at any show this winter. Do so, and get ready at once, and then advertise in the leading poultry papers, letting people know what you won. Don't you own any birds fit to show? Then you have been breeding from a poor grade of stock. You can never in this way advance. Turn over a new leaf, get good stock, and study the *Standard*.

Have you built a bin under cover, to store your poultry droppings, until next spring? If not, do so at once. The droppings of a fowl will almost pay the cost of her feed.

Make your poultry-house warm *at once*. Old newspapers are recommended for keeping the poultry-house warm in winter. First batten outside, then paste strips of cheap muslin over the cracks inside and finally paste on the paper inside, three or more thicknesses, letting each thickness dry before the next is applied. Give roof and sides the same treatment. Four ounces common glue, dissolved in water, and an ounce of carbolic acid to the gallon of paste, will improve its adhesive quality and head off the lice.

Will the time ever come when our farmers learn that a well-kept flock of poultry, for the money invested, is the most profitable of all farm stock? They seem, as a mass, persistently to close their eyes to this fact, and refuse to accept it, or act on it.

Don't forget that green food is absolutely necessary for the fowls during the winter, and must be supplied.

Have you got the incubator ready? It will soon be time to commence hatching Langshans and other large breeds. Look after this matter *now*.

Deal squarely with your customers: have everything just as represented. These are some of the secrets of success.

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THE PRINCIPLES OF FEEDING.

BY SCIENCE.

The enquiry of the Editor in regard to oyster shells—their use in the poultry-yard and pigeon loft—can be placed like the rest of feeding—on a scientific basis. What is food? In the widest sense, *all* that an animal needs for its support that is derivable from the world around it. Apart from that need for lime salts, founded on their existence in most of the tissues of the body especially the bones, there is in pigeons that breed so frequently, and still more in fowls, an excessive demand for lime salts for the construction of the egg shell. As explained in the last issue of the REVIEW, one part of the egg tube is a gland to separate the lime salts from the blood, into which they found their way from the food, as usually understood, and in the case of the bird from the many sources other than ordinary food. The difference between a bird roaming free and one confined is, that in the former case it can choose its own diet, lime containing material included, as it will, *i.e.*, as it's appetite demands. Now appetite is simply the expression of deep need. I have been amused to see even ducks, just after feeding, running about, looking among the coal ashes sprinkled over their run, and rapidly picking up bits of half-burned coal. Look in the stomach (gizzard) of a chick, hen or pigeon, and you will find such pieces of hard material—small stones, etc. These are in place of teeth; and notice that the walls of that gizzard are muscular and thick, beyond what is the case for any other animal. The whole is, in full, a mill.

But the Editor's question is very much to the point, viz.: When ground oyster shells are eaten by the bird, do they serve any other purpose than that just now pointed out? From definite observations I can answer—yes.

A short time since I killed some young Jacobin pigeons (that were badly marked, not desiring to breed from them, nor sell culls and allow others to perpetuate poor stock), and before they became pie I had a close look at all of their organs, including crop and gizzard A pan of ground oyster shells had been in the loft before the birds. In both crop and stomach the particles of shell were seen to be rounded off at the edges and reduced in size.

The shell of an oyster is first made up of carbonate of lime, united with animal matter. When dried, or moderately burnt, the latter is driven off and the lime salt left. By extreme burning they may be changed into the purest of lime. But as this is caustic it is not so suitable for the birds as the carbonate (as found in chalk, marble, limestone, etc.,) produced by drying or gentle roasting. The digestive juices are remarkable for their dissolving powers, hence there need be no difficulty in understanding why they should act on the particles, as I have reported above. This action would be much slower in the case of the fresh shell (unburnt.)

Now it is plain that this food should not be mixed, as a general rule, with the soft food, and forced upon fowls. Nature, as speaking through appetite, is the best judge, so the ground shells, like charcoal, gravel, etc., should be left before the birds. Remember, too, that an excess of lime salts neutralizes the acid secretion of the crop and gizzard, and may interfere with digestion.

I have made an observation that may be useful to some: My young pigeons and broody pigeons are the keenest of all to get this material. Why? They need it; the old ones for shell-making, and the young ones to help form bone. It should be good for leg weakness. Would it help the long limbed young pouters? I reply, then, that lime salts are among the ingredients useful to birds, both as food and mechanically (as ground shells) to assist in the grinding of food; but that, except in rare cases, it should be put before the birds, leav-