some that had never laid an egg moulted the most. Therefore he concluded that holding back meat and egg-producing food from pullets had no effect upon retarding moult; that one had better feed liberally and take chances on moulting; to let nature take her own course as to moulting, and to take the eggs when you can get them.

LIME NECESSARY FOR HEALTH OF FOWLS.

Another experiment was to ascertain the function of grit. Two pens of cockerels were selected, fed normally, except that all lime was withheld. One pen received powdered mica spar, the other pen the ordinary mica spar, or crystal grit. The birds did not thrive, and had to be turned out in order to save their lives. In a trial of the same kind with pullets, they ate all their eggs when lime was kept away from them. By testing breaking joint of thigh bones of these birds, it was proved that a hen would use the lime in her bones to produce eggshells if she could not procure it in any other way. One pullet's leg-bones actually became flexible during the experiment. The pullets seemed to have an abnormal craving for something they could not get. When lime was restored to them, all quit eating their eggs. Thus, oyster-shells or lime in some other form were proved to be absolutely essential to the hen. A laying hen must have lime in liberal quantities.

MORE ABOUT INCUBATION.

Mr. L. H. Baldwin, the efficient chairman of the Conference, then resumed the discussion of artificial incubation. He recommended the running of machines at a high temperature, as less mortality resulted than with lower temperature. The ordinary thermometer sent out with machines was not reliable; great mischief might be worked by an unreliable thermometer. He was convinced that 103 degrees on the eggs by an accurate thermometer was the best temperature to start with. After that the eggs should get more airing and cooling than was usually given. The percentage of evaporation seems to make little difference; the egg seemed to be able to control its own evaporation. White diarrhœa, so common among incubator chicks, was rarely found in hen-hatched stock. This disease could be overcome, he believed, by running incubators at a higher temperature; at least his experiments had proved it to be so.

In the evening Professor Rice gave an illustrated address on "Poultry-raising in New York State." He advocated free range as the great means of keeping up vitality. He also gave a very fine series of slides, showing in a graphic