



The BEGINNER
in POULTRY
C S VALENTINE





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THE BEGINNER IN POULTRY



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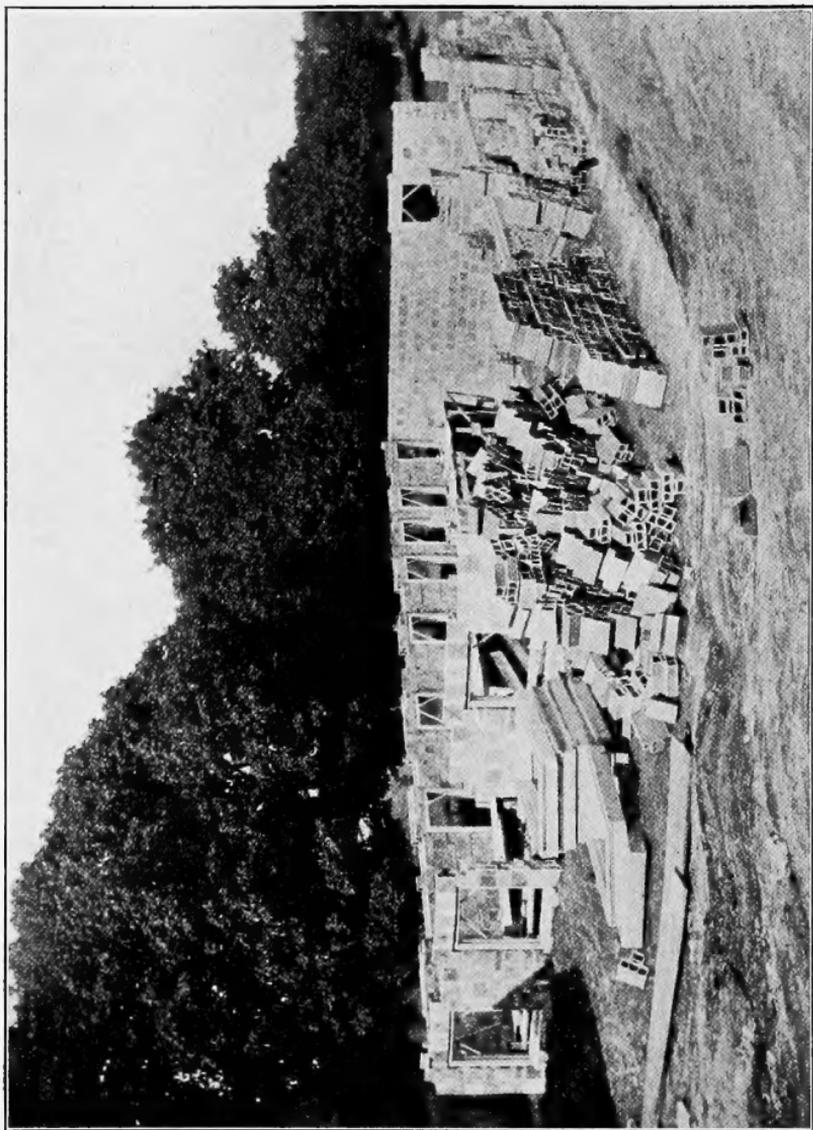
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TORONTO



WHEN THE DREAM OF A NEW JERSEY STATE POULTRY BUILDING BEGAN TO TAKE SHAPE

THE
BEGINNER IN POULTRY

THE ZEST AND THE PROFIT
IN POULTRY GROWING

BY

C. S. VALENTINE

New York

THE MACMILLAN COMPANY

1912

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THE BEGINNER IN POULTRY

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I

WHAT MAKES A POULTRYMAN?

Effect of Business on Character — Dealing with Sentient Beings — Sympathy a Necessary Factor — The Rights of Animals — Justice Tends to Profit — A Protector — “ Good Luck ” — Hen Reasons

AT the risk of seeming, for the time being, unpractical, I wish to discuss this question from the standpoint of the fowls themselves. I believe this to be *fundamentally* practical.

It is not merely the keeping or even the breeding of many fowls through a series of years that makes a real poultryman ; efficient, systematic, successful. Students of men have made and reiterated the statement that horticulturists, as a body, are the finest group of men on earth. This is the impression almost sure to be gained by close observation of gatherings of men of this profession, in conference or convention. But, why should horticulture be looked upon as a profession more than poultry breeding is looked upon as a profession? Why should the actual practice of these “ professions,” or, if you prefer it, “ trades,” differ in its effect on the men who follow them? Or, if you are not willing to allow

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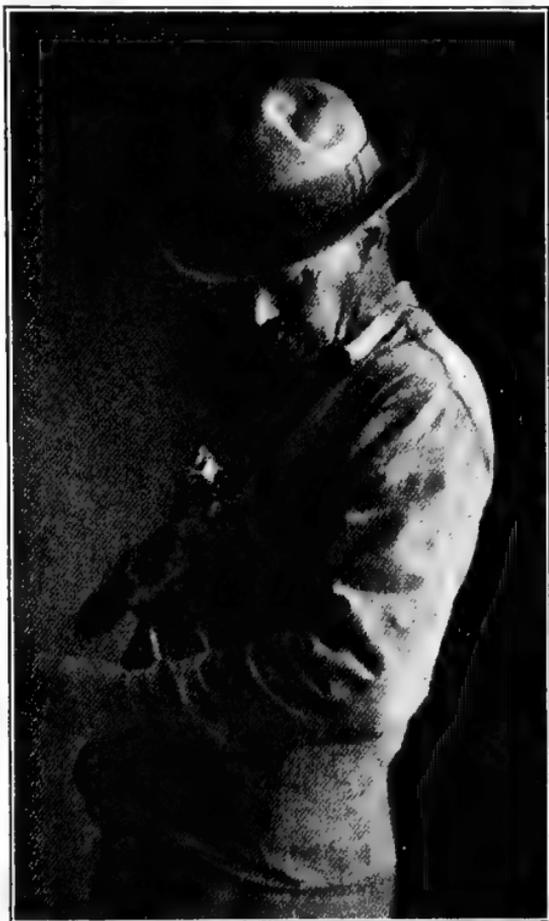
that this is the case, what is the difference of temperament or of feeling which draws a man to the one or the other? And why should the one elevate the character of the men who follow it, while the other (as is asserted) tends to do just the reverse?

Both these occupations lead man closer to Nature. But, in the one, he handles and creates new forms with living things which have not feeling or response; in the other, he controls — as far as a human being may — living things which are sentient, and which have what we may term “personalities” which respond to him, and which communicate with him to a considerable degree. This, it seems to me, is the fundamental difference, and this difference is what makes the difference in the effect upon man himself. This is because, if a man does not deal out justice and kindness to sentient things, he becomes, in the very nature of things, *the less a higher being*. This morning, a ten-year-old lad passed my door, angrily whipping an old horse lagging in the spell of unprecedented heat; yesterday, a farmer's daughter soused a too-persistent sitting hen in water till the bird was nearly drowned, to “break” her of the natural impulse. These common occurrences are unjust, and, because unjust, they are callousing. And there are scores of ways in which man may, and does, make callous and brutalize himself, in dealing with the living things subject to his will. This does not affect these animals alone, for calluses grow and fester, and the man who is cruel to his stock becomes insensibly cruel to his wife and children.

I have spoken at the outset of sympathy as a necessary factor in the successful handling of sentient things. This sympathy will not be shown, in the majority of

instances, unless the person concerned has been educated to it; first by teaching and example, then through training, and eventually through observation and study of the animals. For real sympathy is not merely a chance matter of tender-heartedness; it is fundamentally a matter of seeing conditions, at least in part, from the point of view of the other being.

One who is to deal with living, sentient creatures, needs, then, to study these creatures as creatures of feelings and of rights. He needs to observe their ways of doing things when they are free to do as they will; their ways

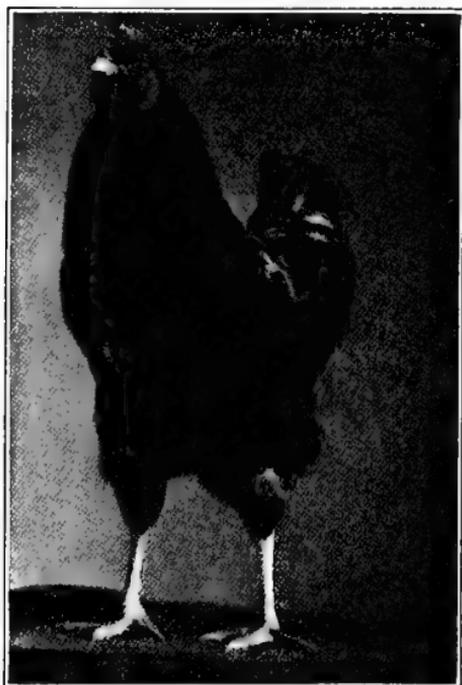


Sympathy — A Necessary Factor

as a group or class, and also as individualities—separate members of the group. Indeed, one who goes much among any groups of animals, with eyes at all open, can-

not but observe these many things. But, to delve into the reasons for certain phases of group behavior and also for certain individual habits will render them far more interesting and attractive. The former can often be traced; the latter far less often.

Observation of the habits of groups and of individuals leads directly to more and more interest; therefore to increased sympathy, and to a sense of the rights of even



Strength

the lower animals.

Not until we have studied rather deeply into the reasons for common behavior and for exceptional behavior in animals subject to us are we fitted, in any real sense, to become complete masters of their fate. For masters of the beings within their possession, men, women, and children always are, as long as these beings are weaker than they, or believe themselves to be weaker. The

strength of man thus

lies in the weakness or the submission of that which he commands or controls. It may be weakness of character, or of will, or it may be weakness only physical (although physical weakness leads logically to the other weaknesses).

The beings under the dominion of man must, then, appeal to him, through their weakness, to his sympathy and his sense of justice. The sympathy of one man will be aroused by the thought of a bird as a pet, which his feelings will not allow him to kill. The sympathies of another will be far more practically shown in the kind care and regular attention to their needs which he apportions to the creatures under him. That this is precisely what tends to make them most profitable is cause for thanksgiving; were it not the case, life might be one long torture to the subject animals. While many are too kindly natured to feel justified to raise animals for the express purpose of killing for profit, yet the dominion of man *is* over the lower animals, and the greater pain which accrues to them through his handling comes from his neglect of their daily needs and hourly comfort, rather than in death; since they do not usually anticipate death and it can be made painless by the use of the right methods. We need to assure and reassure ourselves that it is especially hunger and fear and pain from which we are in duty bound to defend the lower creatures, to whom we are as gods. Maeterlinck apprehends and expresses this attitude of the creatures, when he makes the dog in the play, "The Bluebird," address the man as "My little god."

As the sympathy and the sense of a certain social kinship is aroused in the dominator, man, toward his underlings, he grows into the attitude of a *protector for justice's sake*, rather than merely for profit's sake. It is at this point that every method of manipulation of the flocks turns into "good luck" in his hands. His chicks grow rapidly and evenly; his hens sing joyful

lays for his ears and deposit profitable "lays" in the nests which he carefully and sensibly provides. It is a simple matter, this of providing a nest just to the hen's taste; so simple that any one ought to be able to do it



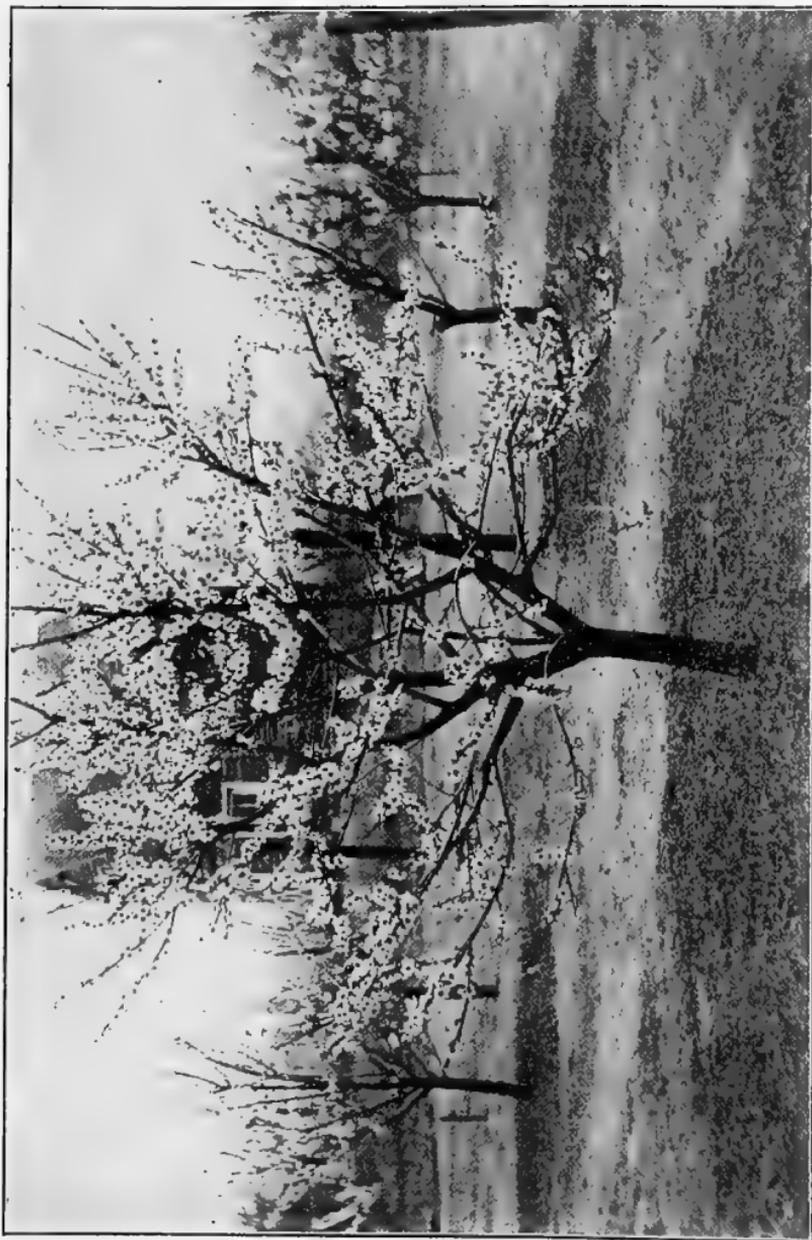
Social Kinship shown by Pride. This, with Sympathy and Strength common to Man and His Birds

exactly right, it would seem. Scores of unsympathetic "practical" people may tell you it is all bosh to consider the whims of the fowls in matters of so little moment as this. The hen is due to lay anyhow, they will argue, and why should any sensible, practical person go to the trouble of doing things in any special way, just to please the whim of a stupid hen?

But, in the first place, and answer enough, the hen is *not* "stupid." There is nearly always a well-defined

(hen) reason for the special course which she desires to follow. Because it is a part of her nature to steal aside and lay a nestful of eggs for the incubation of her prospective brood, she likes a rather dark and quiet stow-away nest, even when housed under artificial conditions, and she likes it better and better as it becomes fuller and fuller of eggs. Because of this innate feeling, she will choose a nest containing a nest egg before one which is empty, other things being equal.

But, suppose that it is not a matter of nest eggs. Suppose that there is a full tier of nests made comfortable and inviting, each with its dummy egg, and placed just where you want her to lay; suppose that she persists, as one hen, though there may be a dozen or more of her, in laying in another, less desirable, nest, or even on the floor in the corner? The average handler will be sure to "Drat her!" as a silly, stupid, and, above all, obstinate good-for-nothing, when all the time the probable reason — and a perfectly logical one — for the bird's seemingly erratic action is that the man has omitted to provide a suitable alighting board in front of the nests. In her efforts to fly full tilt directly into the nest from the floor, her outspread wings strike its sides, and, failing to double herself up into it, as she drops back, she goes to the floor. A dozen failures bruise and discourage her. After watching her till she becomes discouraged, and obstinate in depositing her egg in the floor litter, shall we not rather say: a stupid, unseeing man who has not tried to learn the needs or the ways of the hen, but has insisted on her doing things in his way *when circumstances which he has provided made it impossible*, or at least very difficult, for her to meet his wishes?



The Peach Orchard Poultry Yard. Getting Ready for the Chicks

II

MAKING THE REAL START

Waiting on the Hens — Imprisonment for Life — Buying Sitters — Imperiling Success — Prices of Hens — Cost of Chicks — Quick Product from Hens — Maturity of Pullets — Large Investments Unsafe — Who Furnish the Failures?

Now we strike a puzzle: *how* are you going to start? In a large, or a small way? With machines, or hens? Or with baby chicks, made ready for you by some one who has experience? I cannot decide this for you, altogether, because so much depends on what you are going to put into the proposition, aside from the money investment.

One might begin with half a dozen hens, a dry-goods box for a house, and with a cracker box or two for nests. One might be very intensive, and keep these hens shut within their box all the time. That would mean that every morsel of food and water and litter which they receive must be supplied them, and all the waste incident to the life of the hen must be removed carefully and promptly by you, if you are to handle them yourself. Are you ready for the task? And what if you eventually increase to several hundred fowls? Will you then be willing to become such a slave to your expected money-makers? Again, are you willing to imprison for life these sociable helpers of yours? If so, any poultry supply house can furnish you a book which will tell you, in detail, almost every move you must make in thus handling the birds. There

is even a school — a private concern — where all these points are taught.

If you are not willing to take on so imperative a service, you will provide a good, green range for the birds, let them wait on themselves just as much as may be during all open weather, feed them each a handful of grain once a day, with a few meat scraps from the table or a little milk instead of the scraps, if this is handier. They will begin to lay for you in April if you have procured them in March (and this is about as early as you can well begin, on this plan) at the north. But, it will be several weeks before you will have any hens ready to hatch for you, so that you can do no early hatching unless you can buy some sitters. This sounds feasible; but there will be the difficulty of moving them to their new quarters, and the possibly greater difficulty of finding any for sale at all. For, at this special season, all who make any specialty of poultry are quite likely to need all the broody hens for their own work; and this, even though they use several hatching machines. You will hardly find it good business to buy incubators while you have few layers and little experience, especially as you might not be able to procure eggs in sufficiently large numbers. Besides, when eggs are not plentiful, they are likely to be held too long for best hatching. The Beginner, of all workers with poultry, needs good tools and good eggs; else, he cannot tell whether any trouble which arises is due to his own errors, or to the eggs, or to a poor machine.

I wonder whether you would not rather buy some new hatched chicks outright, from some one who is known to have *good ones*, and begin with them? You

might procure a good brooder, or, if you thought it better to go to no further expense, this first spring, you could raise them in cracker boxes or fireless brooders. That means that you will keep them in the dwelling at



One might Buy Some New-hatched Chicks

night, if you begin early in the season; but, you can put them out in a sheltered place whenever it is sunny. It won't do to let the wind blow on them much, but they would rather be warmed by the sun, when it shines out warmly, than by any indoor heat that could be furnished.

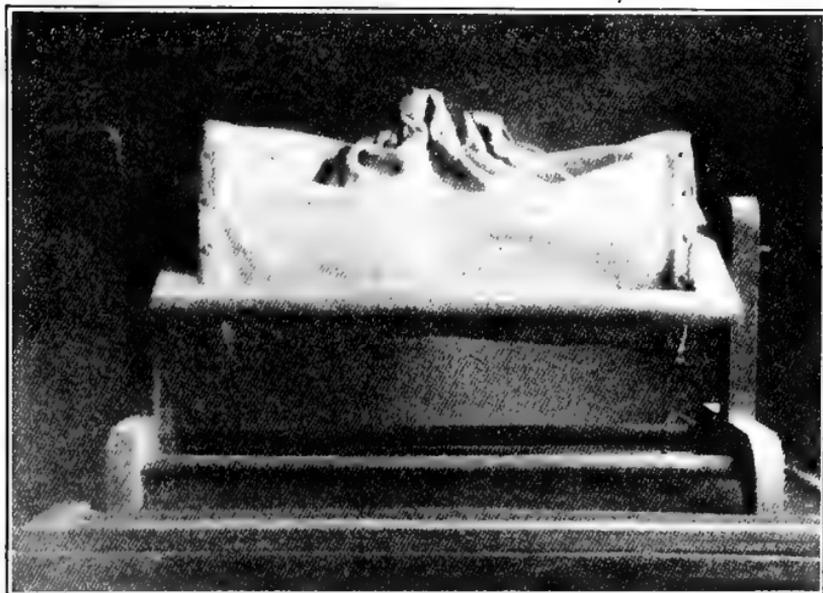
Will you get fifty to start with? Or twenty-five at first, and perhaps fifty more three weeks later? There is a great advantage in buying chicks in this way, just the number you can handle comfortably, and just when you want them. All in a bunch are of the same age and have an equal show, as far as it can be given them. There will be none older and much stronger to crowd and trample the young ones, as is almost sure to be the case if the chicks come along eight or ten at a time, and are bunched in one flock after a few weeks. If you want to try two or more lots the first year, don't make the mistake of letting them run together. This is about

the worst blunder a Beginner can make. It is one that probably eighty out of a hundred do make, for lack of forethought. Perhaps fifteen more of the hundred do it in spite of warning, because it is so much easier, and because they cannot apprehend the vital importance of keeping the different ages separate. The result is that very few really first-class chicks are raised, because the majority of learners have thus imperiled their own success at the outset. And this error affects them at every stage of the work from this period of early chickhood on.

If it were not for just one thing, I might advise you to buy two or three mother hens with their broods, for the start. But, unfortunately, nearly all sitting hens have lice. And when the chicks have parasites to fight, from the first, you have a slender chance to raise any really good ones. The strongest may keep themselves pretty free by vigorous use of the dust bath which they find in any plot of soft, dry earth. But they cannot make good headway against those on top of the head, which are so often found when they are taken from the nest for cooping. You, too, must fight these lice all the time. Don't you see that the real question, all along the line, is how far *you* can be trusted?

Have you noticed how almost universally those who ask information ask for the *good* points of fowl, or machine, or whatever may be the subject of inquiry? Yesterday, I saw in horticultural print, a query as to the *faults* of a certain popular peach. Every one who writes about this peach praises its good points. The inquiry brought out the fact that it had several very bad points, one of them being that it succeeded only in a few localities. Its praise, then, was utterly misleading

to most readers, unless the bad points were mentioned at the same time. With this thought in mind, I am trying to show the pitfalls that go with each method of beginning with poultry raising. There is a difficulty with brooder chicks which the average Beginner will not be expecting, and which may send him stum-



"You, too, must Fight These Lice." Lice-killing Machine. Introduce Birds and Lice Powder, and Rotate

bling beyond recovery of his balance. If not bought from some one known to have good, free-range, healthy, vigorous stock, these machine-hatched chicks are quite liable to develop "white diarrhoea," the most dreaded scourge of the incubator chick. This is said to be incipient even in the egg before it is incubated, in some cases. In case this should occur, you might lose every one before they were three weeks old.

The production of day-old chicks has become tremendous, and you who are new to the work are almost sure to argue that in buying chicks you know exactly what you are to get, while with eggs you buy only a "chance." It is quite true that baby chicks can be shipped safely for some hundreds of miles. But, as long as white diarrhoea has the upper hand, they may be looked upon as pretty much of a gamble, if incubator-hatched. One firm said, in a letter in March, 1911, "We expect to sell 50,000 this coming season"; another returned \$4000 received for orders which it could not fill. One seller says, concerning this method of getting stock: "The buyer receives his chicks and sees what he gets, and does not have to watch the old hen and cannot come back on the seller and say eggs were infertile. In this one way alone the chicks business is best." As a discerning Beginner, however, you may notice that here is no argument whatever for you; that is, no argument for the actual value of the chicks. If they die after receipt,—well, you are a Beginner. Of course, it is *all your fault*, and you "cannot come back at the seller!"

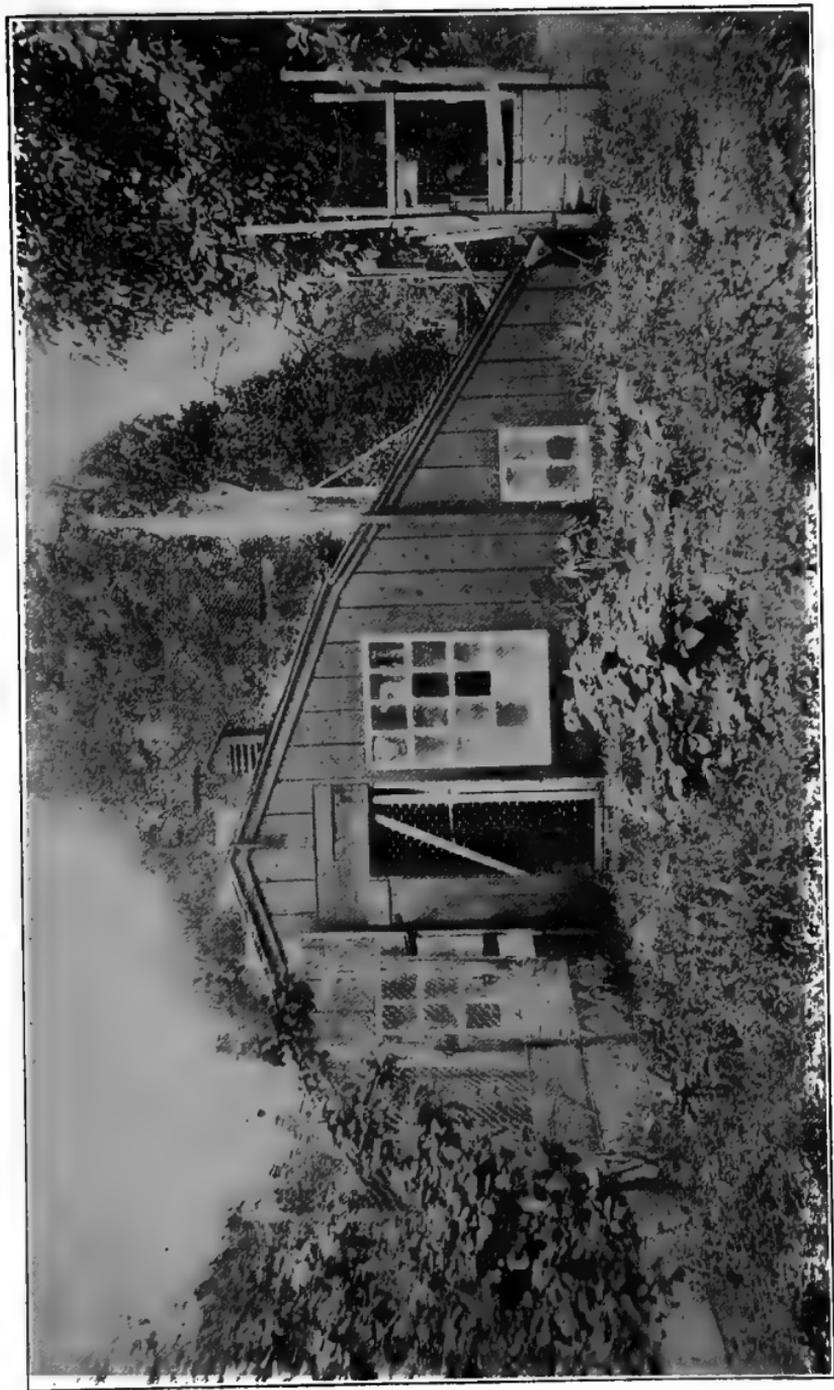
On the whole, though it is easiest, and requires less initial investment, possibly, to buy chicks, it may be safest and cheapest for you, in the end, to start with the six hens, or ten, if you prefer. You may not get chicks so early, by this method, nor can you have them all of the same age, unless you can buy additional sitters and set them all at once. But I do not know but you will be more certain of reaching the autumn with a decent flock of pullets to repay you for your trouble and expense. Ten common hens will cost you \$7.50 (if you are very



Connecticut Turns Out to Study Poultry Topics at Storrs: the Field Meeting. One Way to Make a Start

lucky) to \$10. But, if you prefer to begin with fair, pure-bred birds of the breed which you think you will like best, you may get the six layers for \$9, possibly, and four common hens for sitters for \$4 more. But prices now tend to run higher than this for even ordinary pure stock, especially in the spring, when most of the surplus has been sold and the supply is likely to be short of the call.

The two lots of chicks which you considered buying would have cost you anywhere from \$7.50 up according to quality and your location. In favorable places, possibly even a little less; I see them advertised, at times, at eight cents apiece, but this is rare. The specially good point about starting with the hens is that with six good ones you can count on about thirty-five eggs a week for a short time, and with ten hens, if you develop skill in feeding, you may get fifty or sixty eggs a week for a short time in spring. Thirty-five eggs a week would supply five sitters with work every eleven days, if you wished to use them all that way. It is not wise to save them up much longer than this. If you can get the sitters for them, you will be lucky, for this brings your lots of chicks only eleven days apart in age. You can sell the hens for nearly what they cost, when the chicks leave them, and your own layers will be yielding eggs right along more or less until the middle of September, perhaps, giving you eggs to sell. You may get enough for the table till well into October; but November and possibly December will be months of all outgo and no income, unless your pullets are early enough to begin with October. A good pullet commonly takes six or seven months to



A Picturesque New Jersey Poultry House, Owned by an English-bred Dorking Lover, Henry Hales, Sr.

develop, so that, if not hatched till May, you cannot depend on them to give much yield of eggs before November or December.

I have purposely taken you through this maze of figures and possibilities, in order that you may see how many chances there are for you to make irreparable errors during the first season, and how necessary it is for you to study the chicks, the chances, the pitfalls, etc. It is almost equal to Greek, but far more interesting and profitable, provided only that *you* can be depended on.

The matter of beginning in a large way with incubators, which demand eggs in lots of fifty and upward, I think best not to consider favorably at all. The chief reason is that, if you are a genuine Beginner, you have not been tested, and, until this is at least partially done, it is decidedly better not to incur large risks. Operations on incubator scale, continued throughout the spring and earlier summer seasons, demand a considerable investment; as there must be brooders, weaning coops, feed for large numbers, and housing for the winter stock. All of this investment must be made within the first seven months. The chances are great that, if you should begin in this way, you' would meet with so much discouragement and loss that your machines, coops, etc., would be for sale within a year or two. You could not get half price for them even though "little used," as there is very little call for second-hand poultry supplies; all but Beginners acraze over poultry know better than to buy them. And most Beginners will prefer to start on a smaller, safer basis. Besides, everybody is suspicious of the enthusiast who

quits too soon, and this alone will "queer" the sale of his appliances.

Do not be deluded, therefore, into getting a large lot of expensive buildings and supplies at the outset, before you know the real necessities of the work, or what you really want. *The Beginners who fall into this error furnish most of the class known as "The Failures."*

III

CHOOSING AMONG THE BREEDS

Breed and Class — Study Classes First — Making and Molding Breeds — The Important Classes — Which Standpoint? — Outstanding Breeds — The Champion Laying Breed — Size of Eggs

STRICTLY speaking, shape is the determining feature of a breed. But among poultrymen, the word "breed" is so often carelessly applied to varieties, that it is necessary to know this habit of theirs in order to make sure of understanding them always. The Standard of Perfection is always changing, partly because new varieties or new breeds are admitted from time to time, and partly because it is revised once in five years. For this reason, it is scarcely wise, in a book like the present one, whose life may cover many years, to state definitely the special requirements of the Standard, or to refer to special contents except in a general way. Thus, I may say that the Standard of Perfection, at the time of this writing, contains about 140 variety descriptions. Perhaps the strict meaning of the word "breed" would seem different to different people. Some would say that there are something above fifty real breeds; others would contend that there are more.

The term "Class," as applied to group units of similar kind, is rather an arbitrary word. But its key point is that the units which compose it, of whatever name they may be, have common characteristics. It would be a puzzle of puzzles, indeed, for a Beginner to try to select



Young Plymouth Rocks, and an Especially Attractive Open-front Colony House. Rocks are in the American Class

from the many breeds and varieties, if jumbled together, just the one variety which would best suit his own aims and his own personal likings as well. He may be nervous, and thus inclined to abhor nervous fowls ; he may be just snappy enough to abhor a slow and apparently stupid variety, etc. How can one select from such a large number, with any degree of certainty of getting just what he wants ?

Fortunately, the grouping of breeds into Classes is a great help just here. And I regard the Class to which a bird belongs as the one important thing for a Beginner to study first. Under each Class, he will find placed the birds which are nearest alike in certain general characteristics. If those characteristics appeal to him, he needs to study more definitely only the breeds under this class, and the varieties under these breed names which appeal most to him.

Before he goes very far, he will wonder how breeds come into existence, and who makes breed laws. For, each breed must have its law, or it would soon be changed beyond recognition, by the many breeders into whose hands it passes, each of whom may like to mold it a bit to his better liking.

The making of a breed or variety is, at the initial stages, a matter of individual work ; or, sometimes, of accident. Sometimes, two or more people agree to work together to perfect a certain type of bird. After a time, they begin to tell the public about it, and when they have bred it to a uniformity sufficient to comply with the rules of admission to the Standard of Perfection, — that sum of all poultry law, — the originator, or originators, apply to have it “admitted.” Sometimes there is

an intermediate step. Various breeders may get together, form a Club for the new candidate, formulate a Standard for it which seems to them best fitted for the ideal development of the new variety, or breed, and offer both the bird and its Standard for acceptance. If accepted, this Standard is incorporated in the Standard of Perfection, with the other recognized laws of the many breeds and varieties. This is done as soon as is feasible after the formal admission. It may be when a new edition is needed ; it may be when the Revision year comes around again. Should it chance to be formally accepted only a year or two after a formal revision, it might be in the Standard, with description, for some time before a special, ideal illustration appeared. I think this was the case with the Columbian Wyandotte, when it first entered the Standard of Perfection after having complied with all the rules for admission.

The Standard of Perfection separates the many varieties of fowls which it describes into ten distinctive Classes, before it reaches the "Miscellaneous" breeds ; of these, there are three, grouped together. Then, there are three additional Classes for turkeys, ducks, and geese.

The important Classes among those allotted to the domestic hen have been, for many years, the American, the Mediterranean, and the Asiatic Classes. But, with the phenomenal rise of the Orpington fowl, in its many varieties, comparative popularity has changed somewhat, and it is probably true that the English Class, at the present time, stands next after the American and Mediterranean Classes. This class includes the very old Dorkings, the Red Caps, which have made little head-

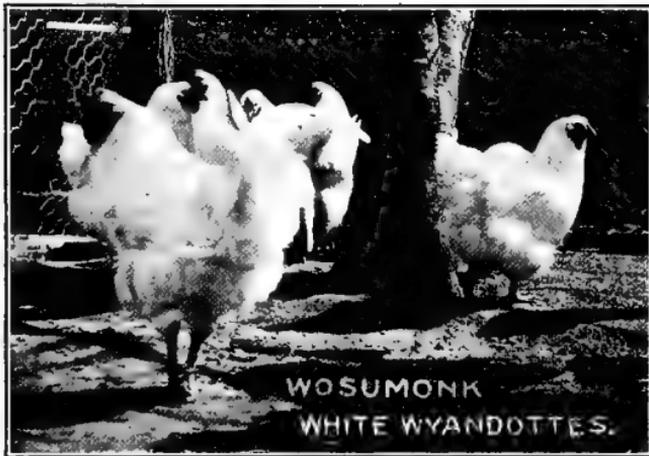
way in this country, and the Orpingtons, which, in the 1905 edition of the American Standard of Perfection, were represented by only one variety, the Buff Orpingtons, but which in 1911 can show three varieties there. There are several other varieties in England, where the breed originated.



Dorking Male from Prize Stock. Representing the English Class

Suppose that you, not even yet a Beginner, it may be, but planning to be one, are reading up on Breeds, Classes, etc.; in fact, on everything connected with domesticated fowls. You will have made up your mind, possibly, whether you want to take up poultry from the utility or the fancy standpoint; because this one thing is likely to be decided largely by your financial status and your business leanings and characteristics. This is, really, the first point for you to decide, as upon it must depend,

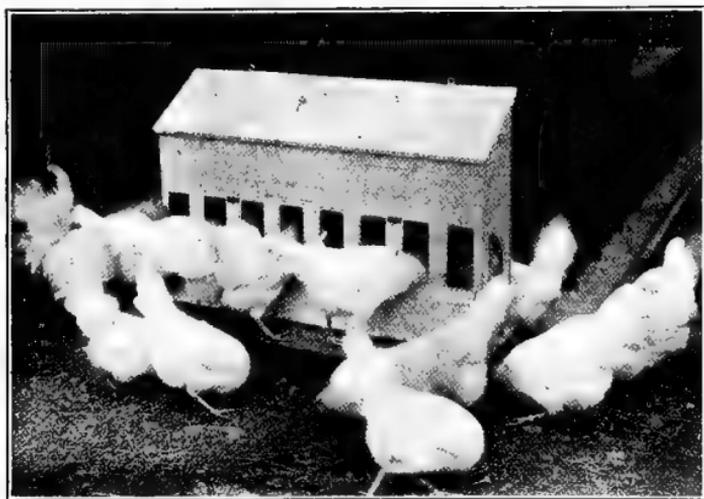
to a great extent, your choice of a breed. At least, if you decide on commercial poultry, first, last, and all the time, you may cut out from consideration most of the breeds, without further parley with yourself or any one else. The commercial line has its own two divisions, which are not wholly sharp, because, even though one go in for eggs especially, the conditions are such that



The Most Typical Representative of American Ideas among General Purpose Fowls. American Class. (Courtesy of Mrs. Benigna G. Kalb, Texas)

he must produce more or less poultry meat for sale. If you are planning on a large scale, the matter of two or three cents a pound will be of moment to you, and you will be careful not to select a breed which has black pinfeathers. The Houdan, the Langshan, and the Black Minorca will each present its appeal to you, it may be, but you will not listen, because, although each of these has its "talking points," it has not become an outstanding breed in this country. And, when this is true of a long-tried variety, this one fact alone is sufficient to warn

the Beginner to let it alone. The commercial growers of poultry meat in America have, in the great majority, found the American breeds to meet their needs, and this is especially true if they desire to combine meat and egg production. In any case, it is safe for you not to let your first questionings cover any beyond the American



Cornell Feed Hopper in Active Use. White Leghorns, representing the Mediterranean Class

varieties, the Orpingtons and the Mediterraneans. The first two are sufficiently good general-purpose groups, in nearly all their varieties, for any poultryman who chances to like them; the last is in some quarters accredited to be the champion egg producer of the world, among domesticated hens. All the Mediterranean breeds are very superior layers. There are five breeds, in thirteen varieties, under this class. Two of the Minorca varieties, and one of the Leghorn varieties are black; which fact shuts them out of the consideration of the

large producer. The Minorcas have large size and lay a handsome large white egg ; but they make little headway, so far, against the Leghorns. The Leghorns, White, Brown, and Buff, have a host of admirers, the White being most popular. All are prolific, hardy, non-sitting in instinct. The Standard of Perfection says that they are identical except in the distinctive colors. But, if you would like to hear some comment on this point, talk Leghorns with from ten to fifty Leghorn breeders. I feel rather sure that you will find none among them who will agree that the seven Leghorn varieties are thus identical, with the single exception of color. Very similar, in many points, all will admit them to be. But identical? In theory, perhaps. But, not even the White Leghorn flocks of various poultrymen who have them in purity are in fact *identical* in characteristics with one another.

Among the Rose-Comb Brown Leghorns, for instance, there is a wide variation in type, among different flocks. I do not think it is very generally known that there are two types. These are really very distinct, when we consider that they are supposedly bred to the same Standard of Perfection. Until recently, it was a standing puzzle to me that the authorities should so often say that the Rose-Comb Brown Leghorn laid a smaller egg than the White Leghorn. Some years ago, too, I sold, through a poultry supply house, a sitting of eggs from this breed. They were refused, on the ground that they were not from pure stock, the proof adduced being that the eggs were not chalky white. On one other occasion, I received a card, saying : "Eggs received in good shape. Would like to have you explain how the eggs come to be

not pure white. I have raised Leghorns a number of years, and have always had pure white eggs." Upon this, I wrote to one or two poultrymen whom I knew to



Dark Cornish Fowls. In Oriental Class. (Storrs Experiment Station)

have had other Rose-Comb Brown Leghorn eggs besides my own, inquiring as to the color of these others. One of the other lots was sold by the man who, at that time, was winning all the first prizes in the largest show in the country. The replies stated that all the eggs seemed

much alike to their writers, and I dismissed the complaints as perhaps whims of the complainants in question.

But, withal, I could not see why such a small egg was frequently attributed to this variety; as, in my hands, its eggs were of larger average size than those from the best White Leghorn breeders, three of whom were represented in my stock. In the spring of 1910, however, I bought some eggs for hatching from a leading winner at the New York show for a number of years in succession. These eggs were very white, but nearly every one was ridged or abnormally shaped in some way, and they were scarcely more than two thirds the size of the eggs which my own Brown Leghorns had always produced. Then I began to understand why I received testimonials, now and then, saying the eggs were larger than the writers had expected to see. The fowls themselves differ almost as much. In the case of the producers of the chalky eggs, double mating had been practiced, and all the red color bred out of the birds, eggs, feathers, and all. In the other type, single mating was the rule, and the red showed in the handsomely colored males, the lovely seal brown of the females, and the cream-white rather than chalk-white of the eggs. All this does not explain why the chalk-white eggs are so much smaller; but the fact remains that, as produced by pullets, not one of them from our hands goes to a customer for table eggs, as we feel it an imposition on the buyer to offer them even to this kind of customer. I think this type must be largely responsible for the well-known lack of size in "grocery eggs."

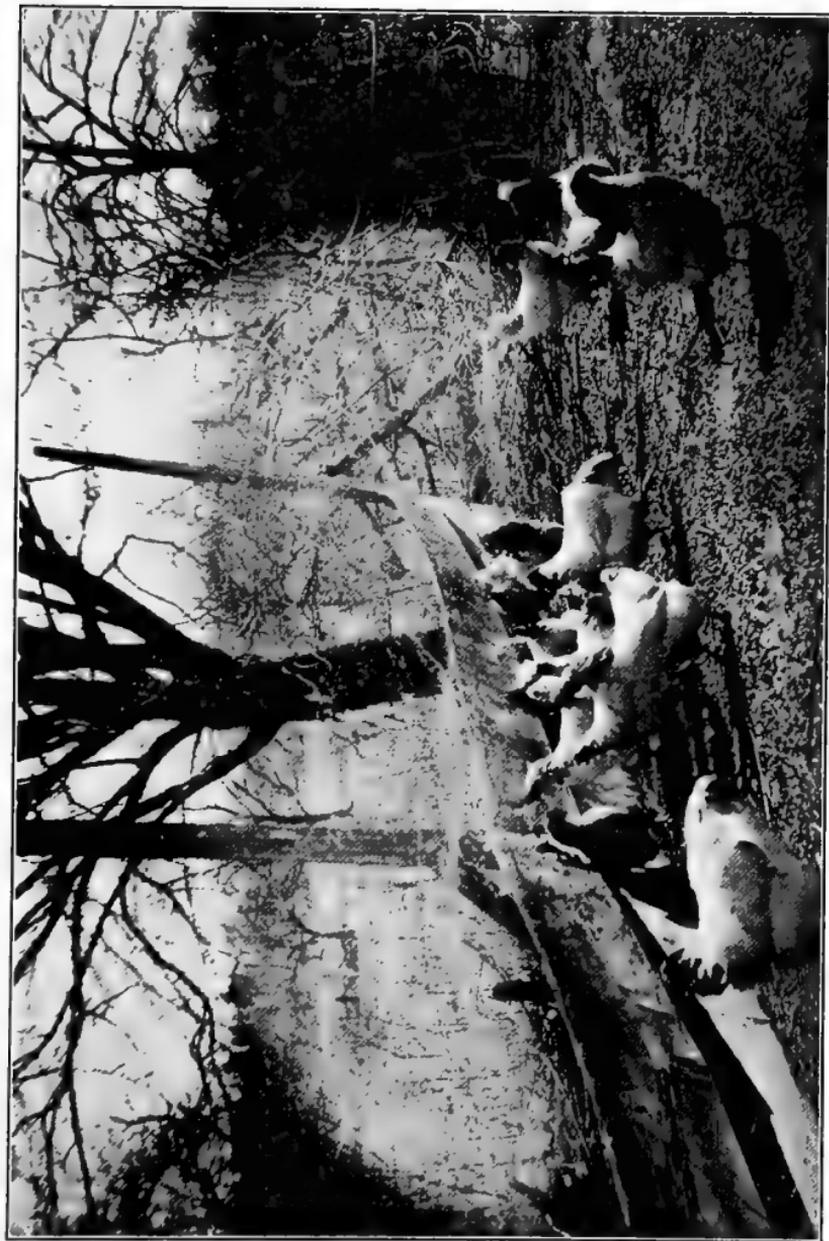
In the matter of prize winning in public competition, the Rose-Comb Brown Leghorn holds the breed prize

for most profit above cost of feed and greatest average number of eggs for all in competition; most of the best prizes other than this, for some years in succession, have gone to the White Leghorns. Successive contests have reaffirmed results to such an extent that the manager of the birds in competition has reported his conviction that the best layers are within the Leghorn, Orpington, and Wyandotte breeds. These results are reported from the other side of the globe. A report said to be from a government poultry expert credits a White Leghorn pullet with 152 eggs in six months, and a Silver Wyandotte hen with 193 eggs in her second-year test. This report comes from New Zealand, where women have the suffrage. Whether this makes any difference in the poultry reports, tradition as yet sayeth not, but it is generally conceded that hens lay better in this part of the world than they do in America.

It may be worth your while to fix firmly in mind one dictum of the American Standard of Perfection, to the effect that the most useful specimens of the Leghorn breed are those which approach nearest in size and also in shape to the requirements of the Standard. If this be true, it disposes at once of your idea that because you are to breed only for utility purposes, you will not need the Standard. I hope, however, that the day is not far distant when separate Breed Standards may be available, at least for all the more important breeds. Such compendiums could be sold cheaply, and would meet a brisk demand.

In choosing a fancy breed, remember these vital points:—

(a) A new breed gives more culls than an old one.



Columbian Wyandottes at Home. American Class. Among the Best Layers

(b) A parti-colored breed is more difficult to breed to perfection than one of solid color.

(c) A buff breed is more difficult to breed than it appears to be, mixture of breeding color leading to mottling of shades; and fading of older plumage giving a similar appearance when any new feathers are present.



Buff Birds often Show Mottled Shades

(d) A white breed is difficult to breed chalk-white.

(e) A red breed gives difficulties somewhat similar to those connected with buff birds.

(f) A black breed tends toward purple sheen instead of the commonly desired greenish sheen.

(g) The white, the red, and the buff breeds are usually higher in popularity than black or parti-colored breeds.

These points may be vital to the Beginner who wishes to become a fancier. Too often he learns then by making wrong choices, which he must correct later.

IV

HATCHING AND BROODING WITH THE MOTHER HEN

The Right Kind of Eggs — Deterioration in Eggs — The Fierce Sitting Hen — The Novice Learning — “Made to Sell to Amateurs” — You and the Hen — Handling the Sitters — Good Quarters for Sitters — Nests for Sitters — Warding off Difficulties — Moving the Broody Hen — Testing — Brooding

WHEN one loves fowls, it is most fascinating work to keep company with them through the various phases of their life history, as it develops. Most people approach it backwards, making acquaintance with the matured bird first, the infant and developing progeny later. Every year, every month, — almost every day, — there is something to learn. Even after one has been a poultryman almost a lifetime, he will still learn new facts, if he be open-minded and open-eyed.

When one is to hatch with hens, it is one of the nice tasks to make sure that the right kind of eggs in the proper number are ready and as fresh as possible, just at the right time. Because one may be uncertain as to just when the hens will be ready to sit, eggs may chance to be kept on hand awaiting their pleasure, during several weeks. During all this time, but especially after the first ten days of holding, these eggs are deteriorating. Experiments by Station workers have shown us the percentage of deterioration found by these workers. This

may vary, and would vary with the temperatures, and perhaps with other variations in handling, but these figures may be taken as fairly showing the average facts when eggs are well kept in favorable temperatures. The Cornell Station found that, after three weeks' holding, the hatch was 12 per cent; after five weeks, 6 per cent. The chart gives other percentages found.

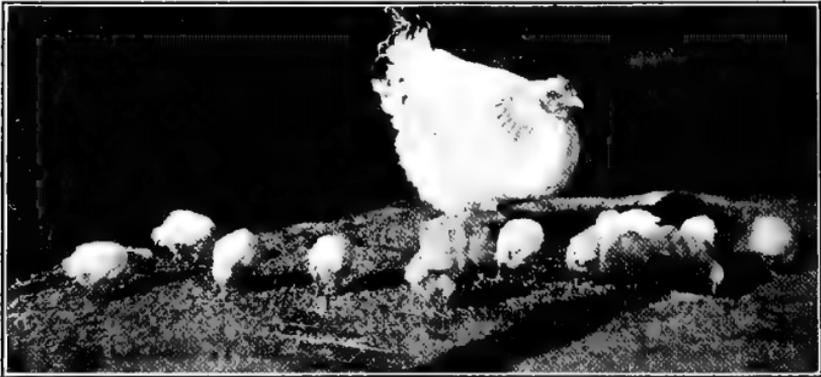
Of all the fearsome lions in the way of the genuine Beginner with poultry, none, I think, is so fierce and forbidding as the sitting hen. Forbidding, in fact, as you feel certain when she warns you, with frequent and shrill threatenings, to keep a safe distance. Fierce, according to breed and individual disposition, as she attacks, with wing and beak, the thief who would touch her precious chicks; actualities, or possibilities only, though they be. The question as to how to handle the sitting hens is possibly the commonest of all. It comes from nearly every Beginner whose previous life has not been brought into touch with poultry except at the table end. And, strangely enough, it is one most frequently neglected by writers. It is difficult, as I have found by trying, for one who has always known about fowls and their handling, to imagine the state of mind of one who knows nothing at all about their ways and needs.

Poultry workers are a unit on one point, at least, viz. that failure will be almost assured if the sitter is left to her duties in the company of the other birds. Good practice universally favors moving the sitter to a quiet, secluded place, comfortably warm during February and March, and comfortably cool during the heated term. Though I have never seen this statement made, my repeated experiences convince me that a good hatch

depends very largely on the comfort of the sitter. If she is ailing, or harbors vermin, or even if her nest is not properly built, she will be so uneasy as to imperil the hatch. Even if she is thin in flesh, she is not so likely to give a good hatch as is the fat hen. Breeds, varieties, and individuals differ in this matter, but the average hen in good condition, with a well-made nest, and no disturbing conditions, has a good chance to bring a good hatch from good eggs. Those varieties which have Asiatic blood, or this blood combined with Mediterranean (a common combination), may be uncertain in their individual tendencies. Some will be good sitters and mothers, some poor; the more purely of Asiatic blood, the more uncertain, clumsy, and generally irritating they may be. Such hens may take "the sitting fever" so hard that they will not eat for the first week; some never eat properly while sitting. This is one chief reason why a sitter should be in good condition when her task begins. Else, she will become but skin and bone in the course of the month which is near the real sitting period; even though hens' eggs need but 21 days' incubation, the days consumed in moving and settling the hen, and the two or possibly three days before it is wise to attempt to remove her with her chicks will nearly make the month.

Practically all the large and the intermediate breeds have more or less of Asiatic blood. Many of those which do not are non-sitters. The White Wyandotte is the best sitter and mother with which I am familiar. These are a little more easily moved than others, although hens of most breeds can be handled almost at will, if one know how.

Webster's Dictionary says that the word "broody," meaning "inclined to brood," is rare. I think his intimates were not poultry people. I use the word "sitter" mostly; but many always speak of "broody hens" and even use the word as a noun, speaking of the hen as a "broody." "Brooding," proper, is warming and sheltering the chicks *after* hatching.



Winter Chicks in Large Open Shed. Columbian Mother. Columbians Have Some Asiatic Blood

There are people who hatch with the incubator and brood with the hen. Others have a different idiosyncrasy, and hatch with hens, to bunch several broods together and brood with the wooden mother. They believe that they do the work with less trouble, or with better ultimate success, than when working in the regulation way. Yet, in doing this, they but add the disadvantages of both methods together; for their hen-hatched brooder chicks will have lice and their incubator-hatched chicks, brooded with the hen, will have been subjected to every handicap that may come from machine hatching, before the hen is given a chance to show what she

can do. For this reason, it seems to me that these methods are to the last degree inconsistent and undesirable.

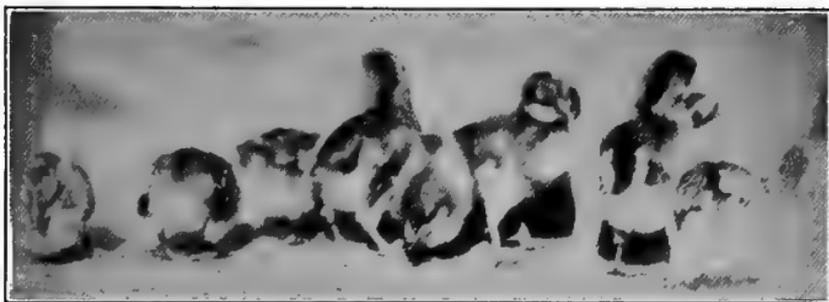
The hen-hatched and hen-mothered chick is at the least free from the handicaps which are almost universally, at the present time, conceded to weight down the incubator chick. The hen starts fairly, and the handler, if the right kind of a student, will really learn more pertaining to his business by hatching with hens, while he is still a novice, than he can possibly learn through the use of the machine. One significant quotation from the manufacturers of one of the modern incubators may illumine the mind of any Beginner. They say: "Fully two thirds of the incubators made each year are *made to sell to amateurs and Beginners.*" It is added that such machines are never seen on the solidly established places, where the workers "know the ropes." But they are sold by the thousands to Beginners, who fail with them and quit the work, or else get decent machines later, when they have gained some expensive experience. It is to save the Beginners from most of this expensive experience that this book is written, by one who has been through the experience school.

If you, reader, grasp, at the outset, this idea that a large proportion of the very cheap incubators are virtual traps to get your money, you will be far more ready to give the hen a little sympathy in the place of vituperation, or at the least to make some allowance for her when you are tempted by poor results to lay all the blame upon her. I cannot too strongly impress it upon you that you and the hen are to do team work, and that if you do your part wisely and well, adding the full

quota of brains to the combination, you can overcome her lacks very largely, and *the team will win out together*. But I wish to say this very plainly: *If your brains will bring you more money and more satisfaction in some other combination, you are committing only folly to cast in your lot with poultry, unless it becomes a matter of health.* I think this is the rock on which many poultry raisers split. If the business becomes large enough to furnish a living income, it will take a man's time, and he must ponder well whether or not this is the best investment of his time and strength, all things considered.

It is in handling the hens which are to perform the service of incubators for you that the knowledge of hen nature on which I have so strongly insisted will early and freely be drawn upon. It is usually essential that the sitters be moved to a special brooding apartment, and one who does not understand a hen can seldom move her successfully, for use as a sitter. The Mediterraneans, being "non-sitters," do not often manifest the sitting instinct, and it is common belief that when they do, they are fickle and unreliable. However, if handled by one who knows how, most of them prove as reliable as those of the heavier breeds. And, when not too fussy, they make the best of mothers for the baby chicks. One who reasons on the subject will easily see in advance that a nervous, flighty breed like most of those in the Mediterranean Class, could not be expected to make as good sitters and mothers under all circumstances, as would the hens of quieter nature. Especially is this true under the close surveillance of modern methods. In some circumstances, — for in-

stance, when a hen was raising her brood alone, out in the fields, — a bird of the Leghorn or Game type, which would fight fiercely for its young, might prove better than a bird of the more sluggish breeds. And there are some kinds of eggs, notably those of pheasants, for which a light-weight sitter is usually considered very superior. The Bantam breeds are sometimes thus used.



Rose-Comb Brown Leghorn Chicks. A Nervous but Sprightly Breed

The “apartment house” for the sitters does not need to be made to order, if it have natural advantages. Early in the season, it needs to be, though warm, well ventilated. Later, it needs to be cool, and even better ventilated. The loft of a barn, or an airy cellar, may furnish good conditions early in the season. Later, they may become, the latter too close and the former too hot, even to the extent of ruining the hatches. I often use the second floor of the barn for early hatches, although it is not very convenient; the main floor or the barn cellar does very well for the later ones. If no such good, secluded place is ready to hand, one may then, with a clear conscience, spend a little money to prepare a special room for the sitters. Such a room, at its best, is so placed that it will be sheltered from the heaviest

winds, yet in a sufficiently airy location. It is in shed form, at least as far as being open on one side is concerned, and it is placed in at least partial shade. Indeed, if small, it may be movable, so that it may have more shade as the season advances. To my mind, it will be decidedly better without a board floor, provided that you raise the dirt floor sufficiently; storms must not flood it with surface water. Dirt floors are usually filled in to the top of the sills, when there are sills.

The nests may be made in a series, half-a-dozen or less being united. These are less trouble to move about than the detached nests. An invalid might find the detached nests better, because lighter to handle. It is decidedly better to have the nests open at the front, rather than at the top, as the hens often break eggs in stepping down into the latter kind. To make a series, seven-eighths by twelve-inch material may be used for ends and partitions, half-inch stuff for the tops and backs. Indeed, they may be all in skeleton form but the back, if desired; but in practice we find it better to have the tops solid. A three-inch strip will make the front firm enough, and retain the eggs. This is, of course, nailed across the lower front of the series. One may get almost the same results by using cheap cracker or soap boxes, provided only that they can be had in the right sizes. The size needed will vary with the breed, but the general-purpose hen, weighing about six pounds, will need a nest about seventeen or eighteen inches long, and at least a foot deep. If the nest is shallow from front to rear, the hen will sit sidewise always, but she cannot be so comfortable as in a nest which permits her to assume any desired position. I

think the one worst mistake made by the majority of poultry handlers, even those who are not Beginners, is to make the nests and coops too small. A foot added to the length and width of a small coop may double its capacity and more than double the possibilities of securing a well-raised brood.

In speaking of depth, above, I meant depth from front to rear. The actual depth of the nest, which carries the eggs to be hatched, is really one of the important points, taken in conjunction with its shape. Upon these two points often rests the fate of the expected brood. If you ask me what is the one thing most to be feared in connection with the sitting hen, I shall be compelled to answer, "Broken eggs." It is this that leads to every other evil. It fouls both hen and nest, and this leads to attacks of vermin. It closes the pores of the eggs so that many chicks are almost sure to die in the shell. With many chicks dead in the shell, and the rest swarming with lice, what chance have you left for success?

There are three things which you can do to ward off these evils; these three things are worth more than all the after work of every kind that you can possibly give. You can make the nest of such shape in the bottom that the eggs will neither lie upon their fellows, nor roll away from them and out from under the sitter; you can powder the hen carefully with insect powder at the beginning of each week of incubation, holding her head downward, and making sure that the moderate amount of powder used works down to the skin where the lice hide; you can select your eggs very carefully for firm, substantial shells. If you do these three things, feed

and water properly, and give her fertile eggs, you will usually have no need whatever to berate your sitting hen. I should warn you again, however, that the condition of the hen at the beginning of the hatch is a most important point. Some of your hens will not make good hatchers because their temperature is too low, especially early in the season. A hen that is too fat will be clumsy ; but one in high condition, plump and in finest health, will be the one that will usually give you the best hatches, other things being equal.

Your sitters should be kept quiet, and be subject to no interference, either from other birds, or from children or adults who are not their regular attendants. They should leave the nest at least once a day, for feed and water. Most people remove them all at the same time during the morning round, in order to save uncertainties, and see that they all get back properly. This is one of the regular morning chores. It is altogether better to start several sitters at the same time. If eggs are strongly fertile, from a good even lot of hens, you will have a fine bunch of chicks, all of similar age and strength, so that they start fair, at least, if from good stock.

If anything is wrong with the eggs, as shown at testing time, the good eggs can be divided among a part of the hens, and fresh clutches given to the rest, thus saving their time. I would not give one hen more than eleven hens' eggs during February or March, at the north ; but from April 1 onward, it is usually safe to use thirteen, and large hens will cover fifteen nicely. But one should always consider that the hen must move her eggs about in the nest continually. Therefore, the more eggs she has, the greater are the chances of acci-

dent in newly placing them and therefore, also, the need for a little "play" of the eggs; if they lie too closely together, it will be difficult to change them about; if the nest is too large, they will roll too freely. It is wise to let the hen shape the nest well before more than one or two dummy eggs are put in; then the size which conforms to her body will determine how many she can cover well. All outlying empty corners should be filled with the nesting material.

Speaking of the dummy eggs reminds me that I have omitted to describe the best way to move the broody hen from the laying house to the sitting apartment. The first, and perhaps the chief point, is to let her grow to be a determined sitter before you attempt to move her. Not even the most experienced handlers can move, with uniform success, hens that are newly broody. Let them remain on the laying nest about two or three days, or till the sitting fever is fully established; then, having prepared the nest, remove the hen carefully and quietly, just at dusk, to the new location. Give her some dummy eggs, and, if the nest be a detached box, face it toward the wall, leaving only sufficient space to give the bird air. About twenty-three hours later, rotate the box, offer feed and water, and let her come off of her own initiative, if she will do so. If not, take her off. She will then, probably, *first* become aware that everything has changed; she is in a strange place! She will probably cackle, in great consternation, and may attempt to fly out. Do not interfere with her in the least. As dark comes on, she is rather likely to look about, see the eggs, and scramble on to the nest. If not, replace her, and face the box again toward the wall. Repeat

the process on the next afternoon, just before dusk, and each day thereafter until she goes back of her own accord. Then leave the box facing outward, and after one more day she may safely have the real eggs which she is to incubate. If you give her the good eggs when first moved, it is *your* risk.

If the nests are in a series, the procedure is the same, except that the box cannot readily be faced toward the wall. In such cases we throw a loosely woven phosphate or feed bag over the front of the nest. Should the hen prove obstinate, it may become necessary to use a board to shut her in; or, the series can be made with a wire netting front, which opens as a door, all in one piece. This is probably the best plan, for one then knows just where his sitters are, all the time. If the nests are of separate boxes, with board floors, I usually throw in two spadefuls of fine moist earth before adding the generous armful of soft hay, which makes the best nest. I often use excelsior, but this makes a very poor nest unless one is careful to pull and fluff it till there is not a knot or lump left. Any bunch in the bottom of the nest makes much trouble. The rim of the nest is very important. The hen likes it high, so that she may snuggle deep into it. This is good, if one does not make it so high that she tends to break eggs when returning to the nest after absence.

Again I say, study the hens. Knowledge of their habits and likings will help you out of nearly every difficulty. Lack of it will keep you always an unskillful poultryman. Individuals will be exceptions that prove the rule; but as a flock, the birds will have the same general tendencies.

There are several so-called "natural" systems of handling sitters, the gist of them being that the hens are confined, together, in a system of nests built as a series, yet each having its own little run, so that no hen may be interfered with, and none can get on the wrong nest, — an unfortunate habit with some hens which is responsible for a good percentage of lost "sittings" of eggs. As the process of incubation must be practically continuous, and at a sustained and even temperature, the sitting hen must leave the nest but briefly. Generally speaking, the eggs should not become so cold that they feel cold to the touch. From the second to the twelfth of the twenty-one days required, however, the danger of a fatal outcome from too long cooling is considerably greater than it is after the chick is well formed in the egg, and generating animal heat. Near the end of the period, I have known eggs to be left overnight by the hen, and still hatch well. One does not care to assume the risk voluntarily, however.

One's "Jack-at-a-pinch" system may consist only of the needed nests placed near enough together to be handily cared for, in any vacant room; or in a rough shed under a spreading tree when it becomes warm. The crucial point is that the hens shall be under such control or surveillance that they shall not be able to "mix those children up" to the extent of leaving any without warmth, or to give a surplusage of two or more mothers to one clutch of eggs while others chill. Neither must they fight for place.

Plain, nutritious feed and water and a bath are all the sitter needs daily, except to see that she "stays put." Whole corn and grass or clover are by far the best

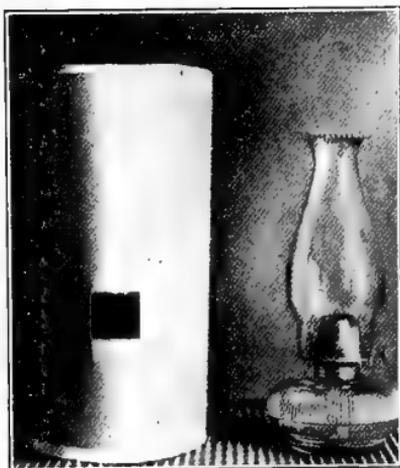
feeds for the sitting hen. With these and careful attention, she will be in better condition at the end of incubation than when beginning. A dust bath will be her great delight and help, throughout. If eggs are not strongly fertile, time can be saved by setting three hens at once, and giving the fertile eggs to two, resetting the third after the first test. I prefer always to set two to four hens at once, if conditions permit this. The question of resetting after a full period is one which often bothers the Beginner. In a poultry paper, I recently saw the proud announcement that the author of it (presumably a Beginner) has kept one hen sitting from March to September. So far from being a matter of congratulation does this seem to me that I feel like rebuking sharply any one who thus practices cruelty to the helpless in his power. A fat hen may, on occasion, sit twice; this will mean not less than seven successive weeks, and probably more. But I think this should be the extreme limit; it is really too long.

With goose eggs, especial care is needed to make a comfortable nest. It should be fashioned deeper than for hens' eggs, as the eggs are often about three inches in diameter. The nest should be deep enough so that the hen may rest, in part, at least, on the rim of nesting material. Three eggs is an uncomfortable number of goose eggs, as they do not lie well together; five is a good number on which the hen may sit in fair comfort, and which she can cover properly in a well-made nest.

Testing is such a simple, desirable, and informing act that I feel that no one should omit it. Through its information, one may, at least in part, count the chickens

before they are hatched. This is one of the ways in which we discount the knowledge of our fathers. People say that the Egyptians of thousands of years ago did count their chickens in advance, at least to the extent of offering from the public hatcheries three chickens for every four eggs brought them. But this was banking on the skill of the breeders and of the superintendents of the hatching process. I wonder if the "clever Yankee" has, even yet, reached the point of equaling the bare-legged Egyptian in skill and cleverness!

If you have a reflecting lantern, the easiest tester is a large tube or cylinder of pasteboard, set on end, forming a well into which a lantern is dropped. Or, it may be set over a lamp with a large wick. Just opposite the flame, a hole is cut in the pasteboard. — I have used heavy building paper. — Over this is gummed a bit of black felt or other material impervious to light, itself having a central hole scarcely an inch and one half in diameter. Working in a darkened room, one holds the egg up



The Easiest Simple Egg Tester. Set the Cylinder over the Lamp

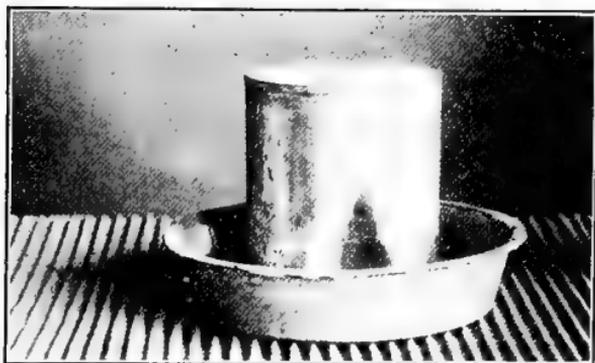
to the hole; the light, shining through the translucent egg, showing what has taken place inside the shell. With a white-shelled egg, one may test at the end of the fifth day, and plainly see the lively, spidery body

within which means a developing chick. This small body lies on one side (but is mobile within the egg to some extent) and toward the large end of the egg. Around it, and tending to lie lengthwise of the egg, is an indistinct nebula, a bit reddish or darkened ; but much of the egg is at this time still clear. The infertile egg, or the one which has died very early, may show only a central, floating globe a bit darker than the body of the egg.

As the chick develops, the darker portion spreads and intensifies, day by day, till, when the hatch is about two thirds through, the shell is nearly filled with the body of the chick, which makes it opaque except for the air space.

Your part of the brooding is very simple. It will consist, first, in seeing that the mother's feathers are entirely free from matting. A bit of soft feed or of white of egg may have caused them to stick together near the tips. One morning you may go out to find your best chick hung by the neck in this natural noose, if you have not made sure that the feathers are free. Then, it is rather safe, even if you have powdered the hen carefully, to rub one or two drops of liquid oil like sweet oil or hens' oil into the down on the head of each chick. If there is any reason for distinguishing these chicks, set the foot of each one squarely on a soft pine board, and punch through the web with a hollow, hand awl punch. This works better than any spring punch I have seen. The chicks do not need any feed till thirty-six hours old, but you can throw in a bit of pulverized egg shell, or some chick grit, at once, if you like. Feed the hen some whole corn, water her, and leave her to care

for them. The two points you need to make sure of are that there are no rats or other vermin to carry them off, and that the coop is placed, if early in the season, in a spot sheltered from wind and open to all the sunshine possible. Later in the season, you will select a place shaded, at least in the heat of the day. Dense and complete shade is at all times to be avoided. Air and sunshine in moderation are the fowls' best friends.



Improved Water Fountain

The water vessel for tiny chicks is to be either a patented "fountain" of chick size, in two parts for careful cleaning, — which may be had in glass, — or an improvised fountain consisting of a tin can reversed in a saucer, having one or two holes near what is now the bottom, which works on the same principle as the more expensive sale fountains; or, you may use a very shallow dish with a flattish stone in the center to keep the chicks out of the water, lest the down get wet when they run through it and jostle each other.

The matter of feeding will be taken up in another chapter, and that of the best kinds of coops will also

be treated in another connection. When the chicks are very small, I like to inclose the coop with a strip of wire netting, making a tiny yard which hinders them from straying away, and keeps out most marauders. Permanent framed netting panels are neater, and always ready.

BEGINNING ARTIFICIAL INCUBATION

“Follow Copy” — Good Eggs the First Requisite — Work that is above Average — “Cold Storage” Eggs for Hatching — Exigencies of Trade — February rather Early — “Fertility” — Eggs at \$150 per Sitting — Temperature Controls Development — Advance Care

WHILE I believe that the Beginner may learn more about that which he is really studying, the fowls themselves, by hatching first with hens, rather than with the machine, I am aware that a fair proportion of people will prefer to begin with the incubator. Perhaps the best general rule I can give them, which will cover everything, is, “Follow copy!” In other words, the most common mistake made is in trying to follow the notions of many writers who think they know more about incubation than the manufacturers of the machines can know. The printed instructions which go with the machine are to be followed, for success. That circumstances alter cases is a truism. The machine which you have bought may require different handling from those which A, B, C, and D wrote about, and only the manufacturers are supposed to know the best way to handle those particular machines.

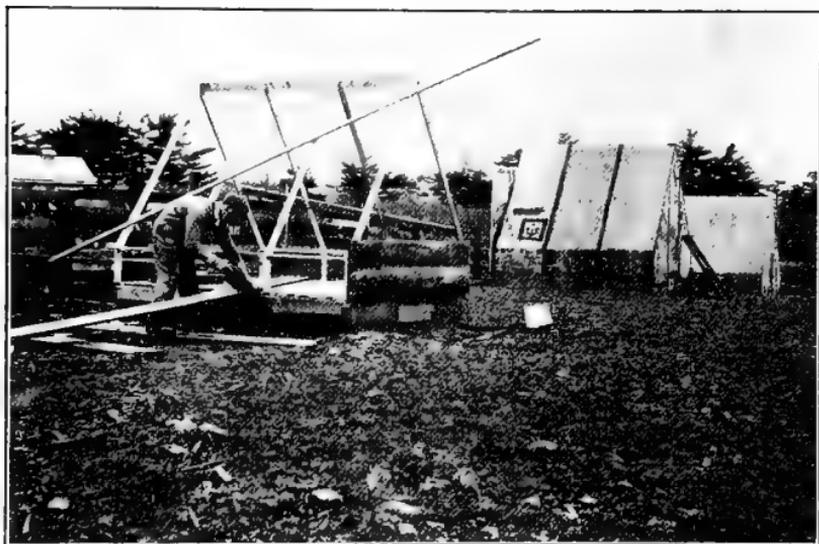
Absolutely the first requisite for artificial incubation is good eggs. Is this not true of all incubation? Certainly; but the egg has a harder gauntlet to run in artificial incubation than it has under natural incubation, and, say what we may about incubator chicks being “just

as good," the fact remains that white diarrhoea most commonly attacks broods of incubator chicks. Moreover, the spirit of the age has no use for the "just as good" article; it wants the best to be had. When any one at all familiar with hatching conditions will declare positively, as Mr. Milo Hastings has done, "It has been thoroughly demonstrated that with good parentage, good incubation, and good brooder conditions, white diarrhoea is unknown," it becomes entirely a question of the man back of the work, *if* we admit that these affirmations are true. Hastings places all diseases of poultry in three divisions: (*a*) those inborn; (*b*) those induced by unfavorable conditions, whether of food or of environment; (*c*) those which are due to noxious bacteria. The last would include all the contagious diseases, those which are endemic, etc.

It has been said that excessive cost of production and excessive losses in raising the stock cover much of the reason for failure, when that comes. It goes without saying that no man sets out, in any business, to be a failure; *he sets out to be the exceptionally successful one*. He may not be aware of this, but it is in "the back of his mind."

If you, then, who read these lines, expect to be a success, *it is necessary that you do work that is above average* in giving your chicks a heritage of health and vigor, and in surrounding them with favorable conditions as to food, sanitation, etc. "Just as good" positively will not do! I think the greatest difficulty the novice poultry raiser meets is in finding some one "reliable" on whom to rely. Down at the bottom, however, it is too often the worker himself who is not sufficiently reliable.

It may be because of lack of time, or it may be because of lack of ability to handle details. In the case of most Beginners, probably, this detail poultry work is added to the "day's work" so that the worker does not have a fair show. This means that he cannot give the poultry a fair show, either.



The Cornell Gasoline Brooder House at New Jersey Station; One in Process of Construction. Saves on Cost of Production

Early in March, one year, a suburban Beginner delightedly announced to me that she had an incubator full of chicks ready to hatch. She wanted me to see them when they came off. She was full of enthusiasm. The actual hatch was twenty-two chicks, as I learned later. A month later I asked about her chicks. Her face fell. "All dead." The cause was white diarrhoea; a related fact, that she was using a second-hand incubator, probably carrying the germs of the disease.

The machine, the egg, and the handler are the three great factors to a successful machine hatch. Inasmuch as the handler furnishes both the eggs and the machine, it looks as though he were the most important of all. The greatest temptation a modern business man has, it may be, is to press the button before he is ready. So, the Beginner with artificial hatching and brooding.

To send for the catalogues of six or eight of the best machines, to study them carefully *with reference to their weakest points*, and to attend some show where they are on exhibition, and where he can question the agent, should be possible to almost any Beginner.

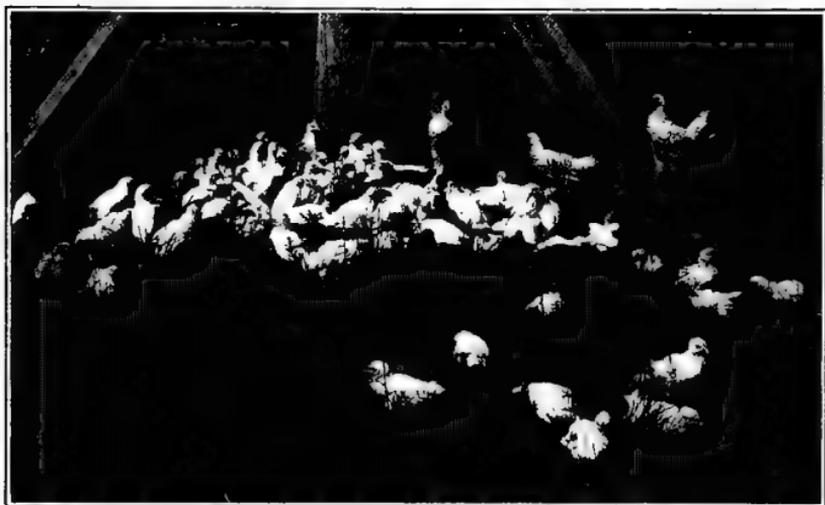
The mistake he makes most frequently, is to buy before he has digested this information; to buy, perhaps, from a silver-tongued agent of number one or number two, before he has heard the silver words of numbers three, six, and as many more as he can capture; or, as can capture him!

A book like this can scarcely recommend any one machine. I will say, only, that, personally, I prefer a well-made, copper-tanked, hot-water machine; but that the hot-air machine is at present more popular. Also, that the trend is more and more toward the sand-tray machines, as events seem to point to the fact that non-moisture has been the cause of many failures in the past.

The manufacturers of the older machines are, in the large, more conservative in statement than the newest claimants of the Beginner's money. Whether a Beginner is wise to trust himself to other Beginners in such a fundamental matter, let the good sense of the buyer decide for him.

One of the Bright Ones has recently said: "The

Cold Storage Egg is all right — as long as it is LEFT THERE!" But, the real Mission of the cold-storage egg is *not* to remain in storage. It was put there with the one idea: to await its coming out; and its bringing-out party is a masquerade, in which it takes the part either of a fresh egg, or a "Just-as-Good-As."



A Part of Cornell's White Leghorn Record. Chicks Artificially Hatched and Brooded, and Graded as "Weak"

If I should have the temerity to ask you, "What about incubating a cold-storage egg?" you would not even consider the subject. You would only laugh scornfully at the folly of such a proposition. Yet, I suspect that there are very few fanciers who do not send out eggs for hatching, and very few poultry raisers of any kind who do not try to incubate at home, eggs which have several of the qualities which go to make cold-storage eggs to you, *unthinkable*, as possible producers of chicks.

I believe that the real reason for the failure of thousands of incubator eggs to produce vigorous chicks, and of other thousands of incubator chicks to come to maturity, is to be sought in the quality of mind of the man or woman who handles the stock and eggs. To this may be added the exigencies of the fancier's trade. These exigencies usually demand that birds be kept in yards. As the trade begins earlier each year, it comes about that a goodly proportion of the eggs for hatching are laid at a season when eggs are produced contrary to nature, by fowls in unnatural conditions, supplied with foods that are not natural to the breeding season.

Some time ago I inspected the brooder houses at one of our State Agricultural Experiment Stations. I had thought I noticed a slight hesitancy, when I had asked to see the brooder stock. While I was looking them over, the poultryman in charge told me confidentially that he kept the brooder houses locked, and showed the chicks as little as possible, because he was ashamed of them. Yet the plant itself was good, the man clever and systematic; and he told me that he had done absolutely everything he knew to be for the welfare of the chicks. Still, even the best of them could scarcely be said to look rugged, and a large proportion were actually drooping, or sick; this was in February.

We may admit that February, at the north, is still rather early for hatching and brooding. Stock is confined, and supplies of eggs are not wholly regular, so that some will be kept in storage (if not "cold-storage") several weeks, it may be, before being incubated. And, even if the eggs were all right when gathered, they may be far from all right—for anything but "just-as-goods"

*Time to keep eggs for hatching

ALL EGGS KEPT ON END IN EGG CASES UNWASHED CLEAN TURNED DAILY IN LIVING ROOM

AVERAGE TEMPERATURE 65 DEGREES

NO. OF EGGS	50	50	50	50	50	50
NO. OF DAYS KEPT	35	28	21	14	7	1
PERCENT FERTILE	8	19	52	78	80	86
NO. OF DEAD GERMS	1	4	8	8	6	0
NO. PIPPED	0	0	4	5	3	3
NO. OF CHICKS	3	0	6	16	17	37
PERCENT HATCH OF TOTAL EGGS	6	0	12	32	36	74

Report Chart of Hatching Test, Cornell Experiment Station

and baking purposes — by the time they are shipped to the customer, or insultingly offered to a self-respecting hen at home. Then, there is another view of the matter which I think is often overlooked: this is, that a pretty good proportion of the eggs gathered in January and February will have been chilled before they were stored at all. Much is said about the low fertility of eggs, from January to March. In my opinion, this supposed “infertility” is more often due to chilling of the eggs than to any other cause. Many use the word “fertility” very loosely. When an authority states, gravely, that eggs from the same lot showed perhaps 75 per cent of fertility in the machine and 85 or 90 per cent under the hen, we know that no strict meaning can be put on the word “fertile” in this connection. But, be this as it may, there are other causes for poor hatches than real infertility. Eggs laid in these three early months are more than likely to be held longer than at any other period of the year. *Thus, age and low temperature, both of which have affected the cold-storage egg at which you may jest when considered as to hatchability, are very likely to be conditions also of the loudly advertised Eggs for Hatching at five to \$150 — they say! — per sitting.* Even though you could be convinced that any eggs are worth that amount of money, if of the best, the pampered hens that lay eggs held at \$150 a sitting cannot be made exempt from Nature’s laws. If subjected to exposure, their eggs chill, even as the five-cent eggs of the grocer type; and, if the stock be kept under conditions such that the eggs cannot chill during the extreme season, the balance of Nature pulls down in another direction,

and the eggs become largely unhatchable through lack of stamina in the breeding stock.

Professor Horace Atwood recently expressed, in a bulletin from the West Virginia Station, a universal rule, as follows: "The temperature at which the eggs are kept is the factor which CONTROLS the *rate* of development of the embryos." He was applying it to the



Incubator Cellar, West Virginia Experiment Station

eggs under incubation, and went on to say: "*If* the temperature at which eggs are kept (in the machine) is slightly too high, the eggs will hatch before the twenty-first day; while temperature which is slightly too low may delay the hatch till the twenty-second or the twenty-third day, or possibly even later." We who have practiced artificial incubation did not need that Professor Atwood should tell us this. We know it since long ago.

But, we often ignore *the related fact* that the growth of the embryo is a process only suspended, between the period of exclusion and that of being put to incubate, and it is a process suspended because, *and only because of the temperature in which it is held*. Subject the embryo, accustomed to a temperature of 104 to 107, — which is the temperature of the hen's blood, — immediately upon exclusion to a temperature of 32, or below, and what right have you to think that it will not be injured, or die outright? Subject it, on the contrary, to a temperature of 100 to 140 degrees in an express car, and what right have you to expect that it will do other than take up the arrested development when the temperature is favorable, or die when it is fatally high?

All the foregoing is simply to lead up convincingly to this: The proper care and handling of chicks demands, IN ADVANCE, all that combination of favorable conditions which will insure the production of a perfect egg, well-shelled: but it demands no less the best of care for that egg while the process of development is suspended; and also that this process shall not be suspended too long. A fertile egg, after it is presented to us, is a living, young animal, existing in what may be termed an abnormal environment. In a temperature of 40 to 50 degrees, or thereabouts (50 preferred), it will remain in excellent condition (if kept dry) for about ten days, and will hatch, up to that time, nearly as well as what we term "strictly fresh." In a damp place, however, it may very soon be attacked by some injurious fungus which finds its way through the shell.

Despite the discouraging ravages of white diarrhoea, in its varied forms, the season of 1911 saw an access

of confidence in artificial hatching, among many who rank as leaders, before unknown. I attribute it chiefly to the poultry world having passed from under the domination of the non-moisture idea. One worker, who said he would scorn to get less than 70 per cent or 80 per cent of the eggs put in, in good, livable chicks, attributed his own success, so uniform, to the use of a first-class hygrometer.

In selecting a machine, the crucial point seems to be to get one well ventilated, with a good case made of seasoned wood, and with proper packing and a good thermostat regulator. The trouble does not usually, in these days, lie with the regulator. I once bought a one-hundred-egg machine for ten dollars. It had double doors (the inner one of glass), the best lamp I have used, the best outside case I have seen on any machine, and a good regulator. In all these it was almost faultless. Yet it would not keep up heat in a room below 60 degrees and it had an egg tray that sagged and billowed enough to make a dangerous variation in temperatures. The brooder that went with it was worthless, even as a "fireless." I could never see why, with so much that was above the average, two slouchy points should have been permitted to spoil the machine.

Once the eager Beginner has become possessed of a machine of good, all-around type, and enough unchilled, well-graded, well-shelled, fertile, uniform eggs, we may bid him good speed toward the goal, reiterating once more the warning: "Follow the directions of the man who has used the machine the most times, under every imaginable condition; namely, the maker."

Concerning the comparative quality of the eggs from hens and pullets, as sources of vigorous chicks, the results of eight experiments at the West Virginia Station tabulate as follows:

	OLD HENS	PULLETS
Total number of eggs incubated less those cracked in turning	1094	871
Average weight of eggs per hundred . .	12.96 lb.	11.19 lb.
Total number of chicks	840	591
Per cent hatched of eggs incubated . .	76.7	67.8
Average weight of chicks per hundred when removed from incubator . . .	8.28 lb.	7.12 lb.
Average weight of chicks at second weighing, per hundred	29.56 lb.	23.07 lb.
Total number of recorded deaths . . .	42	85
Per cent of chicks which died	5	14.5

In every item the hens have a decided advantage.

VI

HANDLING AND FEEDING THE YOUNG FROM MACHINES

Brooding Equipment—Vital Points in Brooding—The Best Brooder—Disinfected Common Sense—From Incubator to Brooder—A Fair Chance for Life—Saving Chicks, Saving Work, Saving Money—Keep the Chicks Outside—A Warm Back—A Fireless Brooder—Shipping Baby Chicks—Good Feeds

SPECIFICALLY, this chapter deals with handling chicks, although much that is general will apply also to all young domestic birds. For years, it has been an opinion very generally expressed among poultry writers that good brooding was a much more difficult matter than good incubating. One of the keenest men I know of, closely and largely connected with poultry work, says he knows of no phase of poultry keeping that requires more thought than the proper selection of brooding equipment for the young. This equipment is always high-priced in the best grades. But, because the builders of brooders are more likely to know the principles underlying the matter than are those who have bestowed less thought on it, it is vital to the Beginner to secure the best brooder to be had, unless he should decide to use a "fireless." The one reason why he can do this is that the "fireless" does not have to deal at all with the principles of artificial heating and of ventilating such heated space. Beyond this, the question of using the fireless brooders is simply

a matter of substituting close personal care for the automatic work of the higher priced heated brooders. One who handles a fireless brooder must expect to give time instead of money in order to have his chicks "properly brooded."

"When does one cease to be a Beginner?" inquires one whom poultry people generally call an expert. "For myself," he says, "I can say that I am still very much in the Beginners' class." Had he said, "the learners' class," we could all agree; for he who ceases to learn has ceased to be a reliable worker, or a reliable teacher.

The best article I ever saw on brooding chicks discussed "four vital points in brooding." These four points were exercise, feed, space, and uniformity in age and size of chicks brooded together, in the order here given. You may notice that *all these are points depending on the operator*; hence it must be taken for granted that they are based on the use of the best brooder attainable.

Two of the stock questions which editors receive but never answer, are, "Which is the best incubator?"; "Which is the best brooder?" I shall not try to give the name of the best brooder, but that brooder is the best which affords the least chance for the Beginner to go wrong. This means, one in which the heat cannot go fatally high or drop to a fatally low point; one in which the chicks are free to select for themselves from several temperatures, at any given time. It must be one which has good circulation of fresh air, and no corners where chicks may tend to crowd and smother. Because the round hover meets most of this demand,

it is the favorite type. To my mind, a hover should always permit ventilation above the chicks; hence, I would have it made of a porous material, instead of wood. A thickness of felt, or two of burlap, could be used, fastened upon a wooden rim. I would not use a hover at all, were it not for the fact that the chicks may huddle in a corner of the brooder, if there be no hover.

The first point in handling the chicks is to leave them in the hatching machine till they are strong. More chicks are lost for lack of this precaution than from any other one cause, in my belief. Nearly every incubator operator is in such a hustle to lose no time getting his machine "set" again, that he hurries the chicks out of it before they can all stand, and before they have sense enough to do anything but huddle toward warmth. On the way, he exposes them to cold, and possibly does not get the brooder just running right, and soon he has a beautiful bunch of crowding, soiled, hollow-eyed chicks, and two weeks later, he wont have any, and will be so discouraged that he will be glad of it! He will suspect the feed, the eggs, the brooder, anything except the real cause, and will possibly write to some Station which will tell him he should have disinfected his eggs and his incubator. Too many people need to disinfect their common sense, so that it may grow strong and robust enough to inform them that a chick just out of the close, warm egg is in no state to grapple with the universe the first day! His mother's feathers, or the close, warm spaces of the incubator are a big enough world for him to learn to use at first. When he can safely take more air, open the machine ventilators wide; then, when he has had a few

hours of this, open the door a crack, but keep your heat well up; after a few hours, make the crack wider, still keeping the heat at not less than 95 *down where the chicks are*. Most machines will show about five degrees difference between the bottom and the trays, when the door is closed. At all events, keep heat enough so that the chicks will spread about happily, and always follow this rule as long as you handle them. When they begin to pant for air, that robust common sense of yours will tell you that they need less heat and more air. Do not neglect its counsel, no matter what the thermometer, the Experiment Stations, and all the poultry papers and books combined tell you! The chick is the only one that knows, and he is telling you the facts you can bank on.

When the chicks are hardened a bit, as above, and can all stand, remove them, under cover, to the brooder, which you have started 24 hours before, and which registers 95 before the chicks are placed in it. If some are still weak, remove the strong, but leave the weak in the incubator till they are ready. One grower of chicks estimates that sorting the chicks so that none of any special lot are stronger than the rest will make a difference of from 10 to 20 per cent in numbers raised. This is a low estimate. Let the variation be great and the room limited, or any other condition not wholly favorable, and 50 per cent may not cover this loss. "Nothing is more bewildering and exhausting to the little chick than struggling constantly for life in the midst of an immense crowd of his own kind," says the writer noted. He puts it strongly; as the conditions demand.

Will you give this bit of downy life a fair chance for his life by furnishing him with air, warmth, room, so



Ostriches Five Days Old. Ostriches have Become "Poultry" in America. "A Well-ventilated Brooder Kept at 90° F. is the Proper Thing." (*Vide* Agricultural Yearbook, 1905)

that he may have an even start? Not till this is done, may you go on to that which comes next. The "next" will consist of food, in variety, water, and a chance to exercise; simple enough to provide, surely. If you want to save *work*, you can get chick scratch feeds and patent cracker feeds of the supply houses; if you prefer to save *money*, you can hustle around till you find stale bread—*not* moldy—at a bakery or restaurant possibly, then you can buy a little bran and middlings, corn meal if you wish, pin-head oats (steel cut, some call it) and cracked corn, and, if you provide clean, short litter for him to scratch in, the chick will grow thankfully. In cold weather, use effort to make sure he cannot get too cold; in hot weather, make sure he cannot get too warm. A brooder house open to the south and having much glass is a trap to the Beginner. Even an open shed, permitting the sun to shine fiercely on a brooder with glass in the top, may bring ruin on the entire brood, when the weather passes suddenly from cold to hot at mid-spring. A Beginner is almost sure to turn out his lamps, when he finds the brooders getting much too warm. This will prove fatal when night comes on too cool, and the brooder has to be heated slowly while the chicks shiver. Better *open it up wide*, turn the lamp low, but keep the brooder itself warm, so that it needs only closing to be soon ready to warm the chicks, when they need it.

The real point is to have the chicks in the brooder just as little as possible. For a day, perhaps, confine them to the inner room; for one or two more, according to season, confine them to the outer, cooler room, encouraging them to exercise, by giving fine grains in an

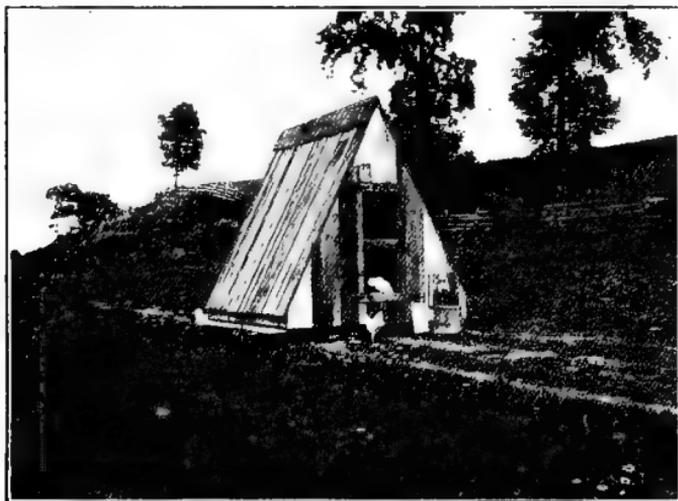
inch of chaff or clover. Then, as soon as you dare, get them on the ground, but see that they are sheltered from cold wind. In summer, always provide some shelter from the sun, no matter what the age of the chicks. A fiercely hot day may take off some of your four-months-old specimens, if they have no shade. A rule to cover all conditions might be "Reverse the conditions, for hot and cold weather." In cold weather, make sure that the heat cannot get too low; in hot weather, watch the other extreme, and make sure that it cannot get too high. I never like to close the sliding glass window of the brooder entirely, unless it is where strong wind affects it. And I don't like the top windows of glass. They are seldom safe. We must have light in the brooders; but it should come from side windows; else, we would better raise the cover more or less, and use a screen to keep the chicks within, when necessary. Top glass radiates away too much warmth when it is cool, and bakes the chicks during hot sunshine.

Any one may read, in these days, about "Old Trusty" Johnson, an incubator manufacturer. His one principle of brooding, judging by the way he harps upon it, is that about all a chick needs to bring him up successfully is to have his back kept warm! Mr. Johnson never gave any explanation of the reasons — so far as I know. But Professor Atwood, of the West Virginia Experiment Station, referring to the fact that a chick, when cold, runs to the hen and shoves its back against her warm body, adds: "There is a good and sufficient reason why the chick warms itself this way, rather than by jumping on the hen's back and sticking its feet down among the feathers. The reason is this: A chick's lungs are very poorly

protected, anatomically. Surrounding the spinal column and projecting in between the ribs, the lungs of a small chick are covered only by a bone so thin as to be partially transparent, and by the skin with its accompanying down. When a chick becomes cold, its lungs are apt to be the first organs affected, and, unless they are soon warmed, a cold may be contracted and the lungs may become inflamed or congested. In many cases, the congestion may become so acute that the tissue is broken down, with the formation of small nodules of a cheesy consistency. Thousands of brooder chicks die annually from this cause." His conclusion is that top heat, with little or no bottom heat, contact top heat, if possible (or, as next best, radiated heat from above), is a necessity to the best brooder system. The Prairie State Universal hover and the Cornell Gasoline brooder are named by Professor Atwood as the ones he has used which best meet these requirements.

The fireless brooder can be used by any one, probably with greater safety than any other brooding device, *provided* it is used in a room of moderate temperature at night, and in sheltered, sunny positions during the day, if in very early spring. Any kind of a grocery box may be the foundation. The larger the floor space, the better; but if this space is large, it is better to partition off a room at one end for the sleeping apartment; while the chicks are still very small. After two weeks, or as soon as the chicks begin to prefer coolness to heat, the partition may be removed. The best cover I know consists of two sheets of soft cheesecloth, cut some inches larger than the top of the sleeping room. At its best, it may be padded with feathers; or, with cotton,

an inch or two thick. If padded not quite to the edges of the sleeping box, it may be dropped to any position above the chicks, — of course very close while they are tender. Thus, it allows a bit of ventilation along its edges. On an extra cold night, another cushion may be used. If this is a bit larger than the first, it may be



The Cornell Gasoline Brooder as used among West Virginia Daisies

adjusted to cut off as much ventilation as is safe. The one rule as to this is that the chicks can stand rather close air when but a few days old, but become more subject to smothering as they grow older and the weather becomes warmer.

As to brooder space, remember that *the manufacturer's space estimate fits the baby chick*. As it grows, one of two things must happen: to provide sufficient room, the space must be enlarged, or some chicks must die. It is for you to choose; but not for you to whine later

if you have chosen to believe that they "will get along all right" when crowded. *They will not! Don't bank on it.*

Many people wonder how it is that infant chicks can be shipped halfway across the country and arrive in good condition. It is because they are supplied by Nature with nutriment for a short period. It may even be better for them to be thus out of the way of a too kind feeder for the first two or three days. If chicks are kept quiet and warm, with not too much light,—in other words, if they are not stimulated by the conditions provided,—they will not be anxious to eat until they really need food. If stimulated, they will be likely to eat too soon, and will thus upset the work of the digestive apparatus at the beginning.

When they begin to manifest active interest in things about them, it is usually time to offer feed, in small quantity at the first. I notice Dr. N. W. Sanborn says, "My chicks remain on the tray of the machine until thoroughly dry; then the tray is removed, and the chicks stay on the floor of the incubator for a day and a half." His brooder, warmed to 100 degrees, with the floor covered with litter, then receives them and offers them an invitation to scratch a little. A board confines them within four inches of the hover, so that they cannot become chilled by losing their bearings. Water is before them, but they get no food other than the weed seeds and clover leaves and grit found in the litter, until four days old. He says: "The yolk that was absorbed just before hatching supplies plenty of good food until *the fourth day*, when I begin to give cracked wheat. When the chicks are seven days old, a small hopper of

high-grade beef scrap is put before them." Dr. Sanborn's chicks are never again without this beef scrap till they go into the laying house. He feeds nothing but cracked wheat and beef scrap till the fourteenth day, when half the wheat is replaced by cracked corn. He always gives a full feed of cracked grain just before dark, and does not limit the cut grass or clover, lettuce, turnip tops, or whatever may be available as green feed, after the fourteenth day. He says, also, that it reduces the cost of raising the chicks to feed a dry mash of "ground grain and meat," and that it raises nice chicks, though not leading to so much exercise as the cracked grain in litter. After three weeks, the grain and meat are fed in separate hoppers.

The hoppers, the water dish, and the litter may be outside the brooder as soon as the chicks are strong enough, if the conditions are favorable. If the chicks are kept inside, the ventilation is watched very carefully, the heat being kept a little in excess, in order to keep the windows open more. He says, "A brooder that can be shut up tightly is a dangerous one to put into the hands of a beginner." (With this I agree heartily.) He adds that the very best feeds will be wasted if chicks are allowed to get chilled or wet. He speaks of "the chill which is the usual cause of white diarrhoea," and says: "When I visit my brooders, if I find the chicks lying with heads just in sight, outside the felt (fringe) of the hover, I know the heat is all right. I much prefer this test to the best thermometer I can buy." Most of those of experience will agree with him in this. But a thermometer is a good help in knowing the temperature when the chicks are not under the hover.

It is rather common to argue that brooder chicks are far better because they have no lice. Watch out, all the same!

Feeding hen-hatched chicks does not differ essentially from feeding machine chicks; the real measure of quantity is the amount of exercise the chick is getting. If plenty, it can stand heavy feeding; if little, the feeder must be careful. It is rather difficult to feed a hen and chicks together, as one cannot tell how much feed the chicks are getting. Whole corn for the hen and soft feed or granulated feed outside where the hen cannot touch it, is the way out. And hen-hatched chicks, like others, need feed, always available, after they once get safely on their feet.

VII

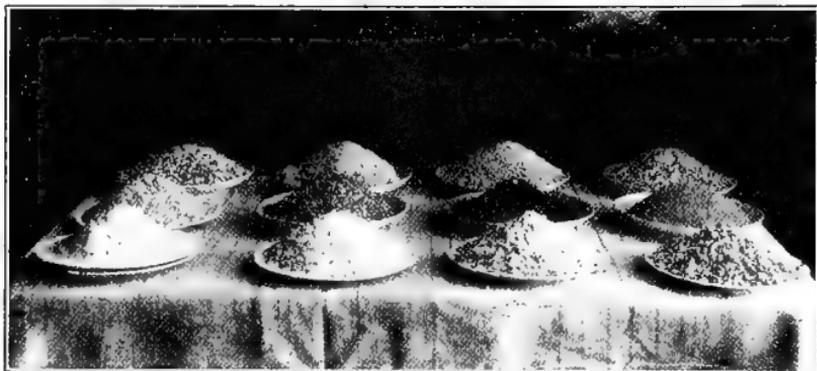
STUDYING FEEDING VALUES

Losses from Feeding Errors — Adapting Feeds — Good Feeds the Basis of Hen Health — Chief Sources of Protein — The Common Grains — Tables of Food Values — Grouping Feeds for Economic and Rapid Food Combinations for Daily Use

THE matter of right feeding presents itself with the first bunch of chicks or the first lot of fowls acquired. It has such an important bearing on the whole question of success or failure that it must needs be studied with earnest care by all who would handle stock of any kind. In the case of poultry, a single loss among common stock counts for nothing as compared with a loss among the larger animals, the latter often being a tragedy to the poor man. But, inasmuch as there are large numbers of individuals in all important flocks, and necessarily housed in groups, it must follow that a feeding error (or any error) will affect the matter of productiveness at a multitude of points, and may determine by itself alone whether or not there shall be any profit whatever.

I am not of those who would make a change in the feed every time the flock fails to begin laying at the exact period when eggs are expected. The frequent expression, "Those hens ought to be laying," may mean, in essence, only that their owner ought to know more about his work, or have more conscience toward it. I would rather make a careful study of the feeding habits of the fowls and of the prominent classes of feeds, and

get from this a plain, everyday "rule to go by" that will serve practically as a general basis for all feeding. Having such a foundation, one will then be fitted to bring common sense to bear in any individual case of failure of the birds to meet expectations.



Good Standard Poultry Feeds. Beginning at Left, Front Row: Middlings, Cracked Corn, Oats, Beet Pulp. Middle Row: Bran, Cut Clover, Granulated Charcoal, Linseed Meal. Back Row: Pigeon Feed, with Many Peas, Corn and Oats Mixed, Commercial Mash, Commercial Scratch Feed

It is fortunate, indeed, for the feeder on a farm that the family within the home and the group families in the farmyard subsist substantially on the same, or related, foods. They are not served in the same ways; yet the very fact that the fowls which are most widely noted for giving a liberal income are those that subsist largely on table scraps goes to prove clearly that the proper ration for our fowls is one not greatly differing from those which we provide for ourselves.

Inasmuch as the chief natural foods for fowls are grains, grasses, and other vegetable products, the question at once arises: What is it, in table scraps, which



Above, Sprouting Oats. Right, Roots Partly Started. Left, Advanced to Best Stage. Middle, Badly Matted, but Still Excellent Feed. Below, Left, Beet Pulp. Right, Choice Restaurant Waste: Rolls, and Other Bakestuffs. Good Feed for Both Hens and Chicks

makes them a better egg producer, on the average, than the same quantity of grains and grasses *au naturel*? Three points which may be mentioned are: (a) variety, (b) cooking, (c) the addition of meat. The breads, cakes, crackers, dumplings, macaronis, etc., are naught but cooked grains chiefly, but higher in feeding value than pure grains, because fiber, etc., have been taken out; the cheeses, custards, starch puddings, etc., are chiefly eggs and milk, both animal foods; and the meat forms a supply of animal food more sure than that which may come from insects in summer. In winter, insects, worms, etc., are unattainable, in many localities, even by fowls supposedly "on range." Unless the ground is bare and the herbage somewhat green, "on range" in winter can mean little more than at liberty to go and come.

We may see at a glance that here is nothing that cannot be obtained through the right handling of the common, regulation poultry feeds. But, another point presents itself: it takes more planning to secure variety, and it takes more work, to provide cooked food for the birds, especially when flocks are large. (Caldron kettles are part of the regular equipment of many large establishments.) And, there is another consideration: feeds are of varying degrees of concentration and of palatability, and upon a clear understanding of the proper proportion of course fibrous feeds to those which are rich and smooth and concentrated, rests the value of any given feed mixture. Upon its palatability rests the amount eaten. If a feed is not good, from the hen or the chick point of view, it may mean poor chicks and non-laying hens, even though it may contain the proper

elements for growth and productiveness. This is one of the reasons why beans cannot be fed in large proportion: fowls do not like them, and, when fed, they must be partially disguised by combining them with something well liked.

It is to be understood that feeds for herbivorous animals must always consist almost wholly of herbage, and that the animal eating mixed vegetable and animal rations in a state of nature must always be kept severely on the safe side; as a surplus of rich, animal food is almost sure to result in slow poisoning, undermining, and finally ruining the bird's health. This is a cardinal error, since on keeping an animal in health depends, in the final test, the per cent of profit.

Men, in general, are sick, it is said, because they do not eat properly; or because they are dissipated; or because they lack self-control in some one or more of many ways. If we cannot feed ourselves so as to keep in health, what chance is there that we can do better with the animals in our charge? These animals are not under their own control. They should be free from all damage caused by lack of self-control, because they and their feed are under our control. But that fact may only make things worse; it depends on us. Yet, as soon as we begin to handle them for expected profit, the profit question takes hold of the handling and we tend no longer to feed them for the best health, but for the best immediate production, which we presume to be for the best profit.

This presumption is, to a degree, false, because founded on a wrong premise. The premise is that the feed which brings the most winter eggs — for instance

— will bring also the most profit. This by no means always follows. We have to consider not only whether or not this feed can carry the fowls forward in the most rugged health, but also whether or not it is the feed which will produce a given number of eggs at the least cost. All feeds are made up largely of muscle-makers, energy-makers, and pure fats, in varying proportions. It is also true of nearly all foods that it is the muscle-making portion, passing by the name of proteids, or protein (sometimes called nitrogenous feeds), that costs most money, weight for weight. The amount of protein in a feed needs to be considered, always, in rating it as high or low in price, in connection with the actual money to be paid for it. That feed at two dollars a hundred which contains 20 per cent of protein is a much cheaper food than another at the same price which contains only 10 per cent. We may often see this illustrated in the prices of brans and buckwheat middlings.

I suppose we might be astounded, were we to study into the matter, to find how much of our table and household supplies are made from the wastes of other manufactures! Certainly, this is even more true of our stock feeds. Most of them are by-products. Yet, it is often said that we use the poorer portions of the grains on our own tables and give the best to the domestic animals. The wheat middlings which we relegate to the farmyard stock is 15.6 protein (an average of 32 samples), while spring wheat patent roller process "family and straight grade" flour averages less than 11 per cent; not to mention that we have taken out, also, much of the salts so essential to perfect health. In feeding fowls and chicks, any small plot of ground

may be made to furnish vegetable growth, and many weeds are almost as good as more aristocratic plants. The grains and meat will furnish an abundance of actual fat and fat makers. But we need more protein, and it is the wastes from other manufactures which largely supply the proteids wherewith we enrich and balance the coarse "roughage," in making a combination feed for any kind of stock.

Just here we must feel the need of a simple table which will show at a glance the chief sources of the protein or muscle-making portion of our feeds. The United States government is authority for the correctness of these analyses.

TABLE A. — COMMON HIGH PROTEID FEEDS

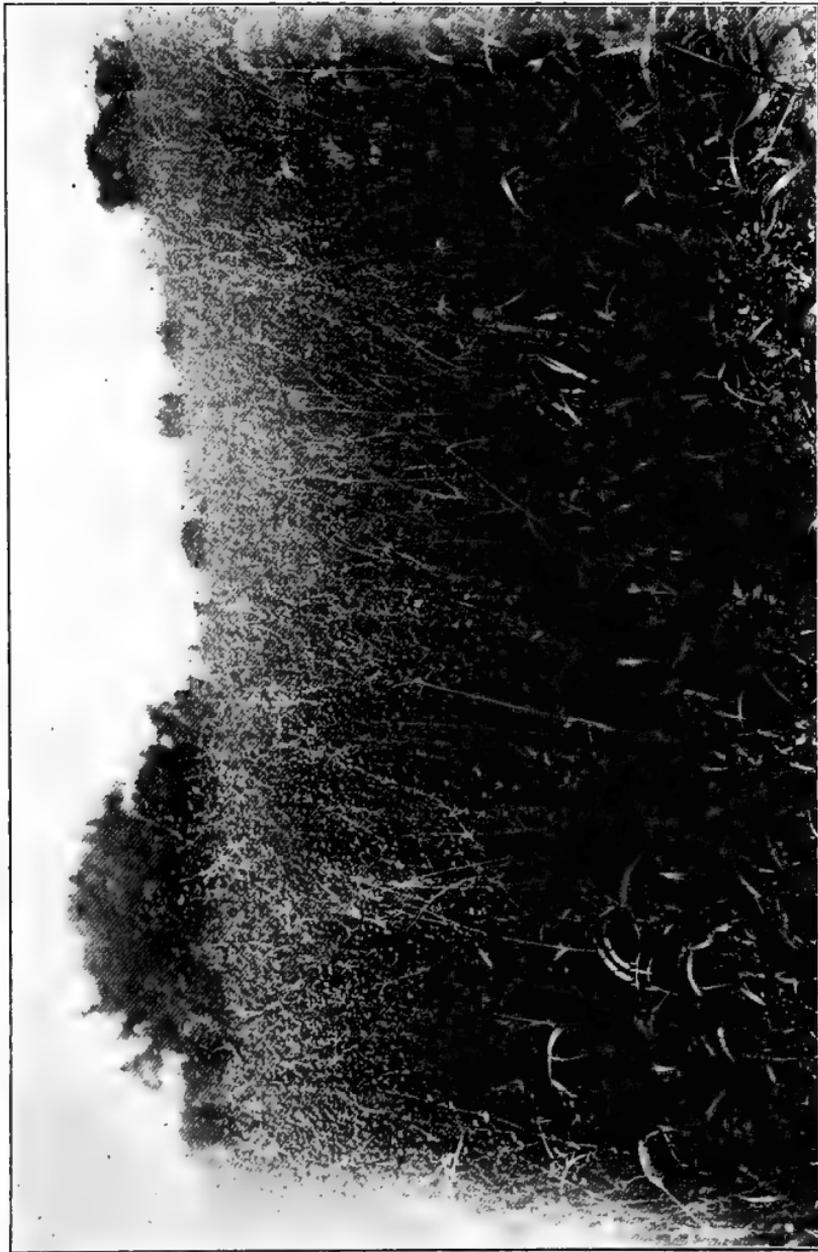
	PROTEIN	CARBOHY- DRATES	FAT
Buckwheat middlings	28.9	41.9	7.1
Cottonseed meal	42.3	23.6	13.1
Linseed meal	32.9	35.4	7.9 (old process)
Linseed meal	33.2	38.4	3.0 (new process)
Malt sprouts	23.2	48.5	1.7
Brewers' grains (dry)	19.9	51.7	5.6
Gluten meal	29.4	52.4	6.3
Soja (or soy) beans	34.0	28.8	16.9
Cowpeas	20.8	55.7	1.4

The meat meals and scraps put out by various firms may run anywhere from 40 per cent upward in protein. Milk albumen, another commercial animal feed, is also high in this most precious element. Gluten feed, which is the form now more easily procured (possibly the only one), may run a little lower in protein and one half higher

in fat than the gluten meal given in the table. The glutes are the waste of starch manufactured from corn. Malt sprouts and brewers' grains are a by-product of malting, as their names imply. The source of cottonseed meal is also known from its name, but it is a by-product, the cotton itself being the chief aim. Buckwheat middlings, a good egg feed, is the refuse from manufacturing buckwheat flour, and there is a buckwheat bran, coarser, containing more fiber, and of less feeding value. Linseed meal is the waste from producing linseed oil. The old process did not extract so much oil as the new process, hence the difference in analysis. A ground linseed is also to be had, but, as it contains over 30 per cent of fat, is not recommended as poultry feed.

I desire that you will give much thought to the above table, because upon the proper combination of the proteids with the other food elements may rest your ultimate success. It is really primer work. Other things count strongly, but this point must be emphasized.

The fact before mentioned that protein is often more costly in some one of these feeds than in the others has much bearing. This feature is not constant. That is, supply and demand or market manipulations may send the price of the very one you like best up to such an extent that the protein, in which it is rich, may cost you possibly twice as much as the same amount of it in some other item from the table. If you cannot classify the feeds, here is an excellent chance for you to stumble over a pitfall. Suppose that flaxseed is very high in comparative price, this year, while buckwheat is very low. This may mean that the two by-products from these grains will have about the same comparative actual



Minnesota Flax Ready to Harvest. Linseed Meal, a By-product from the Oil Extraction, is a Valued High Protein Poultry Feed

value. Will you be quick enough to change at once from the high-priced to the low-priced source of protein, and open-eyed enough to change back, or discard both, if next year's prices change radically? This is the basis of successful and economical feeding. The by-products may follow the staple grains up or down in price, or may increase in continuous ratio as prices go on upward, and as certain things are more universally called for by poultrymen who are learning fast. Some staple feeds are becoming almost prohibitive in price. The editor of *Poultry*, living in the far West and contending with heavy freight rates, finds meat scrap costing him five dollars a hundred. We used to get it here for less than two dollars; now, in the East, we pay three dollars, or perhaps more.

One cannot go far wrong in the use of the common grains, if these are plump, in good condition, not too new, and not fed to excess. The word "excess" may have two meanings here: one may feed to excess by giving more feed than the birds can digest, or he may feed any one element to excess by using too much of it, in proportion to the other elements. Feeding too much starch, proportionately to the other elements, is a very general mistake — possibly the one most frequently made in feeding grains for egg production. Yet when feeders learn that it is the protein that brings the eggs, when it is added, because the ordinary feeds do not contain enough for heavy egg production, it becomes a temptation to use too much protein; which may bring on bowel difficulties or satiety. In a state of nature, the fowls ate many seeds (grains), it is true; but the majority of wilding seeds are small, and they were well balanced by the

green vegetable feed and the insects which the birds could usually find. Besides, they needed an egg ration only during a very small portion of the year, before the grasping hand of man "improved" them for his own ends.

The matter of green feeds is so important that it must have a chapter to itself. When poultrymen speak of "balance" in a ration, they are very likely to mean only the proper proportions between the amounts of protein and carbohydrates present. But in balancing for perfect health, the pasturage becomes one of the most important items.

A few years ago, all the advanced poultrymen were splitting hairs over the proper balance of the various elements in all the feeds used, with the emphasis, as stated above, on the two chief elements as to quantity. This phase passed, and we now hear far less about it. But it remains true that a rough balance between the muscle makers, the fats, the true energy makers and, in the case of partly herbivorous animals, the green feed, must always be maintained. The feeder needs to have in mind a general idea of the proportions of each in any ration which he may "throw together" at any time. These proportions must be such, first, as to keep the animal in rugged health; second, they must also be such as will render the stock productive to the highest degree that can be reached with safety to the producing animal.

The United States Department of Agriculture exists only for the purpose of making life more tolerable and work easier and more productive for all the people whom it reaches. It has analyzed practically all table foods for the good of the households, and every common grain

and mill stuff for the benefit of the stock. These analyses were repeated again and again, in order to get a fair average of figures in the ratios. In some cases, over 300 samples were analyzed. Some very simple tabulated forms will give our eyes the information which they seize so much more quickly than do other servants of the brain:—

TABLE B. U. S. TABLE OF AVERAGE VALUES FOR WHOLE GRAINS

	MUSCLE MAKERS	ENERGY MAKERS	FATS	FIBER
Corn	10.5	49.0	3.4	2.1
Wheat	11.9	71.9	2.1	1.8
Oats	11.8	59.7	5.0	9.5
Barley	12.4	69.8	1.8	2.7
Buckwheat	10.0	64.5	2.2	8.7
Sorghum seed	9.1	70.0	3.6	2.6
Rice	7.4	79.2	2.1	1.8

TABLE C. U. S. TABLE OF AVERAGE VALUES FOR GROUND GRAINS

	MUSCLE MAKERS	ENERGY MAKERS	FATS	FIBER
Corn meal	9.2	68.7	3.8	1.9
Oat feed	16.0	59.4	7.1	6.1
Corn and oats (equal parts)	9.6	71.9	4.4	5.8 (est.)
Barley meal	10.5	66.3	2.2	6.5
Wheat bran	15.4	53.9	4.0	9.0
Wheat middlings	15.6	60.4	4.0	4.6
Wheat shorts	14.9	56.8	4.5	7.4
Rice bran	12.1	49.9	8.8	9.5

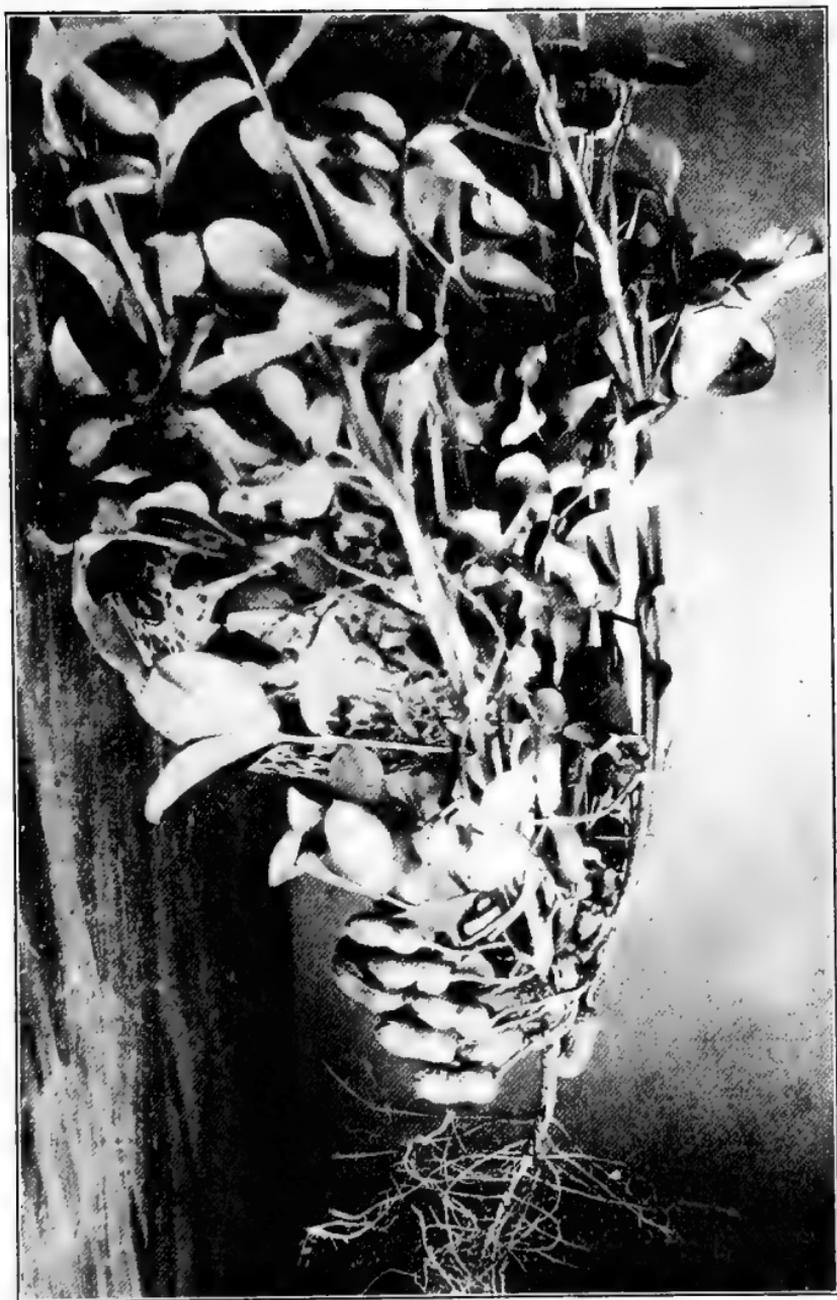
What is scientifically called "nitrogen-free-extract," I have headed simply "energy makers." These analyses are for "fresh, or air-dry" materials.

Please note that in the mind of each feeder need to be niches wherein are kept the several food groups. One group is the clovers, the key interest of which is that, when dried, they run from 10 to 15 per cent protein, white clover being the highest, the cowpeas (a near relative) next. These also furnish necessary roughage, averaging from above one fifth to above one fourth fiber. A second group is the high-protein grains, those running 11 and 12 per cent and upward. Special localities have shown the higher averages. Among these are Tennessee, Virginia, Colorado, and Indiana wheat (see Government Handbook), Colorado wheat, under 50 analyses, averaging above 13 per cent. Massachusetts sweet corn runs well toward 13 per cent protein. A third group is the high-fiber stuffs, including buckwheat, soy beans, cowpeas, rye, and oats; barley meal, buckwheat bran, and malt sprouts are extra high, because the mill stuffs and wastes contain more than their natural proportion of hulls. Such poor stuffs as rice hulls and cottonseed hulls are more than one third rough fiber, — the latter, indeed, nearer one half, — while corncob meal is nearly as high. These are, I consider, entirely too rough and coarse to use as feed for fowls, even though they average above 4 per cent of protein content.

An important group is that of the extra high-protein vegetable products, most of which are mill stuffs, ground and sometimes sold in combinations. This group will include, from the cereals, gluten feed, linseed meal (new process preferred because containing less fat), buck-

wheat middlings. Cottonseed meal, ground peas, and ground beans belong here; most of these analyze between 18 and 33 per cent protein, the highest, cottonseed meal, running above 42 per cent. The animal meals go still higher. These are good friends to the poultryman, but sometimes deceitful, so that he needs to know all that is to be learned about them, and to be able to group and interchange them at will. His great economic struggle will be in connection with them, also, let it be remembered.

It will not do to jump at the conclusion that cottonseed meal, because vegetable and high in protein, is therefore the best feed to be had. A correspondent who ranks with the Beginners writes me that he has discovered through experience one fact, viz., that cottonseed meal is the cheapest source of protein. In the same letter he inquires how to treat rheumatism in his stock (probably legweakness!), failing utterly to connect this reliance on cottonseed meal with its legitimate outcome. One who feeds this needs to erect the red flag of "danger ahead" on the bin or barrel containing the feed. And especially is this the case with the Beginner. Some experts say that cottonseed meal is *never* safe to feed young animals; others believe that good judgment may make its use safe. Speaking especially of cattle feeding, the New Jersey Station (Bulletin 174) has said: "The injurious effects which have sometimes been reported from the use of this highly concentrated food have, in many cases, at least, been due to feeding it by itself or without being intermixed with any other foodstuff. When it is thoroughly incorporated with other foods, especially those of a starchy nature, it can safely be



A Peanut Plant. In the South, the Peanut Furnishes Valuable Feed for Fowls, High in Protein Averaging nearly Twenty-Six Per Cent

used in the quantity indicated (4.5 pounds daily per cow) without injurious effects." Two hundred five-pound hens equal in weight one thousand-pound cow; which fact may give us a basis for feeding this meal safely to fowls.

Concerning protein values, Professor H. R. Lewis of the New Jersey Experiment Station said, in 1912, in a platform talk to poultry keepers of the state: "Protein is the feed most expensive to buy, most difficult to produce on the farm, and which we absolutely must have. Its place cannot be taken by carbohydrates or fats. Meat and bone, milk and insects, best supply it. One pound of digestible protein to each 100 pounds of live weight is about right (to feed). Digestibility is an important feature. The three objects of feeding fowls are maintenance, flesh production, and egg production, and the proper food is determined by the product desired."

As a compact table for making up rations for any desired purpose, Professor Lewis showed the following, on a chart:—

FINISHED PRODUCTS BELOW CONTAIN:

	WATER	ASH	PROTEIN	CARBOHY- DRATES AND FAT
Hen	54.8	3.8	21.6	17
Pullet	55.4	3.4	21.2	18
Capon	41.6	3.7	19.4	33.9
Fresh egg	65.7	12.2	11.4	8.9

The feeds which best supply the elements needed in the product are the ones to be chosen. Comparison study of these tables is urged.

FOOD MATERIALS BELOW CONTAIN:

	WATER	ASH	PROTEIN	CARBOHY- DRATES AND FAT
Corn	11.6	1.5	7.0	76.4
Oats	11.0	3.0	9.2	56.8
Meat scrap	10.7	4.1	66.2	31.1
Green clover . . .	71.0	2.1	2.9	16.4

VIII

A STUDY OF JUICY FEEDS

The Value of Juicy or "Green" Feeds — Values Tabulated for Quick Information — Practical Value of a Knowledge of Water Content, etc. — Sprouting Grain and Cultivating Green Crops — Fodder Stuffs — Onions — Weeds — Poultry and Fruit

UPON a just appreciation of the value of green feeds, in the proper proportion, must rest the success of the many who must yard their fowls; and this especially when the space is limited. *No matter how good the care otherwise, highly concentrated foods like grains, millstuffs, and meat will eventually ruin the flocks, unless the supply of green stuff be liberal.* The fowl on good range which receives a bit of supplementary feed once a day is a free and independent entity and is not very likely to get into feeding difficulties of any kind during the open season, unless she is accidentally choked or poisoned. At the north, during the period of compulsory housing, she is no better off than her near neighbor, the yarded town hen. She may fare even worse, from the fact that her owner has not hitherto been obliged to learn how to handle her in confinement. On the farms where fowls range free during most of the year, so little thought is given to winter care that the winter season is often merely a season of existence, a period of unhappy waiting for decent conditions to arrive with the spring. This is one strong reason why so many farm fowls lay no winter eggs.

For all housed, or closely yarded stock fowls, then, we may make this rule: The thrift of the birds, as far as feeds may affect it, will be in exact proportion to the balance of the ration with the "green" feeds, juicy and dry. The hays and especially the clovers, dry, form an important item in winter feeding, and give bulk without furnishing so much water as to overdo the matter. The word "balance," in this case, may be taken to refer not so much to actual, comparative contents of the fresh, vegetable foods which we are now especially to consider, but rather to a certain effect upon the bird which is due to the use of vegetable juices, etc. The table below may show how largely made up of water the fresh vegetable growths commonly fed to fowls — or which might easily be fed to fowls — are:

	PROTEIN	ASH	WATER
Red beets	1.5	1.4	87.73
Potatoes	2.1	1	78.9
Carrots	1.15	1	88.6
Cabbage	2.4	1.4	90.5
Onions	1.4	.6	87.6
Squashes66	.41	94.88
Lettuce leaves	2.27	1.71	86.28
Oat fodder	3.4	2.5	62.2
Sweet corn kernels	2.88	.56	82.14
Corn fodder	1.8	1.2	79.3
Sweet cornstalks	1.7	1.25	80.86
Maize silage	1.7	1.4	79.1
Cowpeas	2.4	1.7	83.6
Red clover	4.4	2.1	70.8
Orchard grass	2.6	2	73

Apples, as a regular supply, are followed by excellent results in the egg basket. They are, of course, well up in water content, and the sugar in the juice is more than one tenth. In Rhode Island Greenings, which are especially fine apples, the analysis is given as 11.97 per cent. Sweet apples, strangely enough, are given as being a little lower, but only a fraction of one per cent. Pears have not quite 9 per cent of sugar. Most of these figures are averages. Samples vary endlessly. For instance, oat fodders, in five samples only, varied from 1.5 per cent of ash to 4.2 per cent. Though all were rated as "fresh, air-dry," some would doubtless be nearer ripening than others. At least, this might easily account for a considerable variation. To call attention to the difference between the analyses of green fodders and dried, I mention here that Red clover hay is given as containing 11.33 per cent of moisture, 2.07 of nitrogen, with 9.51 per cent of phosphoric acid and potassium oxide. A rough general rule might be that air-dried samples of grasses, etc., analyze about three times as high in protein, etc., as the green samples. In winter, a combination of the cut clovers, clover chaff, etc., works well in connection with a juicy vegetable like cabbage or mangel-wurtzels.

In order to grasp the practical value of this knowledge, in its application to supplying green feed to yarded stock, we need to fix our minds especially on two facts: (*a*) the wastes cannot be swept from the animal system without water in abundance; (*b*) the eggs which are to pay for a hen's keeping cannot be produced by yarded birds without supplied water in abundance, since the average egg is itself 73.7 per cent water, and the maximum amount is almost 75 per cent.

If we were to put this into the form of a logical conclusion, as in school, we should finish: "Therefore, in order to insure healthy fowls and a maximum product, no poultryman *can afford* to allow the drinking water to evaporate into thin air in summer or to congeal into ice in winter. For, drinking water should be always accessible to the fowls."

Another imperative "therefore" is: Therefore, no poultryman who wishes his fowls to pay a profit can afford not to provide them either with liberty and nutritious range, or else with abundance of juicy vegetable growth in good variety, when under yarded conditions.

A familiar example of making use of what one has lies in the case of unsalable potatoes. If these can be chopped till they are easy to swallow, and mixed with a little bran, they may form an occasional ration of which the fowls will become very fond and will add both to their thrift and their productiveness. Beets of any kind, cut in half and skewered against the wall at one foot from the ground, or fed in a protected trough, often prove reliable "first aids to health," and also to productiveness. The beet pulp—a gray, chippy looking stuff—which is a waste product from the manufacture of beet sugar, is a notably good feed for those who must buy. It comes in large bags. We have paid from \$1, when it was less known, to \$1.35 at the present time. The Experiment Stations say that, although it does not analyze high in any essential element, all stock thrives better with it than without it.

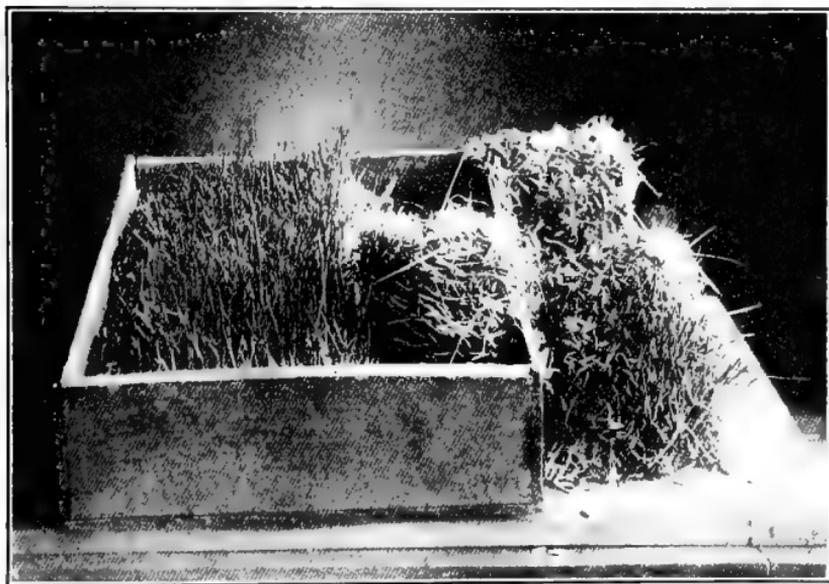
A few hours' soaking will metamorphose a half-peck of it into a half bushel, possibly, of attractive, juicy beet shavings. The animals unite in decidedly favorable

testimony as to the palatability of the mess. It is best fed, I think, in connection with one third its bulk of clover meal or chaff and the same bulk of bran, with corn meal and wheat middlings enough to form a rather firm and somewhat sticky mash. If the meal can be well scalded, it will behave much better. One may add meat scrap in any desired quantity, up to the 10 per cent, if the meat is to be fed with the mash. My own preference would be to place the meat, mixed with a very little clover meal, in feeding racks by itself, leaving it before the fowls all the time, or for a specified portion of each day, the covers being closed during the "close hours."

The one ideal way to handle small lots of birds which are kept for fancy breeding and which must be constantly segregated from others is to have two long runs sloping gently away from each pen. Openings should admit the fowls to either, as the owner desires. While the fowls occupy one, the other is seeded and growing a crop of green stuff, into which they may be turned as soon as it is well established. As they often trample and foul more than they eat, it is better, for a time, to let them into the fresh yard for stated periods, perhaps an hour at night and another in the morning. As the growth hardens, they may occupy the yard all day, when the companion yard is to be sown.

If fowls are not to be kept in separate small flocks, yet must be restrained, it is better to have one yard entirely surround the long house, or the series of colony houses, in order that a few furrows of earth may be sown and turned or cultivated every second day, oats being thus buried very liberally beneath the surface.

This will give the fowls plenty of green feed, as it starts into sprouting and growth. Some have assured me that barley is even better, as it tillers more abundantly; *i.e.* each seed throws out more stalks, when it lies long enough to get a real start. The New Jersey Station, after experimenting with sprouted oats, wheat, and buckwheat, announced that in every case oats produced most pounds and made most gain.



Sprouted Oats, Tops Four Inches High, Making Real Green Feed For Yarded Birds

In the case of the yarded and segregated small flocks of high-priced birds, it can probably be made to pay to bury grains in the soft earth by hand power. The fowls get the needed exercise actively, and the needed juicy morsels at one and the same time, while the owner is saved the effort of growing and handling the sprouted grain. The deeper it is buried, the longer it lies moist,

and the better it will be when the fowls eventually unearth it. This also gives the fowls the constant opportunity for occupation and, one might say, recreation of the fowl kind. This means much in the better health of the flocks.

Much can be done in growing rape, large-head lettuces and cabbages in very rich, cool ground, in plots alongside the chicken yards if it is possible to find the right soil there. A yard that has been used as a fowl run is good. The condition of the soil makes a great variation in this class of feeds. I have seen soils kept virtually bare by the presence and ranging of a small flock; in others of similar area rich and well grassed, the ranging of an equal number of birds made little impression in wearing away the thick, grassy turf. Here is variation in opportunity, and variation, be sure, in product, because of natural variations in conditions. The chief point is that the birds must really get what they need. *The easiest way is the best, if fully feasible.* One who has choice is throwing away his lead if he do not select the most favorable conditions, where Nature is his best help. If this cannot be done, the next best thing is to provide the best conditions as cheaply and easily as it can be well done.

There is a very easily raised product for early summer use in the fancy curled mustards. The fowls do not like them as well as they do lettuce, but on some soils they will furnish more feed, almost equally tender. They should not be allowed to go to seed, as they might then become a bad weed, like other mustards. These are so beautifully curled and crested that they are about equal to parsley for garnishing, and to some palates they make



Heds of Pearl and Hungarian Millets. Plants and Seeds Make Good Poultry Feed

a most acceptable source of greens. For this purpose, and as greens for the poultry, they need to be used while

rather young and crisp. The frilly growth makes them easy for the fowls to attack. Ease of division is quite a point of advantage in a green stuff that is neither rooted in the ground nor cut fine before being supplied.

Such fodder stuffs as sorghum, the sweet millets, and especially sweet corn are of especial value as supplied green feed for geese, when this method of handling is necessary. The geese delight in the sweet cornstalks, which are better when slender and young. These are equally good for hens and ducks, if they can be made fine enough. When corn is planted more thinly and allowed to ear, the milky ears, just a little older than for the table, furnish one of the most attractive and wholesome feeds for either chicks or fowls.

Those who can raise onions will find them one of the cheapest green feeds available for chickens and any fowls not laying. Mr. John Robinson says that cooked onions may be fed even to layers, in quantities not above five pounds to a hundred birds. Too heavily fed, they taint the eggs with their penetrating odor. These are most excellent to give zest to the mashes and thrift to the fowls. It is well, with these, as with any new offerings, to mix them well, in small proportion, with some well-liked ration, until the fowls form a liking for them. Both the chicks and the older fowls become ravenous for onions, cooked cabbage, and the like, once they have learned how good they really are.

During a portion of the year, the fowls can be kept in pretty good health with little green feed aside from what may be supplied in certain favored weeds. There are reasons besides the mere flavor why the fowls will eat some supplied stuffs and reject other sorts. The pale

green somewhat ragged "pigweed" grows quickly, is tender, and offers itself in natural mouthfuls. The same is true of purslane, the "pusley" of old-fashioned folk. Tenderness is the first point with such natural supplies. Summer grass is first favorite, and large tufts of it pull up easily when the soil is wet and soft. A few geese, if yarded, will devour several small armfuls daily.



Pearl Millet, Seven Feet High : Makes Shade and Feed for Poultry

Most poultrymen who raise yarded stock aim to grow fruit trees in the yards. It is almost the only rational way, since shade is such a vital necessity to the fowls. All waste fruit forms good feed for the poultry, and the ground pays a double profit, the only difficulty being in protecting the trees while small, and wiring them off as they come to the ripening period each year. With a small family orchard, individual trees can be wired off

without moving the flocks at all. Some have said that fruit trees grown in poultry yards were sappy, brittle, and short-lived. When this is true, I think it is chiefly because of lack of balance in the fertilizer. The droppings from the fowls make the ground rich in nitrogen, the most expensive part of a fertilizer, but may leave it lacking in potash. But potash alone can be bought by the hundred pounds. Either muriate of potash, or sulphate of potash is a good fertilizer for fruit trees, and would solve the problem of some of those barren orchards which grow for twenty years (owners have told this story) without fruiting. These potashes are very concentrated, and a little goes a long way. Some California orchardists say that nitrate of soda alone will be all that is needed in some soils. This shows its effect very quickly, and would please all for this reason. I use it on early vegetables to hasten maturity, but have not tried it on trees. Muriate and sulphate of potash have given us good results on peaches, pears, plums, and apples, in connection with poultry droppings distributed by the fowls themselves. The yards are plowed each season, and cultivated later; more than once, some years. This is chiefly to sweeten the ground for the fowls. The potash helps here, also. If I had wood ashes, I should probably use those, as all farmers do. But in buying, I prefer to buy the potash "straight," as wood ashes are said to vary much in quality.

I think it should appeal to the common sense of all, that, if one does not want spongy, sappy trees which produce too much foliage and fruit of second quality and inferior quantity, it behooves him to supply *all the great, important elements needed* by the trees; even as he must furnish *all the important elements* in the food for his fowls.

IX

HOW TO PREVENT DISEASE

The Difficult Disease Problem — Cutting Off the Sources — Common Percentages of Loss — The Vital Question — Active Agencies of Prevention — Analogy Between Man and Lower Animals — Exercise — Patent Feeders — Ventilation — Disinfection — Patent Cures — White Diarrhœa

THE "Disease Problem" is one of the most difficult of all his puzzles, for the Beginner. It is usually far more difficult for a man than for a woman poultry keeper, since she finds it rather easy to relate her knowledge of human, physical ills, to those of the outdoor friends under her care. Since the puzzle is such a difficult one, and often so endless in its various forms, it is quite the part of good sense to inquire whether there be not some way to cut off the physical ills of fowls at their source.

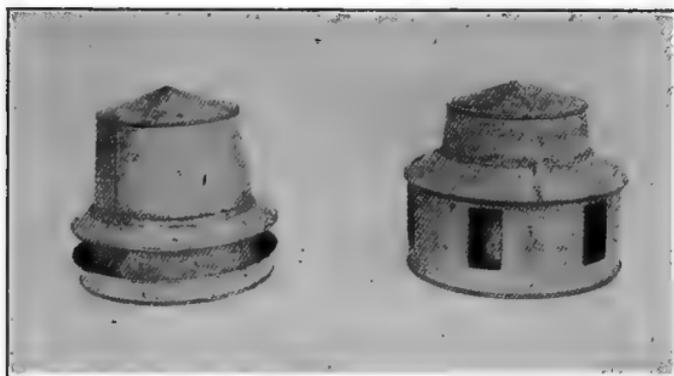
It might be rather shocking for me to affirm, outright, that this source is, for the most part, man himself. But it is quite largely true, because most of the ills of poultrydom are ills relating to unnatural conditions. And the birds cannot apply the remedies which instinct would suggest, because they are not free agents. We might look at a single fact concerning man himself, to find whether or not he is fitted to deal rightly with fowls in matters pertaining to health. One of the most widely experienced physicians and surgeons of our day, Dr. J.

H. Kellogg, states that we have an average of about three million sick persons in this country, all the time, and that, of this number, *just about one half are needlessly ill*, because of dissipation, or excess, or overeating, etc. If this is the best man can do for himself, what hope is there that he will do better with his stock? Just this, it seems to me: that he can restrain his stock from excess and lack of judgment in eating, when he cannot (so he says) restrain himself. In rigorous selection of conditions, and in sanitation, then, lies man's power to *bury the great problem, instead of burying his ailing fowls*.

Some of the older poultrymen, speaking out of bitter experience, insistently proclaim that the ax is the best medicine. But this is made to refer to individual cases of disease, which are constantly cropping out in some flocks. It may be only putting the matter in a different form to say that culling out weak specimens between breeding seasons is the best way to raise the average health of the flock. These come to the ax, or its equivalent, of course. But in the case of culling only as individuals develop disease, throughout the season, one is very likely to raise progeny from some of the weaker fowls, to take their places and to inherit their woes another season. The method of allowing none but lusty individuals to go into the stock flock at all, cuts off at the outset the possibility of getting descendants from the weaklings. It is the only sensible and sure way.

This is not saying that one will thus cut off all possibility of disease. But it makes more difference than the breeder who has not tried it could well believe. It is very common, in average flocks, to lose four or five

hens a year out of seventy-five or a hundred. Some have even reported losses as high as between 20 and 30 per cent, through experiences common to all flocks in the regular course of living, such as the molt, etc. The point one needs certainty on is, how much disease ought to be expected, under the best care and conditions; how much of the average loss can be warded off? Fowls pushed by means of stimulants to the very limit of capacity for egg production must, of necessity, show some breakdowns. The vital question is, "How many?"



Cornell Water Fount, with Protecting Cover Removed. Clean, Cool Drinking Water Wards Off Disease

I think no poultryman of any prominence exists who does not lose some birds. If working for records, the loss, which may be called almost unavoidable, will come from trouble with the egg organs. In the famous laying contests at the Agricultural College at Hawkesbury, Australia, some hens died, even when kept in lots of six, and carefully selected in advance for special test. We can know the facts about these things only from experience, — our own or that which others report. I do

know of one large firm which reports a loss of not more than one per cent, among its thousands of layers during the entire year. This may be regarded as the ideal toward which every poultry raiser should struggle. But only the best of selective and preventive work can bring any poultry raiser close to this ideal.

The owners of this great farm, the size of whose operations may be indicated by the fact that it places, on occasion, orders for 20,000 hatching eggs with one firm, have described their system somewhat in detail. One year, out of a lot of several thousand cockerels, 1500 were selected as the most desirable. This bunch was reduced, later, to 1000. When they were about half grown, a final and more exacting selection threw out one half of those remaining. On the same basis (that of saving about one in eight as breeders), the farm producing 100 young cockerels would keep the best dozen only for breeders. On some farms, under small handlers, selection is much more rigid than this; only the best two or three raised being reserved to head breeding pens. Selection being first for vigor, then for type and beauty and prolificacy and all other desired qualities, the few reserved, if from good parentage, ought to be almost perfection as far as the eye can judge. (Further discussion of selective breeding will be found in the chapter on Line Breeding.)

Our first and keenest inquiry, here, must be directed toward finding out the active agencies which enter into practical prevention; or, on the other hand, into the spread of disease. The great preventive agencies are good food, proper exercise, fresh air and the sunshine which is its complement and a disinfectant as well,

chemical disinfectants, etc. ; the great disease-producing and disease-spreading agency is germ contagion.

We have the specific discussion of feeding principles in another chapter.

It seems a very simple proposition to state that all necessary exercise may be provided through the method of administering the feed, and furnishing abundant litter. But the litter problem, simple as it looks, is a perennial problem to poultrymen, chiefly because most materials tend to mat together when slightly moist and trampled, so that the grains fail to become buried in the litter, and its reason-to-be is thus not justified. I find that it helps one toward correct practice to know the rea-

sons for any suggested method. To be sure, the beneficial result of exercise for any animal should not need



A "Turn-stile" Automatic Grain Feeder. Exercise Makes for Health

to be explained to any one who understands animals. And, as man is himself an animal, he should be able to reason out the value of exercise to all other animals. But, I think he tends to forget that he is an animal, on the physical side, and thus often fails to draw the analogy between himself and the lower animals. To be sure, fowls are not, in all things, like the four-footed animals, yet the main organs — the bodily engine parts — are much the same for all.

Exercise for fowls can be encouraged in varying ways. To provide litter for scratchers and water privileges for swimmers is the easiest and quickest way to insure exercise. Running, flying, scratching, and swimming are Nature's methods of exercising her winged and scratching and swimming birds. Flight, the poultryman must usually curtail more or less to suit his own interest. It follows justly that he must take a bit of extra trouble to provide other exercise for his fowls.

There are several patent feeders, especially designed to induce the fowls to scatter small grains by their own activities. This they do by tilting or jarring the receptacle containing feed, and the busier they become, the more feed they get. The receptacle is usually hung two or three feet above the birds, at least. The existence of these ought, it seems to me, to stimulate poultry feeders to whom such a method of feeding would be helpful, to invent for home use devices whereby the grains might be thus scatteringly given down. All the more when the poultryman provides in large quantities, expecting to replenish containers only at intervals of a week or so. It is quite necessary for those who thus depend on providing feed at long intervals to have a

fixed, habitual systematic interval of inspection of feed boxes. Otherwise, the birds will surely be left, at times, without the proper supply of food.

One of these patent devices for "little and often" feeding of grains is shown in the cut. A modification, which is, I think, of recent invention, provides a set of feeders for each and every pen in a continuous house, all attached to a rod running the length of the building; each having a cut-off, and all being operated from one point by means of simple gearing.

Although a few of the teachers are going back to the long-discarded plan of warming the poultry houses artificially, — for the Mediterranean breeds, at least, — the great majority are swinging toward the cloth-front house or the open, sunny shed, for daytime housing of layers, at least. It has always been found difficult to ventilate closed houses properly without admitting drafts. Probably the best device for this purpose is the overhead, diffused air ventilation gained by passing the air admitted above through loosely laid straw. (Possibly this will not seem to some a strictly correct use of the term "diffused.") To break the stream of air into small enough particles so that it shall not come upon the fowls as a draft, is the key to poultry-house ventilation. A method open to all who have built a high enough house is to cut a small door in the gable peak on each end. A very loose ceiling, laid just high enough overhead to permit the easy passage of the attendant, will be sufficient to support straw, which is then filled loosely in above the ceiling. The ventilating doors may be made to slide, and can then be adjusted at any time to meet prevailing weather conditions.

The one great agent or force now relied upon to combat contagion is disinfection. Sunlight disinfection is best of all, and should be always operative at danger points. Disinfectant material is sometimes strewn dry upon board and flooring surfaces; it is sometimes added to thin whitewash; it is sprayed into incubators and over eggs and upon mucous surfaces when these can be



Fowl's Gizzard, Abnormal
through Disease

reached; it is given as a solution in the drinking water; it is furnished the fowls in the form of tablets to be taken in internal doses, individually. The best of the M. D.'s are coming more and more to order first a purgative, to be followed by a bowel disinfectant, for nearly all diseases. So many and such varied diseases are now being laid to the door of incomplete digestion (either of stomach or of bowels) that it seems quite the part of

folly not to learn the theory and the "first aid methods" of modern medical practice and to apply them to daily life. This may be, first, in the use of proper family foods and proper ways of eating; second, in applying these laws as far as is practicable to the care of the various animals under our care. The D. V. M.'s are following close upon the methods of the M. D.'s and both are using applied common sense freely.

Some of the best poultrymen rely largely upon air-slaked lime for disinfection. Thrown upon roosts and floors and into coops and nests, common testimony rates

it as a reliable preventive of much disease. Because fowls have sometimes been injured by eating lumps of lime, others are shy of using this cheap aid. The remedy is — not to distribute lumps. Whitewash is a universal cleanser and purifier, and its whiteness has also a value in the fowl house in the reflection of light.

The roup medicines, the diarrhoea and cholera medicines, the applications for chicken pox and mangelike affections, depend largely for their curative virtues on the disinfectants which they contain. The lice paints most popular contain such ingredients. The whole round of preventive — and, one might add, of curative practice as well — revolves about the use of disinfectants.

Even for “gapes” (the choking caused by thread-like red worms in the windpipe) the only practical, immediate general treatment, when the runs cannot be changed to fresh ones, is to spray these runs with a not too strong disinfectant. Twenty years ago, I raised chicks on thoroughly infected ground with practically no loss, by spraying the soil with disinfectants.

It is rather safe to say that the most widely reaching scourge of the modern poultry yard, “white diarrhoea,” in its several forms, has absolutely no chance of cure unless it be along the line of preventive and disinfective treatment. Scientists making a special study of this disease have, up to 1912, acknowledged that the only advance toward successful treatment lay in the use of disinfectants. The treatment was applied to the eggs, the incubators and the brooders, the excreta, etc.; and, even with this, the breeding of rugged, outdoor-grown stock was named as the best surety against the disease.

During the investigations of Professors Graham and Rettger in Connecticut, while seeking the germ of white diarrhoea, it was found, not only that the dead chicks and the living chicks carried this germ, but that the eggs also, and some of the breeding stock, were infected with it. Some one said recently that he knew of growers who, last year, lost as high as 1200 out of 1500 chicks hatched. I count it absolute folly even to hope to succeed with poultry under such conditions; and as absolute folly to expect to produce good chicks from hens or eggs which harbor these destructive germs.

Several years ago, Editor Robinson, in an article on the waning health and productiveness of poultry, said that some mysterious cause was at work, lowering the vitality of our flocks in general, year by year. He seemed to have no inkling as to the real cause; but I do not think it is necessary to look farther than the unnatural conditions under which very much of our breeding stock is kept, to find this undermining cause. It is exceedingly difficult, even with the best of handling, to hold breeding stock in permanent confinement, or to raise stock for future breeders in confinement, and still to bring to maturity the best of vigorous, well-grown progeny from such stock. It means the use of every device known to make unnatural conditions to approach the natural, and, in addition, it means continued selection for vigor and constitution. Theoretically, the great "first aid to the injured" would be fresh blood from stock raised on juicy, fully nutritious range; but, practically, the fancier finds this too detrimental in other directions.

X

MOLDS, SMUTS, AND BACTERIA

Mysterious Enemies — Preventive Forethought — Using One's Records — Blocking Out a System — Aspergillosis — Breathing Organs of Fowls — Poor Curing and Mold — Handicaps of the City-bred Farmer and Poultryman — Studying ground Stuffs — Milk and Bacteria

NOT only every Beginner, but virtually every worker with poultry, meets, somewhere along the road, mysterious enemies to his fullest success. These cause him infinite anxiety and questioning. One may fight an open foe with a good will and with courage; but the secret enemy kills courage; and even hope, sometimes. These invisible foes are usually to be grouped under the three heads — molds, smuts, and bacteria. Their habits are such that they may affect whole broods, whole flocks; they may spread destruction like a pestilence, when the knowledge of a single fact might have made the worker victorious over them. Their power for wide-spread destruction rests in two items: they are invisible to the naked eye, or virtually so; and, they are often in the food.

A promising brood, with which the utmost pains have been taken, may have reached almost the age of safety, in thrift and happiness. Suddenly one or two are noticed to be ailing, and, before the owner has had much more than time to wonder what can be the trouble, nearly all are showing signs of distress. In a day, it may be, — or two days, — or a week, all have “dropped

off." It is utterly discouraging, and the chief pull on the courage is the fact that, so long as he does not know what the cause may be, the worker has no warrant that the next lot will do any better. There are so many unexpected happenings all along the way, that the poultry worker must, above all things, be a student and an observer of conditions. If he does not know, he must learn how to diagnose every difficulty that may arise. The very best teachers, full of eagerness to impart the wisdom of which they are supposed also to be so full, cannot tell him everything, in detail. A principle is worth more to him than a hundred details, if he have judgment; if lacking this, he is not the one to succeed soon with poultry.

There are many methods which can be described; good ones, and successful. Every novice asks first and most insistently for methods. It takes a big book to give methods, when a very small one would give the underlying principles. But, *after* a flock is accidentally poisoned, or is gripped by some hidden foe of which one knows nothing, neither methods nor principles are of much avail. The key to the situation is foreknowledge, and that is of no avail after the crisis is upon one. Its work must be all put in as preventive detail, or preventive principle. It is just at this point that most inexperienced poultry raisers and very many who have been in the work for years, make their worst errors; they do not exercise forethought. This seems a difficult thing to learn to do. Somehow, the experience and the advice of others who have made mistakes, cannot be adopted and adapted in advance, by learners in the way. When these later workers have fallen into

the slough, when they have made the same mistakes, then, and then only, does the advice gain the ear of the inner consciousness, so to speak.

It is just because this is the average habit of mind, that we so often say that it needs a person of systematic mind, and one who can exercise forethought, to care for poultry most successfully, and with the least charges "to experience." Consider that these are often the heaviest charges against the industry, in specific instances. These are the real cause of small profits, and of losses, when these last are met. And it is because one can go over the work and put his finger on the point of loss and failure so much better if he has kept accounts, or a diary of work, that these are urged. They are the beginnings of system; but they are not more than beginnings, *unless the worker go over them carefully at the beginning of a new season*, and find out exactly what they teach, and then take steps to do better. An irresponsible person will not, or cannot, do these things; hence, such a one is bound to be more or less of a failure as a poultry raiser.

The above may seem to be a digression. To me, it is not; because, it leads to the chief point I wish to impress, viz., the necessity of forethought. How much feed shall I be likely to want? What is likely to be the capital required for this? What is likely to be the normal loss? The normal product? Where will disease and disaster be likely to sneak in on me? In other words, one needs to go over the whole work, preferably on paper, and block out a system of handling every important item of it, remembering that, where arbitrary figures are to be used, *it is the normal*,

and not the possible, that should be taken as a basis of expectation. I saw a statement, recently, that just this fault belittles nearly all the work published from the Experiment Stations: that they are too prone to give favorable figures, but leave unnoted items of expense, such as labor, etc. Possibly the critic did not consider how difficult it might be to allow a fair amount for labor, since those who do experimental work need to have superior help (at superior prices, probably); and apportionment to specific jobs may also be difficult. In fact, it seems to be a human failing to ignore the difficulties of "the other fellow" and to look at his results only, casting upon these a very critical eye. Perhaps that is the way we keep each other in the straight line; but it does not always seem quite generously fair.

As an instance of the way the mind of the owner works, an item from a poultry periodical of the spring of 1911 may be illuminating. The breeders of one certain variety had been asked by the editor how many eggs per hen they considered a fair, average yield per year, in that variety. A baker's dozen of replies came to hand. One breeder gave himself leeway by making the output of pullets from 160 to 200; several gave 185 as the average they considered "fair"; one did not choke on 200 as his estimate of this "fair" average for the breed; and my own average, figured from all but one, which I will mention later, makes the consensus of opinion 163, and pulled down to this chiefly by the figures of one who probably estimated the pullet year from a different date, as he gave 138 for pullets, and 160 for hens. One man alone gave facts instead of estimates, stating that his entire flock of many hun-

dreds of birds *actually averaged* from 125 to 130 eggs each year. If we note also, in this connection, that the average as reported for the country has, in past censuses, lain considerably below 100, we shall get a still clearer view of how the owner's interests may influence his judgment, admitting that all have given their honest opinion.

A second question, as to when the variety reaches laying maturity, was answered so variously as to make one wonder if there were any general basis of judgment. The time given varied from "four and five months" to "seven months" and "six to eight months." Is it not fair to ask whether this is actual variation, actual guessing, or variation in habits of mind in the owners?

Or, is it pertinent to inquire whether molds, smuts, bacteria, or the scores of other differences in environment or feeding or handling, could make all these variations in results in one single point?

The great point to be made in connection with diseases due to molds, several of which are grouped as species of aspergillosis, when mentioned scientifically, is that they do not tend to yield to treatment. This means that the one way to avoid the losses which they threaten is to prevent their incursions. In nature, they fasten themselves preferably to dead organic matter, but they are very adaptable, and can exist under varying conditions. The puffball is a familiar form of fungus which takes on a dusty condition. The fungi which cause aspergillosis, though not so much in evidence as the puffballs, haunt the dusty particles which rise from musty grains, straw, etc.

In order to understand many things in reference to fowls, it is important to know something about their breathing apparatus. The more common diseases of fowls attack the digestive organs and the respiratory organs. Birds breathe faster than does man, and they have an addition to the bronchial passages in the form of air sacs. Of these there are nine, mostly in pairs, and named the cervical (two), the interclavicular (one, formed from two, originally), the anterior thoracic (two), the posterior thoracic (two), and the abdominal (two) sacs. Dr. Salmon says that these act as reservoirs of air and *feed the lungs between breaths*, thus insuring a plentiful supply of air all the time.

As fowls, having no sweat glands, cannot throw off impurities as man does, partly by sweating, the lungs, aided by the air sacs, must perform more duties than those belonging to the lungs in man. It will be noticed that these sacs, located at neck, breast (front and rear), and abdomen, and in some birds, opening even into the bones of wing, thigh, and breast, communicate with nearly all parts of the body.

Any infection which is in the air as dust can scarcely be hindered from attacking the air passages of birds. Dr. P. T. Woods says that such infective spores are found in moldy litter, in damp, swampy land, in the dust of grain, and in any land which has been heavily manured and exposed to long-continued damp or humid weather. Any one who knows farm life knows how often poorly cured straw, hay, or stalks becomes moldy in the mows and stacks; sometimes even before the shocks and cocks have left the fields where they were grown. This is a matter of weather and of curing;

which curing the weather largely controls. Even a good farmer is subject to having spoiled hay, straw, grain, etc. Not so often as his more careless and inefficient neighbor, to be sure, but every agriculturist is much dependent on weather conditions: he never controls them, although he may learn to dodge some of their vagaries. And, even after grain is garnered and threshed, it sometimes molds and heats in the granaries.

The poultryman is dependent on the farmer, the miller, the grain dealer, many times. If brought up in town, he may know absolutely nothing about all this early history of his straw and grain; nothing of the possibilities of lurking death in the litter or the grain which he buys. And, because he, too, is under the dominion of Nature's laws, the bran or corn meal which he buys may heat and mold *in his own bins*, without his suspicion of anything wrong. The born farmer learns these tricks of circumstances as he grows from boyhood to manhood; the townsman without country background may be an utter ignoramus, having not one idea about hundreds of things which are as the alphabet to one brought up under farm conditions. Points about milling, storage, handling, fanning, sifting grain and mill stuffs, must be learned by the poultryman who comes from city conditions item by item. And, in the meantime, we can only say to him: "You must be sure to buy only sound, bright grains and first-class mill products, and to avoid dusty litter."

One of the poultry periodicals published, a few years ago, a question from one of its subscribers, which startled even the M. D. at the head of the Department, seasoned by years of answering questions pertaining to

fowl diseases. Some sick birds were described as going blind; others as unable to swallow; others as thirsty and ravenous for food; some were lame, some had lost control of the legs, some were very nervous; with some there were symptoms of internal pain; some showed convulsive attacks, and some had discharges and cheesy swellings of eye, nostril, and mouth. Let me hasten to say that such aggregated evil conditions are not at all common; indeed, they were so uncommon as to show inexcusable carelessness or lamentable ignorance, and the first thing the M. D. advised was to kill all that were much sick. Then he ordered disinfection, internal, external, and almost *eternal*, with burning of litter and change of feed. The owner confessed to feeding kaffir corn, millo maize, and broom corn seed "in all its dust and straw," and said that he had heard that broom corn dust was poisonous to human flesh when the skin was broken. The M. D. stated that the mold spores contained in the dust of the broom corn seed and straw were undoubtedly the root of the trouble, and ordered the whole outfit of unusual grains discontinued, at least for a time.

It seems to me that a majority of people are so constituted that they cannot follow directions unless they know the "why." The Beginner who can follow directions, as given by those already successful and expert, need never fall into any such difficulty as the above. But I give this instance as a striking warning not to use dusty stuff when it seems possible that the dust may be due to mold.

It is good training to visit a mill, or several dealers in mill products and study the appearance of the ground

stuffs. The bright, clean appearance of first-class ground products soon appeals to the eye. The nose may also help the eye; even the "feel" of these products is something to be learned, as having a bearing on the question of quality and adaptability of feeds. When moist mash is used, it makes much difference to the birds whether or not it is of a certain consistency. Many mill products will give only a union of grain and water, from which the water tends to separate continually. Others, added, may change it into a soft, smooth, attractive foodstuff which the fowls welcome eagerly. And these things make a difference with growth and egg yield.

Many of the symptoms of paralysis, nervous contortion, etc., mentioned above may go with bacterial affections. Such trouble may come from allowing the birds to drink barnyard seepage; even a drinking vessel, allowed to grow slimy in hot weather, may be the source of these or kindred troubles. Foul ground, foul houses, foul water, or foul feed may lead to "mysterious" disease, under some of the heads which we are now considering.

In the summer time, bran, corn meal, and meat meal need to be closely examined. The grains may heat and mold; the meat meal may be of such quality as to be entirely unfit for young chickens, even though the older birds were able to use it without becoming sick. Good scrap is bright in color, and it is usually thought best to buy that which is not too fine, lest it contain fertilizer refuse.

Milk is a well-known carrier of bacteria; milk that shows less than 100,000 such germs to the cubic inch being passed as very good by some Health Boards.

These bacteria are vegetable growths, and they are of two kinds: noxious, and the reverse. At least, many claim that only the real disease germs are noxious, in milk. There is nothing better for poultry, both old and young, than good milk; but where milk is given as a drink, in hot weather, special care is necessary. There is nothing else, I think, that will become filthy and evil-smelling as quickly as a milk fountain that is not regularly cleansed, unless it be the ground about it, where the birds drip the liquid. The vessels should be made as clean as for the table, twice a day, in hot weather. The ground should be spaded at once, if it becomes foul, and a broad fountain base to catch leakage or drip is a wise precautionary supply. An old pie-plate will do the work, if nothing else be available.

Although it is contended that there are several forms of "white diarrhœa," the one discovered by Professor Rettger, working with the Connecticut Experiment Station, may possibly deserve more than usual notice by chick raisers, because the source is affirmed to be the mother hen. The Station work in 1910—the data being published in April, 1911—covered one set of comparative experiments, in which 200 chicks, hatched together, but part purposely infected with white diarrhœa, were used. It showed both the virulence of the disease and the vigor of uninfected chicks. All were incubator chicks. Division was into three infected lots, and three check lots, uninfected. One lot was infected from a chick that had died from white diarrhœa; one from an infected hen; one from the yolk of a fresh egg. Two of these cultures had been carried over from the previous year. By the fifth day, 14 in one lot were already dead. At the

end of 25 days, 71 per cent of the three infected lots were dead, while the survivors were stunted and anæmic. In the three lots of uninfected chicks having the same care, only four out of the hundred had died. One inference from the above might be that it is unwise to feed egg to small chicks in yards where white diarrhœa of this type is prevalent.

XI

MEDICINES, DISINFECTANTS, AND INSECTICIDES

Household Remedies for Poultry — Packaged Supplies — Cleansing, While Nature Repairs — Discharges and Protrusions — A Spraying Paint — An Incubator Disease — “ Always at It ”

It is far better not to need a medicine chest than to provide the very best that could be thought out. But, human nature being what we know it to be, we can easily foresee that the average worker will not fail to need medicines at times, even though the times be infrequent. The poultry keeper who can learn to use his household remedies will be in a measure less dependent than one who buys medicines especially put up and specifically offered to poultrymen. This is partly because modern “ specifics ” are rather likely to be old friends under new and strange names, with 50 per cent to 100 per cent added to the price, — to pay, I judge, for the making over. This means that kerosene, or gasoline, made into Robinson Crusoe’s Lice Paint with the addition of something equally cheap, then canned, may appear as a most valuable poultry supply at one dollar or one dollar and a quarter a gallon.

Or, take our somewhat intimate friend, tobacco dust ; or perhaps plaster of Paris. Juggled and combined a little, they come out in the open and claim to be one of the necessities of the poultryman’s existence, at 25 cents or 50 cents for a little box holding it may be three or four

ounces. Egg Forcers, too, follow the rule: cayenne pepper, linseed meal, and a few other of our old friends, with, possibly, gunpowder and Spanish flies — who knows? — masquerade as a new and wonderful Egg Food.

Expenses for boxing, labeling, and advertising new supplies must be met, and a reasonable profit added, of course. This is perfectly legitimate, and there are many business men handling poultry for pleasure or to provide fresh supplies for the family table, who are glad to pay the manufacturer for doing the detail work of making supplies of all kinds ready for instant use. But one should consider that this work must be paid for, and that the smaller quantities one buys, the more he pays in proportion. Clover which may sell for six to ten dollars a ton as hay, becomes "clover meal," or "cut clover" at two dollars a hundred. The disinfectant that started at six dollars for five gallons, becomes \$1.50 per gallon, and 50 cents per quart. This is the common way of trade, and is to be expected; but it is wisdom on the part of those who must make money from their poultry, to do a bit of figuring on these things; because, the price of the disinfectant, above, is, proportionately, above 60 per cent more in the smallest lot named than in the largest. With few fowls, it is not wise to buy in the large quantities; but there are preparations equally good that can usually be made at home at very small cost, provided that one's time be not too valuable.

The diseases commonest among domestic birds are those affecting the liver, the bowels, the head and throat, and the egg organs. Among these, all but those of the

head and throat may be induced by wrong feeding; and even the last may be brought on by wrong handling. The liver, the bowels, and the egg organs are, however, subject to diseases which may pass from fowl to fowl in the flocks. Dr. Salmon has stated his belief that even inflammation of the oviduct, resulting in clusters of eggs looking as if cooked, and ruining the bird showing the difficulty, is contagious, or may be so.

This brings us to the consideration of disinfectants. More and more, everywhere, the medical profession is leaning on disinfectant treatment, — just careful cleansing, while natural forces repair the difficulty, whatever it may be. Most of the disinfectants in use in poultry yards at the present time are closely related to one another. The intestinal disinfectants recommended by Dr. Salmon are naphthol, benzonaphthol, betol, and salicylate of bismuth, the dose of each being named as one half to one grain for a full-grown fowl. Speaking of "blackhead" in turkeys, which, though beginning in the blind sacs and affecting the liver, may yet rank as an intestinal disease, he urges that all the turkeys on the place should be killed, disinfection in general being confined to the runs and ranges. But he says that if internal disinfection is attempted, hyposulphite of sodium may be useful in doses of two to four grains, or betol in one-grain doses. Or, sulphur, ten grains; sulphate of iron, one grain; sulphate of quinine, one grain. This last is very often a friend to the poultryman, especially in cases of cold and roup.

There is a list of nearly forty species of worms infesting poultry. Dr. Salmon calls turpentine an excellent remedy for "all worms which inhabit the digestive canal"

of domestic fowls. It may first be tried, one half diluted with olive oil. If failing in its object when thus administered, it may be given pure. The dose of turpentine is from one to three teaspoonfuls. Fortunately, worms in fowls are not very common, although most poultrymen have them to contend with at some time, if they keep fowls through many years, and especially if many are brought in from outside. One who buys eggs is a little safer from such troubles. If worms appear, the safest and quickest treatment is to destroy all affected fowls, and to disinfect the runs thoroughly.

It is, as a rule, useless to treat any difficulty with the egg organs, unless it may be those which come from abnormal laying, or from the attentions of the male. External swellings at the vent, mild discharges, and protrusions may be treated with disinfectant oils. Any of the tar products are good, or the petroleum residues. When I chance to have zenoleum on hand, I use that, and find it very good. Any of this class, related to carbolic acid, or phenol, is likely to be good and effective, wherever a disinfectant is needed. Internally, or on raw surfaces, they must be well diluted, as noted above. A further word on these will come in when we consider insecticides.

In treating diseases of the head and throat, the story of disinfectant treatment is repeated once more. The liquid roup cures and the washes that are used are commonly muriatic tincture of iron, permanganate of potash, or dissolved copper sulphate or peroxide of hydrogen. The last two excoriate harshly, and the fowls struggle and suffer much. Dilute peroxide—to one half—is better. I have found tincture of iron most satisfactory,

painting it on the cankers, if the disease has reached this stage. If not, I use one or two grains of quinine to a fowl, or aconite and spongia in the drinking water. A dozen homeopathic pellets of aconite to a quart of drinking water, given early in the attack, may ward it off very promptly.

Good poultrymen everywhere rely less and less on medicines, but more and more on prevention and disinfectants. The chief means of prevention for this last class of diseases has been the open-front poultry house. In such houses, diseases of the breathing organs are not common. Sunshine and fresh air, here, as everywhere, are Nature's best simples.

Disinfectants to be used to ward off vermin may be considered a necessity to every poultryman. He who is most cleanly and who uses the most dry earth, kainit, etc., on the droppings boards, will need the least insecticides. Time, money, and work in incredible proportion will be saved by using these aids as preventives. It is rather easy, by spraying roosts once a month in hot weather, and once in two months, possibly, in the colder months, to keep the houses entirely free from the red mite (which is gray or brownish when not gorged with blood), one great foe to successful poultry raising. If lice paint be used for this spray, the larger lice which infest the fowls under the feathers will also be destroyed, as the fumes of these sprays are fatal to the vermin.

A paint, or spraying material, of this sort, much used, is made by dissolving a pound of naphthalene flakes in one gallon of kerosene. After it stands a day or so, with occasional shaking, it will probably be in good condition to use. Fowls, and even chicks, may be treated by

painting a box on the inside, and placing them in the box, with a burlap bag thrown over all. But close attention is necessary, to see when they have had enough. A prominent turkey raiser treats the mother turkeys after this manner when taking them from the nest, before she allows them to be cooped with their broods.



The Best-Medicine Chest : Nature's Own Disease Preventives and Cheap Disinfectants, Sunshine, Air, Earth

Twenty minutes of this insures that the lice on the mother shall not, later, pass to the younger, choicer hosts, the tender poults.

A large handler of poultry supplies in this country puts himself on public record as believing white diarrhoea to be "an incubator disease." By this, he means that it is due almost wholly to incorrect conditions surround-

ing the eggs while under incubation. As the members of this firm have handled incubators and incubator chicks during many years, and have given their utmost study to the conditions belonging to artificial hatching, one may not carelessly deny their conclusions. These people say, cleverly, that a pullet represents the combination of a small chicken, a large quantity of feed, and a few other conditions. They are willing to go on record as saying also that bowel trouble with incubator chicks is unknown "unless heat goes wrong in brooders!" Lining this up with the statement about an incubator disease, we begin to feel that both incubators and brooders will "bear watching," even after we have used our best judgment in selecting the right make of machines.

Some one says that the poultryman who would fight vermin successfully must be like the lice themselves, "always at it"; which is by no means a bad way to bring to our minds the fact that this is a war in which there is "no discharge." However, with systematic use of the disinfectant "paints" and careful whitewashing of inner walls, one may come out victor, and not work half so hard as he must needs if he neglect things till the legion foe get the start of him.

XII

METHODS OF CIRCUMVENTING VERMIN

Protecting One's Enthusiasms — A Poultryman's "Inspiration" — Roving Vermin — Rats — Items to be Noted — Before — Or After? — Man's Age-old Enemy — Rat Harbors Mean War on the Chicken Yard — Government Bulletin on Rats — A Plague of Mice — Mice and the Poultry Keeper

IN the winter of 1910-1911 I wrote to an egg customer of the previous season, who had bought 24 eggs for hatching, to see if I could buy any of his ducks from these eggs. His reply was, "None to spare; owls, rats, polecats, and minks left me but three." I knew, too, one family of Beginners in poultry raising who spent nearly two years in repeated efforts to make the poultry houses on their newly bought place rat-proof. A woman poultry raiser wrote me the details of a fierce fight against mites "in piles," which had gained a hold before being discovered. She reported a victory in sight at last, but added, "I shall never again have the same enthusiasm for poultry raising."

Enthusiasm is a compelling factor in any business that is to be successful. Therefore, it is the part of wisdom to protect one's enthusiasms from needless chilling. The most abject failures follow the loss of that kindling enthusiasm which leads to good work. Thus, it is only good sense to guard against anything that may lessen enthusiasm, even though your practical man will sneer at enthusiasms as illusory.



Apple Tree. Bark Showing Much Injury from Meadow Mice.

In order to be an enthusiastic poultry raiser beyond the beginning, then, it will be necessary for you to keep your poultry houses and coops clean, lest you entail disease; sprayed against the small vermin such as lice and mites; close-netted against roaming vermin—weasels, minks, cats, and even the neighbor's pet dog.

If you station the coops near a hummocky swale, there is danger of minks, etc.; if too near a forest, owls and hawks and crows will demand, and will take, a toll; if near a highway, vehicles and dogs must have their chance at your pets and your profits; if too near infested barns or rubbish-heaps, rats will eat and foul and waste the feed if it be openly free and plentiful, or devour your eggs and chicks if the grains are safe in tin-lined bins. 'Possums will have a try at your dainties in the way of eggs, etc., even if they have to enter the houses to get them. Polecats know the juiciness of young chicken meat, and the fox and "the little rid hin" have always been at polite loggerheads.

Fortunately, few are likely to have to contend with all these trials; still more fortunately, none *need* be subject to their depredation, if he work his wits hard enough in advance. I don't know who it was that said, "Inspiration is perspiration," but inspiration and most other things are perspiration to the commercial poultry raiser! Even fretting will induce perspiration, at times.

Early in the year 1910, a city woman established herself in the country, just between the places of two old hands at poultry raising, as it chanced. She was full of original ideas. She lectured by the hour on the *true methods* of making money with poultry (original ways, of course) and generously instructed the two hard-



"Inspiration Is Perspiration," whether painting the Home-made Weaning Coop, or Knocking Together the Feeding Crate at the Left. Small Chicks Can Feed Safely under this Crate

headed ones on either side. She told how to handle incubators, brooders, laying hens; discoursed on the painful sickness of the sitting hen,—wrapped in such a high fever,—and radiated wisdom in general. Fate was most unkind to her, after all this generosity, and, during this particular season, all her enterprises were hounded by “ill luck.” Just as the early chicks were getting a fine start, a trio of neighborly cats, jealous, possibly, for the laurels of the neighborhood, attacked a brooder run in the daytime and took, at one clip, fifty of Miladi’s up-to-date youngsters! After the Arabian was purloined, they locked the door to his apartments; this tells the whole story of loss by vermin. Which is better, poultry keepers all, to pay out good, hard moneys for concrete and lumber and wire netting to make things shipshape and safe; or to pay out 25, 50, or 100 chicks “on account” (of experience) and *then* go and buy the lumber, etc.?

TABLE OF ITEMS FROM EXPERIENCE

Item I. Look out for the Family Cat!

Item II. Look out for Rats and Rubbish Piles!

Item III. Look out for Fox Terriers, which are “Fly By-Nights!”

Item IV. Look out for Crows, Hawks, and all the Woods Haunters!

Item V. Look out for Minks, Weasels, Water Rats, and all the Water Vermin.

Item VI. Look out for Mites and Bedbugs and all House and Roost and Nest Vermin!

Item VII. Look out for Head Lice and Vent Lice and Wing Lice and Thigh Lice and Feather-eating

Lice and all the Body Vermin, including Fleas, Chigoes ("jiggers"), and What Not, especially the "What Not," because that includes all that we are not usually looking out for!

"Before"? or "After"? Friend, which is it to be? "Before" means coops full of thrifty chicks, "luck" galore, and enthusiasm unbounded as to the future of poultry.

"After" means small bunches of ailing chicks, discouragement, losses inexplicable of chicks and fowls, losses of enthusiasm and a pessimistic outlook on the future of poultry (with a very small *p*).

You who read — do you think you are clever? Do you believe in yourself as a good business man — or woman? Do you think it reasonable to believe that the "billion-dollar" poultry industry of this country is carried on at a loss? Is it safe to wager that *you* can come out even with the average of your more than five million competitors, in a fair field and with no favor? So?

Well, then, what about the rat? An article in one of the great magazines during 1910, entitled "Our Duel with the Rat," made the statement that the rat was the only living thing against which men had made no perceptible headway, and more than hinted that it is to be a duel between man and the rat for the possession of the world.

I have seen a more recent statement that the family cat destroys more chickens than ALL other enemies taken together! Many of us may doubt this. But, as to the rat? Which is the worse, both being so guiltily guilty?

An exultant letter received from a farm on the day



This Species Is Infrequent and Does Little Damage. As Shown Is about One Eighth Natural Size

of this writing, says: "One of our cats is the greatest ratter we ever saw." Were she yours, would you keep her, as being the lesser of two evils? I have known one cat, with five kits to feed, to kill \$75 worth of fine poultry in a single season.

This, as other questions, narrows finally to man's understanding of the animals under his care. For, if he understands their nature and habits of "mind," he can usually bend them to his will. A good mouser and ratter is not so likely to need to catch birds, but it may be that the hunting instinct is strong. Nevertheless, a hunting kitten *can be taught that the chickens are under the protection of her master, just as she, herself, is.* A few sharp scoldings, or a drubbing, if need be, will grave this lesson on her consciousness. Then, with proper care, she will be all right. But if you feed her chicken heads and waste, how can you wonder, and why should you — *how dare you* — complain if she goes farther and takes the bodies also? If you allow your hens to lay soft-shelled eggs which break easily, how dare you blame them for becoming egg eaters? Look to yourself, dear Sir — or Madam. Is not your judgment given you for the very purpose of helping you to avoid such obvious errors, and *to fix your dominion over the lower animals?*

The rat, however, is in a class by himself. He is an enemy to man from the ages. And, now that we know that he carries and distributes the dreaded bubonic plague throughout the world (even crossing the ocean with it, as a stowaway), and has passed it on to the squirrels in some places, we need to impress it fully on our minds that he is an enemy to be feared and fought to the finish. The extreme suspicion and the intelligence of the rat

make him difficult to deal with, but he has a weakness : more than aught else he seems to fear the place where rats die, or disappear, or where things are torn up and topsy-turveyed. He can be fought on this basis.

He can be fought on the basis of prevention, and the cities are being called upon to unite in such warfare. We need to deal with him always on suspicion, even as he deals with us. We need to clear up every harbor of boards or rubbish heaps or tumble-down buildings. The rat *must* hide ; this is our cue. We need concrete floors and foundations which he cannot penetrate. We need to fight him in advance, everywhere and always.

The necessity for extermination of the rat has recently become so grave that the United States government has placed its immense prestige behind the movement. Several countries have made efforts along this line, but without wholly satisfactory results. It is evident that *international* coöperation will be necessary to handle this small but shrewd and vicious enemy to mankind. One of the first undertakings urged is the "rat-proofing" of all buildings within city limits. It is to the seaports and cities, largely, that the outlying towns and the country places owe the plague of rats. Yet the cities alone cannot now deal thoroughly with it. If the cities kill, as San Francisco, in her extremity, did, the country is saved. But if the cities drive out, without killing, the country places must suffer from this action. It is evident that every individual must add his effort at extermination. The rat-proofing of granaries has long been a necessity for the farm ; not so, apparently, the rat proofing of grain barrels and bins. These should not be neglected. The hopper feeding of poultry, so

popular of late, works in the direction of helping the rat, unless the rat-proof hoppers are provided. Sheet metals, or papers made poisonous or repellent may be used. In feed alone, the rat causes world losses of millions of dollars in value. In old-world cities it has caused the loss of many thousands of lives. And in our own western borders, many thousands of dollars were spent to free us from the plague which had found an entrance, and was being distributed by these vermin throughout all the burrows and cellars and refuse piles in the great coast city. When it had come to a choice between the wholesale destruction of either the people or the rats, the most expert plague authorities in the country took the matter in hand.

Perhaps the keenest interest, just now, lies in the bacterial preparations being widely advertised. In 1909 the government put itself on record as having found these not sufficiently effective. That is, "when fresh and virulent," they will kill most of the rats which really eat the baits; but the infection passed on to others is on too small a scale to be considered a reliable means of rat extinction.

The two chief points made by the government authorities, with reference to keeping down the plague of rats, are the necessity of denying them harborage and the equal necessity of destroying their food. In the cities, garbage, and especially kitchen refuse, is said to be the chief source of food supply. In the country, particularly on poultry farms, it is the feed bags and barrels and hoppers left ready to their taking of the contents. Even without these, there would remain the unhoused grain and the insecure chickens.

And, if the ground squirrels take (as affirmed) a \$10,000,000 annual toll from the farmers, who can estimate farm losses from the ever-present rats?

As respects the poultry keeper, it is not going beyond the limit to say that the presence or the absence of rats may alone decide whether he make a profit, or suffer a loss through his venture. Margins everywhere are small, and losses from depredations of various sorts, infinite in number, though each one may be a bagatelle. I cannot be too insistent that the Beginner train himself, from the earliest minute, not to permit rat harbors, and not to leave the feed so that these vermin can maintain themselves at his expense, later to steal and kill — perhaps worse — also at his expense. Cornell Station has a pattern of a rat-proof hopper for feeding small grains or dry mash, and I think supply houses carry a somewhat similar one for sale.

A United States Bulletin can be had, covering all the points on which information is usually desired. In localities where rats or squirrels have become a scourge, the Biological Survey will, whenever possible, send a skilled assistant to demonstrate the most reliable ways of ridding the land of these pests. Poisoning with barley and strychnine is one of the modern, most approved, methods of destroying rodents.

There are two points in connection with field mice that may make it imperative for growers of birds to study and to fight these also, insignificant although most people may regard them as being. Plagues of lice, grasshoppers, ants, and mice have abundantly established the fact that nothing is too small to become a menace to man, if its aggregate numbers increase suffi-

ciently at any one point. And plagues of mice have long been known in the older countries.

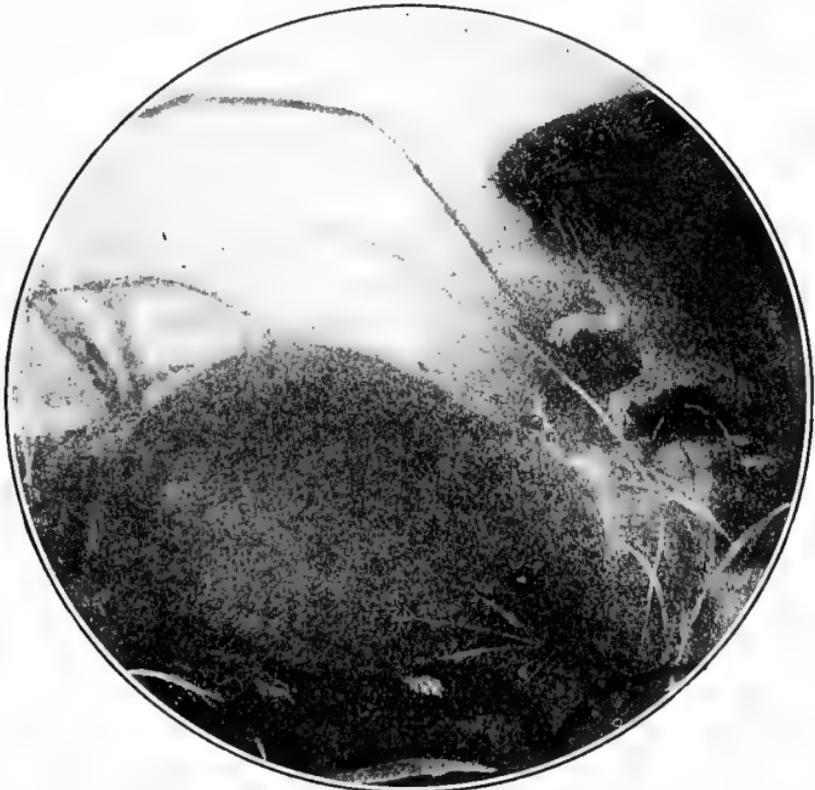
The two points to which I wish to call attention are the fouling of grain feeds for pigeons, by the excreta of mice, making the food actually poisonous, and the fact



Alfalfa Field Ruined by Field Mice (Department of Agriculture Year Book)

that scourges of field mice, counted "among the oldest and most disastrous known in history," destroy vegetation almost completely. "Pasturage, hay, alfalfa, clover, grain, — whether growing or stacked, — vineyards, shrubbery, and even forest trees have been destroyed." This hits the poultryman at a vital point, especially in the alfalfa country. During 1908, according to the United States government Report, a species of mice

infested the alfalfa fields to such an extent, in a portion of the state of Nevada, that 15,000 acres out of 20,000 were a total loss. The government was obliged to take



The Destructive "Carson Meadow Mouse," a Plague of which in 1907-8 Ruined Alfalfa and Potatoes, severely Injured Beets, Carrots, and Fruit Trees. Poultry Depends on all of These

a hand in the destruction of the field mice, reported as reaching "the astonishing total of 12,000 to the acre."

The farmers found out their debt to some other friends at this time: hawks and owls, gulls, herons, ravens, skunks, badgers, weasels, foxes, and coyotes

assembling in the valley and killing "at least 45,000 mice a day." The Survey came to the rescue in this plague experience. The Department Report for 1908, which tells the story, declares: "Poisoning is the most generally applicable, cheapest, and most certain means for controlling mouse plagues at present known." It also recites the various methods of combating the plague, poisoned green alfalfa placed in the runs and burrows being "fatal to practically all the mice, in the areas treated." As field mice produce, annually, from two to six litters, which may average six, running occasionally to a dozen or more, the early young breeding, probably, the same year, the danger of overmultiplication is always near. The United States government has consistently favored holding Nature's balances, as far as may be, arguing that the few chickens which roving vermin may kill are nothing as against the losses that may follow the persistent destruction of the predaceous birds and mammals, whose chief food is worse enemies of man. Concerning large enemies of mice in the incident reported, the report says that probably 3000 of these appeared in the valley during the mice plague, and adds: "It may be assumed that these 3000 natural enemies would each destroy an average of 15 mice a day, or 450 a month, or collectively would kill 45,000 mice a day, or 1,350,000 per month. *This number, vast as it is, is far too small to put an end to a well-established plague, although more than ample to check a plague during its early stages, or to completely wipe it out after the numbers have been materially reduced by poisons or other agencies.*"

What is known as "the plague mouse" almost always

belongs to a genus known as *Microtus*, of which fifty species inhabit the United States, and some one of these may be found in practically every part of our land. Their estimated annual damage is \$3,000,000. But the indirect damage of mice plagues, as affecting poultry raising, etc., through the feed might be impossible of computation. Most of these mice are short and chunky, with short, round tails, short ears, rather small eyes, and short legs. The cut of the Carson meadow mouse (the one fought in Nevada) well shows their characteristics.

XIII

TYPES OF MODERN HOUSING

A Common Type — The Preferred Lumber — Lengthening the Life of Materials — A West Virginia Experiment Station House — A Deep, Shed House, Colony Type — A Broad Construction Principle — Shelters for Hot and Cold Climates — Layers in Weaning Coops

It is deemed far from desirable to give a long dissertation on building and many plans, when there are several hand books at twenty-five and fifty cents each, and bulletins from the states interested in poultry, treating this subject at more or less length, and in full detail. Two or three plans which have been used, and which show modern tendencies in poultry housing, will be all that any poultryman will need.

A very common and satisfactory type of house, especially in New England, is nothing more than a double, equal pitch shell, ended toward the south, and having this south end open, or screened with wire or net, inside of which is a curtain. This is dropped only when the owner thinks it necessary; the less the better, as a rule. This curtain may be on nice, shipshape frames, hinged, and opening inward and upward, or may slide to the right or left on rings and wire, or it may roll up on a light pole run into a wide hem at the bottom, as the poultryman pleases.

The dimensions, 10 feet \times 16 feet, use lumber to good advantage, and a house of this size costs less in proportion than a smaller one. If built permanently, this is a good size. If you like to have a movable house,

built on skids, to be used as a colony house in summer, the units drawn together in groups for easy care in winter, 8 feet \times 10 feet is more desirable to handle, as it will not rack so much with moving, and is not so heavy. This size, too, cuts well without waste.

PORTABLE HOUSE IN USE AT WISCONSIN STATION (See Bulletin No. 215)

This portable chicken house is designed for small flocks and will accommodate ten to a dozen chickens. This is 6 \times 8 feet, boarded horizontally. The portable house is covered on the exterior with tar paper, which is put on up and down, all joints being cemented. Over each joint and also between, nail a $\frac{1}{2}$ \times 3 inch strip to prevent the paper from working in the wind. The door has a screen wire covering for daytime and a hinged cloth screen to cover the wire screen at night. The roost is movable and is placed 14 inches from the ceiling. Four skids of 4 \times 6 inch material running lengthwise of the building on which the floor rests, make a ready means to move the house from one place to another.

BILL OF MATERIAL FOR THE PORTABLE HOUSE

Hemlock may be used instead of pine, if kept well painted.

Roof, Sides, and Dropping Board—

250 board feet of 8-inch shiplap, No. 2 pine.

Floor—

54 board feet of 6 inch matched fencing, No. 2 pine.

Cornice Fascia, Dropping Board Frame, and Window Casings—

4 pieces 1 \times 3 inch, 16 feet long, No. 2 pine.

Rafters, Studding, Skids, and Girts—

7 pieces 2 \times 4 inch, 12 feet long, No. 2 pine.

4 pieces 2 \times 4 inch, 10 feet long, No. 2 pine.

2 pieces 2 \times 4 inch, 16 feet long, No. 2 pine.

11 pieces $\frac{1}{2}$ \times 3 inch, 12 feet long, No. 2 pine.

Miscellaneous—

One 6-light sash, glass 8 \times 10 inches.

One double roll 2 ply tar paper, 216 square feet.

Eight square feet poultry netting, 1-inch mesh.

Three strap hinges 4 inches long.

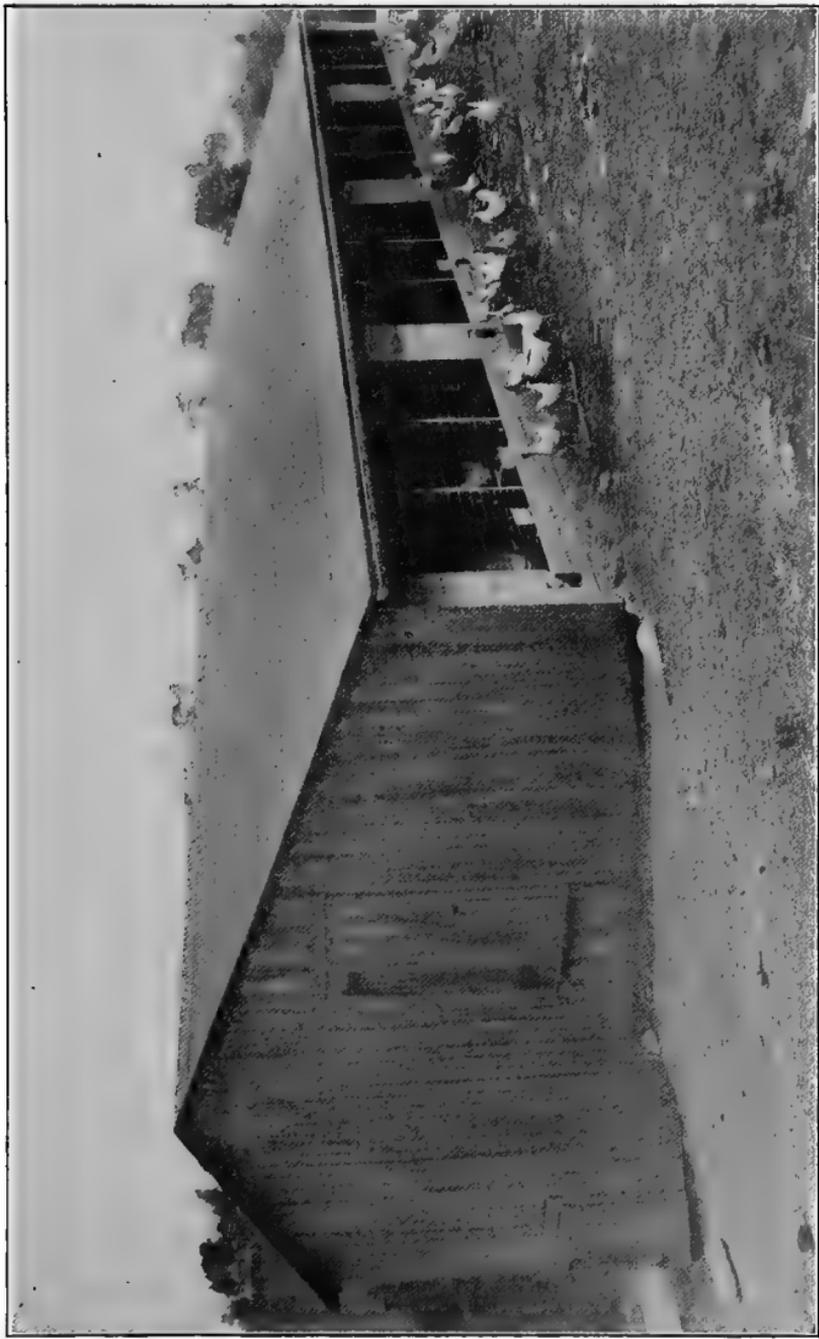
One hasp and staples.

The kind of lumber used must depend on circumstances. Hemlock is often the most available and the cheapest. If dressed on one side, the smooth side should be laid to the inside of the house, when covering with patent roofing outside. Pine, cypress, locust, poplar, all come into play in different parts of the country, cheapness and lasting quality being desired. All exposed shingles or underground pieces may be saturated with one of the coal oil products before using, to lengthen their normal life. As years pass, one half the expense and loss may be saved thus. In our locality, no one puts anything but chestnut into the ground. The chestnut blight will doubtless settle that. But, in my opinion, a cheap post, dipped, is equal to a high-priced one, undipped.

Because a very large proportion of the poultry work of this country is carried on upon soil which is distinctly unfavorable, I think it wise to speak strongly here. Dampness is a fatal fault in a poultry house. But when conditions are difficult to change, men put up houses on damp ground, without board floors, and thus base their work on a crucial blunder. Because Professor Halpin has put this point well and with reasons, the following quotation from Bulletin 215, Wisconsin Station, is given here: "A damp location means a damp poultry house all the way through, and the result is that the fowls are affected with many troublesome diseases. Damp ground that is likely to remain muddy around the house is not satisfactory, because the hens' feet become soiled and, as a consequence, the eggs and nests become dirty, and dirty eggs are unattractive on the market. If cleaned, a large amount of labor is necessary, and with the best of care, cleaned eggs never look

so well as eggs that have never been soiled. When hens run at large on wet ground, the litter on the floor of the house soon becomes dirty and wet, thus making a very unsatisfactory place for feeding. The ground out of doors is also unsatisfactory for feeding, as wet ground soon becomes filthy and the filth sticks to the feed, making it impossible for the hens to pick it up without consuming more or less filth. Ground which is naturally wet is cold in the spring. It is also slower to become aerated, and holds filth on the surface much longer than dry ground."

Many of the Experiment Stations favor the portable house, especially for growing stock. Virtually, the portable colony house is the same as if one built a poultry house on the old type of long farm sled as a foundation and floor. Sometimes the "runners" are made of two pieces each. A "three-by-four" might have spiked to it on the under side, a three-by-three, or a three-by-two-inch piece, the latter to be replaced whenever it rots or grows too punky. This method adds much length of life to the house. Such a house needs to be well braced, and not too large, as the large houses would be racked too much in moving. For the farm, it appears to me that this house is to be preferred to all others, for small flocks. It need not even be floored, where the soil is dry and sandy, or where it is in use only in the dry summer seasons, for growing stock. If for use in windy situations, or in winter, it needs some method of closing the space between the runners, at the rear. I think a drop board tightly fitted, and furnished with hooks to fasten shut, or open, as desired, might meet this need.

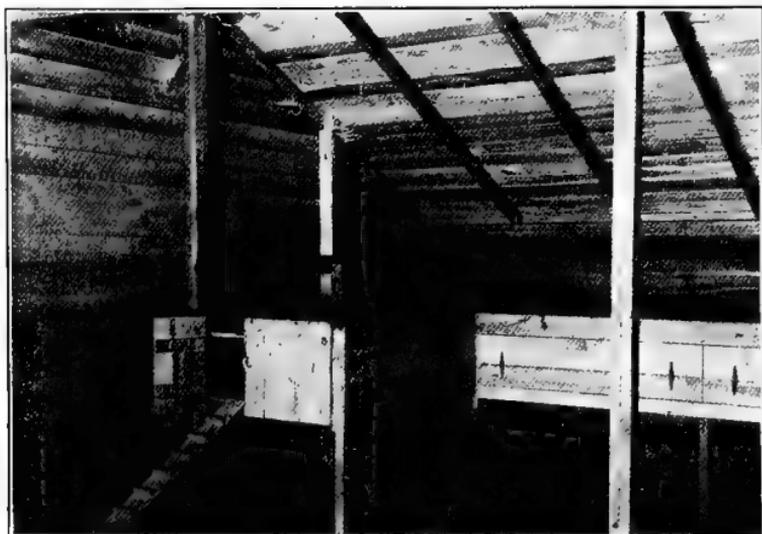


Adapted Tolman House, West Virginia Station, Front View

The West Virginia Experiment Station was one of the earliest to show especial interest in poultry. For many years, Professor Atwood has been working steadily at poultry puzzles. I think he was the first to insist that eggs should be weighed at intervals during incubation, in order to determine whether or not the air moisture were sufficient. Although not much attention was given his views at first, the general trend on the moisture question is bringing the people who study these questions in the direction of his thought, and they are discussing it with more appreciation now than at any previous time. The West Virginia Station has put out a Bulletin of Poultry Housing, by Professor Atwood, which consists largely of the description of an open-front laying house, which, he says, is well adapted to West Virginia conditions. It is really a multiplication of the Tolman unit; that is, several Tolman houses under one roof, this being a long house, while the original Tolman house is a colony,—or detached house. The vital characteristic of this type of house is that, having an open front, and discrediting the use of curtains, it theoretically banks or traps the heat under the ridge, and places the roosts so that the hens get the benefit of this at night. This is attained by making the roof of unequal double pitch, the front portion being much the longer, and thus sloping to an unusually low front plate. To offset the sunshine lost in this way, windows are commonly placed in the east and west walls.

The photographs give a good idea of this "Tolman Long House" if we may so call it; this adapted Tolman House. The front is of wire netting only. The house

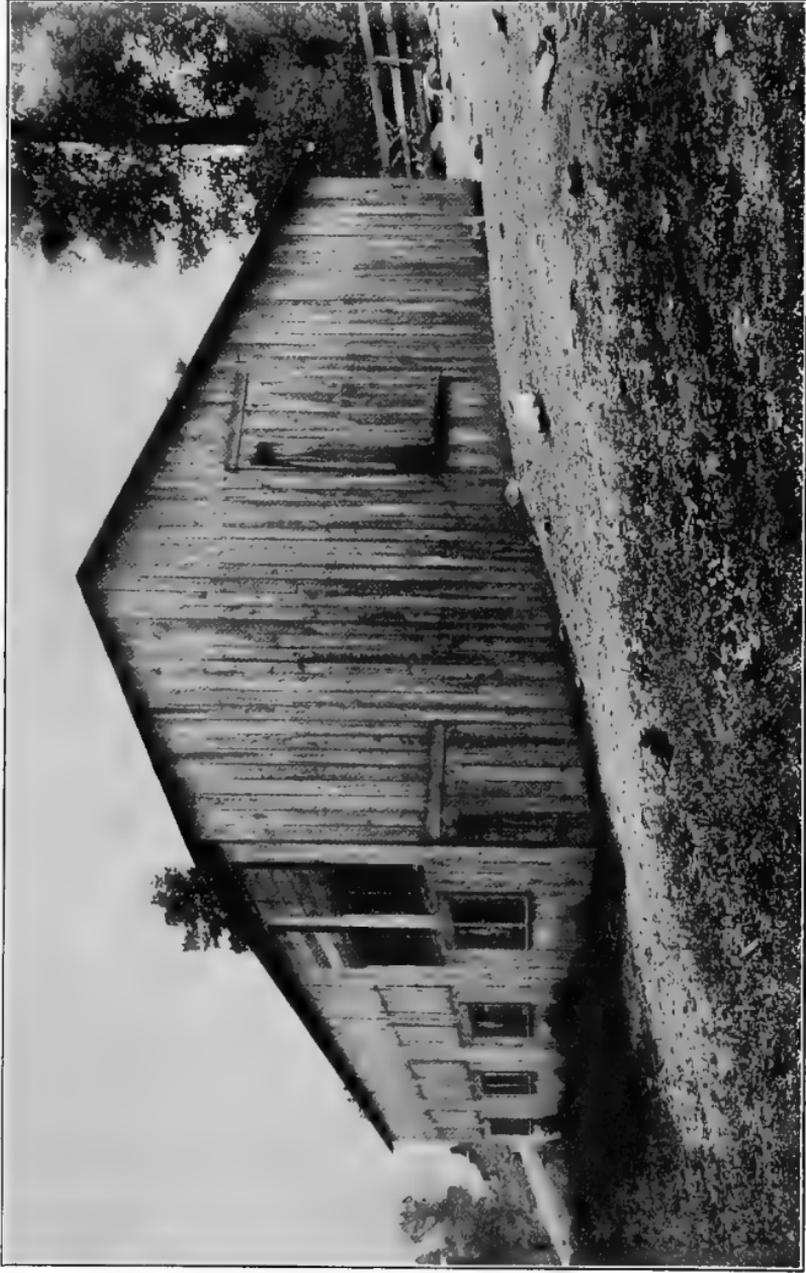
is unusually deep (24 feet), and its 64 feet of length is divided by solid partitions into four sections, 16 feet each. It is 5 feet in height at the front, and one foot higher at the rear, the peak of the roof being one third the distance from the back, and $10\frac{1}{2}$ feet above the floor. The ground, in this case, sloping toward the north, a scratching room is provided below the main



Roost Platform and Nests, West Virginia Station. Between the Nests are Two Platforms

room, reached by a trap. This has a dirt floor. The nest boxes, as will be seen from the cut, are placed between two board platforms, with a hinge door in front for easy access, and a ladder for the hens to reach the nest platform. A house like this necessitates strict watch for mites, which choose the neighborhood of the roosts as their chief haunt.

For ventilation during the summer heat, two doors



Rear View of West Virginia House, Showing Scratching Room Below, and Ventilating Doors under Roosts. (Photograph by W. E. Ramsey)

are placed in the rear wall of each room, under the nesting platform. This gives free sweep for air across the pen below the hens, at night. At zero temperatures, even White Leghorn combs do not freeze in this house, the front being constantly open. A year's use has proved the house satisfactory. Being built by contract, of locust, poplar, and hemlock, with yellow pine for roof sheathing and flooring, it cost \$450, and gives comfortable quarters to 400 Leghorns. This is about \$1.12 per hen. The main floor gives nearly four square feet per hen, and the birds have, in addition, the equal floor space below. Poultrymen, as a rule, abominate an arrangement like this, which has not head room for an attendant, but it gives extra space without much extra cost.

A duplicate of the Bill of Materials is given below; for one section only:—

BILL OF MATERIALS FOR MODEL POULTRY HOUSE. ONE SECTION ONLY, 24' × 16'

- 6 pcs. posts, 6" × 2' 6" locust.
- 3 pcs. posts, 6" × 3' 6" locust.
- 3 pcs. posts, 6" × 4' 6" locust.
- 11 pcs. joist, 2" × 8" — 16' 0" long, hemlock.
- 11 pcs. joist, 2" × 8" — 8' 0" long, hemlock.
- 9 pcs. sills, girders, etc., 2" × 8" — 16' 0" long, hemlock.
- 14 pcs. plates and joist bearers, 2" × 4" — 16' 0" long, hemlock.
- 40 pcs. studding, etc., 2" × 4" — 12' 0" long, hemlock.
- 9 pcs. rafters, 2" × 6" — 18' 0" long, hemlock.
- 9 pcs. rafters, 2" × 4" — 10' 0" long hemlock.
- 50 ft. b. m. patent siding, 5" face, poplar.
- 700 ft. b. m. shiplap, 5" face, poplar.
- 600 ft. b. m. roof sheathing, 4" common No. 2 y. p. flooring.
- 350 ft. b. m. double surfaced y. p. ceiling, ½" × 4" No. 2 com.
- 600 ft. b. m. flooring, matched y. p. ¾" face, No. 2.

- 75 ft. b. m. ceiling, $\frac{5}{8}'' \times 3''$ matched and beaded, y. p. No. 2.
 2 pcs. $\frac{7}{8}'' \times 10'' - 16' 0''$ long, S-4-S, poplar, feed trough.
 1 pc. $\frac{7}{8}'' \times 4'' - 16' 0''$ long, S-4-S, poplar, feed trough.
 1 pc. $\frac{7}{8}'' \times 7'' - 16' 0''$ long, S-4-S, poplar, nests.
 4 pcs. $\frac{7}{8}'' \times 5'' - 10' 0''$ long, S-4-S, poplar, nests.
 1 pc. $\frac{7}{8}'' \times 8'' - 12' 0''$ long, S-4-S, poplar, gangs.
 2 pcs. $\frac{7}{8}'' \times 5'' - 12' 0''$ long, S-4-S, poplar, gangs.
 1 door frame, $2' 10'' \times 6' 0'' - \frac{1}{2}'' \times 1\frac{3}{4}''$ rebate strip, poplar.
 1 door frame, $2' 8'' \times 4' 0'' - \frac{1}{2}'' \times 1\frac{3}{4}''$ rebate strip, poplar.
 1 door frame, $2' 11\frac{1}{2}'' \times 6' 5'' -$ fitted with $1\frac{1}{2}'' \times 1\frac{1}{2}''$ hinge strip for
 double acting door, poplar.
 2 doors, $2' 10'' \times 6' 0'' - \frac{7}{8}''$ double surfaced, matched and beaded
 batten doors with $\frac{7}{8}'' \times 4''$ battens, poplar.
 1 door, $2' 8'' \times 4' 0'' - \frac{7}{8}''$ double surfaced, matched and beaded
 batten door with $\frac{7}{8}'' \times 4''$ battens, poplar.
 1 mullion window frame, 2 single sash, 6 lt. $10'' \times 12''$, poplar.
 2 sash, $1\frac{3}{8}'' - 6$ lt. $10'' \times 12''$, glazed S. S. A. glass.
 5 squares composition tarred felt roofing, 2 ply, first quality.
 2 squares tarred building felt, 2 ply.
 14 lin. ft. mesh wire, $3''$ sq. mesh. $50''$ wide, No 20. wire.
 14 lin. ft. mesh wire, $3''$ sq. mesh. $32''$ wide, No. 20. wire.

One may build a simple, shed house, deep in proportion to width. Such a house, or its modifications mounted on skids, will fill every need of the small poultryman. If the roof were bent down in front, making it of double pitch with lower front, much cold air could thus be shut out, with no added expense for materials, and only a little more trouble in building. If bent at a point far enough back, one would get the Tolman house outline. Professor Atwood says: "In poultry houses having a shed roof, the warm air constantly flows away from the fowls when they are on the perches, thus making the shed roof type of house colder for the fowls at night." I think this is a point which poultrymen have very generally overlooked, in their zeal to get every ray of

sunlight during the day. I believe it to be one of the key points in getting winter eggs. If, however, one have a shed house, snug night quarters may be easily provided, at a little additional cost, by laying a light platform on two strong horses, and setting thereon one of the three-by-six feet floored weaning coops which can be had of any supply house, or which can be made at home, if desired. These form ideal sleeping rooms for small pens of fowls, and, with such night quarters, Leghorns will lay well even if running in a cold shed during the day. This I know from experience. In fact, *no breed that I have tested in this way has failed to give good winter returns, even in January.*

The combination principle that must govern all construction for poultry shelter is: comfort, with the greatest amount of fresh air possible. Although there is not a particle of doubt that some could make more money growing pullets to sell than they could from trying to produce winter eggs, the fact remains that the larger *possibilities* in winter eggs dispose most people to try the gamble for them. This is what it really is for many, during December, January, and February. Given good feed in sufficient surplus above a maintenance ration to produce eggs, the rest depends on the comfort of the birds. This is best and most safely attained in localities where sharp winds may be expected, by making all walls but the front absolutely wind-proof, and leaving the front more or less open. Professor Atwood says that double-walling at the back furnishes much-appreciated harbors for rats. I do not hesitate to say that more difference can be attained by locating the house in a sheltered spot than from giving it a second wall when lacking the

shelter. Professor Atwood is the first whom I have known to recommend a shelter or windbreak at a little distance in front of the house. It would certainly have value, and I think a board shelter of this sort might pay if made in strong, well-braced panels, to be set up for the winter season only. Cedars make a windbreak that hens enjoy to the full.

Poultrymen in Minnesota and in Maine testify that the open-front house works well there if muslin-covered ; by some, a modified open front is preferred. This is chiefly boarded, but with openings covered by muslin.

In localities where summer heat is greatest, I would try shelters made of wire on a frame of light studding, boarded only on one side — that of the worst winds — and having a roof projecting six inches or more on the sides and front.

In some years, I have taken my birds from the long houses and placed them in weaning coops, under light shade when possible. The fowls so moved never failed to give better results in eggs than those remaining in the long, too-warm house. They not only laid more eggs all summer, but they gave more in autumn.

A point very likely to be slighted by the Beginner who is constructing permanently, is that of raising the floors and making sure that water shall drain away from the building, no matter what the location. The general rule is to fill in with dry earth to the top of the sills. Even this will not prevent seepage in an earth floor, if water comes down to the house from above. There must then be an outside drain, or good banking. This one point often makes the difference between a satisfactory, and a wholly unsatisfactory, house, and in general

experience, health, and egg yield. The concrete foundation disposes of this difficulty effectually.

Edgar Warren, a New Hampshire poultry raiser of some reputation, describes one of his houses, newly built, which he regards as "a model." It is twelve by twenty-four feet on the floor, seven feet high at the front, four and one half feet high at the rear. It faces south, having three glass and two curtained windows. The glass is at the south and east. The curtained windows are three by four feet in size, fitted with frames hinged at top and covered with heavy duck. The roof is double-pitch, the short rafters being three feet, the long ones ten feet, in length. The floor is of boards, and the house is covered with patent roofing of red rope on sides and ends, the roof being shingled. The material cost \$50, and it was intended to house fifty hens. Mr. Hunter, a poultryman and editor for almost a lifetime, criticises adversely the short front pitch, the low back, and the shingle roof; also the east-end window. Many poultrymen like the quickly laid cheap patent roofings for roof as well as sides. They keep drafts out more surely. But the Beginner can see, by this difference of opinion between experts, that there is room for the exercise of his own judgment, and for adaptation to circumstances.

Five square feet of floor space is counted a fair amount of room for each hen, when the flock is confined. Professor Halpin calls attention to the fact that while each hen might be satisfied with five square feet, or less, if she could also use the space belonging to other hens, by moving about a large house, if confined alone in a space of five feet or less, she would not thrive; that is, the larger the house, the more safely can the space per



Skeleton, Showing Progress of Construction on the "Clark House," New Jersey Station, New Brunswick

hen be cut down. He thinks farm hens often have not more than one square foot of space per hen. If the house is to be only a roosting place, this may be all right; but it certainly is all wrong if the hens must stay much in the house.

The "A" house is cheapest of all, and may, if desired, be used on a sled foundation, the usual square base being one board high. Such a shelter is not adapted to laying houses, which an attendant must enter and move about in. It is often used for sheltering outdoor brooders and weaning the chicks after the brooder is removed. Professor Halpin favors a roof, called "the two-thirds span," with the gable one third the way back from the front, especially for deep houses. He says: "Built with the same pitch of roof and the same elevation at the rear, this house contains less air space and is, therefore, warmer than the shed roof type. It requires twice as much cutting of rafters." (See New Jersey Roof Chart.)

I am especially glad to call attention to the style of the "Clark House." This is usually called the "semi-monitor" type. Deeper houses are becoming more and more favored. Any old, shallow shed type of house can be made into a deep semi-monitor house. Sometimes a low front portion is added, merely for a scratching place for laying hens. The height of the old portion would limit the height of the new. Professor Halpin says: "It is possible, in this type of roof, to reduce the air space and secure sunshine in the very back of the pen, and it makes a very practical small poultry house. Many times, the south side needs only to be covered with wire, and in mild localities it is to be recommended for the open-front type."

ECONOMICAL CONSTRUCTION

SCALE 1:3

NOTE LENGTH OF ROOF

VS.

HIGHTH OF FRONT

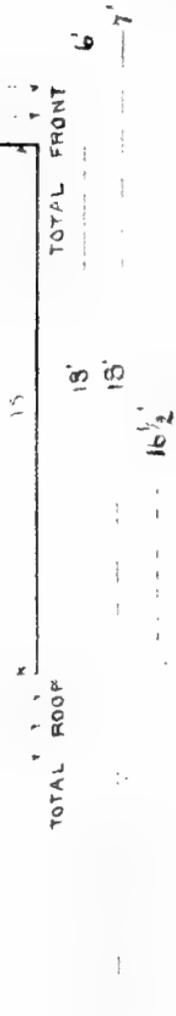
EVEN SPAN

TWO THIRDS SPAN

SHED ROOF

TOTAL ROOF

TOTAL FRONT



8 1/2

The clever reader will note that this house seems much like the Tolman house, but that it overcomes the lack of sunshine due to the Tolman low front. The semi-monitor throws sunlight to the very back corners, and thus satisfies the modern demand for the disinfective power of sunshine throughout the house. But, in doing this, the glass which occupies largely the narrow upright space where the roof breaks and lowers, becomes a radiator of heat, thus cooling the house quickly. This is overcome by curtaining these upper windows, or shuttering them.

At the New Jersey Station new houses of various types, and using different kinds of roofings, were erected in 1910. Professor Lewis recommends only one type of building for a permanent house that is to be set directly on the ground. This has a solid wall of brick, stone, or concrete, the last being the most economical. For the wall, a trench is first dug, and bedded several inches deep with cinders. On this is set a form for the concrete, narrower than the trench. The concrete itself may be made as an agglomerate of stone, etc. On both sides the concrete, cinders are filled in for drainage. The wall rises above the surface. A layer of good cinders is at the bottom of the concrete floor. A two-inch coating of concrete, consisting of six parts sand and gravel to one part cement, is laid upon the cinders. When this is dry, a finishing coat made with three parts sand to one of cement is laid very smoothly. If the house is deep and long, a pier is set at the center, at intervals, built after the same manner as the side walls. On this stable foundation, the preferred house is erected.

Concerning the permanent house and the best type of foundation, Professor Halpin says: "Where rats are at all troublesome, a substantial cement foundation is a good investment. This should always be brought from six inches to a foot above the surface and then



At Work on Solid Concrete Foundation, New Jersey Experiment Station.
Note Removable Forms and Binding Braces

filled in with coarse material such as gravel, etc. In extremely wet locations, especially in clay soil, it often pays to excavate under the entire house and replace with stones or other coarse material, and then connect with tile drains to remove all the water from under the house. In many localities where stones are abundant, poultry houses are placed on stone walls, but unless cement is used to fasten the stones together securely, rats will often work under the house and

do a great deal of damage. A loose stone wall soon becomes an ideal dwelling place for rats, and should, on that account, never be placed under poultry houses.

“A dirt floor must always be well above the outside surface, so that the water drains away leaving the floor dry and comfortable for the fowls. Where a cement foundation is used for the house, one can frequently tamp the surface hard and then fill in to the top of the foundation with sand. This sand should be replaced each year before cold weather.

“A cement floor is much easier to keep clean and is durable and rat-proof. A cement floor should never be left bare, but should be kept constantly covered with at least three inches of sand and with from six to ten inches of straw in winter. When sand cannot be had, extra care should be taken to keep the floor heavily littered so that none of it becomes bare.

“In case a cement floor is used, it should always be built so as to be just even with the top of the foundation so that the entire surface is smooth and easily cleaned. Where a cement floor and foundation are placed in a house, it is usually better to put in the floor before constructing the house.”

XIV

HOME-MADE CONVENIENCES

Handy Paneling — Movable Labor Savers — A Makeshift Grain Feeder — Vertical Nest Series — Comfort First — A Feed Hopper — Swinging Jail for Sitters — Oat-sprouting Cabinet — Summer Coop of Wire — Run for Small Chicks — An Original Coop — Large Piano-box House

As the average Beginner does not care to make large investments till he has tried things out a bit, one of the things for him to learn at the start is that some home-made contrivance may do just as much good work for him as a higher-priced, patented "supply." Some of these things may come into hourly use, like a feed hopper; some into daily use; some only into seasonal use, like the wire weaning coop.

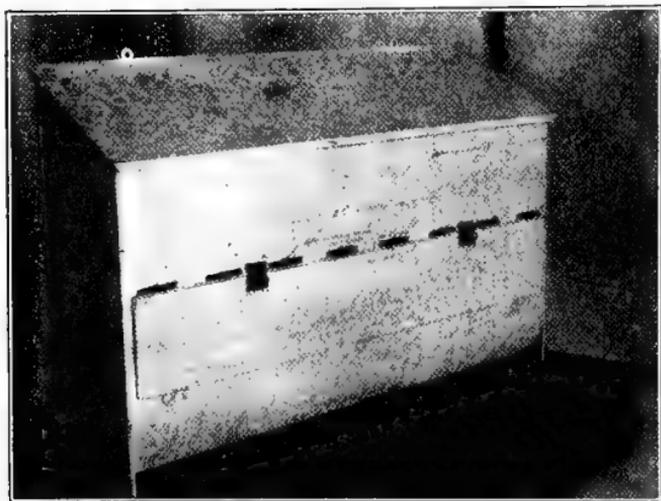
One of the simple things which may come into daily use during the chick-raising season is a set of panels, two feet, three feet, or four feet wide, it may be. The two-foot panels are nearly always made of inch-mesh netting, as they are chiefly used to confine small chicks. If not told, nearly every poultry raiser learns slowly, through experience in spoiling many of his chicks, that even the smallest chicks must be confined by an inclosure that is firm and taut; and vertical; else they will soon learn to walk it like a tight-rope. If it incline at all, it must be inward, at the top. Three panels, made of wire net, stapled to one- by two-inch frames braced at the middle, may be hinged together. Three strong

leather hinges will do, if the hint as to stiff setting of the inclosures is strictly followed. Two of these panels may be two feet two inches wide and ten or twelve feet long. The third may vary in length from the width of a coop to any desired length, up to twelve feet. The union of the three may form a yard running out from a coop or house, or may be used as a triangular yard to confine chicks at any desired point. The quality of being movable or portable is of very great advantage in housing or yarding helps. There is on sale paneled wire fencing of this character which is very good indeed. It can be made more cheaply by one who is handy, but a sample of the sale kind is a good object lesson in bracing, which is the key to usefulness in such supplies.

A small, single panel, smoothly made on three-fourths inch framing material to fit the style of coop selected, may be the means of saving scores of chicks. These are chiefly used to close the coops at night, and they cut off all depredation by roaming vermin at night or before the owner gets up in the morning. These are best fitted to slide behind the slatted coop fronts. The worker who does not take great pains to select a first-class type of coop, and make them all to one scale, so that the panels may fit all the coops, makes an initial mistake that may cost him much.

A makeshift grain feeder, useful especially to those who have to be away all day, but good for any poultry keeper with a few fowls, consists of a castaway, bottomless pail, to the bottom of which may be wired a pie-plate turned bottom upward. A narrow space is left between the pail and this loose bottom, so that the pail, when moved, will scatter a few grains of feed. The

pail is hung from the ceiling of the house, and the hens will "do the rest." The house needs to be well littered, in order that the fowls may scratch for what they bring down. The cover to the pail may fit as tightly as the owner desires. If it is smaller than the pail, the pail may be hung a little high, and the birds will fly up and



Cornell Rat-Proof Feed Hopper Closed. This Reduces Cost of Production and May Be Copied

get some grain that way, at the same time scattering more.

A series of nests which I have used in a small space came as the result of necessity. The house I was using had not wall space enough for the nests upon the usual level. A long, narrow box chanced to be available. Instead of placing it horizontally, I set it up on end, fitted it with shelves, and nailed front strips to each, thus forming nests. Such an arrangement would be an imposition on the hens, however, were it not for the alight-

ing stick placed at the base of each nest. These sticks are sometimes in the worker's way; hence, it is wise to study the space, and place the series of sticks on the side where they will interfere the least with moving about. If on a side next the roost platform, the hens will appreciate this lift. These nests must not be placed too close together in the series, as the hens would not have room to fly up comfortably.

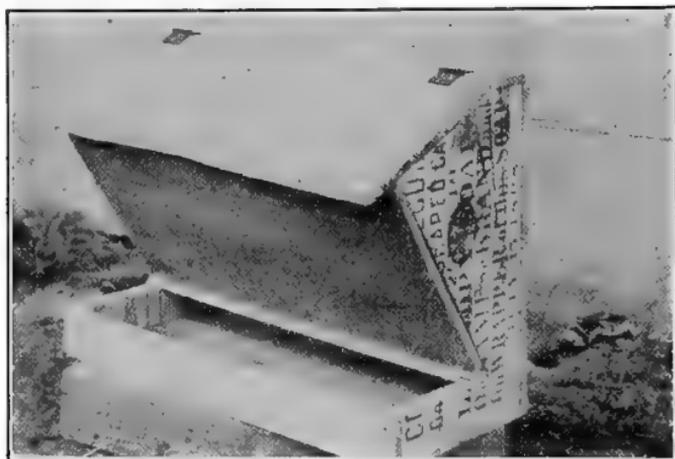
This is not a small matter. On the day I write, I have been reading the story of the success of a Beginner's venture in poultry. He was not an ignorant Beginner, however, for he had taken a College Poultry Course, and had practiced much and taught somewhat before he struck out for himself. He has been immediately successful on a large scale; but the thing I wish especially to note is that every employee on his place is trained to think first, last, and all the time of the comfort and contentment of the birds.

A wall feed hopper may be made from a soap box or other well-shaped grocery box. It may have one, two, or three compartments. The chief trick is in setting the diagonal front at the right height and angle to feed



Make-Shift Series of Nests,
Placed Vertically

down promptly, while yet not too bountifully. One of the chief needs, nowadays, is to see that feed boxes of this character are rat-proof. The Cornell hopper shows how this is managed. Such hoppers, when used, as they often are, in feeding dry mash, lead to much waste.

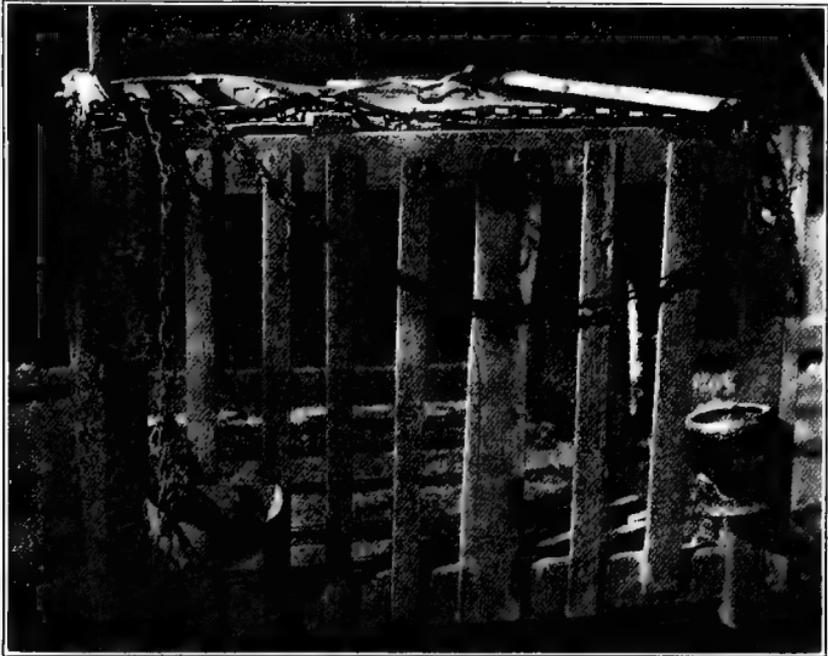


Wall Dry Feed Hopper. Made from Soap Box

A flat, shallow box, set below the hopper, may save some grain to the birds.

A convenience needed by every Beginner, and by every poultry keeper who hatches with hens, or even keeps sitting varieties, is the "jail" for sitters. From early June, onward, especially, there will be a continuous succession of sitters, "repeaters," etc., candidates for confinement. "Breaking up" these sitters, or "broodies" as some call them, is a continual problem to Beginners and to farmers. Sousing with water, chasing with dogs, throwing violently from the nest, tying by the leg, are not only cruel, but they are not efficient methods of gaining the end sought. What the

birds need is a bit of rest, a new idea, and extra food enough to give a new fillip to the laying powers. The swinging jail supplies the needed opportunities for rest, new ideas, etc.; good feed with plenty of ground oats in it will give a new start, and the confinement need not be solitary. The "jail" is made slatted on all sides but



Swinging Home-Made "Jail" for Sitters

the top. It may be swung from the roof, about a foot from the floor; but, far better, I think, is a position under some leafy tree, swinging from a horizontal branch. Green feed must not be forgotten. A door in the top gives chance to catch the fowls when necessary, and cups on the outside may contain the feed and water. Sometimes, one board across the short way of

the coop gives the birds a better foothold and sitting-down place. A little trough may be introduced at feeding time, when many birds occupy the "jail" at once. No poultry raiser should be without this helpful appliance.

The cabinet for sprouting oats has become one of the regularly offered supplies. Such a cabinet may be made by any worker who has more time than money, and who needs to furnish extra supplies of green stuff. This means virtually all town poultry keepers, and many farmers during the winter season. Those who have apples, cabbage, clover chaff, etc., can get along without sprouted oats; but the oats form a fine addition to any winter ration, and to all rations for fowls in confinement. The cabinet consists essentially of a four-square upright frame, made with cleats to carry a set of four-inch-deep drawers, in which the oats are spread after soaking. In winter, some place a lamp in a boxed compartment below the drawers for added warmth.

When we get outside the house into free air where the chicks are to be raised, we find several things which can be made at home with a saving of money, if time be available. The netting weaning coop is one of the most desirable aids to raising good birds, as more chicks are spoiled during the weeks after weaning than at any other time. When left alone to take care of themselves (as they think) they are timid, especially at night. Not one in the bunch is willing to be exposed to danger on the outside, near the front; hence, they crowd and trample for the back corners, and smother on hot nights. The coops soon get too small, and this is too apt not to be noticed. The birds grow too large for the openings

between the coop slats, and hip and back injuries become common. The remedy is a good-sized weaning coop, with a low, broad roost. Entering it in the daytime they learn to like the roost, and soon, to use it at night, also. Those which do not must be taught to do so.

During the hottest six or eight weeks, my preference would be for a coop constructed chiefly of wire except for the roof and the side next the prevailing wind, which we will make the back. The roof should overhang to protect the end birds from rain. This coop may have two one-inch by three-inch strips nailed together to form each corner angle. A similar strip may be used at the top, on both sides and in front. A ten-inch board should follow all around the bottom. Such a coop, being so light, must be anchored to the ground, or it may become a flying machine during any high wind. It may have a floor or not, as the owner chooses. Generally, I prefer a floored coop. The back is to be of matched stuff, or carefully battened. If the worker has been foresighted enough to plan his early coops on the right scale to permit this, the panels which closed the baby chicks securely may now be used as buttoned-in fronts to the weaning coops, which will need an upright strip at center to help this plan, and also for strength. More of these coops throughout the country would mean many more good birds in the fall.

In raising motherless chicks without a brooder, a handy inclosure may be made so as to be easily movable from any spot which has become undesirable, at will; from soiled ground to clean, from shade to sun, or the reverse, from wind to sheltered corner. Half-inch

stuff, ten inches wide, with cleats on the ends of each board, make the preferred sides. Two boards may be ten feet long; the other two, three feet, more or less. Two feet of flooring at one end gives always a dry refuge, but the device is helpful without it. A bracing cross strip will be needed at the middle. For baby chicks, it can be used without a screen top; but since a screen will mean safety from prowlers, it is a wise precaution to have one. The screen is best made separately, and hooked securely to place. Twenty-five chicks may be comfortable and happy for three weeks, under such a screen, if the shelter be moved often. They are better on wider range, of course, when this is available and free ranging is safe. "Hand-raised" chicks cannot wisely be given unlimited liberty, because they have no center to keep them together, as when there is a hen to call them and a place to call "home-and-mother."

An excellent brood coop, two feet by three feet on the floor with general form like a shed, may have the two back corners cut off, to render it a safer home. If the roof projects and is made to fit over the coop proper, it will give easy access to the floor for cleaning. By cleating, on the under side of the roof, it is made to fit very closely. One third the front may be boarded for a shelter corner, the rest slatted just closely enough to confine the hen, and a netting panel used for night protection. The front section has room behind it for this panel to slide in. The roof is removable.

Piano boxes, both upright and laid flatwise, are much used by those who can secure them. They cost a little more than half as much as new lumber in some localities.



Seventy-five Piano Boxes Helped Keep Down Cost of Production on "Peerless Poultry Farm," New York Farm. (Courtesy of C. K. Vanderbilt)

One poultryman of my acquaintance, Mr. C. K. Vanderbilt, built a house for two hundred hens, using piano boxes entirely for the siding. The house is 16 feet by 65 feet, with incubator cellar 15 feet by 16 feet; milling room and grain storage of the same size. It took about seventy-five piano boxes for material. The house is 8 feet high in front and has muslin front "windows."

XV

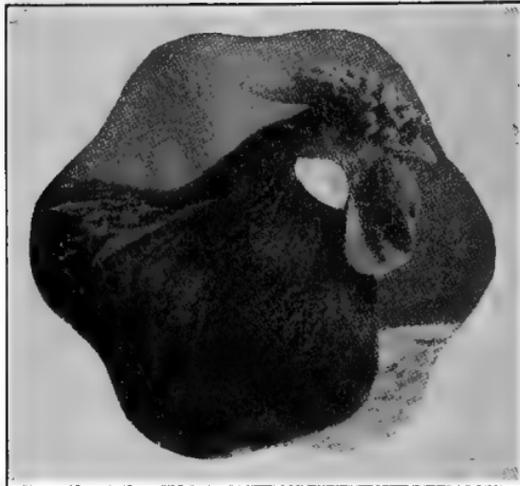
THE IDEAL BIRD

The Good Pullet — Lusty Strength Based on Proper Food — Exercise and Health — Three Methods — Rosy Stories — Age of Maturity — The Fancier's Ideal — Intrinsic Value — Judgment of Quality — The Average Bird a Unit of Measure

To the egg farmer, his precious maturing pullets are the delight of life and the objects of keenest care. On them will depend his winter income. On their earliness, thrift, and general well-being, his hopes are founded. It has been said elsewhere that the Beginner's first business was to learn to raise good birds. The difference in results between a good and a poor pullet is often the difference between money in and money out during the long winter. He whose pullets are a source of money out, throughout the long winter, while bringing nothing in, will soon become skeptical as to the profits in poultry keeping.

A good pullet is well grown, thrifty, full of vitality, active and eager in temperament, and usually a hustler after food. Breed characteristics make some difference, but the pullet which is active for her feed is more likely to make the satisfactory layer. This eager activity depends far more largely on the perfection of health and a keen appetite than most people imagine. The real work of developing a crack pullet lies in so feeding her that she will eat every ounce possible, while still not overeating. Overfeeding and ill-balanced feeding tend

to heaviness and laziness; these, in time, tend toward barrenness and general unthrift. The animal economy calls for food just balanced, to its needs, whether those needs be bare existence, growth, active exercise, or reproduction. And it is one of the laws of animal being



Head of Rose Comb Brown Leghorn Male Approaching the Ideal. Wattles Not So Well Rounded As Standard Demands. Note Look of Strength

that lusty strength to produce many and vigorous progeny rests on the simple basis of proper food, combined with sufficient free exercise. The invigorating and stimulating power of exercise, its warming, digesting, and cleansing powers, its prevention of crop-bound, diarrhoea, rheumatism, cramps, and

in young chicks, leg weakness, are a long list of credits; when we add that by keeping mind and body occupied, it prevents the formation of bad habits, such as feather pulling, comb picking, "cannibalism," egg eating, and that it also prevents gorging and logy breaking down, works off surplus fat, makes eggs more fertile and insures stronger chicks, we have a table of values which Beginners and old hands alike may well look over frequently; *lest they forget!*

Every Beginner, who is raising his first flock, has three

chances. First, he may produce a lot of pullets, ranging from very poor to very good, and carry them all through the winter. Second, he may raise about the same number and kind and cull sharply, carrying only the strictly good through to the next year. Third, he may handle his advance work so well and so intelligently that he will have very little culling to do, nearly all his pullets being of the grade which will pay to keep over. In the first case he is doomed to pay money out all winter, with infinitesimal returns. In the second, he will get fair returns above expenses, if the birds were early hatched. In the third instance his outgoes may be large, but his income will be larger, and only in this case will his hopes be fulfilled. This third method is fully possible only to the one who holds control of the stock which laid the eggs to produce his pullets. Culling properly begins with the breeding stock. In the farm flock, every bird is usually a breeding bird. If every breeding bird is active and vigorous, there need be no cull pullets when the chicks are handled with sufficient judgment and care. But if any of the breeders are below par in physical vigor, no care of the chicks can make them all first class.

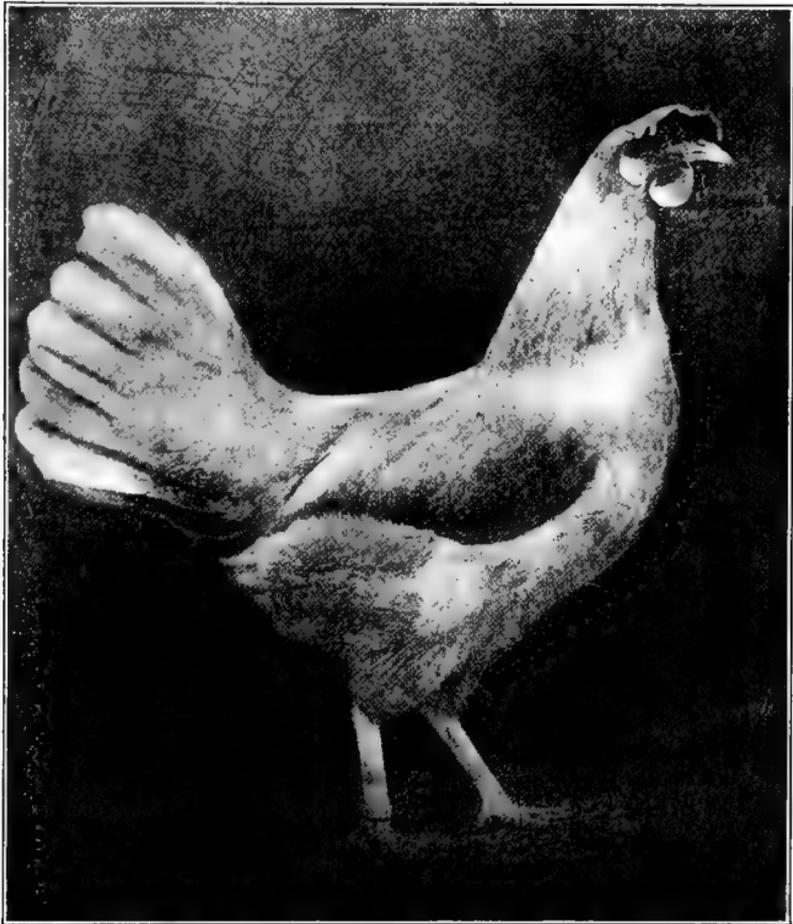
The rosy stories of pullets laying when fourteen to twenty weeks old, so often told, become a stumbling-block to all Beginners. The quick maturing Leghorns and their kind should lay earlier than the Asiatics, but the ideal pullet does not lay too early. In reviewing the catalogue of a breeder who claims wonderful laying records, I was struck with the sentence: "Not one of these laid an egg before the middle of December." Running over the topics in "999 Questions and Answers"

I find this on early laying of pullets: "It depends to some extent upon the breed and very largely upon the care and feeding from hatching time till maturity. Under the most favorable conditions, pullets should begin to lay at about eight months of age." This is the most conservative statement I have ever seen in print. Most such answers affirm that the birds should lay at about five to six months. I think the extended experience of most growers will show rather that seven months is a very common maturity age. This means that birds which are to begin even as early as mid-December must be hatched by mid-May.

There is only one point in which good pullets fail. In the breeding pen, while many thousands of pullets produce their quota of eggs for hatching every year, and many of them produce good chicks, the chances are in favor of the yearling or two-year hen, with a cockerel well toward a year old, producing better ones. "The best is good enough for me" is not a bad motto for any poultry keeper. One who takes this for his poultry motto will not try to raise chicks from immature poultry. Older birds will have been tested at least through one full season, and any short of full vigor will have been culled out. This insures better average vigor in the chicks than can be obtained with immature, untested birds. Such tested hens, which have been tested at the same time for digestive and laying capacities, will do much towards growing chicks and matured fowls to reach the ideal of the motto, both as to vigor and as to producing capacity.

In the eyes of the utility worker, the ideal bird is typified by the specimen in the prime of health, matu-

riety, and vigor, and capable of fullest productive capacity. But to the fancier this bird is only half ideal. To the



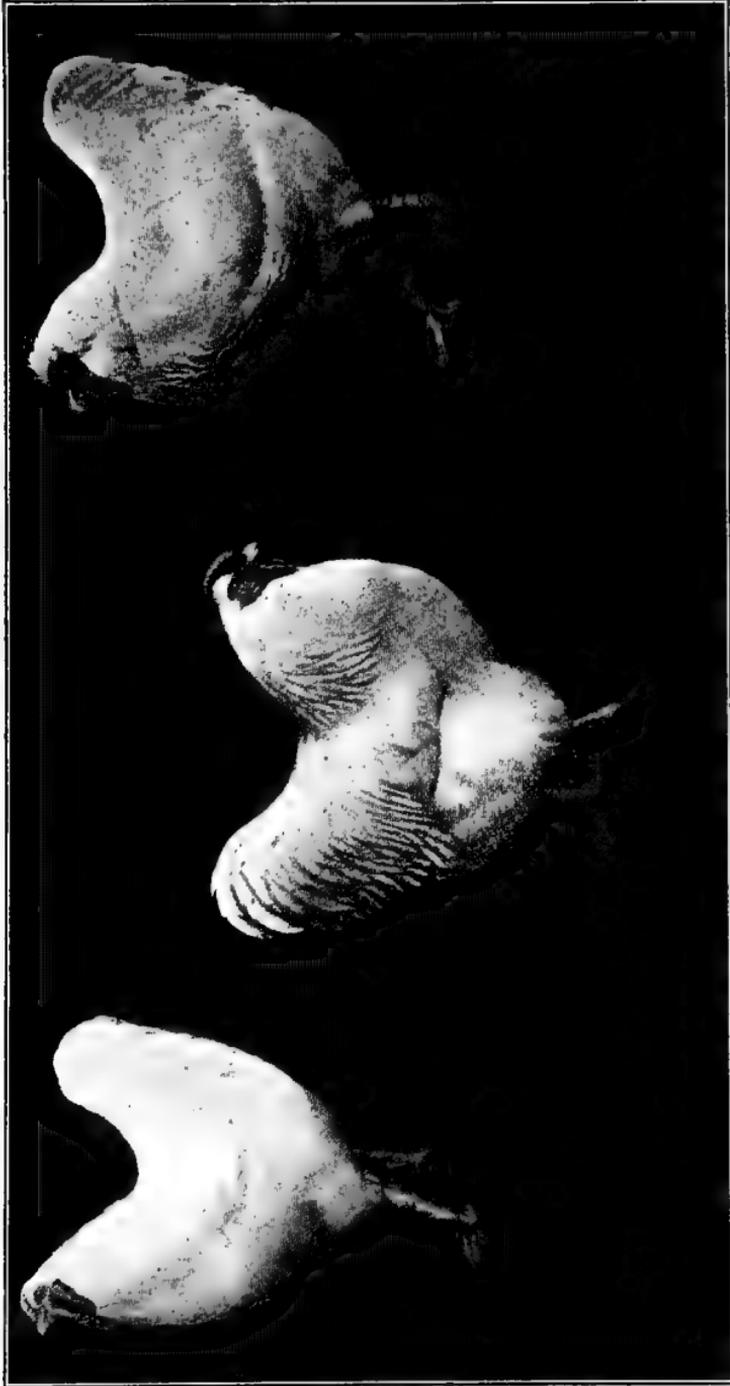
“The Beauties of Symmetry:” White Leghorn, Nearly Ideal

beauty of health and vigor he desires to add the beauties of symmetry and of outward coloring. Some one says, “The ideal bird must combine in its make-up both fancy and utility points.” Some deny the possibility of this.

(In another chapter I have shown the difficulties attending the attempt thus to combine beauty and work-a-day qualities.) Yet, since beauty becomes but ugliness without the lovely bloom of health, this health must be basic for the fancier. And since the utility quality of egg laying is an absolute necessity to the continuance of her kind, his exhibition female is decidedly lowered in both intrinsic and extrinsic value if she be not a good layer. A mid-West judge recently stated that some exhibition specimens of a heavy laying breed which he had obtained from the breeders of "the best," in the fancier's point of view, were "simply worthless" as egg producers. This is the result that may be expected to follow surely upon the attempt to create an ideal bird by breeding solely to the beauty standard.

What is an ideal Wyandotte? Is it the chalk-plumaged, short "retuse" specimen, resultant from the effort to fill the demand for an all-white, short-bodied, blocky, bird ideal? The Wyandotte is *the* blocky bird *par excellence*. But it is utter folly to reshape her till she is longer from breast to back than from front to rear, and to ruin her laying capacity while creating a monstrous freak. The ideal bird is never a freak; there is no demand for freaks among the sane who work toward ideals; even beauty freaks — if such can be — are barred!

Judgment as to quality is a thing of growth. It comes through daily seeing, handling, and comparing the birds. The feathers are so deceptive, that in order to know the condition of the utility chick or fowl, one must accustom himself to the feel of the body, under the feathers. By handling many birds many times, one acquires, in time, a sure judgment as to condition,



Re-Shaping the Wyandotte. At Left, an Early Wyandotte Male; at Center, a Later Show Specimen; at Right, a Type Recently Shown, and nearing Orpington Style

weight, plumpness, etc. The position of prominent, movable bones back of the keel is considered a pretty fair index of the approach of laying maturity, or of laying at any time. As the body is distending, or becomes



“The White Queen.” This Bird Has Been Used as a Model of Runner Type.
Photograph Not Retouched

distended, with eggs, these bones spread apart springily. This spreading is probably a sure index of the approach of laying. But, as these bones naturally lie farther apart in some birds than in others, it is necessary to be some-

what familiar with the breed and the individual birds in order to make the test a sure one.

In the same way, a mental "unit of measure" becomes the possession of the fancier who lives through many months with his birds. The unit of measure is the average bird. The fancier has to acquire a keen judgment as to how each individual bird compares in value with the average specimen, and also how far it is below the ideal of its breed, either for the breeding pen or the show room. Most fanciers would prefer the bird that was pretty good in all sections to one that was exceptionally good in some sections while notably poor in others. The poultry publications which publish the best untouched photographs are of much value to the Beginner, because of these alone; they offer him good birds from which to make comparisons. In his own yards, he may not have them because of a restricted purse; and if he has them, he cannot know it until he either exhibits or studies birds of known value till he has formed a basis for judgment.

XVI

LINE BREEDING AND MENDEL'S LAW

Root Meaning of Special Terms — Multiplied Ancestors for Every Bird — Giving a Fowl Fewer Ancestors — Possible Evils — The Emphatic Point — The Theory of Line Breeding — Double Mating — Applied Heredity — Color Domination — Scope of Mendel's Law — Its Limits — Brevity Points

IF you are a fancier just budding, you will be looking over everything you can find about breeding, and will often stumble upon the expressions, "line breeding," "Mendel's law," "atavism," "strain," etc. While these words are in the dictionaries, poultry keepers sometimes shade the meanings a little, and, in order that we may have them grouped together, I will give the root meaning of each of several terms which are almost sure to be used in any discussion of this kind.

Strictly speaking, the word "hybrid" means the progeny of a union of two species; "mongrel," that of the union of two breeds. A "cross" is a mixing of stock, "a hybrid of any kind." A "mongrel" is also the progeny of a cross of any kind. "Inbreeding" is breeding together animals that are closely related. An "outcross," according to Professor Pierce, Poultry Instructor of Iowa State College, is the result of breeding together birds of different varieties, *or even different "strains."* A "strain" is the resultant of inbreeding, more or less, together with selection. When birds of any flock have been selected for certain qualities and

bred together till they bear a family likeness easily noted, they may be properly called a "strain." The Standard of Perfection calls it "a family bred in line." "Atavism" is what poultrymen often call "throwing back" or "jumping back." It is reversion to the traits of ancestors, perhaps far back.

One who has not thought much along these lines needs first to grasp the fact of multiplicity of ancestors behind each of his fowls. A certain pet of yours, shall we say, had a father and a mother. So had the father; so had the mother. Here are seven birds. The four grandparents had each two immediate parents; this makes fifteen. The eight great grandparents had each two immediate parents, making sixteen more. The next step back gives thirty-two more. Here, in four steps backward, if there has been no close breeding, we find sixty-two ancestors of your pet. In a smaller degree it is the "melting pot" over again; each fowl has an infinite number of ancestors, and is the sum of the traits of her ancestral family. But this family is a combination, it may be, of hundreds of families — of thousands! Who shall say how many? Is it any wonder that you cannot make the descendants of your pet what you will, when you have to combat constantly characteristics continually recurrent from the past, which to you now seem faults?

Line breeding, to put it into clear and common terms, is simply an effort to give a fowl fewer ancestors. This is done by breeding her to another which has — at least in part — the same ancestors. Three results may be counted on: (*a*) the intensifying of faults; (*b*) the intensifying of virtues; (*c*) the lessening of vigor, *unless*

exceptional care is taken. The Cornell professors say, in a Bulletin on Breeding for Constitutional Vigor: "Close breeding can be followed with success *only* when the *first* consideration is given to mating strong individuals." A. S. Galbraith, the English poultry expert, arguing for inbreeding, even to produce heavy egg production, tells of an experiment of his own. Only eggs from the best layers were set. Every hen laying *even one infertile egg during the laying season* was rejected; also, every one which had ever been ailing, though but for a few hours. Not one exception was allowed. I emphasize this, because the tendency of Beginners, and of most breeders, one may admit, *is to allow exceptions that spoil the work* attempted, usually because the exceptions are well up in fancy points.

"Prepotency," the capacity of any parent to transmit his qualities to his progeny (more than his share, the dictionaries say), varies in different birds. It may be intensified by inbreeding. Professor Pierce states the danger thus: "Persistent, close inbreeding, such as the mating of brother and sister for several generations, often results in impaired fecundity, loss of size, and decrease in constitution and vigor." Poultrymen call such repetition of inbreeding "in-and-inbreeding." The closest form is the mating of brother to sister, as they have the same full parentage. Three lines of the same blood may be started and carried by a line breeder: one by mating brother to sister; one by mating father to daughter; a third by mating mother with son. The progeny are then bred together, to suit the theories and plans of the breeder. Many years ago, Mr. I. K. Felch published a chart, showing how the three lines of related

blood might be bred together, to get any desired union of the two blood lines of the original pair. Professor



Near-Perfection to Start With. (Courtesy of M. R. Jacobus, New Jersey)

W. H. Card has recently devised a new chart with the same object.

Probably the point which needs most emphasis when we talk to the Beginner about how he can best essay line breeding, is that he needs, more than any other one

thing, to have an original pair as nearly perfect as possible. Plainly, this must be so; because, he is setting out on a course which will not only intensify virtues, but defects as well. The fewer defects he has to start with, the fewer to trouble him later. Vigor, in both, he must have; perfection in both, is only a dream. Close approach to perfection, however, is usually a matter of dollars and cents. Good breeders will mate a pair for a customer who wishes to enter upon line breeding; they will, doubtless, also charge him well for the birds. Or, if he buy a good breeder's best eggs, he may get something from them to suit his need; but while he is yet only a Beginner, it is not safe for him to trust his own estimate of the birds.

Theoretically, a defect in the male may be balanced by especially good points in the female, in the section concerned. Then, if the defect should appear in the progeny, a mating from that one of the lines which was best in that section ought to "balance" it. In effect, however, that which is expected from a mating does not always appear, because of that uncontrollable factor, atavism, whereby the bird throws back to an ancestor, more or less remote.

It has been said that no *noted* prize-winning family in any line of live stock has been established without resorting to inbreeding, and that the greatest success has always attended that systematic form of inbreeding known as line breeding. When a breeder has really established a line-bred strain of stock, one that meets his ideals, he is ready to reap great rewards for his intelligent work. "There is no satisfactory excuse or argument that can be offered by those who refuse to

follow line breeding," says one enthusiast. It enables the breeder to add, at any time, from one sixteenth to eleven sixteenths of the blood of either parent, and he can mate the original blood as it appears in descendants who are one half of each. Perhaps the most difficult part of the whole work is in keeping the pedigree and marking records exact and complete.

Double mating has long been the hoodoo of the Beginner; and this, despite the fact that leading breeders are fast to say that there is no other way to produce winners of both sexes in parti-colored breeds. Double mating means that different types of birds are used to produce exhibition males and exhibition females. It also means that half the birds in each mating (the females, when one has a cockerel mating, etc.) are rank culls. It also means many more pens, more complexity, many more sets of birds, because the exhibition male is not fit for the breeding pen, in many cases. It means disaster to the Beginner, unless he can put himself into the hands of a reliable breeder, who will mate birds for him and coach him as to how he shall mate the progeny. The Beginner who buys birds of unknown breeding, because they look well, has a worse proposition than any in mathematics. If they have been double mated, and he mates good birds with good birds expecting to get good birds of both sexes, he gets — chaos! And this both of mind and of stock. For every breed in which double mating is practiced, the rules for mating must be carefully learned. To learn as one goes along will take a lifetime. The Beginner's only safety is in learning all he can about double mating before buying, and then buying from a breeder of probity who will assist him toward success.

That rediscovery of recent years known as "Mendel's law" is still a bone of contention. To name it, in some quarters, is to stir up vigorous protest. "It won't work," say a few, who think themselves fitted to pass judgment. Yet, if it be a real law, it may prove of so much basic importance to the breeder that I do not wish to omit giving a little insight into it. A *law* must always produce the same results under the same conditions. Those who question this law of Mendel's say that it does not always hold good, as formulated; which is virtually the same as saying that it is not a law of Nature, at least, when applied to animals. It was first offered as a law for plants.

However, *Harper's Magazine* for December, 1908, contained an article entitled "Applied Heredity," by R. C. Punnett, M.A., a Cambridge University man. Referring to the paper in which Gregor Mendel, an Austrian monk, gave to the world the results of his work of research and experimentation, he says it is one that "for magnitude of issue, can be compared only with William Harvey's classic treatise on the circulation of the blood." Because this especial writer is willing to go on record with this straight-out affirmation: "The principles he enunciated have been shown to hold good for animals as well as plants," I shall base this brief notice of Mendel's law largely on Mr. Punnett's review of its working out. There is, too, another reason. It lies in the fact that he takes a fowl, the Rose-Comb Bantam, to illustrate the law. This breed, having both a white and a black variety, and breeding true in both, forms an accurate and convenient example.

A tendency which we may call color domination has

much to do with modifying results. Should we cross the black and the white bantams, the resulting progeny would be, as to appearance, all black. In this, black is said to be dominant over white — white is spoken of as recessive; since it disappears in the first generation of the progeny. But lo! if we breed birds of this first generation together, this recessive reappears in a certain fairly fixed proportion of about 25 per cent. These white birds will thenceforward breed only white stock. The 75 per cent of blacks, however, are of two kinds as to tendency; they behave differently. These are distinguished as (*a*) "pure dominants," and (*b*) "impure dominants." The pure dominants give only blacks thenceforward, even when mated with white birds. The impure dominants, like their parents, give three blacks to one white, in the progeny.

It is explained that the two germs which unite (the male and the female germ) to form any new individual, are transmitted as entities or units, and not as a combination. That is, no germ cell can carry both black and white; it must be either "a black germ" or "a white germ," as one may say. If both the meeting germs which unite to form the new individual are "white," nothing but white can be produced. If both are "black," nothing but pure blacks can be produced. In effect, the father and mother cells are then pure blacks and give only blacks. If there are an equal number of each color produced by each parent, the above accounts for all unions of the same kind of germ cells. But what would you expect, if the black of the male chanced to meet the white of the female? Would you say gray? Not so Nature. Since they are transmitted,

not as a combination, but as units, we may say *striving for place*, the black, being dominant to white, is the victor, and all the resultant progeny are black. The germ cells of the progeny are part pure white and part pure black, as in the parents, but in both parents and progeny, the 25 per cent of pure blacks added to the impure blacks give 75 per cent of blacks to 25 per cent of whites. Because this percentage is sustained, it is believed that all the hybrids of pure black and pure white have equal numbers of pure "white" and pure "black" germ cells. Whenever, upon union, each parent furnishes a "black" germ, the resulting progeny is pure black; whenever each furnishes a pure "white" germ, the resulting progeny is pure white. But whenever one furnishes a "black" and the other a "white" germ, the opportunity for variants is given. And, because black is dominant, and each parent has one half its germs of the dominant black, black overcomes the white. We may show it in this way:—

MEETING GERMS	{	BLACK, joined to BLACK, gives BLACK.
		WHITE, joined to WHITE, gives WHITE.
		BLACK (dominant), joined to WHITE, gives BLACK.

It has been found, on rather wide trial, that structure, size, shape, color, and fertility in plants, and numerous characteristics in animals come under this law. In sweet peas, color is dominant to white; tallness is dominant to dwarfness. The crossing of tall and dwarf sorts will, therefore, give three fourths tall in the progeny. "The long, Angora hair is recessive to short hair in rabbits," etc. The Cambridge University Experiment farm began, some years ago, experiments to transfer immunity to rust to the best varieties of wheat, accord-

ing to the Mendelian law, with excellent results. The polled character in cattle has been found dominant to the horned characteristic. Thus is offered a painless method of "dehorning." Mr. Punnett says: "Man, too, is subject to those same laws of heredity that govern the transmission of characters in plants and in other animals." I mention this here in the hope that it may help to stimulate any reader who may find the law not clear, to make special effort to grasp and understand it. A law of breeding that touches all the plant and animal kingdom gives man a grasp of all breeding problems which makes him almost a divine Creator.

Although I have not seen it so stated, it looks to me, on examination of the illustrations given, that dominance usually belongs to the characteristic longest fixed in the subjects. We might perhaps expect that this would be true. The use of this law is limited by the stated fact that not all characteristics come under its working. Those which do are first sought. When found, says Punnett: "Knowledge of the Mendelian principles will enable him [the experimenter] to combine them together according to his will, and to build up and fix a plant or animal having the properties which he considers most to be desired."

All this is pertinent to the Beginner in a point where he often runs amuck; and this, even though he do not understand the working of the law. It is said that a cross between certain strains of white fowls known to breed true, results in the production of birds entirely colored and very like the original ancestor of all, the black-red fowl. Probably there are few poultry raisers who have not, when in the novice stage, gone to some

expert to ask whether the appearance of color among his white birds, or of white among those which should not show white, was not sure proof of impurity. It is proof of some sort of a throwback, doubtless. But, if it be true that all our breeds go back to the black-red jungle fowl, who is to say from how far back what seems an abnormality now may come!

H. L. Allen, in a sensible article on inbreeding, says: "On the moderate scale which has characterized my own inbreeding operations, I have found line breeding as I have attempted to describe it here a most satisfactory method for producing a flock of birds year after year that will adhere closely to the type desired, *and with fewer reversions to the earlier type*, which, even in our oldest breeds, was existent not so many years ago."

General estimate of the value of line breeding has long limited its value to those who were striving to produce fancy stock. As its possibilities open with study, with experiment, and with the discovery of unsuspected laws of breeding, such as Mendel's law, discussed above, poultrymen are beginning to systematize their ideas, and to see that there ought to be possibilities in a breeding law that would help the market poulterer and the egg producer as well as the fancier. In Australia, poultry egg producers have for some time been breeding in line to produce strains of unusually prolific layers. This has worked, along with the competitive tests, to increase the general egg-laying productiveness of Australian birds.

Over in New Zealand, the man who claims the Indian Runner with the stupendous record of 320 eggs, states that he has not only worked up one strain by line breeding, but carries several others of entirely different blood,

all line-bred strains, in order to save himself from disaster if he should by chance fail with the first. The idea that the same laws can be used to produce the kind of market fowl which the country or the choice of the handler demands is slowly permeating the thinking of the poultry contingent. Despite our belief in the old proverb that like produces like, there was a stumbling-block somewhere, and for many years no one could find just where it lay. Apparently at random, like produced unlike upon occasion. With a law that shows under just what circumstances like will produce unlike, we have the key to the situation. Our proverb may be useful after all.

BREVITY POINTS

Every bird will inherit from the heads' of the line.

Close interbreeding may intensify defects as well as virtues.

Selection culls out defects; selection holds virtues. (Application limited.)

Narrow head, small comb, for the breed, lack of size or color mean lack of vigor; strength of color in eye, face, furnishings, and plumage denote vigor; as does also a strong voice.

Extra size, color, vigor, are demanded in the foundation birds of a line.

It is folly to breed from a bird lacking in size, weight, color, or "snap." Intelligence, interest in food, in life, and in people are marks of thoroughly good stock.

Extra size, vigor, color, are demanded for the birds which are of the Line Foundation. They must be of

the type one strives for, whether it be an egg, a meat, or a superior exhibition type.

It is utter folly to line breed from a poor bird — a bird lacking in any essential point.

It is poor judgment to breed from a bird whose own ancestry is poor.

It is folly to breed from a bird with narrow head, or from a female giving eggs poorly shaped, poor in shell or color, or lacking in size.

It is folly to breed too near the danger line.

It is folly not to cull sharply.

XVII

RECORDS FOR FUTURE STUDY

A Man's Poultry Past — Stopping the Leaks — The Beginner and "Systems" — "Hovering" The Chicks — Methods not Feasible — Income *versus* Outgo — Trap Nesting — Good Dollars Eaten — A Beginner's Success

IF there is any one person, who, more than others, needs to keep accurate accounts for his own sake, and to refer to them often, it is the Beginner. In justice to him, I will say that he is usually pretty faithful to



How Not to Do It. Neglect and Filthy Soil. Study This "Record" Well

the former part of this proposition, — more so than the "old hand." But, there is little value to a record that is not studied. Any one will be apt to study a record of unquestioning success, study it even gloatingly.

Yet, for purposes of education, a record of failure is often far more valuable than a record of success.

Nothing less than the facts and figures spread nakedly before him will enable one who has not been successful to ferret out the real points of difficulty. But the one who fails is too often the very one who has not courage to look at his poultry past!

It is not merely that one ought to know whether or not the stock as a whole, or any special side line, has paid fair returns on whatever of money, time, or strength has been spent in its interest. But, if it have not done so, one must be able to find out just what caused the leaks. For "leaks," in any business which deals with very numerous items or entities, are the most dangerous and uncertain things with which one must deal. And, it is just this one key fact, viz., that he cannot find and stop the leaks, that often makes one man a failure as a poultry handler, while his near neighbor makes money "hand over hand."

A stranger wrote me out of the depths of experience a story of initial success, followed by failure almost absolute. This is so unusual that it was no wonder he felt humiliated, and was on his mettle to re-reverse the situation. Yet, as I reviewed his story, I saw that he had failed at the very point where the Near-Beginner is always prone to fail, — that is, at the point where he begins to increase largely. This worker, however, had not struck quite the usual snags.

His story was that he began with a small flock of Indian Runners. He was fortunate in getting the white egg strain, from the original importations from England, where these ducks have been bred for scores of years.

Offspring from Late Selection - Strong - C.



Offspring from Late Selection - Weak - D.



One Cause of Leak. Comparative Results from Some Cornell Experimental Work

His birds exceeded all his expectations as producers, and, naturally, he increased his numbers. He was just a plain farmer, working for market eggs, but his success outdistanced anything else of which I ever heard. Increasing up to 115 stock ducks, he reported having gathered, daily, for more than a month in succession, an average of 112 eggs. This was a marvelous product, even in the best month of spring. Just at this time, his evil genius suggested that he get some outside, new blood. Not knowing of the two types, he acquired some males which changed his flock to green-egg producers, and reduced the yield very greatly. Thoroughly disgusted, he tried a Pekin cross, which was also disappointing in the extreme. The last I heard from him was that he had just discovered the reason for his failures, and was on the warpath for some pure-bred, white-egg Runners, once more.

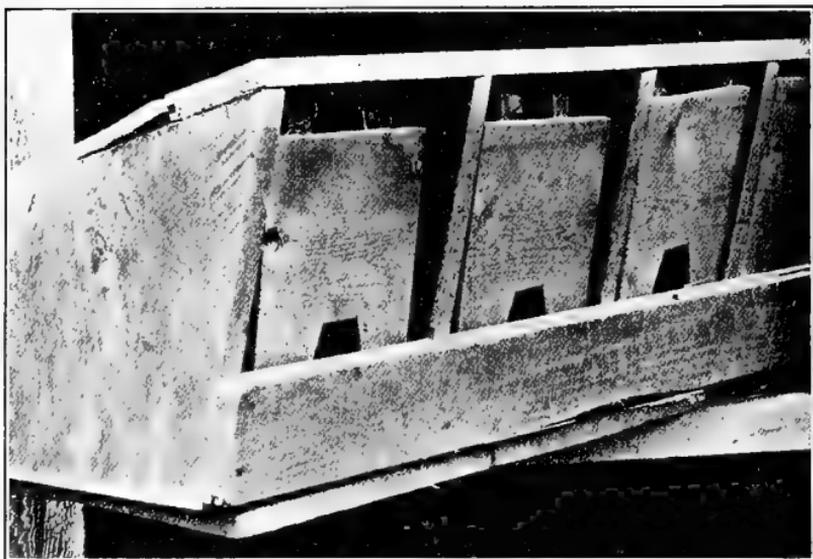
Increase of stock is, in itself, a very healthful sign. But, too rapid increase, or ignorant increase is often fatal. It is here that records help again. The cause of the fatalities connected with increase of stock nearly always lies in the fact that the handler does not manage as he did at the first. Of course, large numbers are necessarily managed somewhat differently from small lots, as to detail work, but *principles cannot change*, and whenever the handling of the increase bumps up against a principle of working that made for the worker his earlier successes, he is in line for failure. For instance, large flocks foul the soil incredibly soon; large flocks of uneven birds crowd and trample all but the fighting percentage; large flocks deplete the bank account most painfully in the off season. At this time, it is of great value to have

a book of records of happenings and of work, and, if possible, of averages, which may be studied for the clew to success with the larger venture.

The trap nest is a simple thing, but the Beginner may simply stand still and mark time if he fail to appreciate its value. I do not believe that the common man can afford to bother with trap nests, all the time, and for all his fowls. But the use of a set of trap nests with one pen of fowls for a season or two will teach one effectively many things which others have tried to teach him, without having been able to make their words striking enough to reach his real consciousness. An essential thing to learn is the necessity of finding how to increase the income without also increasing the outgo. It costs quite nearly the same to *maintain* the idle hen, the fairly good layer, and the rarely good one. But the extra good layer must have an extra good appetite; she must eat, not only the maintenance ration, but enough more for the manufacture of her output of eggs, whatever it may be as to number. As the egg may range from 65.5 to 75.8 water (Atwater's figures), the amount of feed required by the layer above that taken by the idler who merely eats for the fun of it need not be considered excessive. But, she must be a good eater with a good digestion, or she *cannot* be a good layer.

The trap nest will show some surprising things. You may have a lot of hens, looking fairly alike, which are, you think, doing reasonably good average work. The trap may show you that while *you are averaging, they are not*; they are individualizing. One is, perhaps, doing nothing, at least two thirds of the year; another is not so bad, but still much below your averages; one

or two, doubtless, are doing phenomenally good laying. Nothing else could impress this fact on the consciousness of a Beginner so forcibly as a bit of demonstration work I saw at the New York State Fair in 1911. It consisted



Home-Made Trap-Nest Series. Rear Doors, entered from Platform, Swing Inward. Similar Doors in Front, Swing Outward. Hen Leaves Nest at Will, Entering Confining Pen

simply of three "Record hens" and their respective output. The output was shown in wire net receptacles, and was seen at a glance. One of these contained eight eggs; a second contained one hundred twenty-eight eggs; the third contained one hundred seventy-five eggs. Any Beginner, pondering on reasons why some people contend that poultry does not pay, while others demonstrate that it does, needs only to figure the difference in gross returns from the hen that lays eight eggs a year and the one that lays one hundred seventy-five a year, in order

to pounce on that elusive "reason." This is, of course, an extreme illustration; all the more, it shows most vividly just what I mean. On the day before this writing, I read a report from a woman poultry raiser, claiming that her flock of seventy hens had averaged two hundred forty eggs during a year. No one has ever ventured to tell me such a story face to face; but, between an actual eight on one hand and a possible (or impossible) two-hundred-forty average on the other, there ought to be a safe place for the sole of the feet, even of the shaky Beginner.

Professor Dryden, of Oregon Agricultural College, reports a Plymouth Rock trap-nested hen making a record of two hundred fifty-nine eggs in twelve months. "In the same pen with the record Plymouth Rock hen," he says, "we had one which laid but six eggs, although she was of the same breed and received the same care and feed. The trouble was in her heredity."

There are many who say that the phenomenal layer is not at all likely to reproduce herself; that her undue amount of work is such a strain upon the reproductive organs that she will produce eggs not hatchable, or will produce weaklings. That will depend somewhat on her handler. If he, finding her value, pushes her to the verge of exhaustion in trying to get a few more eggs, she may become worthless as a producer of stock. Or, if the egg organs are not perfect, or the digestion be affected by the strain (shown by the droppings), she may not reproduce well. But if she lays an egg perfect in shell and her droppings are well shaped, with the bright, white cap, I say she will give you as many chicks as the next one. That is not saying they will all be like her. But

if you mate her best daughters with a son who resembles her in general, I think you can make progress.

At any rate, it is good sense to reproduce from the best all-around stock you have. A bird good in only one or two points is not a desirable breeder, whether for utility or for fancy. The one practical and sure way to follow this out is to trap nest. If you do this, you will know far more about each hen's individual peculiarities, because you will observe her far more closely. I have known farmers, having cross-bred or mongrel stock, to select roughly from outward appearance and noticing which hens laid oftenest. This rule of thumb is worth something, but it is far from equal to trap nesting. And no one can guess how really inaccurate it is until he has done some trap nesting. He will then find that circumstances have often deceived him.

The trap nest has its undoubted faults: the nervous hen is fretted by it; the more "stupid" one may persist in laying anywhere but within its narrow confines. But any one who has studied fowls will have learned that he must train them to trap nesting as he trains them into all other desirable habits. "Make it easy to do the right thing and difficult to do the wrong" is good counsel, whether dealing with man or bird or beast. Trap nests must be used without the traps until the fowls are fully accustomed to their use, and no other nests must be allowed in the pens. And if you, by chance, have shut your hens in, several days before you furnished them nests, never presume to blame them thereafter for laying in the litter!

The selection of the kind of trap is a matter of some importance. Those having a detention pen into which

the layers pass after laying are probably the best. If this pen be common to several traps, one identifies his layers fairly well, but in case a hen leaves the trap without having laid, he cannot identify her surely. A secondary pen for each nest is the most thorough, accurate, and comfortable combination. But, in using this form, one doesn't want to trap nest large numbers.

An actual report of results, offered the public, reads something like this: "Hen No. 5 laid 250 eggs from September, 1909, to September, 1910. Three of her eggs weighed half a pound. Hen No. 6 laid 258 eggs from October, 1909, to October, 1910. Twenty hens laid an average of 209 eggs in 1909."

Dates, months, number of eggs of individuals, and averages! These data cannot be given accurately unless there is an honest trap-nest system, with an honest, faithful, and accurate handler; no guesses, no mistakes. No such high records can by any possibility be gained without a painstaking, quiet handler who is also a good feeder, and hens selected for constitutional vigor and for eating capacity.

We have with us always the Beginner who wants to raise poultry for fun or for family needs, and who has bowed to the dictum of the experienced to begin carefully, even though he wish to become the wonder of the countryside eventually. Unfortunately, we have, also, the man with the very large ideas which refuse to be cabined and confined, who fully expects to show all those heretofore in the industry what very poor business men and poultry raisers they are. He scorns to figure in anything less than thousands. His only road to success lies in the fortunate securing of a first-

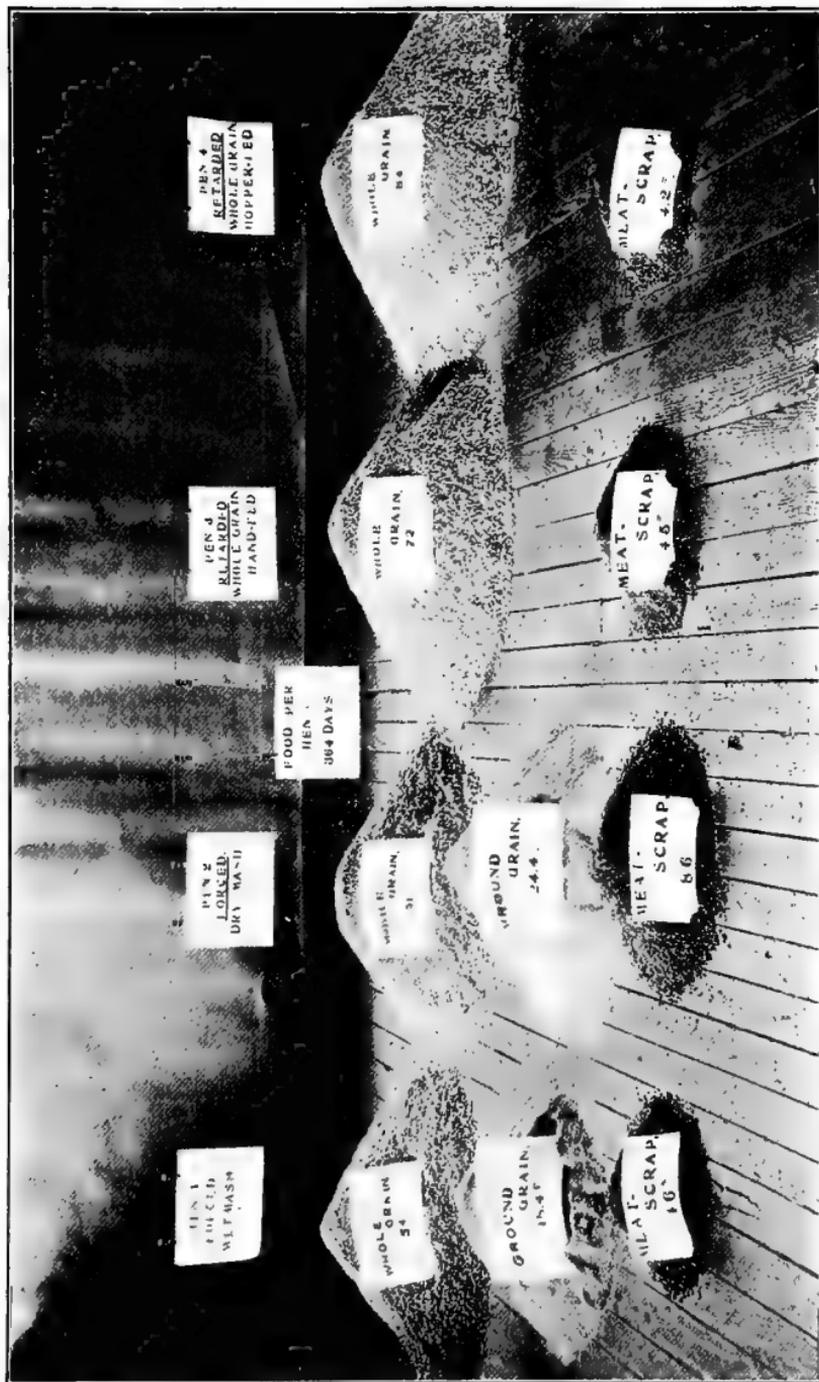
class, fairly conservative poultryman, to whom he may possibly have sufficient sense to defer.

The Beginner who is willing to take small risks until the time when his planning gives reasonable promise of being successful may be pretty sure of making an eventual sweep of the good things of poultrydom.

A sentence from a published report of an editorial visit to an advertiser's poultry farm is exceedingly illuminating. "Two things surprised me greatly on Mr. X's farm: first, the comparatively small number of birds raised; and, second, the wonderful average quality." This report referred to a fancier's operations. But the same result will often follow those of the small worker in just market stock, or layers of table eggs. One who raises but a few young birds is more than usually sure to raise birds of high average quality. If room is at a premium, selection will be much more rigid, and a small flock is likely to get better care and to be free from most of the handicaps which inevitably belong to large flocks.

Records of laying, records of purchase and sale, records, even, of the weather have a value to the Beginner far above that which they may have to one who is entirely familiar with the operations which make for profit. It is quite certain, however, that the latter reached his enviable condition through the aid of records kept when he, too, was a Beginner.

To keep a record of outgoes, without one also of incomes, is to become a detractor of the hen. Not to keep records at all, but to stand helpless by and see good dollars (worth of feed) thrown to insatiate unproductive birds through October, November, and Decem-



"Outgoes : " Comparative Amounts of Various Feeds eaten by One Hen in One Year, under Varying Conditions (Cornell)

ber is to become a more rabid detractor of the laying hen as a money-maker. If this unhappy eggless state continue through January and February and even into March, — as is sometimes the case, — so much the worse for the reputation of the hen. Yet, even then, if the hens fed have been rigidly selected for vigor and parentage, they will have reestablished themselves in favor by May, and will, even after this date, begin to make the income more than meet any reasonable outgo. But who is to know the real facts, if there be no accurate records? No one can deceive himself more as to real facts than the poultryman who relies on guesses or on memory rather than on actual figures. And, as one writer cleverly puts it: “When we keep accounts, we virtually *pledge ourselves to make the fowls pay.*”

The little story told by one young man who, six years before this is written was a Beginner of Beginners, is good proof of the value of records. He started, not “at the bottom,” but down below the bottom, since he borrowed \$5 wherewith to buy his first pair of fowls. Under these circumstances, the birds were in duty bound to pay their own way, and records were a necessity. The pair and its descendants have paid for several good poultry houses and their accompanying yards; for advertising, for feed, and for part of a new dwelling for their owner; besides furnishing something of a nest egg in the bank. The owner has them at State Shows in five states, and has made winnings under more than twenty different judges. He works hard, and studies hard; as most of those in any kind of business need to do in these strenuous times if they would command success.

XVIII

PROFIT AND LOSS

Studying Losses, for Profit — Crowding and Loss — Overcrowded Land — “Relatively” — Where will the Beginner Lose? — The Mental Attitude — Business Instinct and Detail Work — When Experts Disagree — The Handler the Chief Cause of Losses — How Hard must One Work? — Raising Chicks “to Perfection” — Faulty Figures — Disillusion — Making Income cover Season

THE discussion of “profit and loss” usually shows a proneness to dwell on the thought of “profit”; and I think this is especially the case when it comes to a question of poultry. I prefer to discuss, rather, the losses. I chance to know a gallant young poultryman not yet out of high school who has been struggling for some years with this painful kind of arithmetic. At intervals, his mother attacks me with poignant inquiries as to whether poultry ever *really does pay*. And, though I have not the figures, I am given to understand that this flock, into which the lad has put keen interest, enthusiasm, time, and money, far beyond the average, does not pay. And this, despite the fact that the products are largely bought to supply the home table. I gather that the income has an ingrained habit of failing to meet expenses, even though we ignore all mention of time, work, etc., being paid for.

Not long ago, there appeared in a New England publication (probably the most conservative one in the United States, dealing especially with the poultry indus-

These are fully-edged

Profits.

- Profits Depend: { a. On lowering Cost
b. On increasing Product
c. On increasing Price
d. On all-round Efficiency

try) a query from a subscriber as to profits in poultry raising. It was based on a quotation (for which the inquirer vouched as correct) from "an official, in the Department of Agriculture at Washington, D.C.," affirming that said official knew of only one profitable poultry farm in the country! This created something of a stir in eastern Massachusetts, where a pretty large percentage of the people *must* be considered as either congenital idiots or successful poultry raisers, because it is simply inconceivable that they would remain in an occupation which was in all cases unprofitable, and that through many years, even to lifetimes!

The conservative editor to whom this query came pronounced the statement "ridiculous," affirmed that it emanated from a man who was *not* a poultryman, and said: "I doubt whether there is a 'farm' anywhere in the United States where poultry is given attention enough to supply its necessities and the product handled as it usually is on farms, where the poultry is not profitable." I give this deliverance especially, because this particular editor has never been known to put emphasis on the "rosy" side of poultry raising. He believes, however, that the poultry on most farms "might be made more profitable than it is." This point might be very easy to prove by figures. But poultry on most farms necessarily has its relation to the other work of the farm, and it often becomes a nice question as to which is the most profitable to neglect. With some workers, it would undoubtedly be the poultry, at times.

A point made before the discussion noted was closed, brings us again to the question of crowding, and nails it as a source of loss. The editor favored the combina-

A Hen Genius:

"Lady Cornell"

Estimated Food Cost, \$1.66; Labor and interest 1.00 =
The year's cost \$2.66

257 Eggs @ 33¢ \$7.43; Voidings, 29¢

The year's Income \$7.72

Net Profit \$5.06

"The Rosy Side": At this rate, Two Hundred Hens Would Be Good for \$1544.00, Gross Income. Only Accurate Records Could Make This Known

tion of some trucking and fruit raising with poultry raising, not merely for the profit from them in itself, but because he regarded them as a means of staving off certain definite losses common to poultry raising, through utilizing the manure and keeping the land in wholesome condition. "It is not impossible," he says, "to make an exclusive poultry plant pay, for a period of years; but if the land is overcrowded, the risk of loss is increased, and a time may come when the land becomes positively unfit for poultry." I call especial attention to the fact that his view goes beyond that to which I have previously drawn your notice, viz., the crowding as it affects individual birds directly, — and talks of *overcrowded land* as a fundamental, wide-reaching source of loss.

A certain statement of Professor W. J. Spillman, one of the government employees, may well come in for a brief consideration. He affirms that more money "can be lost with chickens, relatively, than with sheep or pigs." The mind of any reader instinctively demands, "Why?" This is one of those statements which prove irritating, because so indefinite that analysis can do nothing with them. What does "relatively" mean, for instance? Relatively, one loses a hen much oftener than he loses a sheep, possibly, if he raises both. But again, relatively, with common stock, he can afford to lose eight to ten hens for each sheep lost, and still come out even. If he chance to be carrying sheep worth five dollars each and hens worth ten or twenty-five dollars each, it would be marvelously easy to prove the learned Professor's point. As a matter of fact, if a man is ignorant enough, careless enough, or stupid enough, he can probably lose all he invests either in sheep or in pigs, not to mention

poultry, and, from this point of view, the quoted statement would mean little or nothing.

Should you ask any old hand with poultry just about where he would expect a Beginner to lose money, he would doubtless answer, "In the things he overlooks, thinking they do not affect the main question." I suspect that slow and poor development of the chicks may be counted the one great common source of loss. This, you may notice, is a "loss" of something the worker never had. But it is surely one great hindrance to profit. It tells in the meat sales and in the egg sales. In avoiding the causes that make for poor development, the skill of the worker is most severely tested, and his timbre most fully shown.

When it comes to the next great source of loss, the matter again depends much on the one just discussed. If there are many poorly developed birds, there will almost surely be weak-kneed culling. Many fowls will be left to crowd and sponge on the good birds. This means relatively large feed bills — big bills and little returns; another loss of something one has never had! *The poultryman's profits are in his hopes and aims fulfilled; his "losses" are in his hopes blasted.* This just about covers the situation.

The mental attitude of the grower is one real key to success. A good poultryman is, in nearly every instance, a good business man. His habit of mind will not allow him to let things go at loose ends. He needs a liking for poultry as one of the fundamentals, but that liking will not take the full place of systematic business methods, the resultant of business instinct.

I believe it to be an almost universal rule that the man



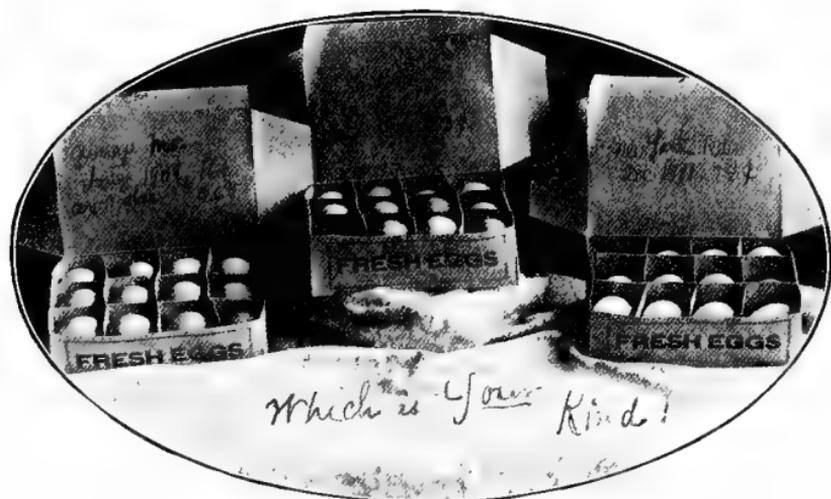
The Eastern Cotton Tail Rabbit. Rabbits are Very Destructive to Leguminous Plants, Many of Which Are useful as Poultry Feeds. (United States Department of Agriculture)

who would succeed in a business composed almost wholly of small detail work, and having many small sources of loss and profit, *must have better business instinct than is necessary to the one who is to handle work with less detail.* Perhaps this is in direct opposition to the general belief, but I have seen it demonstrated too often not to insist on my point. If the learner have the right habit of mind, he can master the operations necessary; if not, teaching, and even experience, will not make him an expert.

Mr. M. Hastings, in his "The Dollar Hen," lays chief stress on keeping down labor, and keeping down expenses. In the number of those engaged in it, he states, the "chicken business" is the *largest industry in the world.* A practical man, himself, he says to the "Man-Who-Wants-to-Know," with considerable vigor: "If your climate will not permit the hen to live outdoors, get out of the climate, or get out of the hen business." This would cut the (literal) ground from under far more than half the poultry raisers of our big country, as none of us at the North have the advantage of a climate where the hen can live outdoors throughout the year. Even though this were sound common sense, it would be no solution of the question for the common run of inquirers, because the average man wants to know how to raise poultry with credit and cash surpluses *just where he is.* To be sure, Mr. Hastings, was referring specifically to those who would start commercial poultry plants, or those who might wish to make a living from poultry alone; which fact somewhat restricts his words from universal application.

Whatever we may or may not say about a certain

well-known system, there is no doubt that its originator is a man of keen and practical mind. In the face of the stern necessity of the above requirements for location, how is it that we find Mr. Hastings so far away from him in his beliefs and practices? The system man affirms that his broilers reach two pounds at eight weeks, and that



Actual Variations in Retail Prices in the United States, in Ten Years: From Six to Seventy-four Cents

he has *no loss* in raising them. He declares, in this connection, that there is "a living in poultry keeping and a living better than 99 out of 100 who 'seek work' for a living are making. The location is but a small factor." One of his maxims is, "To-morrow will NEVER do." In support of this maxim, he asserts that all but one out of a hundred cases of failure in any line are caused either by not giving attention at the proper time, or else by giving more attention to something else than to the business. He refers to the poultry business as

“the one” business where brains count more than muscle.

But, here's a point of great difficulty: each “expert” who would persuade the public that he only knows the one way in which poultry can be made to pay, differs from all others, as a matter of course, with regard to the essentials. How shall the lamblike public sort out the one public benefactor from the scores of public fleecers? It certainly follows that, *if* there be only one right way, all the rest who claim exclusive paths to success are preying upon the public. They *must* be!

Despite Mr. Hastings's final pronouncement, here comes the system “expert,” and, not content with saying that location is but a small factor, he insists that, in considering possibilities of success, he can tell better when he knows the person than when he knows the place only. In this, most workers would agree with him. It is wholly clear that he considers the handler of the plant the most uncertain factor, and that he believes that this handler is likely to be the chief source of losses, when these occur. This is a hard saying for the average inquirer to assimilate without rancor or unbelief.

But, I wonder if the average person who goes into poultry raising expects — as this man affirms is necessary — to work as hard as would be necessary if employed by another! “The work of raising the chickens to perfection should be the first one to master,” says this keen business man. Is it likely that the average inquirer will do this? How many have you known who could raise chickens “to perfection”?

A prolific source of disappointment lies in the lack of skill in making the income from the fowls cover the

year. It does not seem to matter so much whether a man have much capital or little. If he have much, he is liable to waste it; if little, he is rather likely to get tangled up in winter when outgoes are beyond incomes. This is one of the good reasons why asparagus and fruits, etc., may go well with poultry; as they furnish money coming in sometimes just when the poultry income slackens. Much of the work with tree fruits can be done at a time of year when the poultry work is of least volume. This point needs to be watched, in selection of combinations.

XIX

COST OF PRODUCING EGGS, CHICKS, AND FOWLS

Productive Capacity—Cornell's Findings—A Business Poultryman's Views and Methods—Making Prices—Range of Cost in Egg Production—The "Average Hen"—Cheap Feeding—Free Range—Feed in Australian Tests—Profit Twice the Cost—1910 Prices—What shall Your Eggs Cost? Your Chicks?—Sprouted Oats—Principles of Big Business Men.

THIS question, so important for every Beginner to have full information on, is very difficult to be definite about. The best we can do is to give an idea of cost under different circumstances, and leave the worker to apply the facts as stated, to his conditions. Where conditions vary, truth becomes, for the time, untruth. This point the Beginner must have always in mind in computing probable costs.

That which is true this year may be partly false next year; since prices of feed and other materials vary; since, also, as it is applied to different localities, that which is true in the East may be false in the West. Even the productive capacity of a certain fowl may differ according to the climate in which she does her work. Moreover, the poultryman himself is a factor in the result which may make my figures true for one man and false for another, even when both carry the same breed and live in the same locality. A knowledge of feeding values such that it allows the worker to substitute a

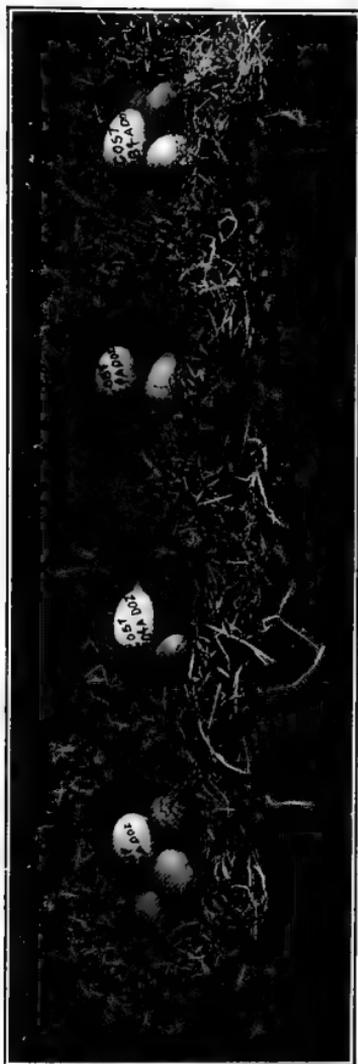
cheap feed of equal nutrient value for one that may be temporarily high through failure of crops or other cause, may make a large difference in the cost of production.

It is generally believed that the cost of producing eggs or market stock is nearly twice as high at the present time as it was ten years ago. Yet, yesterday, I received a letter from an enthusiastic Indian Runner breeder in the South, telling how cheaply he could raise the Runner Ducks, and how much money could be made from them in his locality, from the market point of view only, because they would live so largely on alfalfa and oats "with a little meat thrown in." He continued, "They do eat more than a chicken, but even if they ate twice as much of the same kind of feed, they would still be just as profitable, for they will grow more than twice as fast as a chicken during the first ten weeks."

In the year 1902, the Cornell Station put out a bulletin giving the detailed results of a cooperative test of the cost of egg production in New York State at that time. In this work, a dozen flocks in various parts of the state were used, running in numbers from 25 to 600 hens in a flock. By this, I mean those which belonged to one owner. Although these were all within the borders of one state, the cost of feeding, per hundred, varied from \$28.62 to above \$39 for the seventeen weeks from the beginning of December to the end of March. The average production of the 2100 fowls represented was a trifle more than 23 per 100 daily, and the average food cost of a dozen eggs was sixteen and one fourth cents. The average profit above cost of

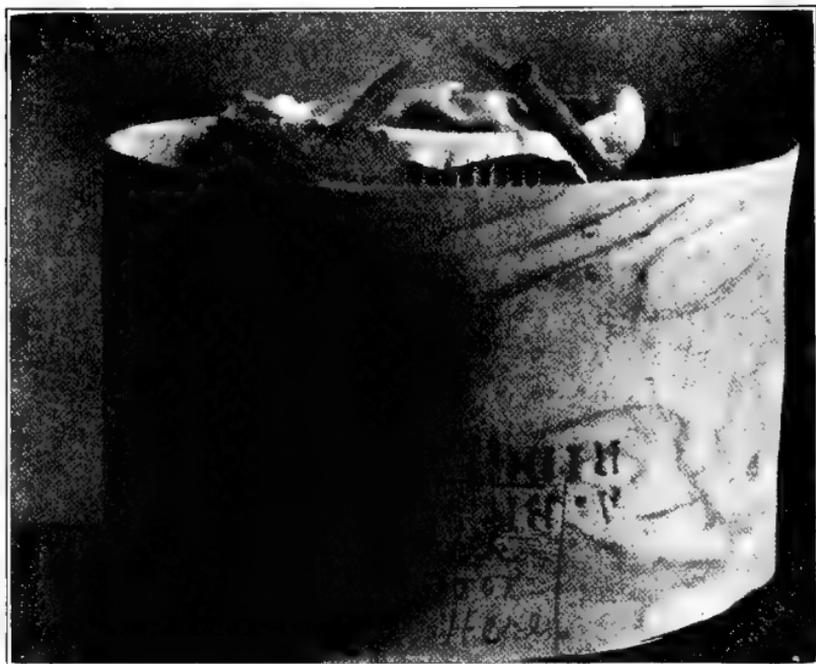
feed was nearly \$24 per 100 hens, for the entire period. It will be seen that this, if it were duplicated in the remaining months of a complete year, would not reach the \$1 per bird which was so long the standard of profit. The poorest flock made less than \$2 profit per 100 above cost of feed, while the best flock (numbering 150) gave \$62 profit over feed per 100 birds, for the seventeen weeks. Possibly the point which may cut closest to the quick of the Beginner is this: No two flocks produced eggs at the same cost per dozen, the best costing a trifle over eight and one half cents a dozen, while the eggs of the poorest handler cost nearly 34 cents per dozen. Others cost 13, 16, 19 cents, etc. It is quite possible that some of these owners had better opportunities for buying supplies. But it is abundantly evident that some were far better business men than the others; possibly more skilled feeders as well.

A skillful dealer in poultry products, writing in the most modern and businesslike poultry publication available at this time, gives his own idea of the attitude of some novices thus: "The second class constitute those who expect to brood chicks for little or nothing. These are the rankest novices in the business and are the especial marks of the 'get-rich-quick' boomers. This kind of person expects so much for so little, that he is hardly worth sympathy, let alone attention and advice. Most of them end with 'fireless brooders' because they are cheap." Another, very different class, noted by this man consists of fanciers who do not care about expense, *if* they get *efficiency*. Rightly, he thinks, we should insist on *these* essentials in any brooding outfit: Efficiency, economy, saving of work, lasting



Above, Variations in Actual Cost of Eggs. Not the Extremes
Below, Extra Large Hens' Eggs, Two and One Fourth Ounces in Weight; Indian Runner Duck Eggs, Averaging Three Ounces

quality of equipment, and what he calls "elasticity." Some brooders, he rates as not convenient; some makes are too perishable; some poorly ventilated; in some, the labor was found so great as to be prohibitive when large numbers were brooded. Being forced by the



Cheap Cheese Box Home Made "Fireless" Brooder

necessities of a chain system of egg-producing farms under one management, to find something efficient, economical, and necessitating little work, he tried the fireless type of brooders, under the best advertised methods. His conclusion was, in effect, that the death rate was too great, the economy imaginary, the plan impracticable where time is an element of value and

labor expensive. He, in common with most other trained business men, believed his best profits must come from lessened cost of production. Ultimately, he worked into a plan of using the low, square laying houses as brooding houses, with an aisle down the center and three pens on a side. Toward autumn, the divisions were removed, instead of moving the pullets. Thus, there was no check to laying. This he names "a real factor in successful brooding." This plan is, he asseverates, an outgrowth "to meet the practical conditions of a money-making plant." He points out its economy, its adaptability to a man's ideas of saving work and expense, its avoidance of the exposure of work with outdoor brooders, its gain in space, its increased yarding possibilities, its all-the-year use of the buildings. It will be noted that all these points are in the line of both efficiency and economy.

Passing to talk of eggs, this man says: "Our eggs are in a class by themselves, and *we do not seek to follow market quotations.*" Prices were fixed at 40 cents and 60 cents a dozen, according to season, and, on this basis, in the second year, a clear profit of \$4.17 per layer was reported. I have not the figures of the cost of production; *all* costs have been subtracted from the income — not merely that of feed.

Some producers have reported the cost of production of their eggs at less than three cents a dozen. An experienced editor replied to a query as to "cost of eggs for the average farmer" that it ought to be about six cents a dozen. It has been stated that 98 per cent of the poultry business of the country is conducted on the farms; but to "average" five million farms and farmers, more

or less, is a difficult matter. Here is the state of Mississippi, for instance, to which the census of 1900 gave an average production of 43 eggs per hen. The farm price of eggs in this state averaged not quite 10 cents a dozen. The hen brought in about 35 cents a year. If, then, it cost nothing at all to feed her, she gave a



One Month's Product : Left, the Forty-eight-egg Hen ; Right, the Two-hundred-fifty-egg Hen

“profit” of about one third what the “average” hen has for almost a generation, I think, been supposed to produce for her owner. The South Carolina “average” hen, according to the same figures, did a little less well, producing, as per report, two eggs less a year than the Mississippi birds. In seven states, the average was below 45 eggs per hen for the full year. Maine hens just touched 100, and two or three others nearly reached this figure. But, when we average these with the hens below 45, how it pulls the figure down ! It seems to me that the most noticeable point in the report is the fact that Maine and New Hampshire lead the United States, and they are among the very worst as to atmospheric conditions. Massachusetts is next in production ; *all*

the states with nice, warm weather are very low in averages. The states with medium weather have medium averages. This exactly reverses what we might expect. The only reason I can see is that the South is careless and does not take care of its hens, the mid-states are too absorbed in general farming to take the best care, and only those who *have to take good care to get returns at all* are showing fair average returns. Better markets at the North may be an added stimulus.

What about the hen kept in confinement? What will be the cost per dozen of the eggs which she produces? That depends on the prices of feed, the quality of the hen, and the quality of her handler; all uncertain points, and difficult to "average." A hen in confinement, with only supplied food, will eat, of hard grain, about one and one third bushels, or 80 pounds. If this were wheat, at two and one fourth cents a pound, her feed for the year would cost \$1.80, and if she laid 100 eggs at three cents each, she would have \$1.20 left to pay for the meat and green stuff, and give the dollar of profit which has been the safe standard for twenty years, perhaps.

But suppose, on the contrary, that one should take one and one third bushels of oats, costing, possibly, fifty-three cents if bought from the raiser and should "process" it, making it into four bushels. This would bring the cost down to thirteen cents a bushel. The fowl's health would be so much better if this were made a liberal portion of her daily ration, that she would be likely to lay more eggs, and would distance the bird fed on wheat alone several times over in the matter of profit.

Suppose, again, that one can get plenty of alfalfa, cut short and fine,—not when it has been through the

hands of the middlemen and sells at the rate of fifty dollars, more or less, for a ton, but from the producer. It is a most excellent laying and growing feed, for the foundation. Two parts of this, one each of bran and fine middlings, and one fourth as much linseed meal would make an excellent dry mash. With ground meat in another hopper, and a full hopper of this mill stuff always before them, the birds would need only enough corn and oats to keep them exercising. This feed ought not to cost more than half as much as all wheat, while it would probably give fully as good results in eggs, and better results in the condition of yarded birds.

One of the better-class poultry periodicals worked up, during 1911, a symposium on the value, in practical terms, of the Wyandottes, the birds representing most nearly the American ideal of a satisfactory all-around fowl. Breeders of Buff, Columbian, Silver, and Black Wyandottes took part in this discussion. A tabulation of these opinions, the result of actual experience, shows the breed up as follows:—

Fair average egg yield, first year of laying :

Highest, 200 eggs
Lowest, 140 eggs
Average of all, 166 eggs

Cost to hatch and grow to laying age :

Lowest (free range), \$.35
Highest, \$.80
Average of all, \$.69

Cost of keeping mature bird one year :

Highest, \$2.00
Lowest, \$.90
Average of all, \$ 1.26

As to feeds, most of the growers began with chick feed.

One grower declared his faith that the free-range chick is both cheaper to grow and better when grown, and said that free range, joined to a provision of beef scrap and cracked corn, was *the very best of chick combinations*. The grower whose estimate of cost was lowest started his chicks on free range and rolled oats for about a month, then used cracked corn and a mash comprising equal parts of bran and oats with half as much beef scrap and twice as much corn meal. When near maturity, whole corn took the place of cracked corn. Dr. N. W. Sanborn, who chanced to be the one whose estimate was the highest, of those that gave exact figures, declared for good commercial chick feed during the first six weeks; after this, dry hopper-fed mash, corn and oats, middlings and scrap; mixed grain, corn, oats, wheat, and barley. Apparently, the difference in cost is made chiefly by conditions of handling (and perhaps continuance of chick feeds) rather than by variation in actual grains fed. I have given the cheapest and the most expensive in order to show this. There are two or three advantages in a good prepared chick feed: it is fine, it is widely varied in composition, containing many different kinds of seed; it has the right proportion of meat. A poor chick feed has too much grit at a high price and too much millet. (Neither is used as much as at one time. The public simply refused to be baited by this class of goods.) One feeder, who stated that he never had sickness or leg weakness among his chicks, used a dry mash consisting of bran, meat scrap, clover, corn meal, and dry bread, "all they can eat," wheat and cracked corn for grain, corn largely predominating.

Only two of these growers, much to my surprise, mention the use of sprouted oats. Only one mentions clover. I judge this to mean that most of them consider free range a necessity, and that they do not need to supply the bulky feeds. If chicks are to be grown in confinement, the one salvation for the grower is to keep them at work, which can be best done by burying grain in the soil regularly, and putting it in so deep that it will sprout. I once listened to the story of a woman who raised wonderful chickens on a city lot. She said she could not have done it had she not had chick ladders, which they were compelled to use, in various parts of the houses and runs. It seems to me that it is decidedly better for the chicks to work *for something* rather than for the sake of work alone.

One point in the Australian Competitions which makes them so valuable to the world at large lies in the fact that they are consistent efforts to do things in a way that can be followed by any worker with poultry. Only in the use of flocks smaller than are usually thought profitable do they depart from the path of the common man. The housing is of the simplest, the feed cheap and everywhere obtainable, the hens actually "borrowed" from the workers of the land for testing in competition. Professor Thompson, the conductor of the tests, says: "the whole of the tests have been carried out on plain, practical lines within reach of the ordinary farmer." The mash, mixed in winter with boiling water and in summer with cold water, is composed of one fourth bran and three fourths "pollard" (which Mr. Purvis says means middlings, in "American"). Twice a week, a pound of boiled liver to ten hens is

SYSTEMS OF POULTRY KEEPING

SCALE 1"=166'

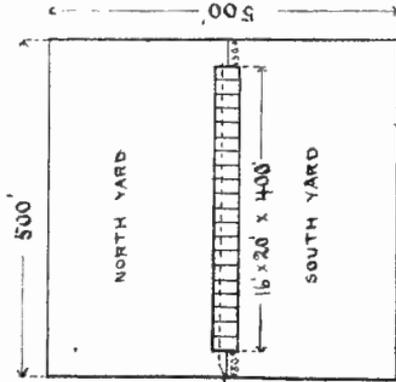
----- LENGTH OF WALK.

COMMUNITY

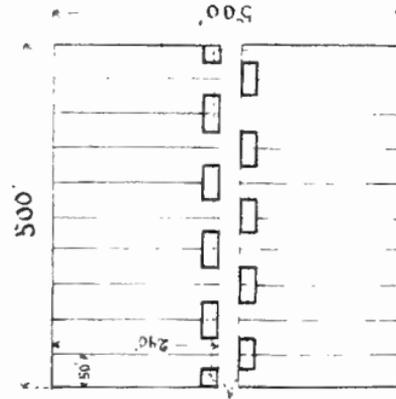
SEMI-COMMUNITY

COLONY

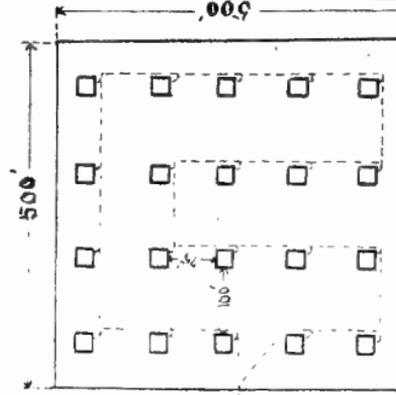
CAPACITY 1500 LAYING HENS IN EACH CASE



SAVES TIME $\frac{1}{10}$ EXPENSE



MAKE YARDS LONG



LONG WALK REQUIRED

Graphic Comparison of Three Systems, Showing How to Cut Down Labor Expense. (From New Jersey Experiment Station)

minced, and with the hot "soup" goes to form the mash for those days, when the ground grain is added. The birds are fed a little more than they will eat up clean. Liberal feeding is one of the lessons of the test; also, according to Professor Thompson: "The natural grasses in a run form the greater proportion of the feed consumed by fowls. Consequently, the provision of *good, grass runs is half the battle in poultry farming.*" Can we assimilate that thought?

The cost of production of these eggs is the interesting point. The 181 eggs per hen were produced at a cost, of the supplied feed, of \$1 each, which is almost exactly 6 $\frac{2}{3}$ cents a dozen. *The profit above feed was more than twice the cost.* Part of this is offset by the greater expense of housing in pens of six. But, supposing that one housed in lots of 25 and received an average of but 100 eggs, which is the best that any state in the Union reports. The gain over cost of feed would then be about 44 cents per hen. This looks like penny wise, pound foolish in exaggerated measure: \$1.75 in *profit lost*—if such an anomaly can be!—per hen would offset the greater cost of housing in small numbers, many times over. But, if it came to a question of labor, the matter would again take on another look; since labor is *the* great expense, as soon as it has to be hired. Hens carried in lots of six mean labor greatly increased, as any one must see.

The Government Report for the year 1910, for this entire country, covers the average price received by farmers on the 1st of the alternate months of 1909, beginning with February, and the 1st of each month during 1910, for each state and territory. These are also grouped

into Divisions, as North Atlantic, South Central, etc. From this tabulated list, I select the figures for May, the month of lowest prices; December, the month of highest prices; and August, an intermediate. February runs, in general, about ten cents a dozen higher than August.

	MAY	AUGUST	DECEMBER
	Cts.	Cts.	Cts.
Maine	21	25	40
New Hampshire	23	27	39
Vermont	21	24	37
Massachusetts	25	33	50
Rhode Island	22	32	50
Connecticut	23	30	45
New York	21	25	39
New Jersey	24	28	40
Pennsylvania	20	23	34
N. Atlantic Division (av.)	21.4	25.4	38.4
Delaware	21	22	33
Maryland	19	19	32
Virginia	18	18	28
West Virginia	18	20	29
North Carolina	17	16	24
South Carolina	19	17	27
Georgia	20	19	29
Florida	22	22	31
S. Atlantic Division (av.)	18.6	18.5	28.3
Ohio	19	19	31
Indiana	19	16	29
Illinois	19	16	28
Michigan	19	19	28
Wisconsin	18	17	27
N. Central (E. of Miss. R.) (av.)	18.9	17.4	28.9
Minnesota	18	15	27
Iowa	18	14	25

	MAY	AUGUST	DECEMBER
	Cts.	Cts.	Cts.
Missouri	17	12	25
North Dakota	16	17	27
South Dakota	17	15	25
Nebraska	17	13	25
Kansas	17	12	25
N. Central (W. of Miss. R.) (av.)	17 4	13.9	25.3
Kentucky	18	14	25
Tennessee	17	14	26
Alabama	16	15	25
Mississippi	16	16	23
Louisiana	18	17	25
Texas	16	14	25
Oklahoma	16	14	25
Arkansas	16	16	24
S. Central Division (av.) . .	16.6	14.7	24.9
Montana	25	30	40
Wyoming	24	28	36
Colorado	21	24	34
New Mexico	21	23	33
Arizona	30	33	41
Utah	20	23	33
Nevada	32	33	45
Idaho	23	26	39
Washington	24	28	42
Oregon	23	27	39
California	22	26	44
Far Western (av.)	22.5	26.3	40.6
United States (av.)	18.6	17.6	29

The manager of one of our systems of branch farms, linked to a hatching and selling center, states that one of the reasons for the success of this system is that they reverse the usual process, so that by virtue of their

united strength and their organized plan of selling, they buy at wholesale and sell at retail.

Suppose, now, that it is true, as some say, that "processed oats" cost only ten cents a bushel. Estimate that three bushels of it will go as far as one bushel of oats not processed. Add 25 cents a year for beef scrap, and, if liberally minded, 10 cents more for grit, shell, and charcoal, all of which are cheap when bought by the hundred. To this you may add just what you please in the way of expense for more variety. (Mr. Briggs, of processed oats fame, says that he has kept hens for six months at a time on nothing but beef scrap and processed oats for feed, with most excellent results; though he does not recommend this as being the best way.) What total do *you* get for a year's feed per hen?

What I am trying to get at is, how much are you, friend Beginner, going *to let* your eggs cost you? Shall it be eighteen cents a dozen? Shall it be fifteen? Fourteen cents? Twelve? Eight? Can you get it lower still? What is your caliber? What your aim? It is *your* problem. The Utah Station has produced eggs for 52 cents per hen, cost of feed for a full year. For how much less, I do not know. But, at 52 cents, with a yield of 150, the feed cost of the eggs would be about four and one third cents a dozen. Some of the hens laid more. I do not remember the average, if it was given, and my figure of 150 is arbitrary. We need to remember that not all, by any means, can make their hens reach this average.

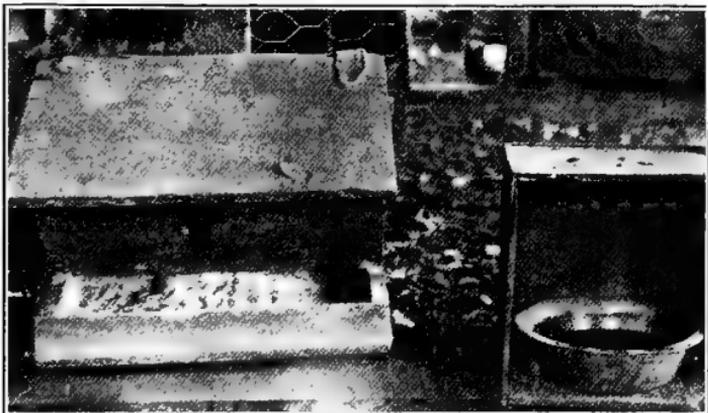
We have allowed above, on sprouted oats and beef scrap, with the digesters, a total of about 75 cents per hen. Remembering that the sponsor of this system

says that it is *easy* to get 200-egg-average layers on this feed, look at this presumptive cost. It comes out in a fraction, and you don't like fractions of a cent any better than I do; we will say, then, that it is certainly less than five cents a dozen—this estimated cost of producing eggs. Now, when you figure out on paper the cost or the profits of *your* poultry, are you going to figure on a basis of five cents, or of eighteen cents a dozen? And, if you figure on five cents a dozen, are you going to make good? There are those who testify that it can be done; they know it, they say, because they do it. But, let me warn you that the *average* producer's cost for eggs—setting aside those raised on the farm, which it has been difficult to get any kind of figures on—comes nearer eighteen than three! Is it not pertinent to ask, "Why?" Is it not more than pertinent for you to consider gravely *which* lot of poultry raisers you will foregather with?

The Department of Coöperation of the Ohio Experiment Station is reported early in 1912 as having sent out a Bulletin on this very matter, a "preliminary," but covering test work for two years or more, among farmers and others. These men returned reports, but received no advice as to how to handle their flocks. Time occupied in handling was computed with care, and figured on the basis of the value of a man's time. Thirty-six counties were represented, ten pure breeds and four mixed flocks. Eighteen were farm flocks, averaging 121 hens and 83 eggs per bird. The feed cost of these farm flocks averaged 59 cents, or nearly eight and one half cents per dozen; but the lowest report was 5 cents and the highest about 11 cents per dozen. The labor cost was three cents

per hen per year, *on the farms*. The average income from the farm hens was \$1.80. The average profit was \$1.18.

The general average of the town flocks was 89 eggs, but one flock gave an average of 145. The feed cost ranged from 63 cents to \$2.43 per hen. Four of the thirteen town flocks *showed deficits*, ranging from 36 cents to 93 cents.



Farm Hopper Feeding and Watering Devices. Keeping the Cost Down

Now, the cost of producing chicks. This depends, first, on the value of the eggs which you put to incubation, and the number which you must reckon for producing each mature layer. In foreign countries, at the central hatcheries, it is said that the operators will take a customer's eggs, hatch them, and return him three chicks for each four eggs, depending for their profit on the number of chicks above a 75 per cent hatch which their methods return them. In this country, it has been said by those who are considered reliable and well posted that it takes four eggs, on the average, to produce one chick. That is, the initial average cost of a chick, in

this country, assuming that eggs are of the same price, is over three times as high as it is in, say, China or Egypt. Mr. Hastings thinks we shall cut down that cost when we reach the stage of many central mammoth hatcheries for general hatching. In the meantime, how is the Beginner, — how are you to reduce this initial cost? If you are in the East, and eggs average toward 40 cents a dozen the year around, can you afford this inexcusable high initial cost? This figures up 13 cents per chick, *just for the eggs to hatch it*, before we have allowed for any loss in brooding, for accidents, etc. Here is a margin of about nine cents per chick which ought, in some way, to be turned from the expense into the profit column. I challenge you squarely: are you the man to do it? Or, are you a woman, and will assist at such a slaughter of the innocents?

Now, here comes Mr. Briggs, who claims to be one of the five of the successful whom he counts in each hundred business poultry raisers, and says that sprouted oats has placed him in this enviable position of being one of the five, and that it will place any one within that charmed group.

A few days before this writing, I saw some figures from a man who claimed to have much experience with poultry raising on the large commercial scale. He said: "We are satisfied with a death rate of 15 to 20 per cent, when thousands are raised under artificial methods, and our largest plants do not get under that." This problem, of how to lower the loss margin, comes to the fore again and again, no matter what the branch of work. We have too much common sense to believe that we can handle living things with as close a margin as may do

for mechanical problems ; but, let us get it deep into our consciousness that reduced loss margins are *clear* gain. I think the most practical way to study this question of necessary cost of production is to fix the mind continually on the two extremes ; to find out, from every available source, the costs of production as they really are ; not to rest till we find out *why* they are so, and then to aim directly at the lower figures, as our own goal.

Referring once more to the thought that it is the best business men who are the most successful with poultry, let us consider the signs of this which appear in the periodical literature of present-day poultry. Do not let us think that this is not germane because the writers are fanciers, while the great majority of poultry raisers, and therefore, doubtless, of Beginners, are not. It is the principle underlying their method which I want to ferret out, stating it so that it can be used by any poultry raiser.

There are two names, among the newer poultry advertisers of the day, which stand out above all others. They take large space in all the better poultry periodicals, to be sure ; but this, of itself, does not explain their success. Men and firms longer in the business, fearing their competition, have done the same thing ; yet the new men have distanced them. One of them keeps before the public the thought of his fair and systematic business methods. The other spends his strength in making startling statements, or making his advertisements interesting. Both make considerable of the fact that they look out for customers' interests. One says, "We are selling on honor and giving results that more than satisfy our customers." The other says : "I made

so many thousands of dollars net profit in one year. My farm and books are open to inspection to any State Poultry Experimental Station. If your Station doesn't find the above statements true, I'll donate \$1000 in cash to your Institute." This last bids for notice by offering to tell how he made \$3600 in one season from 30 hens "by feeding the scraps from my table three times a day." Wouldn't you look up a man like that, whether you believed his claim or not? That is the way human nature works. If he promised to tell you how he bred his big egg-laying strain, how he raised ninety-eight chicks out of a hundred, etc., and offered scores of testimonials from customers supporting what he said, wouldn't *you* be interested in spite of yourself? If he worked with might and main to make *the breed* popular and much talked of, as well as for his own business, wouldn't *you* want to get the benefits of the big crumbs that fall from his advertising table? *He does all these things.* At one time, he took large advertising space just telling how many advertisers of his breed appeared in recent issues, and the proportion that were of his own strain. Don't you see how this helps every man along the line, from the biggest advertiser to the latest timorous would-be?

Suppose that he wrote letters to the editors of influential papers, telling always how good business was, how big prices he was getting, how people begged for eggs from his strain, and how his customers, too, were getting a full share of his "boom." Would *you* not feel that Fate had been kind in turning you toward him and his stock? Wouldn't *you*, too, write him an enthusiastic letter, which would turn up later as a testimonial for him and an advertisement for you, and not cost you more

than the postage and paper? *Human nature works that way*, let me repeat!

Now, the heart of this can be applied to work with utility poultry, in degree. First, the good business sense which selects a good breed, and which raises the very best kind of stock that can be raised, from the best strain for the purpose. Then, the sizing up of human nature, studying what will appeal to it, furnishing just that product. Then, making much of telling your public *that you have exactly what they want*, of the best kind and quality.

Fancy stock has its seasons. Its raisers like to work off all they can in the fall, to avoid housing and feeding expense. The winter months, in such case, will be largely barren of trade. Does the big advertiser therefore withdraw his advertisement? Not at all: *he talks all the year*; he pours out facts, arguments, what-not. If he has nothing else to say, he will use his space in telling the world that he is all sold out, but that another season he will do more and better.

Beside this, put the attitude of the hesitating egg raiser who *just once* puts a timid advertisement into his local weekly, telling people he has such and such goods, and, because the town doesn't fall over itself to hunt him up, henceforth tells all his personal friends that advertising is but throwing money away! This is the way human nature works, too. A man *must* have trained business instincts before he can put money in a hopper and see it run away from him, in firm faith that it will eventually come traipsing back, bringing much more with it. How else could a firm pay \$4000 a page to advertise five-cent chewing gum? Men do these things and make fortunes.

STUDYING EGGS

Market Gradings — The Most Offensive Variation in Eggs — Cornell Demonstration Grading — The Low Grades — Abnormal Eggs — Inflammations — Breeds classed as to Color of Eggs — Shell Textures and Variations — The Ideal Egg — Grading by Selection of Hatching Eggs — Grading and Extra Price.

THE Cornell Station, among its exhibits at Fairs and Poultry Shows, carries a grading table fitted with pockets running lengthwise of its surface, of such shape that they hold the eggs securely, when the table is almost on edge. This brings the student of eggs face to face with the contents of every egg in a crateful. The eggs are bought in the open market and when graded show clearly the various shapes, colors, and sizes which pertain to the market eggs as commonly offered by the farm producer.

Eggs may be placed roughly in three or four grades, it may be; or, as in New York markets, there may be twice as many grades, or even more. Producers in general are quite free in their expression of the sense of injustice which they feel is done them, by the fact that the middlemen, somewhere along the line, advance the price so much, that out of the dollar which the consumer may pay the producer gets, it may be only forty cents, more or less. We must all allow that if the middleman takes the product off our hands, pays transportation, commissions, candling, etc., and stands possible (and

very probable) losses, he must be reimbursed for these, and must also have a fair margin of profit. This he takes as long as he stays in business, and the day that he is compelled to go out of business is usually a poor day for the average producer. But in the matter of eggs, probably the largest item of difference between what he pays the producer and what he receives comes from his doing that which the producer either will not bother with, or else which he finds impracticable, because his product is small in volume. There is a way in which he might do his grading, simply, easily, effectively, which I will speak of later. Since he does not as yet ordinarily follow this method, we will look at the eggs as they actually do vary when offered to the market of to-day.

Market eggs do vary much in shape, in size, in color, in texture, and surface of shell. The critical eye detects most quickly, in my opinion, a variation in size. This is a very offensive variation to the buyer critic. A lot of eggs would much better be all of fair to good size, than to contain a few overlarge specimens, which will make all the rest look unduly small. Next in importance to variations in size may be placed variations in shape. I place these before variations in color (knowing that some will differ with me), because some shapes are so very far from normal as to be notably in themselves unattractive (and useless), while an egg may be almost any tint in the wide range from chalk-white to "seal brown" without being unattractive, except to the prejudiced buyer. Markets and poultry writers do sometimes succeed in prejudicing buyers against certain colors, but ordinarily the markets have to take all the eggs offered

during the entire year. This insures that color in itself does not count much, except in the more critical markets. It is the pell-mell, "common mixed" look given by the contrast between eggs of a dozen shades all in one container, which makes the real "color line."

On the Cornell grading table we would find one row of eggs of snowy whiteness and of perfect shape and size. The second might contain eggs equally white, but of varied shapes; the third eggs strictly white, but not of good size. Here are three grades in white eggs.

Under brown eggs we would find browns of large size, perfect shape, and most attractive color; those of smaller size, but perfect color and shape; also those of abnormal shape. In addition to this, the variation in shade among brown eggs allows for many grades for color; more or less, according to the critical spirit of the market or the grader. "Candling" is a matter of exceeding importance to the middleman, especially during the warm season, inasmuch as it announces the internal condition of the egg to the handler. It is performed by holding the egg between a strong electric light and the eye, and rotating it. Expert candlers work with extreme rapidity and come to have an almost uncanny power of determining qualities. The producer can candle eggs by the use of an egg tester, or it can be done in any dark closet where bright sunshine passes through a knot hole. The only requirement is that strong light shall pass through the egg, while no other light touches it. Clever workers become so skillful that they can test eggs by dropping them into the V between thumb and forefinger and placing the other hand above the egg. This, however, would scarcely detect

slight changes in the contents. There is a grading of defective eggs into "checks," "dirties," and "rots and spots." "Checks" may be perfectly good, except for a crack in the shell. Bakers might be glad to get them for immediate use at a reduced price. "Dirties" may also be good if the soiling comes from a grass or hay stain, or even from excrement, if it has not lain long on the egg. "Rots and spots" should never be used for food, although the inspectors have been obliged to destroy many thousands of dozens of such eggs *which had been sold* to manufacturers of table delicacies!

Beyond the study of eggs in relation to grading, there is a study of them which is of immediate and great use to the beginner. If this study can be made before he begins his work with poultry at all, he will have skipped



Left, Two-Ounce Hens' Eggs; Right, One and One-half-Ounce Pullets' Eggs.
Unsalable in General Market

several steps in the upward path. Most patent and trying in a large basket of eggs, just as they come from the ordinary farm hennery, are the wide abnormalities in shape and size. These, while they may differ widely from the best or "standard" shape, are always comparatively few in number, and on a careful small plant are

generally reserved for household use in the home family. There is always a cause for these extreme abnormalities in shape and size. This cause may be so obscure that one may not point to it definitely, but it is almost sure to be some abnormal condition of the organs of reproduction in the female. It may be only an irritated state, or it may be more serious inflammation or other trouble with the egg tract. But the abnormally shaped egg is proof of a condition which needs attention. The egg tract lies packed closely within the abdomen of the female fowl; it has many folds and turnings, through all of which the egg must pass on its way to exclusion, and during which passage it must increase constantly in size, and must receive several layers of white (albumen) and a tough membranous skin and shell. These are attained in regular order, and the process is one requiring time. It may be two weeks, more or less, between the detachment of one shining, pinkish yellow bead or pellet from the embryo egg cluster and its appearance in the basket of the egg gatherer some fortunate night. The soft tract, full of blood vessels, through which it must pass on its journey toward daylight, is many inches long, and is somewhat closely surrounded by the intestinal tract and other internal organs. There must be some spare room for the developing eggs, and the heavier the laying, the more crowded must be the abdominal space. Males are often clumsy or rough in their service, and may injure the laying fowl with her burden of eggs. Again there may be inflammation of liver or other organ, and this seems to communicate itself to the cluster of egglets awaiting their turn for development. At times the tiny yolks are found virtu-

ally cooked by the heat of the adjacent inflammations. These yolks, abnormal in condition, must set up and continue irritation. Strangely enough, a fowl may continue to produce eggs through months after some wrong condition has been induced. Even too much surplus fat may crowd the eggs, and possibly be responsible for eggs misshapen. When they come to exclusion, abnormal eggs may be twice as large as the average, and increased in proportional length. They may be as small as pigeons' eggs, or they may be flattened into grotesque shapes, or be produced with a shell not closed at one end, and having a small sac of skin, containing albumen, as an added annex. They may be produced with very poor, porous, soft, thin, or brittle shells, or they may be rushed into the world lacking the shell, which is usually the last addition to the perfect egg. All such are a source of loss to the large market producer.

Often, such products may mean only that the hen is too fat. They may mean that the food is too stimulating; in other words, that the owner is too greedy for a big product, and is feeding, it may be, too much meat with this end in view; or, possibly, some "egg food" or "egg tonic" which produces trouble with the egg organs. The "double-yolked" egg, which is simply two eggs within one shell, is pretty sure proof of a too hurried process, in which the second egg perhaps follows the first too closely for all the steps of the process to be taken in their regular order.

But a close study of even those eggs which we would ordinarily class as "normal," because they do not differ radically from the type, will show us that much needs to

be done to make them approach that evenness of grade which is the market ideal. I have spoken in a rather incidental way of the variation in color. All who buy or use eggs know this. The breed classes may be grouped as to color of eggs, though there are many tones to the brown. The Asiatics are brown egg breeds, and the Americans, having some Asiatic blood, have inherited the color in the egg. The Hamburgs, Polish, Houdans, and Mediterranean breeds lay white eggs. Generally, the small or more active birds with white ear lobes comprise the white egg breeds.

Besides variation in size, color, and shape, eggs are found to vary in thickness and surface of the shell, and in its actual texture. By this last I mean that some shells are hard and firm, and fine grained, others being too porous and often brittle. Sometimes, a bird, seemingly having taken a surplus of lime, deposits some of it on the surface as roughness, often raised into warts. All such variations lessen the attractiveness of the egg, and porosity of shell is very likely to point toward some lack in feeding or other unfavorable condition, which will make the eggs uncertain in hatchability.

There is one variation in the outward appearance of eggs, which, while it detracts from their handsome appearance, is not of sufficient importance to cause as much apprehension as it often does. This is a roughish or thickened band or ridge around the "waist" of the egg. It is perhaps caused by an overlapping of shell at this point when it is deposited, and gives the shell the appearance of being pieced together. Some throw out all such eggs when selecting for incubation, on the assumption that such eggs will not hatch well.

I have never yet been able to prove that these hatched less well than the more normal shells. Some hens have a habit of laying such eggs, and some breeds, or strains even, produce so many that it seems to have become almost a fixed habit with them. One year, I bought several sittings of eggs for hatching at five dollars per sitting, of which nearly every egg in the lot showed this characteristic, though otherwise hard and glossy. The smooth, good-sized, glossy egg is the ideal—two ounces being considered the minimum below which eggs should not fall in weight. As to the shape, we have coined a word “ovoid,” which makes the egg shape a distinctive term used to enlighten students in other lines of work. To define “ovoid” itself, other than to say it means egg shaped, is not so easy—Webster’s Dictionary does not even attempt it, probably because it is supposed that all know what “egg shaped” is. Yet the variations in shape of eggs are endless, between the bounds of the near circle and the long ellipse. The real “ovoid” shape is large at one end, and gradually narrowing to the other end, which is, in a good specimen, about one half as thick as the broader end.

Although an egg with some natural gloss is the most beautiful egg known, there is an appearance which must also be described as glossy, which does not belong to a fresh egg. This is when the egg has been incubated, under a hen, for some time; but this is a different gloss. The egg feels unnaturally smooth, and has not the *fresh* bloom of a glossy new-laid egg.

There are very many hens which never lay glossy eggs. This, too, I think, becomes in many instances a matter of strain—certain strains of Brown Leghorns,

of Wyandottes, and, I think, some White Leghorns lay, chiefly, eggs that are lacking in natural gloss.

Now let us go back for a minute to the thought with which this chapter started, the grading of eggs. Unquestionably, it means a great deal of work to grade lots of "common mixed" eggs. But, if this seems scarcely practicable to the small gatherer, we may look at another method which is thoroughly practicable. It must be remembered that "common mixed" eggs are chiefly the output of common mixed fowls. To raise fowls of one breed only is to cut off, by this one action, much of the necessity for color grading. Other gradings will still have to be made, such as for shape and size, and in the case of brown egg breeds there is still much variation in tint. But selection of the most nearly ideal eggs for incubation will be more effective than any other plan of "grading." The fancier cannot always do this, as it may chance that his best hens, from a Standard point of view, lay the poorest eggs from the market grade view. But the egg fancier can do it to a very great degree. He is first to select his breeders from the best and most uniform layers, then from the eggs of these he again selects for incubation the specimens most ideal in every respect. Thus he will soon obviate most of the necessity for actual grading of market lots. In selling through a commission merchant, he would then gain several cents extra price per dozen, which would demonstrate to him very quickly the value of grading.

One who has not seen the general market offerings can hardly imagine the poor appearance and small size of many of these. I once saw the receipts and letters

from a New York commission merchant who was handling the eggs from a certain farm which had introduced many modern methods. He spoke especially of the extra size and quality of the eggs from this farm. I saw also some of the eggs. They were all brown, but not graded at all for color, and they did not seem to me to be extra large. What would be the happy state of mind of such a middleman could he receive eggs *fully graded* to size, shape, and color?

THE FIELD OF THE AMERICAN STANDARD OF PERFECTION, AND THE ASSOCIATION

The Standard Necessary — Membership in the American Poultry Association — “Faking” and the Standard — The Glossary — Instructions to Judges — Variety Descriptions — American Poultry Association Constitution and By-laws — A Powerful Body — Proposed Work for the American Poultry Association — Experimental Work — Proposed Committee on Claims — Systematic Work — Many Women Members — Movement for a Women’s Branch

THE American Standard of Perfection is copyrighted, and quotations of any length are not permitted. The Breeder who would raise fancy stock can no more do without the standard for his breed than he can do without other tools and appliances. But, because such may like to know in advance just what they are giving their \$1.50 for, and because those who do not care to go into the work of the fancy may, nevertheless, have a lively curiosity about it, some résumé of the contents of “The Standard” will here be given.

The American Poultry Association, which consists of all the poultrymen of the country who can see benefit in joining it, and who can also find the \$10 which it costs to become a member — membership is for life — allows no shows to be given under its auspices unless they work strictly under its rules. These rules, and de-



Styles of Feather Marking: Below, Penciled; Above, at Left, Stippled; at Right, Hackle Feathers, Which But Faintly Show White Lacing. The Standard of Perfection Requires These Markings on Some Breeds

mands, down to the color of the eye, the perk of the tail or the feather, or the bit of down or stub on the leg of a specimen, are definite, detailed, and imperative. Exhibitors and judges alike are expected to obey them, under penalty for failure which may amount to the judge losing his job or the exhibitor losing his membership in the American Poultry Association, if he have one; or his reputation, or both.

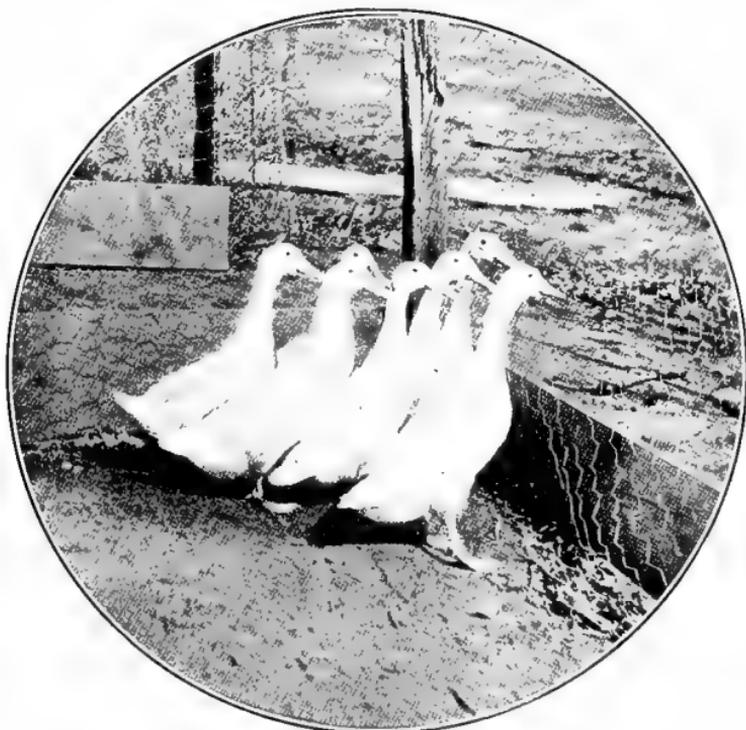
The Association, as now conducted, has Branches all over the United States and Canada; which Branches may consist of one state, or of a group of states. There are also District Branches, and local Associations may join, under certain rules.

The matter comprising the volume known as "The Standard of Perfection" begins with a warning, followed by two introductions, and a two-page address "to the Poultry Associations of America." Exhibitions necessarily presuppose judging of birds, and the local Associations are asked by the American Poultry Association to choose, as judges, preferably, those who are members of the American Poultry Association. Under the rules, a local Association cannot enter any protest in case of a dispute about the placing of awards, except when it appears that the judge has been dishonest, ignorant, or careless. It is stated that any exhibitor found to have shown "faked birds" shall lose his right to compete, and must forfeit any prize that his fowls had been awarded before the deceit was discovered. Inasmuch as the word "faking" now has a standing as a term used by judges and carefully defined in the Standard of Perfection, the acts which it represents should now become less frequent, and more possible of

punishment than they were when the word had no definite meaning. Formerly, no strict line could be drawn between legitimate "grooming" and unfair covering of defects in any bird on exhibition. The principle is given in the words, "any self-evident attempt to deceive the judge."

There are many pictorial cuts, a few in color, but most of them in black and white. These are used both to illustrate defects and to show forth excellencies of sections, feathers, or entire birds. There is a diagram showing every named section in a bird to be described or judged. There are twenty-five such divisions of the body and its covering. This diagram and the Glossary of Technical Terms prepare the student to understand what may be said in the body of the book. Correspondence schools, or individual workers who may wish to get out glossaries of their own, to illuminate their text or other books, must make their own definitions. The Standard Glossary comprises ten pages of special terms used by poultrymen, many of which are illustrated, as well as defined by words. There are several pages of specific instructions to judges, both as to score card and comparison judging. All general disqualifications appear in this part of the book, and are followed by a statement of the exact discounts or "cuts" to be made for all the common defects that may be expected to show in fowls, as exhibited. For instance, counting perfection — the ideal never attained — at one hundred, a crooked breastbone may be cut from one half to two points, according to the gravity of the fault; irregular barring in Plymouth Rocks receives a cut of from one half to three times that amount wherever it appears, etc.

Nearly fifty such "cuts" are prescribed carefully. There are also special disqualifications, which appear with variety descriptions, in the body of the book.



The Author's Favorite Birds: White Indian Runner Ducks

The remainder of the book consists of variety descriptions, mostly illustrated by half tones, together with the text of those articles of the American Poultry Association's Constitution and By-laws which refer to the admission of new breeds and varieties, and which give the rules under which poultry shows must be held. Among such rules are: that no judge may show birds in any class which he is to judge, and no exhibitor may

show under any judge birds which he has bought of this judge within six months previous to the time they are to be judged; that every fowl shown must be the actual property of the person showing it, to which affidavit must be made if required; that exhibitors shall make no attempt to interfere with or influence judges; that exhibitors shall have certain rights of appeal, etc. In a word, they are in the line of all human experience: viz., that it must be made as difficult as possible for men to go wrong. The sixteen sections covering these rules must be printed on the entry blanks of such shows as accept the authority of the American Poultry Association, and are required to be signed in ink by all accepted exhibitors.

Having such a wide field from which to draw, and such wide jurisdiction, the American Poultry Association is becoming a numerous and a powerful body, whose kingdom is likely to increase if it is fortunate enough not to make bad blunders as time passes. The fact that all Branches have recognized and specific voting privileges, and that members may also join the Association direct and vote as individuals, gives every portion of our country power in training the growth of this important body. If the people have the foresight to accept and to use this power, as members in attendance upon its deliberations, they are supreme.

There has been much discussion as to what work this body should take up specifically. Many of the members have done much thinking along this line, and various suggestions, some valuable and workable, others dubious, have been brought out. A utility Standard is one of the advance movements suggested, but the Association is

rather skittish when asked to stand publicly for utility standards, egg standards, etc. Possibly its joint mind sees difficulties which have not occurred to the minds of individuals with pet ideas. It has been suggested by a strong farm paper published in New York that the American Poultry Association form a notable committee



Cock, White Laced Red
Cornish. Breed Re-
cently Admitted to
Standard. (Originated
by Professor W. H. Card,
Connecticut)

to investigate the various "Systems" thoroughly, and make a public statement of its findings. One member suggested that the Association might take up the co-operative marketing of poultry products, somewhat in line with such work in European countries. Many feel that the central body should make specific and sustained effort to educate the public along every line of thought and work in con-

nection with poultry, more directly than through its exhibitions. Under this head, one says that the buying public should be educated as to good and poor quality in stock; one suggests that the Association could get out a monthly bulletin, giving news items, special information along new lines of poultry development, success of Station experiments, etc.; one thinks that important educative and protective work could be done through giving all licensed judges authority to place charges with the American Poultry Association Secretary, whenever anything questionable comes to their knowledge; another thinks its great work is so to appeal to utility breeders that they shall see the great benefit that would come to them through membership in a powerful national body.

Under the head of active support to vital things, many believe that the matter of taking up parcels post — “with every Congressman and Senator,” one puts it — and that of putting pressure upon the express companies to compel better rates and careful handling of shipments are the most promising activities. This last to include, also, just settlement for claims of loss and neglect in transit. One of these members instanced an experience of his own to show in what direction the power and prestige of the Association could be used. A certain shipment of fowls was so smothered by piling other packages above and around the coop, that nearly two thirds the fowls comprising it were killed. Claim for damages was entered. Long delay ensued, with no favorable result. Finally, the shipper stated plainly to the carrying company that, unless he received early satisfaction, he would lay the matter before the American Poultry Association. The effectiveness of this was shown in the fact that, in less than a week, he received full value for the smothered birds.

One member, high in poultry councils, asserts that the government is appropriating thousands of dollars to each Experiment Station in our states for investigation in all other branches of agriculture. From this, he deduces that poultry also should have the benefit of such nursing, and states his belief that our national government, “if the proper effort was made,” would appropriate several thousand dollars each year to each state, for poultry investigation. Another suggests that, since the United States government has not yet burst some of its swaddling bands of red tape sufficiently to take a census of any poultry except that carried upon “farms,”

the American Poultry Association should undertake a complete census. Possibly this is the most herculean task it has been asked to undertake.

A Western hustler proposes that the Association appoint organizers in general, to the number of six to ten, covering the United States, Canada, and Mexico, these to have "subs" in the states, and "sub-subs" in the counties. Selling the Standard of Perfection is also a part of the suggested duties of these organizers.

A Committee on Claims is suggested by one member ; so that, if either express companies or individuals have been unfair or have attempted direct fraud, they might be compelled either to make losses good or to show their own freedom from responsibility. The same man would have state inspection of poultry yards and of cold-storage goods, the latter being labeled as such, under law. This member believes that such a systematic work would place the American Poultry Association where it could bring about parcels post or any other reform needed. He sums his ideas up as follows : " I would make the American Poultry Association such an attractive body that every man who bred poultry could not help but join."

These are far from being all the suggestions made by members for future activities of the American Poultry Association, but they are enough to show all who are interested in poultry that there is opportunity ahead which may overshadow entirely anything that has as yet been accomplished. If "every man who bred poultry" should be drawn in by the attractiveness and helpfulness of the governing body, all the Beginners who read this book must be included. Quite a proportion of the present membership believe that the

Association should not be strictly a fanciers' body, which it virtually is at present, but should also make itself indispensable to the utility man, and this in such wise that he must recognize this service and become a member. Strong effort is being made along this line.

It is but recently that the poultry world rubbed its sleepy eyes in awaking to the fact that women form presumably about two fifths of those actively interested in all matters which are at the present supposed to form the especial bailiwick of the American Poultry Association. Not long after this, the Secretary of the American Poultry Association sent out a circular letter to members, whose preamble voiced the Secretary's recognition of the important part which women are taking in poultry culture, and his belief that the American Poultry Association could do no greater service to the cause it represents than to take an active interest in establishing a women's department, to be known as "The Ladies' Auxiliary of the American Poultry Association." It was proposed that the Auxiliary should be conducted along the same lines as the Branch Associations already under the Association. A part of the purposive outline of this new venture was stated thus: "To encourage women to become interested in Institute work and to contribute articles on all phases of poultry culture to the Poultry Press." Probably the worthy Secretary did not know that women had been eagerly welcomed by the Poultry Press as contributors, for twenty years previously, *provided that* they would work for the serene joy of getting their names in print, or of being "a sister" to the rest of the public; or would take their payment

in advertising! However, I think he was utterly sincere in offering this opening to the women members (present and also to-be) toward more systematic and specific affiliation with the sub-organizations. The name offered was criticized, but the movement was met with considerable heartiness by the press, one editor saying that there ought to be a thousand women enrolled as members of the Association within two or three years. Some few women objected to their status. One said very positively that she would influence the local club to join the American Poultry Association, *if women were to go in on the same footing as men*, but she had "no desire to join any sewing circle." Apparently, there was no one with immediate interest and responsibility sufficient to push the movement, as it has not yet rounded out to fulfillment, at the present writing. It is mentioned here that women in especial, among the Beginners, may know what is "in the air." There is no doubt, as it seems to me, that women poultry keepers as a body or an annex to a body, can get all the recognition which they desire, if they manifest that desire to those in power. There is no industry in the country, probably, with which women are more closely connected, or in which they have had more influence. This seems to be quite generally admitted, and, as I read the signs, I think the men of the American Poultry Association would prefer that the women come in "on an equal footing," but as a separate Branch. However, the American Poultry Association has, at the present time, a goodly number of individual women members, who, being in, and life members, are not worrying much about the status of women therein!



Black Minorca Cock "Perfection," a First Prize Winner at New York.
Courtesy of G. A. Clark, Seymour, Indiana

All poultry interests tend to dovetail together. The United States government has put out a special bulletin on marketing farm eggs. At Denver, in August, 1911, it made a direct effort to ally with itself the strength of the American Poultry Association, in proposing, through Mr. Robert R. Slocum (in charge of the United States Government Poultry Plant, Washington, D. C.) a plan of coöperative marketing, to be furthered by the American Poultry Association Branches.

The plan proposed that, wherever an American Poultry Association member of sufficient business enterprise could be found to start a group, a local group of producers of eggs for market should form a Coöperative Association for selling these eggs. Referring to the stupendous losses through deterioration of eggs, Mr. Slocum said: "The retailer, the shipper, and the buyer *do not stand this loss*. They simply pass it back by reducing the price offered for eggs till it rests mainly on the farmer or producer." He also affirmed: "The whole success of the scheme rests on the building up an irreproachable reputation for the eggs." Methods of insuring this appear in the set of rules proffered as a model for trial. The real grip of the situation rests on gaining this reputation and on shortening the time between production and consumption.

The Rules suggested, under which such groups of producers might work, are based chiefly on these two demands: irreproachable quality, and quick transit to consumer. They include: daily gathering; clean, even-sized eggs in clean, uniform cartons; cool storing, when storage is necessary; stamping each egg and

each carton with the number of the producer; selling none of the stamped eggs through any other agencies; separating white from brown, or other required grading; delivery twice a week; offering no eggs but those laid by the producer's own flock.

A corollary to the plan was that the American Poultry Association should aid in securing good, reliable markets for the eggs of the coöperating groups. An American Poultry Association seal was also suggested, "Which could well come to stand for first-class quality in eggs."

As to the link, it was suggested that each coöperative group might join the American Poultry Association as a "Society member," even though not all were individual members. It remains to be seen what may be the outworking of this plan for the help of producers and Beginners.

XXII

POULTRY SCHOOLS

Sixty-five Great Schools in Line — The Schools as Short Cuts — “Specializing” — Expenses at Cornell — Certificates of Proficiency — Accommodations — Connecticut’s courses — Neither Pains nor Expense Spared — Pennsylvania Offerings — Poultry and Fruit — Work at Various Stations

THE latest information at my command states that courses of instruction in agriculture are now given in 65 of our colleges and universities, these being in operation in every state. None are credited to Alaska. It is my impression that Alaska has now been added to the list of commonwealths giving poultry instruction; although not in a college, it may be. The report says: “About 50 of these institutions also provide special, short, and correspondence courses in the different branches of agriculture, including agronomy, horticulture, animal husbandry, poultry raising, cheese making, dairying, sugar making, rural engineering, farm mechanics, and other technical subjects. With few exceptions, each of these colleges offers free tuition to residents of the state in which it is located. In all the excepted cases, scholarships are open to promising and energetic students; and, in all, opportunities are found for some to earn part of their expenses by their own labor.” Thus, *there is no need for the Beginner who is free to go and come and in good health to assume the risks which accompany taking up a business of which he knows nothing.*



New Jersey's Pride: Her First Poultry Class, Nearly Half Women. (Not All Present)

It is true that most of the books used in the Poultry Courses are the same that may be bought in open market by any who wish. It is true that the courses are often too short to be much more than a beginning in needed instruction. It has been true, in some cases, that the Director of the Poultry Course has not himself known all that was to be known about poultry. But there are some things to be gained at these schools for poultry instruction, which cannot be gained outside them. A level-headed man usually manages them; instruction is given in chemistry, drainage, building, and many other lines which the book student would probably omit; *special attention is given to accuracy of mind and method*; experts are engaged who not only teach students what they think the students ought to want to know, but who encourage questions, so that the students may really get what they need to know. Above all, the practice work under oversight, and under the necessity of making records and giving reports, is of value far beyond book knowledge; which one must apply by continually making errors because of having no real standard of judgment. Errors are costly. Schooling is costly, also, it may — possibly — be said. But very little besides one's own support need be expended, and, as this is a necessity anywhere, the real cost is only the loss of one's earning time, and the difference in cost between support at the schools and support elsewhere. Lads under age going from home would perhaps find support expense increased, although it is kept as near cost to the Institutions as possible; but workers who pay for their board elsewhere would be quite likely to find their living expense actually lessened at the colleges. And, in all

cases, if a deserving student needs a lift, he is likely to get it, and in a way that will preserve his self-respect and independence.

The colleges which offer short poultry courses usually put out a circular describing briefly and clearly just what they purpose to give the student. Some of them offer courses of different lengths, or a shorter course in the summer season — or, at the shortest, a “Farmers’ Week” is given, in which the student, be he lad of fourteen or white-haired head of a family, may specialize — attractive word! — just by choosing from the almost numberless lectures and demonstrations those which have to do with poultry. “Poultry Husbandry” is a finely rounded new term which came up when it was needed. The professors who cover this work at the colleges are professors of Poultry Husbandry, and this word covers all that is included, the best, I believe, of any term available to us.

Cornell University’s circular, for instance, offers a schedule of the “Winter Course in Poultry Husbandry.” The one which lies before me was put out in November, 1911, for the course beginning November 28 of that year, covering twelve weeks, and ending February 23, 1912. This course was one of five of these specials, the others being on General Agriculture, Dairy Industry, Horticulture, and Home Economics. It was '93 when the first course in General Agriculture was given, but 1906 before Cornell was fully awake and ready to offer the Home Economics Course for the girls. The year previous, the boys and girls were both provided for in the Short Course in Poultry Husbandry.

Expenses are greater at Cornell than at some of the institutions ; being stated as now probably averaging about

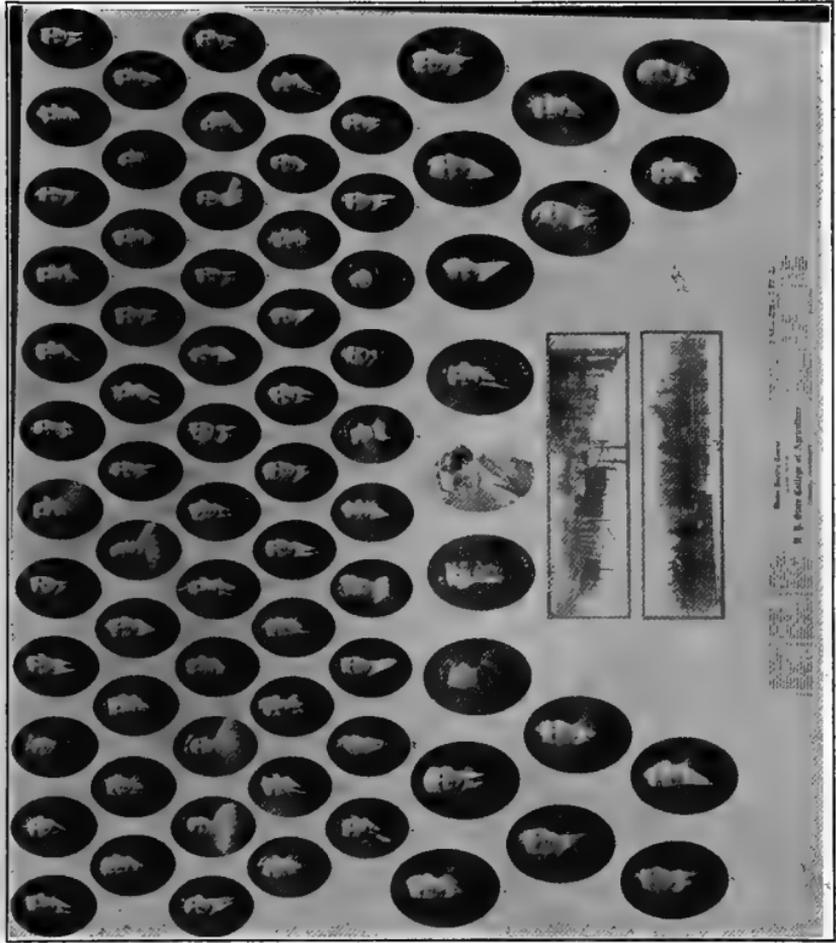
\$95 for the twelve weeks at Cornell. The State Grange has had 12 fifty-dollar scholarships for members of its order, "to be awarded to men and women who attain the highest standing on competitive examination." The Masters of the Pomona Granges had these in charge. There are also special prizes offered for creditable work. In 1908-1909 these numbered nearly 20, and the "Poultry Department Prize" was won by a young woman, for having had the highest general average standing in all studies. One prize was awarded "the most useful student in the Winter Poultry Course Club." The students who have successfully passed all required examinations, and who have completed a short course, may become candidates for a Certificate in Poultry Husbandry, to attain which they must spend a full year in "successful work at an approved poultry plant," from which they must report regularly to the college, give all required information about the work, and be ready for inspection at any time during the year. There are no examinations for admission to the short Winter Course in Poultry Husbandry, but a good common school education is necessary to good work, and those weak in arithmetic and English are advised to review before going to Ithaca. Courses are open to both men and women, from seventeen years upward. Accommodations have been limited, and early application is necessary to gain admission. Fifty-six students has been the utmost limit. It is hoped that the new building voted by the state will give room for all who need the work. I believe there will then be room for 125 in the Poultry Husbandry Course. Instruction is divided as fairly as possible between the study of textbooks, required read-

ing, recitation, and practice work. References are required; they must be from people of standing in the community from which the student comes.

Cornell University reported, in 1911, twenty-five of her former poultry students as connected with poultry Departments in Educational Institutions. One of these entered the Bureau of Animal Industry, and another became a Professor, Bureau of Chemistry, Washington, D. C. More than half of them have contributed leaflets and bulletins to our poultry literature. One is Assistant Professor in Poultry Husbandry at Cornell University, and several others assist there also. Two are women: one a teacher of Poultry Husbandry in the Georgia Normal and Industrial School; the other is Assistant in Poultry Husbandry at Cornell University.

Professor James E. Rice, the first Professor in Poultry Husbandry at Cornell, is still its animating spirit. A man of genial temper and full of conservative common sense, he is ranked as leading Professor in Poultry Husbandry in the United States.

Connecticut issues a Quarterly "C. A. C. Bulletin." The one for the autumn of 1911 tells of a course in Poultry Husbandry covering the period from February 14 to March 24. Instruction is divided between the classroom and the poultry plant practice work "and teaches practically every phase of the poultry industry." There are 71 general lectures, by professor Frederick H. Stoneburn. Special lectures by experts and outside professors are also a feature. Each student is expected to do as much practical work as his time permits, "including construction of houses, judging, scoring, besides the usual work with feeding, incubation, brooding," etc.



One of Cornell's Famous Short Course Poultry Classes

This circular was for the tenth annual course. A poultry judge was specially engaged to be present during the entire course, instructing in all points covered by professional judges and necessary to the breeding and exhibiting fancier. Professor F. H. Stoneburn is the leader in Poultry Husbandry at Storrs at the present writing.

Maine put out advertising in the best poultry papers, in November, 1910, giving the lure of her work in the "Study of Poultry Husbandry." I quote: "The University is endeavoring to offer as full and complete courses in Poultry Husbandry as it possibly can, and will spare no pains nor expense to put its instructional work on an equally high basis with its experimental work." The two plants for these two classes of work are entirely separate. Maine offers five choices in poultry work for students: (*a*) that in the regular Four Years' Course, leading to a degree in connection with other agricultural work; (*b*) the same in the Two-Year School Course; (*c*) The Three Weeks' Short Course; (*d*) The Three Weeks' Short Course; (*e*) The Poultry Institute. No tuition fees for the short term work. "Expense for books is small. Board and room can be obtained at reasonable rates." Maine has gotten a hold which has been slow in coming to the poultry schools. It states: "Many farmers and their sons and daughters take the shorter course in order to be better prepared to make money with poultry on the farm." When this work was in its infancy in this country, almost none of the farm youth presented themselves as students. Better prospects and more available information have doubtless led to betterment along this line. And, I desire to call at-

tention again to the fact that Maine is the only state that produces 100 eggs as an average for all her hens. You who read, will, I think, make the obvious inference as to cause and effect.

I have also, before me, the notes regarding the Pennsylvania Short Course for winter of 1909-1910, put out by the School of Agriculture, State College (this is the address), Pennsylvania. This was a twelve-weeks' course. The Pennsylvania people evidently bear in mind the fact that the farmer is very apt to be "the general farmer" and thus need all-around instruction. Besides offering lectures on the usual topics, practice work in preparing fowls for market, in judging and scoring, in constructing poultry houses and appliances, in running incubators, etc., the college offers combination work. I quote: "The course in poultry husbandry is intended to furnish such instruction and practice as will enable young men and women to become successful poultry keepers either as a regular business or as a very profitable branch of farm work. Hence, the students in poultry husbandry receive lectures in general agriculture, animal husbandry, and dairy husbandry. There are lectures in agricultural chemistry, soils, manures, and fertilizers, crops, veterinary science, and bookkeeping. Or, if the student desires, he may combine work in poultry husbandry with instruction in horticulture."

The Wisconsin work is rather new, and the 1911-1912 Bulletin shows it as "primarily for Undergraduates." Students just beginning the Agricultural College work may take, in the first six months, Elementary work, Pen Management, and Poultry Judging, and gain seven

credits for all. In the second semester, they may take Elementary Poultry Raising, Incubation and Brooding, and an "advanced course" under the head of "Poultry Management"; and gain seven to nine credits for all. "Poultry Practice," taken throughout the year, aims "to familiarize the student with the ordinary work about a poultry farm." Under this come carpentry, caponizing, etc. Assistant Professor of Poultry Husbandry, J. G. Halpin, instructs in all these courses.

The New Jersey appropriation was passed in 1911. Under date of January 2, 1912, Professor A. R. Lewis wrote me that a class of 28 was at work, 11 of whom were women. In other states, the proportion of women has held very low, as a rule. The new buildings at New Brunswick are in themselves an experiment in construction, life of various brands of roofing, etc.

New Jersey put out an "Organization Circular for Educational Work," with poultry. This plans for County Associations, and a State Board of Poultry Husbandry, to be composed of two members from each County Association. The Constitutions are practical, a provision of that for the County Associations being for a library with a librarian, a part of whose duties is to make a summarized report both of the condition and the use of the books. It also provides a means of increasing the library.

The plan provides also for a Reading Course, outlines such a course for a full year, and offers a list of reference books for the library. This list at first consisted of ten books. I am glad to know that my "How to Keep Hens for Profit" was found worthy to rank among this first ten books of reference, concerning

which the officials say that it "should be the aim of every Association to have at least one copy of each in its library."

Special lectures are also urged as a part of the educational privileges of such Associations.

I have felt a close personal interest in several of these Stations which are doing work with poultry: in Cornell, through friendship with Professor Rice, and because New York is my native state; in New Jersey, because New Jersey is my adopted state; in Rhode Island, because I was a student in the first Short Poultry Course in the United States, offered by little Rhode Island; in Connecticut, because I have known Professor Stoneburn since his graduation, and have been on the ground and seen what he has done with almost no facilities. On the foundation laid by Rhode Island, the other Stations are building strongly. The teaching is marvelous, when we consider how much is crowded into one of the Short Courses. The Bulletins are informative, and the colleges carefully avoid being too "rosy" in their attitude. "Facts, and more facts," might well be considered their war cry. And, while practice work, under training, is worth more than unassimilated facts, the facts, the discussions, and the training all together, do make a whole more valuable than one could reasonably forecast as resulting from the short period usually allowed. The fact that, with the Short-Course poultry students it is "This one thing I do," with whole-hearted eagerness, counts tremendously in the result. I have seen no other students so universally eager as poultry students.

Poultry farming combines so well with fruit farming that this ought to make a very attractive combination to

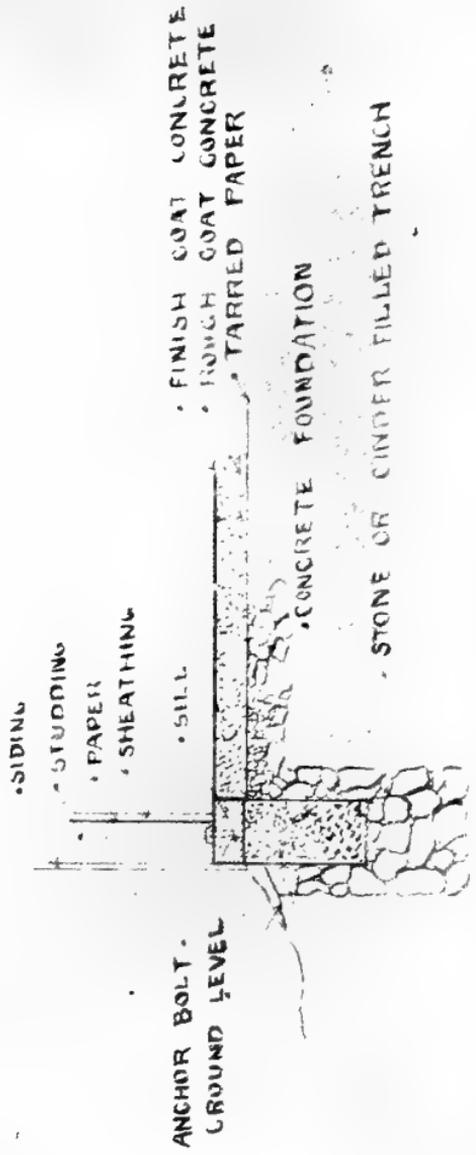
the son who elects to stay on the farm. I am often amazed to see the way in which the best business men put their confidence in fruit. An apple evaporator of my acquaintance, who followed the fruit crop of the country year by year, evaporating in whatever part of the country was most prodigal of fruit in any one year, set a 45-acre farm entirely to apples just before he was ready to settle down. A young fellow of 18, of my acquaintance, who, years ago, was left with a mortgaged hill farm and a family of seven on his hands, set the whole farm to fruit, and now is the envy of all the neighborhood for his handsome furniture, good clothes, and other evidences of prosperity. But I think he has worked harder than any one of those who envy him!

In the middle West lives a fancier of poultry who has built up one of the best plants in the country, and does a very large and successful business. All his fine flocks run in orchards — they could not have a better environment — and it is said that he could any day give up his poultry and live easily, even luxuriously, from his orcharding. There are no two products that grow together more naturally than poultry and tree fruits, unless one shut active hens up with a newly set lot of small trees. This is likely to be the death of some of the trees, unless green feed is supplied with extreme liberality.

The list put out by the government in February, 1911, shows that Colorado, though having a man on the staff in charge of poultry investigation, and having a Farmers' Week in midwinter, does not offer a poultry course. Connecticut offers a Six-Weeks' Poultry Course. Indiana has not only a man as instructor in Poultry Husbandry,

FOUNDATION AND FLOOR CONSTRUCTION

SCALE 1" = 1'



Concrete Floor Construction, as Approved at New Jersey Experiment Station. Construction Is Taught in the Poultry School Course

but one on Extension Work in Poultry. The Iowa Station has a Poultryman on its staff, who is also an A.B. The College, itself, has a One-Year Course in Poultry Husbandry. The Kansas Station has an Assistant in Egg Investigation, and a Superintendent of Poultry Husbandry. Maine has a Poultryman, besides the Biologist, who gives much attention to the poultry work. Maine offers "a Three-Weeks' Course in Domestic Science and Poultry Management," apparently a woman's affair. Maryland has an Associate Poultryman. Massachusetts Agricultural College offers a Short Course in Poultry Culture and has its own Instructor in Poultry Husbandry. Minnesota School of Agriculture has its Instructor in Poultry. Mississippi has its Poultryman on the Station Staff. Montana Agricultural College has its Instructor in Poultry and gives a One-Week Course. North Dakota has its Assistant Poultry Husbandman, a B.S. Ohio has a B.S. who gives part time to Poultry Investigation. Oregon has a Reading Course of five lessons in Poultry Husbandry. Pennsylvania College has its own Instructor in Poultry Husbandry, and the Station also has a Poultry Husbandman. Rhode Island, the first to offer a systematized course, has a Six-Weeks' Course and its own Instructor. Tennessee has a Two-Weeks' Course. Utah Agricultural College has its Assistant in Poultry Husbandry, a B.S. West Virginia has a Twelve-Weeks' Course in the College proper. Wisconsin has a B.S.A. in charge of Poultry Husbandry, on the Station Staff. The Station is a Department of the University, under the control of the Board of Regents. I think it is quite likely that "Animal Husbandry," in some of the states, includes poultry, although it is not specifically men-

tioned. As a rule, the Stations are under government aid, and separate from the Colleges proper. A list of Stations will be given in the back of this book, for the help of those who may want to keep in touch with what their states are doing with poultry. The strong undercurrent making for poultry instruction and state aid to



Sicilian Buttercups, Egg-Laying Contest, Storrs. Nova Scotian Birds. Buttercups Claim a High Record. (Courtesy of Connecticut Agricultural College)

the industry will doubtless tend to increase continuously the number of those giving full poultry instruction. Connecticut was the first to offer a Summer School of Poultry "especially planned to meet the need of teachers, business and professional people." It reports that the poultry class "has been considered the best class in the Summer School since this feature was introduced" and the students of the Summer and Winter Courses to-

gether are said to form the largest body of poultry students in the country in one state for the year, although Cornell closely disputes in numbers. Connecticut is fortunate in having the immediate help of Professor L. F. Rettger, Biologist of Sheffield Scientific School, and Herbert K. Job, the State Entomologist, while Professors W. H. Card and D. J. Lambert are near at hand. Rhode Island, Pennsylvania, and Quebec gave aid in 1911, through their Professors, and other prominent men gave lectures. Cornell is probably the best organized and best equipped of all the Stations giving poultry instruction. The students adore its open-hearted, enthusiastic, capable Professor, James E. Rice, and I heard the Acting Dean of Agriculture rate the poultry work there as high as any in the entire College.

Professor Rice's latest project is a "Poultry Testing Station" to which any one in the state may send 12 birds to be tested for one, or two years, for vitality, egg production, and prepotency. The layers will be officially trap nested, and pedigree hatching and brooding will be carried on as a beginning for "line breeding for vigor, prolificacy, hatching power, market quality, and economy of production of flesh and eggs." Several other aims are mentioned in the Advance Bulletin; but, in connection with what is given in this book in the chapter on Line Breeding it is thought that the item here given will be the one to fix best in the Beginner's mind the value of line breeding of the right sort, and of inherited power in every desired direction.

An enormous amount of poultry instruction is offered in this country, entirely outside the poultry schools, although the professors of these schools often have a

hand in it. A chief textbook used at Cornell is the work of the man who instituted the first poultry short course in the United States, Professor A. A. Brigham, now of the South Dakota Station. The poultry papers number scores — many scores. Some are born and some die, each year, so that it is difficult to know the exact number. Many of the editors find time to write poultry



New Jersey's Long Laying House. Reported Colder Than the "Clark" House

books, and I have known some of them long enough to know that they are themselves learners, gaining something each year. I would not trust any business man who was not of this caliber! The United States government has put out poultry bulletins as needed. Indeed, I have in my library an old United States bibliography of poultry literature, giving twenty-nine large pages merely to *list* the poultry publications then in existence, including some English and French monographs and larger books. If such was our wealth nearly fifteen years ago, what of the present? The more marvelous growth of the industry has been made, and all the work of the poultry schools has been done within that period.

The very manufactures of poultry appliances have added largely to poultry literature. And, although one needs to read with open eyes and judgment agog, there are some catalogues of this kind which contain as good literature on their especial topics as can be had anywhere. It is a rather good education to read just these catalogues, provided that one can keep his head and balance one against another. Milo Hastings has made the unqualified statement that practically all the literature of poultry has been written by those who had something to sell to the poultryman. At least three fairly reputable poultry papers, which furnish good reading matter in their columns, have snatched at the chance to make money from advertising and selling books of the "secret and system" type.

One of our more prominent poultry papers said, some time ago, that careful study showed that about two fifths of its readers were women. It is believed that more than half the people actually engaged in raising the chickens are women with their children. The United States government has issued a special Bulletin outlining methods by which Women's Institutes may be organized and conducted. In 1910, 15 states held Institutes for women, and 160 sessions of institutes for young people were held. There are also special Institutes for youths who have left the public school, from the age of 14 upward, just at the period when they are choosing their work for life. The teaching is especially intended to show how to make money with farming.

The Boys' and Girls' Clubs in the public school are different. The government makes the frank statement that the only way to teach some fathers better methods

of farming is through their boys. In 1910, over 46,000 boys were enrolled in Corn Clubs. Prize winners in four states were given diplomas of merit and trips to Washington. The next year, every Southern state offered such trips, through bankers' associations, boards of trade, educational associations; also through private citizens and through state fairs; while governors and Superintendents of public instruction offered diplomas to all boys who would make excellent records.

Next to studying how to grow corn will inevitably come how to feed it, and how to do other things. With the mother, the boys and girls and the older youth all waking to the opportunity ready to their grasp, and with the Poultry Clubs in the Public Schools, the reign of ignorance and indifference to the farm will surely be dealt an overcoming blow.

Even the wisest in poultry matters dare not venture to forecast what will be the amazing developments in this field of work between 1912 and 1920. With New York establishing Agricultural High Schools as fast as the people will support them; with Arkansas leading in putting instruction in poultry culture into the public schools, where every child can be taught; with Station after Station making special efforts toward poultry instruction; with Boys' and Girls' Clubs starting up here and there; with two wide-reaching Competitions already on, from which reports go out and are published broadcast every month of the year, who shall say to what we shall attain?

The many raise poultry, it is true; *more will raise it* in the near future; we have something like five million farms, the government says, where poultry is raised every

year. But, it would take an egg a day from every one of those farms, to give New York City alone one egg apiece for that day, for each dweller within her greater limits. It doesn't seem much to ask, that each person shall have one egg a day ; but, with eggs at five cents apiece, as they were at wholesale at midwinter, it would take \$250,000 to give each of those hungry New Yorkers their one egg each for that one day. If they had it *every day* — ah me ; you figure it ! I cannot believe my figures. They make it over \$90,000,000. Just for one egg a day all the year for one city full of people eager for eggs !

Eggs have been going up, up, up because demand exceeded supply, much of the year. What if the demand for poultry instruction in the schools should kill the goose that lays the golden eggs ? What if we, one day, raise so many eggs that prices go down, down, down ? Aweel, that day is dim in the future ; and, at all events, the hungry people will be fed, and that will take one care from the shoulders of the social reformers.

XXIII

PRACTICAL LAYING CONTESTS

“Somebody” and Public Contests—Two Opponents of Competitions—Australian Reports and Methods—Proportion of Food Cost to Value of Product—Four Leading Breeds—The Leghorn Adapted to Mild Climates—18 Pens with 200-egg Averages—Mortality During Tests—Deductions from Australian Experiences—New American Competitions, Connecticut and Missouri

DURING the 20 years previous to 1911, there were a number of attempts at laying contests in this country. In these contests, birds were usually under the handling of their several owners, the proof of results required being a sworn statement before a local notary. A certain book on heavy laying was based largely on the published results of such a contest. The author has since “recanted.” One College Bulletin was made up of the history and outcome of a certain competition conducted by and reported by the owners of the several flocks. While only supposedly reliable men would be selected for such work, there is abundant room for lack of public confidence in a contest of this stamp. As a matter of fact, in any contest whatever, there must be some leaning on the character of the men engaged in the work; since we must have human instruments. But there is good reason for requiring that such contests be conducted in a way such that temptation toward and opportunity for deceit shall be minimized to the last possible degree.



Pen of Silver Wyandottes, Winners in Australian Competition. Note Contrast between this Pen and the American Silvers Pic-
tured Elsewhere. (Courtesy *Poultry*)

During the 20-year period above noted, breeders and fanciers and some few utility men took up space at intervals, in the poultry and agricultural publications, urging that "somebody" ought to arrange a series of public contests for the stimulation of the poultry industry in America. Since America got into touch with the Australian competitive work, begun nearly a decade ago, such items have become more numerous and more insistent. One American poultry journalist, in especial, Mr. Miller Purvis, was prominent in supporting this idea. When, however, a great daily took up the work internationally in 1911, giving out a Summer Prospectus following by a few weeks the published inception of a national competition opened by the Missouri Experiment Station, protests were voiced by two prominent poultry writers. The editor of *Farm Poultry* refers to the first competition under the heading, "The Latest Imported Utility Fad," quotes a writer in an Australian paper as saying that Australia's competitions, as at present conducted, are "a waste of good material and a menace to the industry," and avers that, in general, "a laying competition is essentially amateurish and inconclusive." Mr. Thomas F. Rigg, a clever journalist and a man of unusual balance of mind and sanity of outlook, said: "Our idea of nothing doing, of waste of time, energy, and money, is a 'laying contest.'" At the same time, some of the most progressive of state and county Fair Associations were advertising one-week laying competitions as a part of the attractions of the Fairs.

All the rest of the poultry world which parades in print, as far as I have seen its expression of opinion, hailed the incipient American contests as solid proof of

progress. The fact that they were to be handled at two of our well-proven Experiment Stations made the poultry contingent generally give them a warm welcome, and put into them that snap of public interest which they would otherwise have lacked utterly.

Inasmuch as the reports from the one most important series of poultry contests up to 1911 have been received in utter good faith by poultry folk in general, it may be worth while to give a little time to a study of their conditions and their published results. The Beginner may find here at least a stimulus to some very helpful pondering. This notable series, now covering nine years, 1911-1912 being the tenth, — known as "The Australian Laying Competitions," — was planned and doubtless financed by a daily newspaper in Sydney, N. S. W. But, knowing that such contests must be "open to the public" not only as to entrance, but also as to knowledge of all the detail work, and that they must be handled by men above suspicion, the originators placed the work under the handling of the Hawkesbury Agricultural College.

Poultry raisers of New South Wales have always been the chief entrants. New Zealand tried her luck, and America took a fling two years in succession, but it was found that the long preliminary voyage was too great a handicap to allow the long-distance birds to compete fairly; though, even with this, a pen of Rose-Comb Brown Leghorns from America gained one six-months' first prize, together with the breed prize for the same year; also the distinction of paying the most profit above cost of feed for a full year.

A White Wyandotte breeder succeeded in getting



Partridge Rocks (American Class) in Egg-Laying Contest, Storrs. A New Variety. (Courtesy of Connecticut Station)

well toward the top, and a Rhode Island Red pen from America was eighteenth in a list of about 100 contestants. In this competition, 4 pens rolled up market incomes above \$24 for each pen of 6 birds. This is \$4 or more for each hen from eggs alone. In two cases, the average income was \$4.81.



Pen of White Wyandottes, International Competition. Agricultural College, Storrs, Connecticut

The question as to most profit narrows chiefly to that of which can be fed most cheaply. Going back to the consideration of classes, we may say that we might expect it to be a general rule that the Mediterranean classes would eat least, birds of the medium-sized American type next, and the ten- and twelve-pound Asiatics most. This is only common sense, and the real question is. In what proportion does the feed con-

sumed by each of these types stand to the numbers of eggs which they lay? No one can answer this question absolutely, as it depends in some degree upon strain, method of feeding, handling, climate, etc. A rough estimate based upon experience might be: if the Asiatics be counted as numbering 100 to consume a certain amount of feed, this same amount of the same kinds of feed might serve 150 Americans or 200 Mediterraneans. Yet all these things vary with conditions.

In the many Australian tests, conducted successively during the early years of this century, under one skilled handler, the results point to Leghorns, Wyandottes, Orpingtons, and Langshans as the best layers for this particular climate and handling, out of some 25 selected popular varieties. After 1903, less than a dozen breeds were entered for competition. During 1908-1909, the two-year competition in which 50 pens were entered covered only eight varieties, belonging to six breeds, among which the Langshan does not appear. Nearly half of these were White Leghorns. A poultryman of wide experience, commenting upon the report, says that the results were by no means full proof that the Leghorns were so greatly in the lead, but the rather that this expert knew better how to handle Leghorns than he knew how to handle the heavier breeds.

A bit of side testimony on this point may be gleaned from an Australian Agricultural Report, wherein the government expert states that certain breeds do far better in Australia than do others. Australia's temperature is quite variant, ranging from that of latitude 10 to latitude 40 degrees, while New South Wales itself covers about the distance between 30 and 38 degrees

south latitude. This is almost the same as the reach from northern Maryland to northern Florida, and would seem to be exactly the climate in which the Leghorns and others of their type would be expected to flourish especially well. They would feel heat far less than more heavily fluffed birds, while their susceptible heads and thinly clothed bodies would not have to endure extremes of cold; therefore they might be expected to lay well during almost the entire year. Strange as it may appear, the same varieties which appear at the head of the lists, appear also, in other pens, almost at the foot. In one list, the first nine pens are Leghorns, Orpingtons, and Wyandottes; but seven of the lowest nine are also Leghorns, Orpingtons, and Wyandottes! This is far better proof of difference in flocks or strains than it is of difference in breeds. Yet, in the latest report from these competitions to hand, the lowest record was made by a pen of birds of a certain variety, whose owner had twice won the first prize with the same variety! The best record for the second year (two-year competition) was made, not by the Leghorns, but by the Black Orpingtons.

In the latest report available as I write, we are told that only seven varieties in three breeds entered the competition at all. The rest had dropped out, discouraged by failures to win. In the third year of the three-year continuous competition, one pen reached the 200-egg mark. In the latest reports for one year, 18 pens made an average of above 200 eggs each for the year covered.

We get, in these tests, a very good idea of what may fairly be expected from the best available birds, under a certain kind of handling. The averages *for all* were: for the first year of the series, 130; gaining



Silver Wyandottes in International Competition, Storrs, Connecticut. (Courtesy of Connecticut Agricultural College)

gradually up to 1909, the figures read, 163, 152, 166, 171, 173, 180, 180. The cost of feeding was reported at \$1.62 in the 1909-1910 test, and the average profit over cost of feed was \$1.58. This basis of comparison enables any Beginner to figure what any desired number of birds may bring in for him, always assuming the best of care and feed and conditions.

In the ninth Australian contest, seventeen pens of Indian Runners competed against one pen of Cantonese ducks and two pens of Buff Orpington ducks. The Runners stood first to ninth, the Cantonese next, the Orpingtons sixteenth and seventeenth. Five other pens were in a second-year test at the same time: four were Runners, one Orpingtons. The Orpingtons finished lowest. The first three pens of hens in the second year laid 994, 958, 939; the first three pens of Runners laid 1244, 1094, and 1075, respectively. This speaks well for the Runners, the best pen averaging above 207 in their second year, and the lowest of the three giving 179 in the second year. As this is nearly double what United States hens average, it may be considered a remarkable record of performance.

It remains now to consider a matter which, no doubt, affects the finals very greatly, yet which many students of these reports would entirely fail to take into consideration. I call the especial attention of all Beginners to the fact that these layers were handled without the annoying presence of males in the laying pens, and that they were penned in groups of six. This agrees closely with the practice of two of our American "Systems" which require that the birds be kept in very small groups. They differ widely from the tenets of another

of these same "Systems" in which the birds are carried, according to the testimony, in flocks of many hundreds. In the latter case, profits more than four times as great as those gained in the Australian tests are claimed! Prices of eggs average higher here recently, so that this may account for one half of the discrepancy. Where the rest may come in, is, I think, a good problem for the Beginner to study!

The Beginner would do well, also, to consider, briefly, a single sentence in the reports from Australia as to losses in the flock: "The general mortality of the tests is practically all caused by ovarian weakness." This can mean only one thing, viz., that, in the effort to stimulate, through scores of generations, the laying capacity of our domestic birds, we have put such a strain upon the organs of reproduction that weakness in the female often shows there first, even in such lots as have been especially selected for testing, and are presumably above average in vigor of constitution.

But what is the conclusion? Man, in general, keeps hens primarily, not for pleasure, but for profit from their product. If he cannot get the profit, he does not want the birds, except as a matter of convenience. We cannot, then, reverse our treatment, so as not to require large production. And if this be the case, we must make every effort to grow lusty stock, to give the maximum of fresh air and exercise which make for vigorous health, and to show at least some reasonableness of mind in our requirements as to production.

In one of our State Bulletins, not long ago, a report of above nineteen per cent of losses during about fifteen months was given out. If any practical handler of fowls

for profit were to meet with such losses, he would feel obliged to give up poultry keeping. To the contrary, however, it is found true that some who in former years argued that poultry did not pay its handlers, are now talking about the great profits in poultry. Actual



Curtain-Front Laying Competition House, Connecticut Agricultural College, Storrs. All These Houses Are New, and All Alike

annual losses, with average good handling, need not go above four or five per cent. One firm claims a loss of less than one per cent, in the laying stock.

The deductions which the manager of the Australian tests made at the close of the eighth of the series, briefly given, are as follows:—

- a.* Egg production will pay well.
- b.* Poultry farming demands only small areas.
- c.* It can be made to pay, even when buying all the feeds.
- d.* Good strains of good breeds pay best.
- e.* The fewer the number of breeds handled, the more improvement.

- f.* Small pens (in numbers) give best results.
- g.* Varied diet is best, but maize is profitable, in fair proportion.
- h.* Abundance of feed is safer than skimping.

One of the American Competitions to which attention was called at the beginning of this chapter has just taken shape as these lines are written. As in Australia, a daily has come forward to finance the project. It takes the large risks, but plans to make good for itself by charging a stiff entrance fee of \$25 per pen. This periodical is known as *The Philadelphia North American*. Connecticut Agricultural College, Storrs, Connecticut, has accepted the responsibility and the work of conducting the competitions. Buildings have gone up on ground which is fresh, not having carried poultry heretofore. Entries are from the United States, Canada, New Brunswick, and England. There is a list of worth-while prizes, and the public hopes much from the project. An Advisory Board, comprising the names of a number of the best known poultry raisers, instructors, etc., will share the planning and the responsibility. Professor Frederick H. Stoneburn, of the Agricultural College, is brimful of enthusiasm and will do his utmost to make good, as he has always done even when less well equipped and with only his own state to please.

Just before the news of this contest of international interest was given out, the state of Missouri advertised a competition, national in character, to go through at the State Experiment Station, Mountain Grove, Missouri, under the charge of the Secretary of the State Poultry Association, T. E. Quisenberry. 1912 promises to be



The North American International Competition Plant, Storrs, Connecticut

decidedly an interesting year, and the Beginner of 1913 and later years may find knowledge accessible to him which no Beginner might obtain theretofore. Poultry history is making so fast that portions of this chapter have been rewritten twice since the first casting. As an instance of this very point, New Jersey, Ohio, and Maryland have



The Black Orpington Leading Pen, Early in Missouri Competition, at Feed Time. (Courtesy of Missouri Experiment Station)

made state appropriations since the government list was compiled and since the chapters of this book were begun, early in 1911. Also, the first reports from the newly instituted competitions have begun to come in, just before this book goes to press. In the more northern competition, in Connecticut, the White Leghorns are ahead (5 English birds at that) with a record of 68 eggs

for the month; the best that 100 pens could do in the dull, discouraging month of November.

Leading the 131 pens in the Competition in the warmer state of Missouri, a pen of Black Orpingtons made, in November, a record of 101 eggs. The next best record was 82 eggs from a pen of Silver Wyandottes (the original Wyandottes). Other pens even of Leghorns have made records of 3, 2, 1, and alas! zero. A report from Australia appearing at the same time showed twelve pens of White Leghorns, five pens of Black Orpingtons, one pen of Silver Wyandottes, and one pen of Barred Rocks, making records of more than 600 eggs per pen for the first six months. The White Leghorns, let the Beginner remember, are in the Mediterranean Class; the Orpingtons in the English Class, and the others in the American Class. The Asiatics do not appear as a Class, but their blood is in all but the Leghorns — that is, in all these general-purpose birds. The showing is good for the general-purpose varieties.

XXIV

QUALITY IN WIRE FENCING

Complaints of Short Life of Fencing — Users Partly Responsible — Salt Air Deteriorating — Five Points on Quality — Manufacturer and Consumer — The Commoner Grades — Improvements — Heavier Wires — Favorite Meshes.

THIS matter of wire fencing and its quality, so important to nearly all who work with poultry, has been entirely overlooked or ignored in all the poultry books with which I am familiar. Indeed, the two which claim especially to be books of reference on all poultry topics have not a word to say about fencings. The United States government, on the contrary, has found that the farmers and poultry raisers of the country were being fleeced to such an extent in the matter of light wire fencings—generally spoken of as wire net, or wire netting—that it has put out a special information Bulletin, on “The Corrosion of Fence Wire.” The Agricultural Yearbook of 1906 has this reference to the work, showing the reason for its inception, and the immediate outcome:—

“Owing to the numerous complaints of farmers in regard to the rapid deterioration of the modern fence wire in comparison with that manufactured in former years, an investigation of the subject was begun, to see what could be done to remedy the defect. Farmers’ Bulletin 239 contains a report of this investigation, which has aroused the interest of manufacturers and has deter-

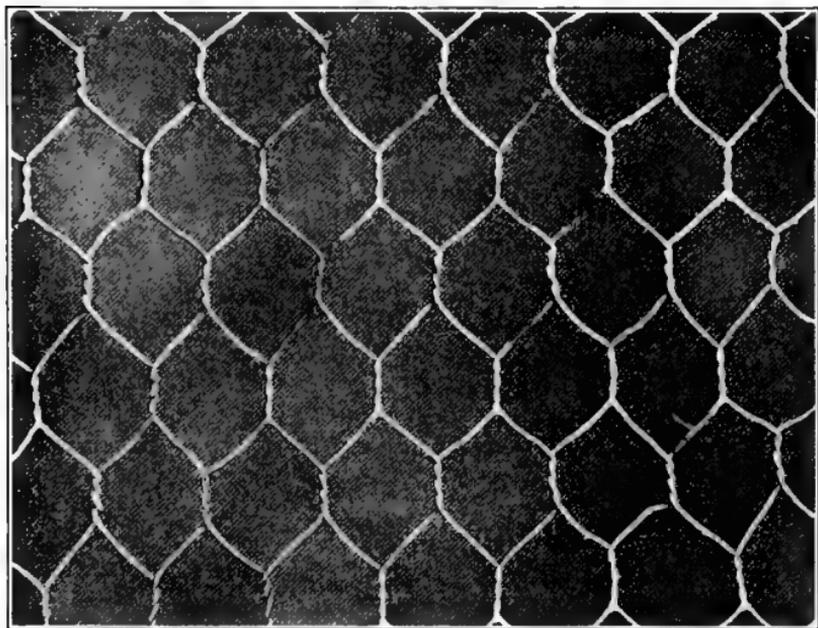
mined some of them to take active steps toward producing a fence wire more resistant to atmospheric corrosion."

The Secretary of Agriculture's report for 1909 (Year-book) contained a full discussion of this important matter, and it is from this source that the technical information given herewith is drawn.

Wire fencing, to the poultryman, means the close-woven netting of wire, of which the commonest type is a uniform hexagonal web with heavier wires at the edges. This fencing comes in all widths from one foot to six feet, in various spacings and in various weights of wire, of which that known as No. 19 is the smallest that gives satisfaction. Therefore, this is the popular size; since it is the cheapest that will "do." General testimony is to the fact that these nettings, which "might reasonably be expected [see Report] to last for ten or fifteen years," will become nearly worthless through rusting, in two or three years. Quite possibly the users of this class of goods are not discriminating enough as to the varying effect of varying conditions on such fencings. It is well enough known that the "life" of such fencing is shorter near the seashore, or near large cities and manufacturing plants which give sulphurous gases into the air. And even in ordinary rural conditions, there is a considerable difference in the life of wires, due to general strength of prevailing winds and the amount of abrasive dust which these winds carry. Where sand is much in the air, deterioration is hastened. But, with all allowance made, there still has been plenty of reason for complaint.

Fencings bought of dealers who have claimed to carry

only the best have gone to pieces in two years. And the heaviest wire fencing known to me—a fence advertised all over the United States for half a generation at least as the standard of quality in manufacturing—has rusted completely away in its lighter wires in seven years, in a location perhaps 20 miles from salt water.



Wire Netting. Darker Wires Show Rust. Rusted While in the Roll

It is a common belief, and we hear frequent testimony, that the wire manufactured twenty years ago or more resisted corrosion far better than the wires now produced. This scarcely touches the matter as it now stands, since the iron wire then used has passed entirely out of use, in favor of the steel wire.

Five points are noted as affecting the rapidity with

which a given fencing will rust under normal conditions. These are:—

a. The actual quality and the characteristics of the steel used in the manufacture.

b. The real character and the quality of the zinc (spelter) used for galvanizing the wire.

c. The evenness of the zinc covering.

d. The weight of zinc—that is, the thickness of the covering.

e. The weight or gauge of the wire itself.

It may be thought that these are all matters for which the manufacturers are directly responsible. While, strictly speaking, this is true, in actual commerce with wire fencings it is yet the buyer who fixes the quality commonly used, *because* he so commonly insists on *low price as the first consideration*. Manufacturers are now making better steel, and are so alive to the necessity of this that the quality is likely at least to hold as at present, if not to improve. The quality of the zinc is a problem not yet fully solved. But great gains have been made in evenness of covering the wire, within the last few years. Heavier covering can also be produced. But, as regards these two points latest noted, the buyer exercises as much responsibility as the maker of the fencing, because only a given amount of zinc will cling to the wire, and a fine wire cannot be made to carry as much as a coarser wire. Hence, the lighter, cheaper fencing cannot be as well made as the heavier one.

The consumers of fencings of this class largely demand a product with a certain price limit. It is to the interest of the maker and the middleman to supply that call which will make for them the most sales. Thus,

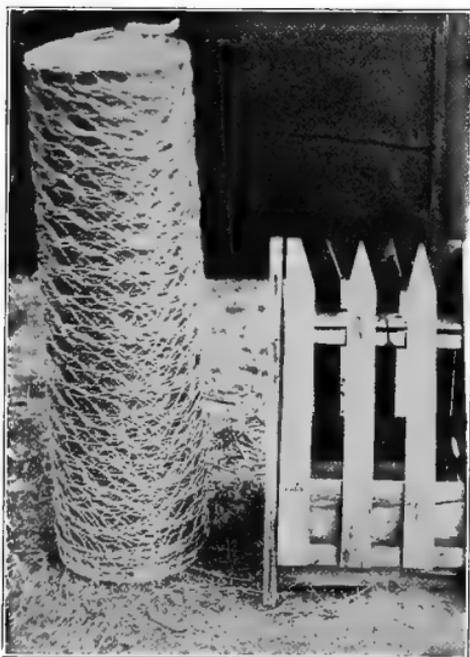
the users of wire fencings, in demanding light wire and low prices, fix the two factors which lead to the rapid corrosion of the fencings. No dealer carries all weights and widths, since it means too much idle capital, and too much used space for storage. He will carry those which have the best demand in his locality, in fullest stock, though generally advising a good quality. This advice the suspicious buyer believes, too often, to be a



Barley, Growing in Six by Ten Foot Frame, in Summer Yard. Stiff Netting and Good Bracing are Imperative

trick to get more money out of him. He is likely to be cramped for money anyhow, perhaps carrying a mortgage. But, no matter what a special buyer wants, he is likely to have to take what the majority demand; since the general call influences the stock that is put in. Mr. A. S. Cushman, Assistant Director, Office of Public Roads, who had charge of the fencing investigation,

states his own belief that lighter gauge wires than No. 9 or No. 10 should never be used for farm fencing, except in the case of poultry and rabbit inclosures. And heavier than No. 9 wire is not considered practical.



Full Roll of Wire Net. Patent Drinking Fount

The limit is therefore narrow. Mr. Cushman states that No. 9 wire is heavy enough for all practical purposes, and that it can be made satisfactorily for farm use in the "mild" steel; which, contrary to general impression, is as resistant to corrosion as the high-carbon, more springy steel, as well as being easier to handle. His opinion is that this low-carbon stock is really a better all-

around material for fencing wire than the spring steel.

The two common grades of poultry netting made by manufacturers differ in that one is galvanized before, the other after, weaving. The wire galvanized before weaving is usually 20-gauge stock, is considered "not fit to use," and should not be bought at all if one desires a lasting fence. It is easy enough to distinguish between the two grades, as the fencing galvanized, as it

should be, after weaving, will not untwist, since its crossed wires are stuck together by the coating.

Improvement in methods has, in recent years, enabled the makers to put on heavier coatings. But there is one objection to this, in that heavy coatings incline to make cracks at joints and bends of the web. Both the maker and the user having made this criticism, a custom arose of wiping the zinc coating to make it smooth and even. Thus, most of it was wiped off in some instances. This rather points to the conclusion that roughening at bends, etc., is something of a guarantee of a good coating.

Contrasting the advantages to both producer and consumer in the use of light and heavy wires, the Report says: "The use of the heavier wire enables the manufacturer to work up a larger tonnage of metal without material increase in labor and other cost charges, and he may also expect to earn a better reputation for his products than he has hitherto enjoyed. The consumer will be repaid in the longer life of his fences and a higher efficiency in the objects for which the structure is designed. It is a mistaken idea to suppose that because the use of heavier wire operates to the advantage of the manufacturer, the selection of light wire must necessarily operate to the advantage of the consumer. A light fence which must soon be renewed *might possibly be considered an advantage to the manufacturer*, if there were only one kind of fence available, or if he entirely controlled the market. But, a consumer is not likely to repeat a failure with a particular brand of fence; and as the competition in the manufacture of wire is especially keen in this country, it is at once apparent that *fences which rust rapidly work against the interest of all concerned.*

If a wire fence needs to keep out trespassers, as is often the case with poultry fences, a strand of good barbed



A Home-made Coop, Original Design. Sliding Panel, and Back Corners Beveled Off

wire, set six to eight inches above the netting, but on the opposite side of the post, will be found quite effective.

The longer one keeps poultry, especially if he be a

fancier, or if he be a town poultryman, or one in business commercially for a living from poultry, the greater becomes his devotion to wire netting — *good* wire netting. Permanent fences, pen divisions, temporary runs, summer coops, line fences, supplementary inclosures, etc., may be constructed almost entirely of wire net. Probably the most useful type, price considered, is the four-foot, two-inch mesh kind. For confining small chicks, however, the two-foot width in one-inch mesh is the favorite. It is much higher in price proportionate to width, however, than the two-inch mesh web. The three-inch mesh goods are apt to be in 20-gauge wire, and thus they have two causes for being less firm than the popular, two-inch mesh grade. But these can be used for confining larger birds like geese and turkeys. The question of width is a rather troublesome one. A fence needs a bottom board, at least, though some dispense with the top strip. High-flyers demand a seven-foot fence. The six-foot width looks much neater, and is more shipshape generally. But many prefer to use a four-foot net, with a two-foot strip above it, because the six-foot strips are so difficult to handle and hang. One poultryman tells me he finds the best way to hang a wire fence is to drive nails in the posts where the top should come — at a measured height — and catch the upper wires on these nails; the rest is easy, all except the trick of learning how to drive the staples properly, without their dropping, breaking, or going in crooked.

. DUCKS AND GEESE

Beginning with Ducks — A Favorable Location — Few Losses — Few Desirable Breeds — Pekins, Runners, Orpingtons — Runner Record Notable — Above 200 Three Successive Years — Extreme Claims — Fowls for Feathers — Testing White Eggs — Feed — The New Coat — Ducks as a Specialty — Popular Breeds of Geese — Goose Farming — Hens as Hatchers — Pasturage — Beauty Breeds — Prices

IT seems to be true that many Beginners take up ducks and geese with diffidence and with fear, believing the work to be more difficult than the raising of chicks. This is so far from true that the losses with waterfowl are on the average proportionately much less after they are hatched than with domestic hens, turkeys, or guineas. Indeed, some one recently suggested that it would be much easier for a Beginner to start with ducks than with hens. With natural water privileges, the work is less, the growth is at least twice as rapid, and the losses far less. These are certainly three very strong arguments in favor of waterfowl.

A favorable location for duck growing has a bit of land sloping toward a stream deep enough to allow swimming and diving delights. Such a place being available, one who delights in poultry has missed some of his privileges if he has not tried raising water fowl. There are many clever midgets of fancy ducks, beautiful for color, fascinating for sprightly grace, sympathetically

linked to man through their apparent pleasure in living, and their delight in companionship. There are several places in this country where these, together with pheasants, and other marvelous fancy fowl can be had. I shall speak in detail of only a few admittedly profitable varieties of ducks and geese.

According to many writers, there is only one duck — the imperial White Pekin, which is most regarded, not for its dignity, not for the egg-laying capacity especially in itself, but for the capacity to produce quickly a heavy and fat quantity of “green duck” for a waiting market. Hastings in 1909 gave one hundred thousand victims per annum as the output of the largest duck plants. A recent writer calls the duck a “machine-like” bird. The places which grind out many thousands of green ducks, chiefly Pekins, are quite numerous; yet the margin between cost and sale price is not large, and the large incomes come to those who have the know how of the business and who make a goodly amount through small individual profits on very large numbers of birds.

But because the losses are few and the chances for using cheap feeds very good, there is an excellent opening for a limited number of growers to grow ducks for the later market, for the feathers, and, in one variety, for the eggs; also, in the case of Pekins, Indian Runners, and perhaps Buff Orpingtons, for the sale of fancy breeding stock. I do not mention Cayugas, Muscoveys, Rouens, etc., in this connection because, though Standard breeds, they are not popular and — although this statement may seem amazing to the Beginner — the popular breeds are the most profitable for the average fancier. This because only here and there a man

has the genius to become an exceptional raiser of non-popular birds at exceptional prices. Put it this way :

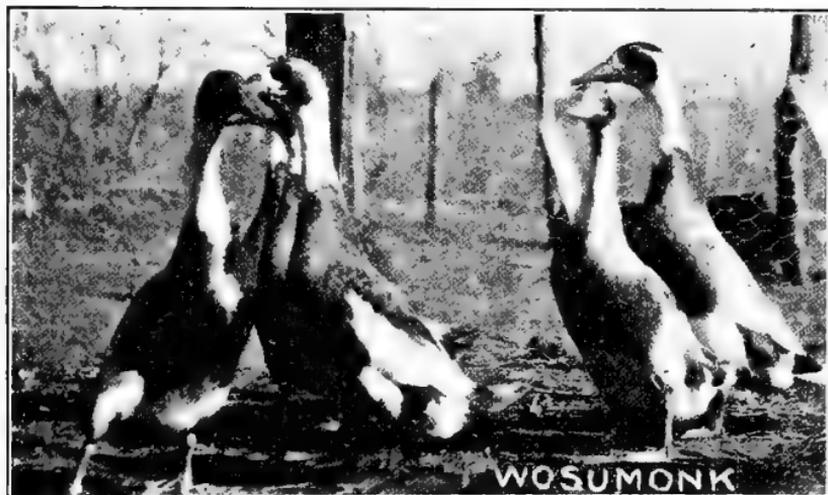


Silo for Beets. These Form a Cheap Feed for Yarded Stock

It is a waste of time and of capital to raise that which is not wanted. Does not that ring like common sense ?

If the would-be Beginner with ducks does not want the Pekin, he is wise to restrict his choice to the new

Indian Runners or the still newer Buff Orpingtons, both of which make their bid for favor on the strength of their being superior layers. Both have imbued their owners with sufficient confidence to lead them to enter their birds in the Australian laying competitions. This is a most extreme test.



A Record Strain of Penciled "Walton" Indian Runners. (Photo by Mrs. Benigna G. Kalb)

The Indian Runners have won first in three of these competitions successively, each time with official record of two hundred and over up to two hundred seventeen. The Buff Orpingtons claim one winning which I have not seen vouched for in print, but for which the claim is doubtless legitimate. There is a certain "Record Duck," an Indian Runner owned by one Mr. Scott of New Zealand, for which the enormous output of three hundred twenty eggs in one year is claimed, and another is "guaranteed" to have laid three hundred and thirty-

nine. A claim of three hundred thirty-four eggs has been attached to a certain Massachusetts hen in this country. This and the above claims for the Indian Runner duck are the highest laying claims I have ever seen. The "Record Duck" had six descendants in public competition and making fine records of their own at last advices. Between this three hundred twenty egg claimed record, which no Runner breeder would think of looking at as possible to the average commercial worker, and the one hundred fifty egg known reliable record for these ducks kept in large flocks, there is a painfully wide margin, somewhere along which the average worker would probably land. The most frequent claim for pens of half-a-dozen or so is in the neighborhood of one hundred eighty per duck (I have *known* of averages above two hundred in this country). This ought to insure a profit of two dollars or over for each duck kept, and, as the losses are few after the easy trick of handling is learned, it offers a good chance to those who have proper facilities. This duck seems to have appealed especially to the women, and there are numbers of them in the country already who are earning a good living for their families from these ducks alone.

Not long ago, I had some correspondence with a Virginia farmer to whom I offered a discount on a book I was selling. He replied that he *could make all the money he wanted from his Indian Runners*, and that if he handled my book he would like to do it without profit for the sake of his customers.

If one were to raise waterfowl for the feathers especially, the white varieties like Pekins, Aylesburys, White

Indian Runners (when these have increased sufficiently) in ducks, and White Chinas or Embdens in geese are to be preferred. It is admitted that plucking the birds is not desirable when laying is expected or when the carcass is soon to be marketed. This is reasonable; for the feed that goes to produce feathers can hardly be expected to produce at the same time eggs or flesh. In practice, it comes about that the combination method is pretty sure to be followed. With Pekins, however, which are only moderate layers, it is often feasible to pluck the birds at least twice in the later season. Ducks that are expected to lay in autumn cannot be plucked without injury to the laying forces.

It is, as a rule, better to hatch ducks by means of a hen, a rather moist location being favorable. The nest may be made of soft hay, on the ground in a floorless building, which is so located that water cannot run under the walls to set everything afloat. Ten eggs are enough for all but the largest hens. Modern poultrymen test all eggs between the fifth and the tenth days. The eggs from the penciled or English Indian Runners, which are pearly white and almost translucent, may be tested on the fifth day. The infertiles are to be removed. These make an excellent partial food for small chicks. Duck eggs require twenty-eight days' incubation. The ducklings are left under the hen until all are hatched and dry, when they may be removed during the period of sunshine to a coop floored with boards, over which are sifted sand or dry earth and an inch layer of soft chaff. The coop should have an attached grass run, its inclosure at least a foot high, and it ought to have a secure front. The youngsters may not

need any food till the next day after cooping. The hens should have corn and water. The ducklings need warmth chiefly, if the weather be cool; if hot, they need shade, with a chance to get into the sun as the day cools. As soon as they need feed they will take it when offered. Bread soaked in milk is the best food to begin with. After this a little bran can be added, with a little meat and sand, and soaked cracked corn at night. Five per cent of meat at first is the standard amount. A large spoonful of sand in two quarts of feed once a day is a fair quantity. Very fine grit is even better than sand. Charcoal helps to keep them in good thrift. A handful occasionally is all that will be required. Water must be always before them in vessels such that they can wash their nostrils, yet not soak their bodies while still downy. As they grow, the little run must be enlarged or a fresh one provided. They need the hen only two weeks or so in mild weather. When feathered, which will be from seven weeks onward, they may be allowed to swim if water privileges are at hand. It is to be remembered that this water privilege, good as it is, has also its disadvantages; since vermin commonly follow the streams and haunt the ponds. Hence, if these are troublesome, close yarding, with security at night, will be the price of success.

When the young are ten or eleven weeks old they will prepare to assume a new coat. If to be sold for market, just before this molt is the time to dispose of every one that is up to average, as they are commonly fatter and better at this period than at any other. If not sold then, they must be kept on until the new coat matures, several weeks later.



Simple but Efficient Duck Houses. Cloth Front Curtains Swinging Upward and Inward

The Indian Runners have been known to lay at less than four and a half months of age. The more usual period is from five to five and one half months, and in case of late hatching they sometimes go seven months before laying, beginning in February, if not earlier.

The Beginner who desires to make a specialty of ducks will be wise to buy a duck book and to become familiar with its contents before investing or attempting the work. Rankin's "Duck Book" is an old standard authority, and the present writer publishes a small book on Indian Runners.

The American Standard of Perfection recognizes seven varieties of geese in six breeds: Embden, Toulouse, African, Chinese, Canadian, or wild and Egyptian. The decorative or fancy sort known as Sebastopol is not a Standard variety. The adult gander in Toulouse, Embdens, and Africans has a standard weight of twenty pounds. The adult Chinese and Canadian ganders weigh up to twelve pounds and the Egyptians to ten pounds.

I know of no other of the lower animals so nearly human in many of its characteristics as the goose. The Beginner who learns as much as possible of the habits of geese before attempting goose culture is the one who will have best promise of success. It is quite necessary to know what might be called the "habits of thought." Geese are more stubborn than even the most stubborn of mankind — which seems utterly needless — and it often becomes necessary to use finesse and skill in order to lead them on in proper subjection while still permitting them to follow their own whims sufficiently to render them content and happy.

Expert poultrymen are a unit in agreeing that com-

fort and content in fowls are what really turn the scale toward profit. Comfort and content necessarily include good handling, because they mean health; but that sympathy which may be established between a handler and his charges seems stronger among geese than with any other farm stock, unless it be horses. The dog would be excepted, doubtless, but he does not usually count as "stock." In view of the fact that geese are long lived and that they grow (even more than other animals) to be confirmed in their "cranks" as they advance in age, it becomes of prime importance to establish at the first and to preserve harmonious relations with them. If, when young, they contract an aversion for, or a hatred of, any member of the family, it seems to become an instinct with them, for it can seldom be overcome, and it will be transmitted to all the progeny indefinitely.

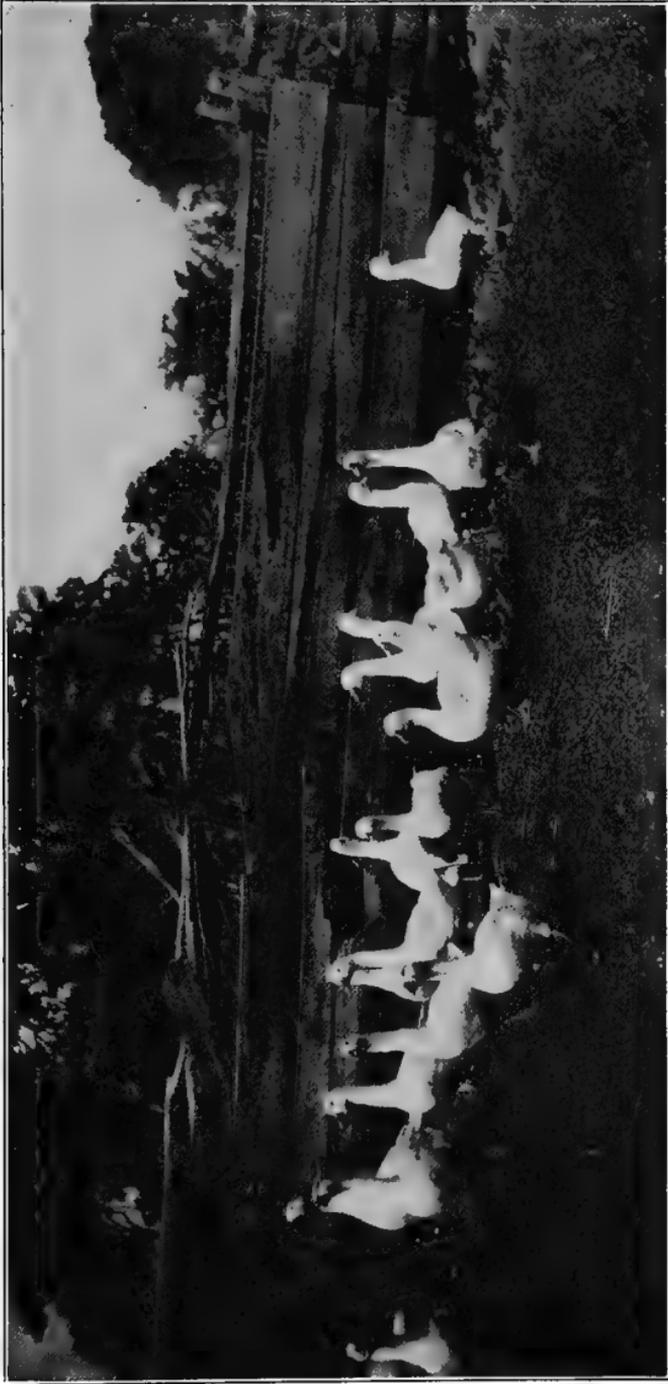
Having become acquainted with the tendencies and habits of the goose family and having, in addition, resolved firmly to work in accordance with these and with sympathy toward this so nearly human animal, the Beginner is ready to acquire some geese. Just because geese are such creatures of habit, it is often best to begin with eggs, in order that one may form their habits to suit himself. Hens are best as hatchers. There may be need of both patience and some expense in beginning, because good eggs are difficult to obtain, and young stock may nearly fail in its first year's breeding.

A Beginner may do well to buy a good pair or trio in the fall and to devote the first summer provisionally to making acquaintance with his stock, raising the few young which they may present to him and bringing the breeders to the proper age for good regular and reliable

production. The goose produces through such an extended period that one can afford to have her take more time to become well matured, but if one would be sure of the training of his geese he must raise them from the egg under his own supervision.

It is not possible to buy geese in the spring, in many localities. Winter market prices are high and winter feed more expensive than summer feed, while production is limited. This means that all that are for sale will be sold in early autumn, if possible, although as breeders they cannot be sold until the sex shows itself and they are matured. The expert will ascertain the sex by physical examination, using a hand magnifier.

Since the goose is a cheap fowl to keep, it is better for those who contemplate what may be called "goose farming" to buy either the big Toulouse or the Embden. By goose farming I mean raising geese chiefly for market in rather large numbers. I have before me the figures from a goose farm in Ireland consisting of twenty well-watered acres on which thirty geese were kept, from which the gross income was nearly two thousand dollars. Some eggs from this farm were sold for hatching; but inasmuch as the income would have been larger had they been turned into geese at home, this need not count against the figures. The average output of eggs from this farm, which carried four varieties, was about forty-one per goose. This is higher than the general average, although the Chinese geese may lay as high as sixty and in rarer cases seventy or above. Toulouse and Embden geese on the average probably lay somewhere near twenty to twenty-five under common handling. As all signs fail in a dry time, so all prophe-



S. A. Little Embden Geese : A New York Winning Strain

cies with regard to birds must at times be at fault. If the home conditions surrounding them are especially good, they may outdo their breed average very conspicuously; for instance, an acquaintance of my own succeeds in getting good returns from young geese in their first year of breeding, and this not once only, but as a rule. They breed well year after year; but they have absolute freedom, water privilege, fine grass range, and the kindest treatment, even to affection. These things do count, and they count doubly with geese.



Embden Geese, about Four Months Old

Young geese are usually mated in the fall. They tend to mate in pairs. The young are best so mated. In older stock it is customary to allow two, three, and sometimes four females to each male. Once the birds have accepted their mates, the matings are difficult to break; indeed, virtually impossible, without locating the birds out of sight and hearing of their former mates. It is to be kept constantly in mind that change is the one thing which the goose most abhors. She is a creature of place and association and habit, and any change in these upsets all her plan of life.

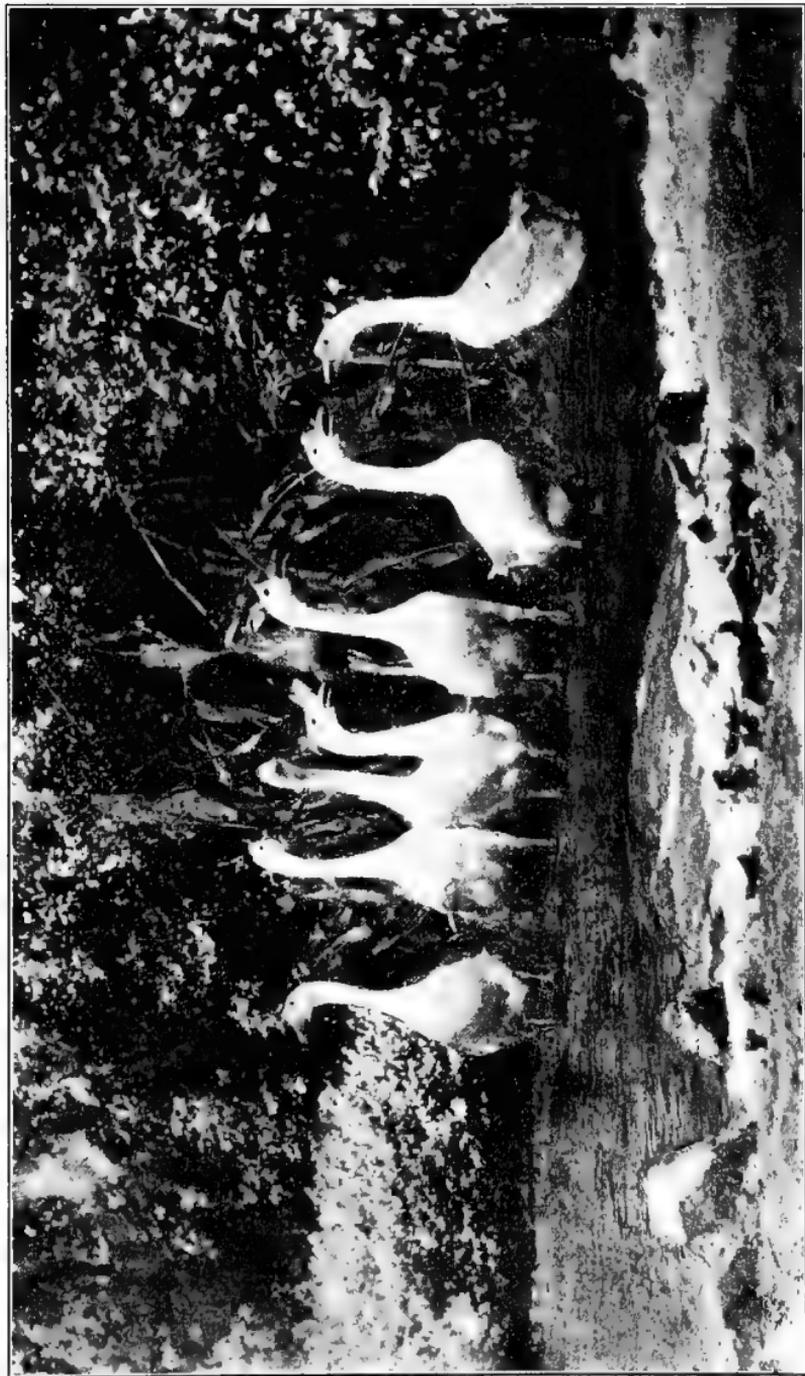
Goose farming and goose raising can hardly become a wholesale matter, though goose fattening almost reaches this plane at times. A good-sized hen must have a well-shaped nest if she is to cover six Embden or Toulouse eggs properly. I find a cheese box is a most excellent nest container for this purpose. For the hen's comfort, a nest for goose eggs must be deeper than is permissible with other eggs. The eggs are so large that otherwise her weight must bear too heavily upon them, or she must constantly support herself partly by means of her feet. This would mean torture in time, and should not be permitted.

It is not so very unusual for every egg to produce a gosling. Moist air about the eggs is needed for proper hatching, and some addition of warm water to the ground about the nest during the last three days may help the hatch. The shells are very strong, and the goslings may need assistance in getting out. They must not be removed from the nest with undue haste, as they are likely to be several days, it may be, in getting up an interest in the world into which they are newly come. When they are ready they will need only water to drink and a plot of short, tender grass from which to feed. In trying to graze they will gain the necessary strength. The young will thrive and grow well on bread soaked in milk; but it must never be forgotten that their natural food is what we call "pasture," — that is, herbage which they may graze from the field for themselves. Where grazing conditions are not good, some have found good help in feeding cut sweet-corn stalks and leaves and sprouted oats. Geese are especially fond of both of these.

Goose farmers in a large way may feel that it is a waste of time to incubate the eggs under hens. In such case, they set the geese on the ground where they have laid, and take the precaution to place a coop or perhaps a lath rack over the sitter to ward off interference from the other birds. Turkey hens also are said to make excellent mothers for goslings—about a dozen eggs form a nestful for these. Even where nests are on the ground, some sprinkling is often done during the last two or three days. This is better than helping the goslings out of the shell, because safer.

When the geese are used as hatchers it is necessary to know their ways. The incubating goose or brooding goose permits no human interference and is but a vicious animal towards any who may be considered enemies, though tenderness itself to her young. She may not feed them, but both she and the male will exercise exceeding care for their protection. The hiss of the mother goose is a warning; if not heeded it is quite likely to be followed by attack, and the unwary foe is rather sure to be the greatest sufferer in a battle. The blow of a goose's wings may leave its mark on tender flesh for six months or even more.

While it is to be insisted that grass is the main food for geese, two light feeds of barley or oats a day are a part of the handling of some expert breeders, from January to May. They say that by this means the goose which would naturally lay but one "clutch," may be induced to lay four times as many. Lavish feeding is, however, not to be advised, and though meat will increase the laying, it sometimes injures the birds, which may then produce imperfect eggs. This simply means



The Swanlike White China Geese, at Edge of Pond : A Beauty Breed

that, by stimulation, the eggs are passed through the "egg machine" too rapidly to attain perfection. I use some meat, but with great care.

Goose farming is practiced far more in European countries than here. From the methods of one of these farms abroad I learn that the goslings are fed for a week, three times a day, on equal parts of oatmeal and barley meal moistened with milk. For the ensuing three weeks they receive the same mixture twice a day, after which they are pastured on fields eaten close by cattle earlier in the season so that the new grass will be short and tender. With this, they are fed only oats at night.

The White Chinese and the Embdens are the beauty breeds among geese. To some, possibly the odd Sebastopols would appeal as beautiful. The popular sorts, however, are the large ones, the Embden and Toulouse breeds, to which the White Chinese may soon become a close third, as interest in it seems to be growing apace. Its peculiar swanlike neck and the odd knob on its head give it distinctiveness, if not distinction, and white birds are always prime favorites, especially as decorations. White feathers will sell for a higher price than those which have color.

A pair of geese is the unit of breeding. Once one has learned how to handle a pair he has all the skill needed for *goose breeding*. Speaking in general, he may then branch out into the Fancy, or into goose farming; or he may just "raise geese" — a few for his own pleasure or for the decoration of the home place — or even for the fluffy feathers on which his wife dotes.

It is comparatively easy to work up a trade in goose eggs, as there are few in the business. A start with

good stock is the initial and the critical step. Exhibition at a good show is the quickest way to make a reputation. But the chief difficulty for a breeder with a conscience, is to furnish hatchable eggs. If conditions of life on his place are wholly favorable for the geese, the chief point is not to try to ship eggs from stock less than two years old. One who has worked up a satisfactory and growing trade often cannot be induced to sell eggs at all, for he knows that even at fifty cents (a common price) to \$1 each, the eggs are worth more to turn into geese. The market price of a well-grown fifteen-pound goose in the East will be near \$2. I sold some for nearly \$3 each in 1911. In a farm paper under date of January 21, 1911, the price for live geese was fourteen cents, and for dressed, up to fifteen cents. This would figure out \$2.10 and \$2.25 for the best, alive and dressed, respectively.

This gives reasonable ground for the poorest fancy geese being priced at about \$5 each, while from that prices may grade up, possibly, to \$50 a pair for winners in large shows. This seems to me rather low, but I suppose the great reason is that goose fanciers are comparatively few in number and thus do not force prices higher. When several hundreds of dollars sometimes change hands with a single hen or cock, it seems scarcely fair to the geese that the prices should be so far below this extreme.

Just previous to this writing, I was studying the hatching eggs price list of a poultry supply house in New York City, for 1911. The lowest price for "Standard-bred Utility" grade was \$2 per thirteen (White Leghorns) or \$7 per hundred. In six breeds it was as high as \$5, and in one \$6 was the price asked for thirteen eggs of this Utility grade. The lowest in "Exhi-

bition Quality" was \$5, and the eggs of six breeds were held at \$10 to \$12 per thirteen. This was for the eggs of the domestic hen.

Pekin duck eggs, "Standard-bred Utility" grade, were offered at \$2.50 per twelve, and the Embden and Toulouse eggs of the same grade at sixty cents each or \$5 per ten. No larger number than ten was offered, and no eggs of the "Exhibition Quality." However, seventy-five per cent fertility was guaranteed in hens' eggs, from March 15 to June 15; claims to be made within ten days from date of shipment. No guarantee of fertility, either "expressed or implied," was made in connection with water-fowl eggs, and no claims were to be allowed for breakage.

LITTLE LINES OF GOOSE LORE

1. Geese are the "human beings" of the fowl family.
2. Geese become attached to people and places.
3. Geese require the simplest of housing.
4. Goose houses may be portable.
5. Geese are easy to raise.
6. They are strictly herbivorous.
7. They must have access to water and good pasturage.
8. Females breed best between two and fourteen years; males between the ages of two and ten.
9. The eggs *may* require thirty days' incubation.
10. Geese weigh up to twenty pounds Standard, but may reach forty or more.
11. A Standard-bred flock has been known to pay at the rate of \$90 each, all eggs being incubated.

XXVI

THE NATIONAL BIRD

**The Handicap in Turkey Raising — Resistant Power —
Destroying the Sick — Lessons from Experience —
Bronze Turkeys — Habits — Feed — An Excellent
Ration — Bourbon Reds**

No; I don't mean that proud bird of freedom, the eagle. But the turkey, although not the emblem of freedom, is almost as insistent on it as the eagle. One hates to write turkey literature, in these days when blackhead is reported here and there all over the country. "Blackhead" is a germ disease, largely fatal, and spreading from bird to bird and from flock to flock. This troublesome disease begins in the blind entrails or pouches, like long pockets, in the lower intestines. There is inflammation, enlargement, and thickening of the contents of these. These pouches, when spoken of together, are called "cæca."

In connection with the change in the cæca are also changes in the liver. Other diseases show spots on the liver, but blackhead shows circular or annular spots, often over the whole area of the liver. The color may be yellowish. Yellow color in a liver always means something wrong. The natural color — what we sometimes call "liver-colored" when it appears in the color of dogs — verges toward a dull, dark, purplish red. Changes in the liver are the quickest and most certain evidence of blackhead. If the cæca are also involved, the diagnosis is pretty certain to be accurate.

Whenever a new disease, a new fungus, or a new ravaging insect appears, the first step toward conquering it is for the scientists at the Experiment Stations to study its "life history." When they know how it looks, how it develops, and what it does, they are not Yankees if they do not find some way to circumvent it. I remember what a matter of life and death the first appearance of the potato beetle was to our farmers. People feared that we could never again raise potatoes in this country. Many farmers came near starvation, on the newly broken lands of the frontier. It was a black, black outlook. But the Yankee came out atop, as usual. It is not for nothing that "when he undertakes it, he'll make *the thing, and the machine that makes it!*" At the present time, the farmer calmly reckons how much Paris green or arsenate of lead or patent mixture he will need wherewith to spray his potato patch, buys it, applies it, and sleeps the sleep of the man who has done his duty, and who need not fear the result.

When blackhead appeared, our scientists began to probe into its life history. They have found out much. They have named the germ and have given it a "bad name" in two senses. They have discovered its cousinship to the small Mephistopheles that causes white diarrhœa, at least one form of him. (They say there are two, or more.)

The conviction is gaining ground that, no matter what the disease, or the victim, — whether it be man, or bird, or beast of the field, — the resistance which is present, or which may be developed in the larger organism attacked by the swarming myriads of disease germs,

is the chief hope. Prevention by disinfectants is good, when there is nothing better; but resistance through robust condition *is* better. Disinfection means killing the germs; there is another way of killing the germs; that is, to kill the animal attacked by them. It is a fair question, Which is cheaper, to disinfect houses, runs, feed, water, etc., and try to save all the sick, or to destroy all the sick, without loss of time, and depend on keeping the rest well? Many poultrymen are so convinced that the latter method is cheaper in the long run, as well as better, that they recommend "the ax" for every sickness in the poultry yards. If this is thought to be going too far, at least a "hospital," where every case of incipient disease may be segregated, is only the sensible protection of the rest.

Mrs. Mollie MacClaughry Allen, an Institute lecturer located in New York State, and therefore within one of the blackhead "zones," has had experience with the genuine disease. At the time of the first attacks, some years ago (as she states), the Stations, while making exact diagnosis of it, had no remedies or suggestions to offer. At the present time, hyposulphite of soda is recommended as a preventive, to be given in the food as soon as the first symptoms appear. Mrs. Allen disinfected the runs as far as practicable, and destroyed every bird that showed the disease. She says, "It is never safe to keep a bird that has once been affected with the disease." Also, that the older and stronger birds were never affected. The second year, she had few losses, but separated, killed, and burned every bird that showed "the fatal yellow" in the droppings. By disinfection, clean feed, "and special attention to

the selection of the breeding stock for health and vigor," she conquered the disease in her flock. It has never reappeared.

I regard it as practically impossible to disinfect the ground on which turkeys range, as they roam so widely. But, the wider and cleaner the range, the less liable is the disease to get into the flocks. The rest of Mrs. Allen's program may be followed by any one. Her first rule, never to spare a bird really sick with the disease, is the most difficult for the average poultry raiser to follow. But she regards it as the key to success.

There are seven varieties of turkeys recognized in this country, viz., the Bronze, the Narragansett, the White, the Black, the Buff, the Slate, and the Bourbon Red. The first, with possibly the last, seem to be the most prominent in the minds of raisers. They are the largest, the Bronze variety being listed in the American Standard of Perfection at from 20 pounds for the hen to 36 for the adult cock; the Bourbon Red at from 14 to 30 pounds. The last, which is the newest, is said to be bred up from a once wild variety of Bourbon County, Kentucky. Most of the others have little hold on the country, though the Narragansett variety was once quite popular. The Bronze turkey is raised everywhere; and, although a small or medium bird is most often needed by the modern family, the call to breeders of turkeys is for large breeding birds. Mr. Felch has said that a twenty-pound female will seldom lay, and that a "tom" weighing over thirty pounds is worthless as a breeder. The big Bronze turkey is the result of a cross; the parentage being a wild gobbler and a Narragansett fe-



White Holland Turkey, "Sir Kay II," and Mates. (Courtesy of Mrs. Benigna Kalb, Texas)

male. Turkeys weighing 40 pounds and upward are used to attract attention and interest in city shops at holiday times. Mr. Felch thinks 28 pounds is the heaviest male that should be used, and that the progeny of such a one will average as heavy as those of a larger tom. The size required in the market varies with the season.

If the first stock or breeding birds on a place are raised with hens, the flocks will always be less wild; but it is not advisable to make a business of raising the turkeys in company with the other fowls. Indeed, the less this is done, the better. Some of the best breeders inclose plots of several acres, especially for the breeding turkeys. A firm which used to sweep everything at the New York show, raised its turkeys on a small island, where they could be as near to a state of nature as possible; though the young were always fed and watched carefully.

Turkeys love to steal their nests, and do not tend to desert a nest which suits them. It is best to place barrels in sheltered, aloof places near the buildings. Turkeys like barrels for nests. These may be roofed with a sheet of roofing paper, for better shelter. They need to be blocked up so that they shall not roll or rock, and it is better to have the front end slightly lower, though the nest itself should be built level in the bottom. Turkeys often lay three clutches, if the earlier eggs are given to hens to incubate. These litters vary from eight or ten to more than twenty, sometimes. Late turkeys are not very desirable. A common hen may cover nine turkey eggs; a turkey hen fifteen, which will average high in fertility, even though one mating serves for the season. The poults are very weak and tender at the

first. They succumb easily to fatigue or wetting. For this reason, they are usually cooped not too far from the house, and a triangular pen of boards used to confine them. Sometimes, only the young are penned, the mother being free. She will not leave them. Green feed is their chief need, or at least they cannot do without it. I fail to see the value of the hard-boiled egg so often recommended. One good grower uses bread squeezed from sweet milk during the first two weeks; later, curd and meal displace it, and cracked corn is fed at night. This is an excellent ration if the poults are on tender grass so that they may get all they need of this. Grit and charcoal are supplied by careful poultrymen, and lice must be rigidly kept off.

The latest variety to find popular favor, especially in the South and Southwest, is the Bourbon Red. I have not bred this turkey myself, but one who has, speaks of it thus: "I was a pessimist on the turkey question until I got hold of half a dozen Bourbon Red turks some years ago; but my experience with them has been so satisfactory that I am a firm convert to the belief that they are the best turkeys for profit in the United States." He enlarges on this by saying that they are more intelligent, more domestic, more easily raised than the other varieties, and will lay ("can be *depended on* to lay") three litters of eggs of from 15 to 18 each, in a season. His feed is whole-wheat bread wet slightly with whole milk, mixed with onion tops and lettuce finely chopped. From 48 hours to one week this is used. Then they are started on hulled oats, wheat, and finally cracked corn. After six weeks they get their own feed by foraging. He allows plenty of milk to drink while

they are small, but does not favor milk curd, "all other authorities to the contrary notwithstanding."

The standard coloring of the Bourbon Red turkeys is chiefly deep, mahogany red, with white; the primaries and secondaries and the tail being white, the neck, shoulders, back, and breast the deep red tone; also the thighs. The shanks and toes partake of the general coloring, being described as "reddish pink," in the Standard of Perfection. The highest Standard weight is 30 pounds, but the breeder referred to above says they range upward to 36 pounds, in fact. It is not extremely exceptional for birds of any breed to exceed the Standard weight of the breed, when that weight is comparatively easy to reach. If, however, the Standard has been placed where it is quite difficult for the average specimens to reach it when in good condition, the case is quite different. Ganders of some breeds have sometimes exceeded their Standard weight by at least one half, while they tell stories at the shows of almost double the Standard weight being reached by old males, well covered with fat. The largest known weight is never considered the perfect weight, in most breeds of fowls.

XXVII

GUINEA FOWL AND QUAIL

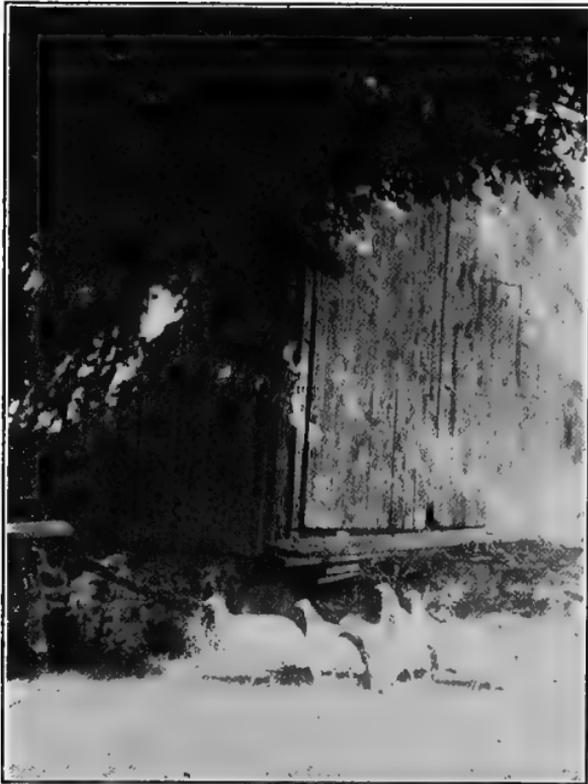
Guineas and Game — Varieties — Unrecognized Varieties Win Their Way — Appearance and Habits of Guineas — Raising Guineas With Hens — Demand and Prices — Guineas as Protectors — Quail as Poultry — Imported Game — Quail at Connecticut Agricultural College, Storrs — Failures and Successes — Hatching Quail in Machines — Quail Our One Hope for Northern Game Birds

IN my book "How to Keep Hens for Profit," I said (page 9), "admitting that their quality suits the market, the Guinea fowl and the Indian Runner duck are more desirable producers of 'game' meat than are the wild fowl." The reason given was that such fowls as can be domesticated, being then more amenable to man's manipulation, roll up the dollars of income faster than can be done with the chances of the hunt. This is true, despite the fact that the wild game costs nothing to raise.

The shy Guinea fowl has been and is still regarded as more than half wild. Yet it has been raised successfully by "barnyard" methods; that is, in actual confinement to a similar extent to that in which common hens are raised.

The "Guineas," as they are usually called, are admitted really to be native to Guinea. The common "Pearl" variety is said to be identical with that of the Guinea Coast of Africa. It is a valuable example of a

fowl long bred, and fairly profitable with farmers and fanciers, not having been formally "recognized" by that poultry authority known as the "American Poultry



White Guinea Fowl

Association." The author of "The Perfected Poultry of America" says, "They have never received, so far as we know, sufficient recognition to have a definite standard prepared for them."

The lack of this "recognition" does not seem to cause any loss of sleep to Guinea breeders. The impor-

tant shows offer premiums for them, and the entries are seldom lacking at shows which I have attended. We find the Pearl Guinea, the White Guinea, and even the "any other color Guinea fowl" listed in the classes for premiums (even by shows professing to be held under American Poultry Association rules), under the same conditions as obtain for the "regulars." New breeds often have to run a gauntlet of injustice, in which a non-recognized breed entered must compete in a class of "any other variety of fowl." Here, it is pitted, not against its own kind, but against all other non-recognized breeds which may be entered. Manifestly this is no real competition, but its value consists in getting the birds into public view. The valuable white-egg, English bred Runner Duck, and the lovely White Indian Runner, have no other recognized place at the date of this writing. Still, despite the authority of the American Poultry Association, and its recognition of a green-egg Runner, many important shows are deliberately making classes for these other unrecognized varieties, because of a knowledge of their superior value. Some Southern show officials claiming entries of four or five hundred Runners, for the 1911-1912 season, are following this method. If these classes fill as expected, it will be a marvelous triumph for the Indian Runner ducks, as only such popular breeds as Rocks or Wyandottes have been able to count on such numbers, even at the leading shows in the largest halls.

The Guinea resembles the turkey more than it does any other of the domesticated fowls, though it is smaller and more stocky in build. Males are distinguished from females chiefly by their cry, the plumage and other

surface characteristics being nearly alike. The Pearl Guinea plumage is of a shifting lavender-gray spotted with pearls of white. The males are slightly larger than the females; the voice is more strident, and where young are being led, the male's careful auxiliary protection of the female and her little ones distinguish him. No ordinary effort which any person aiming to control them can make will be successful, if the young seem to be in peril. One may make unnumbered efforts to head off the male from his family, but always he appears between his charges and the threatening peril, to insure protection. Miller Purvis, in "Poultry Breeding," states that the Guinea seldom weighs more than three and one half pounds. In appearance they are more than twice this size. The supposed cry of "Buck-wheat" so common to the Guinea is credited to the females only.

Though seemingly half wild when hatched by the Guinea female according to her own devices, the Guinea chicks are very dependent on the companionship of other fowls. With the Guinea mother they range widely and roost at any available height in tree top or on barn roof, but their love of companionship makes mothering by the common hen a powerful training in domesticated habits, as, even when weaned they may sit by her if she sits on a later clutch of eggs, and range with her and her baby brood when the latter are hatched. This may not be so good for the health and vigor of the Guineas, but it does make them far easier to handle. It is better to let the hen range with them as soon as they are strong, rather than to coop them closely. Night care is a necessity in many localities, but freedom is al-

most as precious to the Guineas as to turkeys. They eat the same feeds as do other fowls, the range conditions suiting their habits and tendencies best. The Guinea hens are good layers, and often incubate twenty of their own eggs. Fertility is usually good, under fairly natural conditions, and with one or two mates for the male, but nests in brush piles far from the buildings are of course much at the mercy of marauders of every kind.

I do not consider the Guinea hen to be so careless a mother as she is sometimes rated to be; but fowls under wild or half-wild conditions are subject to all weathers and all predatory enemies which may haunt their ranges, and this means lamentable losses. Guineas may lay until midsummer without sitting, if the eggs are removed from the nests, but they are always jealous of human approach to their nests or young. The later sitting brings the chicks out at the most favorable season, when they are much more likely to come to maturity.

There is a good demand for live Guineas and Guinea eggs in the spring, though the price is not high. In the poultry prints it seldom goes above one to two dollars per sitting. From my knowledge of farm conditions, I gather that there is much more cheap trade among farmers than among fanciers. Fanciers nearly always scorn such cheap trade, and often a good medium will be without any advertisers of Guineas. Farmers exchange eggs, or charge, it may be, fifty cents for single sittings. I know of a locality where several farmers supply Guinea eggs and stock to a fancier, who may get twice the farm prices. Even this is not large profit

when advertising, risk, packages, and packing, correspondence, etc., are considered.

There is a good New York market for young Guinea broilers in the autumn and early winter months. This market is a growing one, and it is to be expected that the trade in Guineas and their eggs will reach a better condition in the near future.

Some large hotels place Guinea flesh regularly on their bills of fare under its own name, but probably more of it is consumed as "game." Its gamy flavor renders it such a favorite on some farms that there are no surplus Guineas for sale from them. Guineas are light eaters, and at all times prefer to range for their own chosen tidbits, in shape of weed seeds, insects, etc. They are not destructive, so far as I know, and are sometimes valuable protectors, as no intruder can visit any poultry yard without their raising a racket.

To place quail among poultry is to make some people open their eyes questioningly, but Herbert K. Job, the enthusiastic state ornithologist of Connecticut, states his conviction that this will be the status of the quail at no very distant date.

As a matter of fact, a Government Bulletin (No. 182) put out in 1903, says: "The industry of taming and raising quails for aviaries and for the table is still very small, but if reports can be relied upon it is perhaps well enough established to suggest classifying the birds with poultry."

It is a dozen years, I think, since I had some talk with a very successful squab raiser of southern New Jersey about quail. He was then experimenting with them, and was quite of the belief that success would

crown his efforts to raise them. But I have never since heard from him.

Since that time the quail of the country have been in sad case. Even in the case of larger animals, feeding has become necessary, portions of the Yellowstone Park having been sown to acres of alfalfa so that about



Quail Chicks at Connecticut Agricultural College, Feeding from Hand and Getting Tame Enough for "Poultry." (Photo by Herbert K. Job, State Ornithologist)

100 tons of hay was available. About 5000 game birds, besides pheasants, were imported in 1905, 2392 being quail from Mexico.

These Mexican birds were imported as a direct result of the scarcity of native birds, to meet the great demand for quail of any species for propagation; many quail having died in two severe winters just previous. The

situation has since grown so much worse that the United States Government Report for 1910 states: "Quail have been reduced almost to the vanishing point in the Northern states, but are still fairly plentiful in the middle belt, and moderately abundant in the South." English partridges (imported for the market) have been on sale in Chicago at \$12 a dozen, and ruffed grouse at \$22 a dozen. From the time when buffalo were killed for their tongues alone, and the ruffed grouse ranked in Massachusetts as a pest, we have come to such a pass that our markets demand more and more English game because we have not enough of our own. Early recklessness in destruction, commercial greed, and the transformation of wild into cultivated land, are named as the three chief reasons for present scarcity. The states have become so aroused that in 1910 only Colorado, Tennessee, and Georgia were without restrictive laws of some degree. The next step is an effort at domestication.

At Storrs Agricultural College, Connecticut, the state ornithologist and Professor F. H. Stoneburn, assisted by Joseph Martin, a young poultry student graduate, have joined hands in an effort to raise quail in domestication. The college has a tract of open, half-wild hill land, fairly well suited to the work, and on this the breeders are kept and the young brooded. But the hatching progresses in the incubators, and a machine brooder is doing the material work. The three enthusiastic men mentioned supply the interest and the love which, if anything, joined to good sense, will make the work a success.

The first season began with the breeding birds wired in a promiscuous bunch upon the hill. For weeks nothing



Some of the Breeding Quail at Connecticut Agricultural College. (Courtesy of Outing Publishing Company.)
Photo by Herbert K. Job

but disappointment came of it. The birds did not mate or nest at all freely, and the prospects of many additions to the some thirty breeding quail earlier procured from various points seemed distant or wanting. After possibly two months, the plan of segregating some of the breeders in pairs was tried. Nesting began almost at once, laying followed in eight days, and hopes were again high. The rest were paired in the latter part of June, and in August all were reported by Mr. Job as having laid some four hundred eggs.

The first eggs to be placed under incubation had evidently been looked upon by Connecticut's patron witch — one with a very evil eye. Their age was "various," known only to be too great for good hatching. Knowledge in handling them in the machine was at a low stage, and the hatch, while pretty fair, was not one to shout aloud over. With all care, a perfectly new brooder was appropriated to the quail. Almost before hope could plume herself, the "reliable" new brooder played false. It carried a paraffin tank as part of its panoply, an arrangement supposed to insure mild, evenly distributed heat. The unfortunate working of it proved it to be, rather, *evenly distributed paraffin*, this distribution being largely on the tiny quail! The manufacturer had over-filled the tank. The left-overs were seven.

I saw the seven, in their roomy brooder, contentedly eating posset and maggots, and custard, and all the substitutes for ice cream which appeal to pampered quail which yet must not be pampered to death. They seemed rather likely to prove a credit to their assiduous attendants.

The next lot held the most hopes. When I saw them

there were towards fifty eggs in the machine—fully the most interesting eggs I ever saw in an incubator. The sharply ovoid things were so small that the machine looked like a big nest with a handful of eggs in the center. When I saw them there were twenty-two wee tumblers down in the nursery, and the eggs above were sphinxlike, though a few were pipped. As I left next day, my last act was to look up the young assistant and ask about the quail. He reported several more as having hatched during the night.

Other states have tried experiments with quail—notably Massachusetts—with more or less success. The operators believe they will succeed in time, if not at once. In the meantime, hope is, to the full, as interesting as certainty. And all such efforts will be watched eagerly. With quail as a species of *poultry*, and giving fair returns for attention in breeding, hatching, and brooding, the country would bid fair to be rich in quail. For the quail are very prolific, a single hen often laying fifty or sixty eggs in a season. In a single case one has been known to lay one hundred and two eggs.

It is thirty years or more since the first attempts were made to establish European quail in this country. In a few years several thousand had been liberated in the middle West, the North, and East (some also in Canada). They mated, nested, raised their young; then all disappeared with the autumn migrations! The common failure of the experiment with quail and the growing scarcity, together with “non-export restrictions” being passed by the Southern states for the bobwhite (“our Southern partridge”) have combined to lead toward the conviction that only the success of the efforts to make

quail into poultry will save the small game birds — to the more northern portions of the United States, at least.

I might add just a word about the grouse and pheasant. The ruffed grouse is "our Northern partridge." It, too, is disappearing; attempts at introducing foreign grouse have not been happily successful, and efforts to raise them in confinement may fairly be called failures.



Young Quail, Two Months Old, at the Connecticut Agricultural College.
(Courtesy of Outing Publishing Company.) Photo by Herbert K. Job

In a certain locality in the western part of New York State the farmers are almost in rebellion over the law against killing the pheasants which are making serious inroads on their crops. "Somebody" liberated one, or some, there but a few years ago, and this is the result, they say. On this matter of introduction of pheasants the Government Report, after stating that Ringneck and English Ringneck have been introduced since 1880 into

nearly every one of our states and most of the Canadian Provinces, continues: "For more than twenty years determined and painstaking efforts have been made to establish these pheasants in America; and with the exception of a few regions, such as the Willamette Valley in Oregon, several circumscribed localities in Washington and British Columbia, *the Genesee Valley in New York*, and possibly in one or two other places, it is safe to say that the pheasants remaining in the United States and Canada, not in private preserves, have cost not less than fifty dollars apiece. Furthermore, the few that are left will probably soon disappear if the stock is not replenished by fresh liberations." The European partridge, Hungarian partridge, German partridge, Bohemian partridge, German quail, or whatever other name the species may immigrate under, seems to be the one remaining hope, aside from the domesticating of our native quail. In size this partridge is between our bobwhite and our ruffed grouse. It is about twelve to thirteen ounces in weight, and is admitted to be larger and more rugged than the English partridge.

It is, of course, unwise for any Beginner to attempt to raise such difficult subjects while still a Beginner. But if they interest him deeply, he may acquire all the knowledge needed to handle them, as a side interest, while still "practicing his scales" in raising the common domestic fowls.

There is fascination untold in discovering how industry after industry dovetails with others, till a complete chain is formed, linking together the whole world: man, the lower mammals, the birds, vegetable life, minerals, etc. Poultry raising dovetails into this group on every side.

Here are the boy, the corn, the chicken; here, facsimiles of the forest songsters, the sportsman's delight, the cawing pests of the farmyard and field; here, the cottontail, the wind-shielded alfalfa, the velvet bean, with its close-bunched nodule of nitrogen-gathering roots; here the Illinois corn exhibit (high credit mark to our boys) and the Minnesota flax field, which may furnish, when its prime mission is fulfilled, a lesser help in the residues from the crushed seed, known to us as oil meal. The Great Horned Owl and the Carson Meadow Mouse may be as wide apart as the opposite borders of our land. Even from beyond the seas come some of these enemies, and all affect the welfare of the poultryman, through his fowls.

Some — above — are his enemies; some, such intimate friends that without them he could hardly be a poultryman. They sustain life in his flocks; they keep the balance between friend and foe in Nature, a destruction of which always means disaster to man.

The flax, the corn, the alfalfa, the cabbage, the field peas, must furnish food; the velvet bean and the Canada field pea turned under, enrich the ground for the bumper crops that make it worth the poultryman's while to raise his own truck and grain, at least in part. The rabbit, the meadow mouse, alas! have much to their discredit; but even the hawk and the owl, the crow and the jay, though destructive in part, can be proved even more beneficial, so that the government now urges the protection of all but a few like the Sharp-shinned Hawk, the Cooper Hawk, and the Great Horned Owl; while the family cat is considered a greater sinner than "all the native natural enemies combined."

While the genuine Beginner is not likely enough to screw his courage so high as to need warning to let



This Hawk Feeds Chiefly on Wild Birds and Poultry. Efficiency Demands that it Be Kept in Check

ostriches alone, at least till he can creep, he will be interested in the fact that ostrich farming is a part of America's diversified bird culture. While perhaps not within the limits of true poultry because not fully domesticated, the ostriches certainly rank high as economic birds, and America has been busy ostrich farming — in spots — for about thirty years. Twenty-nine ostrich farms are now reported in this country, carrying above five thousand ostriches. The above ten million fowls reported in the Pacific Division include one thousand eighty-two ostriches on ten California farms. One farm in Arkansas reports one hundred forty-seven ostriches.

American alfalfa helps make the limits of ostrich farming here; they can be grown in any of our more Southern states, where green feed is abundant the year around, though certain localities are especially favorable. A full-grown ostrich is half as heavy as a cow, and the man who would pluck one literally has his hands full. The young produce of 21 pairs, early in the history of ostrich farming in America, was sold for \$30,000, all within two years. The eggs are five inches in diameter and seven inches long, and special incubators are built to hold about 35 or 40 eggs. Between these huge sealed shells of nutriment and the tiny quail eggs, the contrast is so great that the mind can hardly take in the fact that both are birds' eggs, and that both birds are amenable to handling by man and to artificial rearing. The cave man began domesticating animals, and his descendants are at it yet. The group of five-months-old ostriches pictured might be taken for the stagiest of skirt dancers, so bare are their legs and so fluffy their petticoats, so light and dainty their balance and so "low-necked" their attire.

XXVIII

DRAWING AND DISMEMBERING POULTRY

Government Investigation of Shipping Losses—Loss Due to Methods of Killing and Handling—Local Marketing—Partial Dissection—Dismembering a Fowl for Table Use—A Quicker Method—Learning to Carve—Part Dissection of Birds that Die—Results of Overstimulation.

IT is of the greatest value to the Beginner to know where he can get brief, conservative, reliable, and sharply practical informative booklets on special topics. Such are the bulletins of the United States Agricultural Department. As a foundation for the wider knowledge and the discussion which brings out ideas, "secrets," etc., from many hundreds of people, through books and periodicals, there is nothing else so safe as these Government Bulletins, or primers.

In the matter of preparing poultry for market, there is an especially valuable lot of government literature. The almost incredible losses and wastes, occurring in connection with moving the enormous quantities of poultry meat produced from the growers to the consumers, roused the authorities to keen investigation into causes. Having found, through first-hand research work, the causes, it prepared bulletins, lectures, and lantern-slides as mediums to pass this highly valuable information on to the producers and shippers, who stood in such crying need of it. One would not for a minute intimate that all the blame falls on the producers. But a knowledge of the

best methods, on the part of the producer, eliminates, from the very start, many of the worst evils.

During "Farmers' Week" at Cornell University, early in 1910, I saw the slides shown and heard the lecture given by the government representative, sent especially for this duty. The value of such aid is almost inestimable. The government's "Just-How Series," so to speak, is invaluable to all who "want to know." The states stand between the government and their own producers, ready to hand down every good thing, and continually experimenting and searching on their own account and for the benefit of the people. At Syracuse, a few months after the lantern lecture at Cornell, I saw Cornell's Professor of Poultry Husbandry, himself, demonstrating these points for the benefit of many hundreds of interested farmers and poultry people, at the crowded State Fair. All through the state (and other states as well) this hard-won knowledge is passed on: at the poultry shows; at the Fairs; at institutes; and in the Short Courses, to eager young students. The man who does not hunt out the knowledge he needs in these times, is too slow and blind for the times. For the knowledge is out, *fairly hunting him*, all the time!

To be brief, the causes of loss to find out which research work was set on foot, in connection with poultry marketing, were discovered to lie almost wholly in the methods of killing and the careless handling poultry received at that time, and while being prepared for market. Demonstrations were made, showing how correct methods of killing, handling, and shipping eliminate the waste losses. I shall not repeat the methods, as any one can get them from the Agricultural Department at

Washington. (Many of the Bulletins are free; some have a small price attached. A list, with details, can be had upon application.) I will say only that the great improvement turns almost wholly on quick and thorough bleeding, and on preserving the skin from breaking, and the flesh from bruising. "Just how" to make every motion is taught.

In marketing poultry products locally, and to private custom, it is necessary to follow the methods of the market poulterer and the large handler only in essentials. The essentials are good bleeding, clean work, with skin as little broken as possible, and, in many localities, "drawing" the carcass. For the home table, there is still one process which may be looked upon as modified dissection. Partial dissection is often the one reliable aid toward the avoidance of "repeats" in the matter of mistakes in feeding, or in the case of diseases of various kinds. Scalding the fowl is often permissible, and quick severing of the head with an ax is the easy manner of killing. Inasmuch, however, as fowls are most commonly sold with the heads on, it is customary with those who sell drawn birds, minus the heads, to figure in the weight of the heads, unless the price asked has allowed for this loss of weight.

In all towns, the majority of those house mistresses who are free buyers are likely not to know how to prepare undrawn fowl for the table. If the servant be equally ignorant, the situation may appear even tragic to those most deeply concerned. It will, in most cases, probably be necessary to draw the fowls for private custom, on this account. The operation takes little time, after one has attained skill through frequent practice.

But no cook book, or other repository of housekeeping wisdom within my knowledge, gives the method of procedure.



Drawing and Dismembering a Fowl: *A.* The First Knife Stroke at Rear; *B.* Removing Food Tube and Wind-pipe; *C.* the Fingers strongly Drawing Abdominal Contents Outward; *D.* Leg Joint Cut Asunder; *E.* Lengthwise Cut Down Back

The first operation, always, is to slit the outer skin (only) lengthwise, over the food pouch known as the

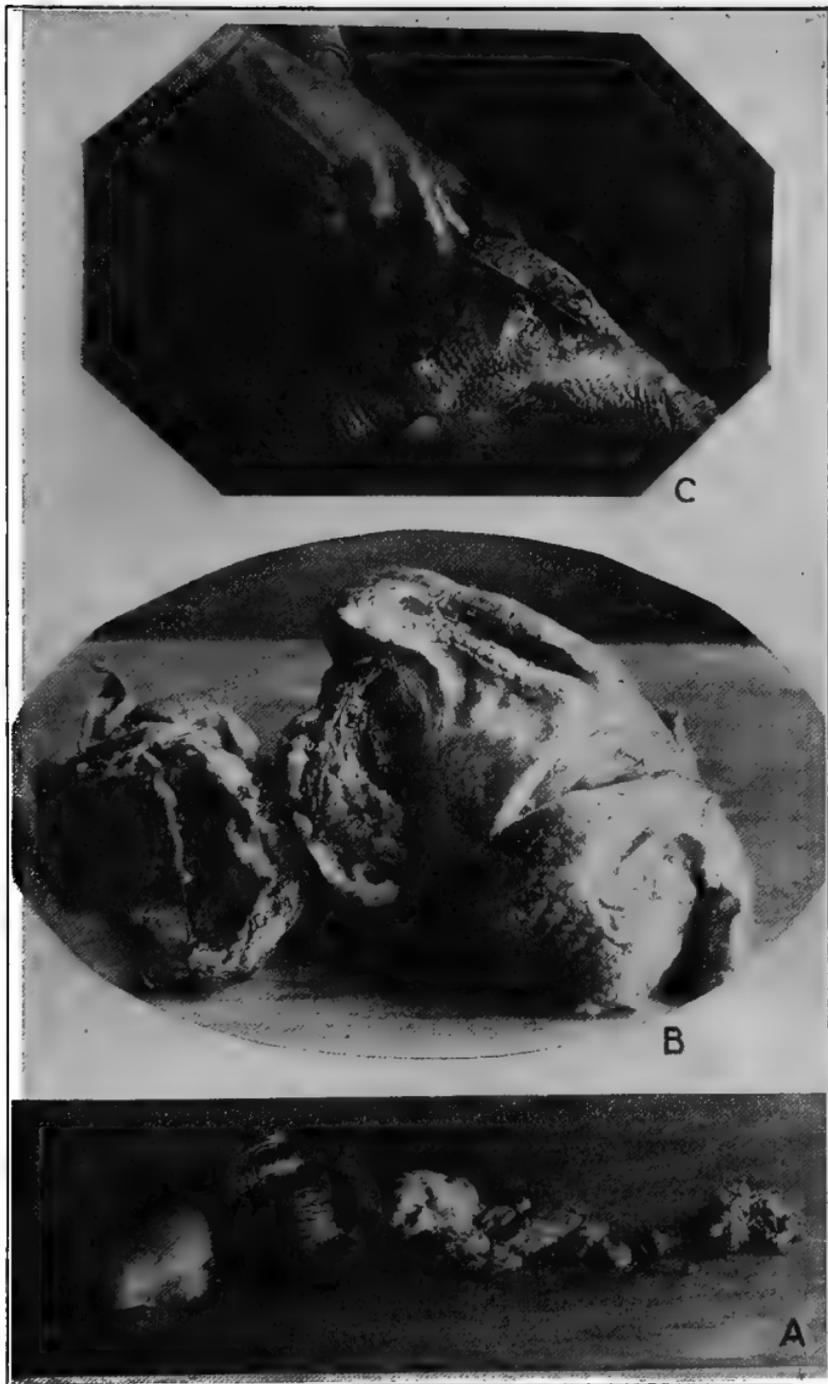
crop. By careful working, with thumb and fingers, the two skins are separated, thus loosening the crop from the outer skin. It is then cut free across the food tract at its lower end. Some care is necessary, in order that the juices shall not escape, in a troublesome dribble. (Some are so particular that, when the fowl is to be roasted, they remove the crop by slipping it through under the main skin at the upper part of the neck, without making any slit in the outer skin. For cooking, the fowl is stuffed by reversing this process, thus filling the space left vacant by the missing crop.

The crop being freed, and the legs split off from the body, the bird is now grasped, in one method, by the skin between the vent and the tail, using the thumb and forefinger of the left hand. The carcass is best held on end, the breast resting on the table. A square is cut about the vent, the slits being made across the raised bits of skin, with care not to cut too deep. If the bird is in good condition, the skin is underlaid with a layer of fat, which prevents cutting the intestine. Careful cutting through this fat lays the abdominal contents partially open. If the opening is not large enough to work through, extended slits, toward the thigh, will give more room. The three long fingers of the right hand, slightly spread, are now carefully but strongly thrust up between the abdominal contents and the breastbone. They will reach beyond the intestinal coil, drop their tips behind it to the back bone, and with a strong, steady pull, draw out all the abdominal contents but the heart, lungs, and kidneys. The knife may be needed to free the membranes at the outer end. The heart and lungs may be removed separately, the last being bedded some-

what between the ribs at the backbone, far up. This is the whole operation of "drawing." It is easily learned, the chief point being the use of care not to cut the entrails. The liver is now cut free from the green gall bag, the gizzard split at the thick end and laid open. A few trials are the only thing to teach one not to cut too deep; that is, so deep as to lay open the rough sac of tough, inner membrane containing the waste. This should come away entire, with its partly digested contents. Scraping of the inner surface of the gizzard and of the outer skin of the fowl make the meat ready for careful washing. Some cooks commit the error of soaking the drawn and dismembered fowl for several hours. Nothing could more surely impair its flavor. It should be washed and scraped as rapidly as possible, drained, covered, and set away dry till ready for cooking.

In another method of drawing, after the crop has been removed, a sharp knife is drawn the length of the back, just at one side the spinal column, the cut being made through the bones only, which are thin at this point, and, in young fowls, soft. A few trials will show how deep to cut. The carcass can then be laid open the full length, as a book is opened, and the worker can see to remove all the contents of the body cavity. When sufficient skill is attained, this is the quickest method known, I believe.

For the Head of the Table who would learn to carve skillfully and with ease, there is no other aid equal to practice in disjointsing an uncooked fowl. A young bird is better for the first practice work, because all the joints and cartilages are soft, and cut, as the saying goes, "like cheese." There is a gristly point in each joint,



A. Egg Duct, Egg Cluster (extreme right), and Gizzard. Flanking Gizzard, Lumps of Yellow Fat which Surrounded It. B. Slash, Forward of Breast Bone; at Left, Thigh Slashed apart from Trunk Portion. C. Exact Position of Knife in the Difficult Severing of Breast Portion from Back

which cleverness and skill can strike almost unerringly. The correct position for the knife, as well as the point of cutting, must be known. At the end of the breastbone is a weak point for cross-sectioning. A little below the middle of the back is a vital point where division is easy, by a backward pull of each end, or even of the lower end if a fork is struck in it strongly. To detach the collar bone is perhaps the most difficult part of the operation, but a cut at just the right angle will do it. The neck joints are twisted off, or cut between the vertebræ, after the skin and flesh have had a circular, clean cut. A sharp, narrow, rather short, pointed kitchen knife does good work.

It is rather necessary for any grower who would be really independent, to learn how to do the cutting at the vent that will give access to the abdominal cavity contents. Often, one look at the interior of the cavity will solve problems which have vexed the soul of the poultryman for weeks or months.

Inflammations, ovarian difficulties, tumors, worms, cæcal affections, fistulas; in fact, nearly all but head and throat troubles, will be diagnosed by a good look at the abdominal contents. The intestines and the egg organs are packed so closely together that difficulty with one may soon mean difficulty with the other. And, when man is continually stimulating the egg organs to added activity, it must be expected that breakdowns from overstrain and overwork will occur. The egg duct may be torn; eggs may escape into the abdomen; cysts will form around foreign bodies, and these will crowd and possibly cause stoppage of the waste tract. The chief reason for the practical dissection recommended

is to make it possible so to connect symptoms with actual causes that the worker can avoid the train of circumstance which brought about the wreck of his hopes, and the loss of his bird. Practice in full dissection, after the surgeon's processes, will not be necessary to most poultrymen, though it is sometimes taught, at least in part, at the poultry schools. In serious cases, where microscopic work is necessary, the State Experiment Station is a safe helper and usually a willing one.

XXIX

ADVERTISING FANCY STOCK

Taking the Fever at Shows — Care to Get Good Stock — The Beginner's Education in Quality — "Utility" — Classified Advertising best for Beginner — A Great Blunder — Sample Advertisements, Good and Bad — The Worst Error — Unconvincing Advertising — Throwing away Money — Advertising with Dignity — The "Run" of Prices for Birds — Prices on Exhibition Stock

LEARNING to raise first-class chicks, to handle stock for its comfort and the owner's profit, to produce fertile eggs and to gain a fair idea of birds, may well give a Beginner enough to keep his mind and hands busy for several seasons. Strictly speaking, no one has any business with fancy stock as a good material proposition until he has mastered the mechanical part of poultry raising and handling.

Yet, it often comes about that the Beginner gets his first impulse toward poultry raising at a great exhibition. In such case he will hardly be satisfied, even at the first, with anything less than stock which is "good" from the Standard point of view. To get anything really high grade, he must usually have some money to invest, unless he is lucky enough to have friends who will give him a start. Many poultrymen, however, are on the lookout for some one with plenty of range who will raise birds for them, the owner often furnishing all eggs and taking what he chooses of the stock (according to the



The A. L. Clark House, Nearing Completion. A Semi-monitor Type, with Unusual Depth. In this Open House, No Combs were Seriously Injured, and Laying was Good. A Good House for Fancy Stock

agreement made) at a set price, which is not very high. While not the best way, this is a feasible way in which a man with a farm but without spare capital can get a start with really high-class stock. Men who know their business say that they would rather have a fair bird from good stock than one of exceptionally good appearance which had not good blood lines behind it. It is on these blood lines that the skilled fancier relies to get him the accumulative forces which will insure him continuancy in producing the best. This continuancy is the one asset of greatest value to the fancier.

All other statements notwithstanding, it is not always safe to rely on getting good stock from any fancier merely because he ranks as "a good breeder." "Buy of a man who has a reputation for having good stock and you are safe," is very common advice to the novice; but this is far from being the real story. There are men in the country with the reputation of breeding good stock going back twenty-five years or more, some of them judges, who are rated by those who know them best as "good fellows to keep watch of." Some who have the widest reputation as winners in best shows, and some who crow loudest in the public prints, will fleece every man who does not know what he wants. This, of course, usually means the Beginner. I could mention half a dozen whose advertisements are known from the Atlantic to the Pacific who are not trusted by the breeders at large who know them. They have good stock, but not all their stock is good, nor are their business methods above suspicion. Another point is that the Beginner, not having been educated up to the price which the best stock brings, asks for the best at a price

suited only to the utility grade, and the expert fancier gets rather in the habit of regarding him as "an innocent" who expects always more than any one of experience would or could give him for his money.

This is not by any means to say that all fanciers with reputations are crooked. I know men in the fancy who are most painfully honest. The statements above are necessary in order to forewarn the Beginner *not to bank alone on a reputation* for having good stock. Let him deal with those whom he or his friends know to have both good stock and good will and integrity.

There is still another side to this, which is, to speak frankly, that the Beginner himself, when he first begins to raise fancy stock for sale, is quite as likely as any one to prey upon the public. This, not because he is willfully dishonest, but simply because he is a Beginner. There are people who sell stock without ever having seen the Standard of Perfection, the fanciers' law of breeding. They may think that their stock is of a good strain, but they do not know the distinction between the middle-grade specimen and the first-class one. The higher the grade, the smaller the variation which adds ten or fifteen or twenty-five or fifty dollars in value. In large shows, it often takes an exceedingly good judge to see much difference between the first and the sixth prize bird, in what is called a "hot class"; that is, a class in which the prize is hotly contested. The Standard of Perfection, toward whose demands each fancier must breed his stock, contains working rules for constant use. It is, in effect, the judges' and fanciers' pocket reference book, to be consulted on every occasion of difficulty or uncertainty.

Any one who does not know the real value of his individual birds may always advertise birds of Utility Standard-bred grade and do it honestly, as the phrase "Utility Standard-bred" is translated at present. The term "Utility" once meant very superior laying stock

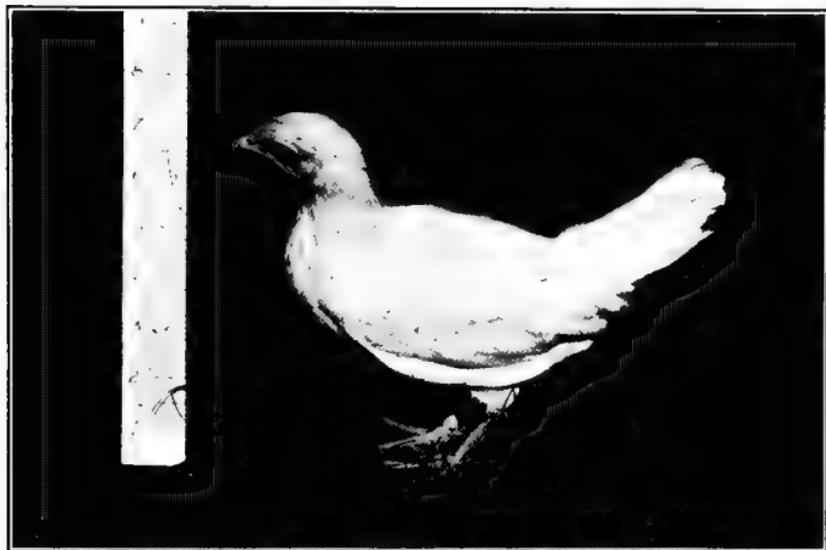


Fancy Stock Acquiring Hardiness:
A "Utility" Quality

that was also Standard-bred, but which did not necessarily have the best Standard points. As breeders express it, not "up" in fancy points; but the word "Utility," being susceptible of various translations and being thus an easy word to juggle with, has come to mean very little more than birds bred toward the Standard, but not meeting exhibi-

tion requirements. These may or may not be exceptionally good layers. They will, at least, have a uniformity lacking in birds not bred to the Standard, and probably a capability to produce some birds much better than themselves in Standard requirements. The uniformity will tend to make them superior market stock, and they may be quite as good layers as the average of their breed, or even better. A few breeders offer high-grade Utility stock and explain how they have bred very carefully for exceptional laying qualifications. These

have as good a right to exceptional prices as has the fancier, pure and simple, and such stock is in strong demand, while the supply is restricted.



At Five Weeks Thrifty Leghorn Chicks are Beautifully Fledged. The Winter Layer of High Priced Eggs must Feather Well. (Cornell Photo.)

In considering matters pertaining to advertising, an early question to arise is whether to use the cheapest or the highest-priced mediums. This settled, the question as to comparative values of "classified" or "display" advertising at once presents itself. The "classified" are usually brief advertisements set uniformly without display type except a leading word or two, under special headings, which sometimes serve as an index, being thus arranged in alphabetical order. Display advertising may occupy from half-an-inch to two or more pages and make use of various sizes of type, of spacing, of set-off lines around about all cuts to attract special at-

tention. A good "classified" ad. of a few lines will sell all that a small place has to offer, if kept before its public in one or two good mediums continuously. It will sell very little or nothing, unless it appears regularly, offers something worth while, and tells the buying public why the goods offered are better than something competitors may offer.

One of the greatest blunders the Beginner with advertising makes is in thinking that a "transient" advertisement is worth anything. Unless it offers commandingly good special bargains in a very convincing way, it is only a catchall for good money. To be sure it costs little; as a rule it is worth less.

I do not by any means intend to decry the "classified" advertisement. It proves a good selling medium for hundreds of small breeders every selling season, and even the large breeder does not always disdain it. I have in mind one breeder carrying a single breed for years, who claims to be its leading breeder (and who does thousands of dollars' worth of business, I have no doubt, each year), yet I do not recall having seen a display ad. over his name at any time. He uses the "classified" columns of all the better poultry papers, and apparently these sell his immense stock. He is an exception, but he proves the value of a classified advertisement well used. I dare to say that far less money is "sunk" in classified advertisements than in the display columns. It is a strange bit of psychology that the average small advertiser will "bite" at so much a word, when he would not advertise at all at so much a line, yet the service may cost him very nearly the same in the two cases. That this class of advertising

is a good thing for the publications is presumptively proved by the fact that even the high-grade magazines have adopted it. Some publishers get good patronage in small classified offerings when they could not get an opening for display advertising.

The matter of adapting the advertising space to the amount of stock to be sold is a vital one to the Beginner, who, unless his advertising pays, may be in a sad case. He is almost sure, however, to need education in percentages; that is, he must not be horrified to learn that from 20 to 40 per cent of the value of the goods sold must go to advertising expenses. Without a good follow-up system, even good advertising may mean only one sale out of seven inquiries. This means much unnecessary work for the returns, too.

A few sample advertisements will show what I mean by good advertising more clearly than any other words can do. These are from current periodicals with change of names, etc., sufficient to disguise them. "17000 White Wyandottes, the largest and best flock in the world. See large advertisement. John Smith, Oberlin, Ohio." This advertisement has only two points of value, viz.: to call attention to the large size of the plant and to the large advertisement; yet one has to look through pages of advertisements to find the large one, and any one who is familiar with general advertising knows that the single, half-direct statement which this short ad. makes is not true — just "buncombe."

"Home Poultry Plant, John M. Smythe, Poulterer, Town Hall, Texas. White Dorkings, Langshans, White Orpingtons, and Rose-Comb Black Minorcas, and some fine cockerels for sale. Eggs in season. Satisfaction

guaranteed." What can you, the Beginner, say is wrong with this advertisement? Doesn't it give the name, breed, location, the name of the plant and a guarantee? Yes, all of these, but the guarantee is the only thing that every other breeder of the same varieties may not also be giving. "Fine cockerels" are offered. Oh, yes, but the word "fine" can be translated in twenty different ways by twenty different persons. The owner thinks them fine and guarantees them and his eggs in a general way, but he gives no prices, which means at least seven letters for him to write where one might have done, if his advertisement draws attention at all. Such an advertisement is not definite enough, has no distinctiveness; but, it fills five lines of page space.

Now see what another advertiser has gotten into six lines: "Trap-nested Orono Columbian Wyandottes, the big kind. Bred ten years for size and heavy laying. Raised on free range, housed in open-front houses. No healthier or better layers known. Eggs, 100, \$5; 50, \$3. Free circulars. Asahel Jones, Hallmark, Indiana."

It must be admitted that what the advertiser says and what the buyer can also read between the lines are the latter's only guides to the actual facts. Here, it is shown between the lines that the advertiser knows the modern methods of getting stock that is productive, well grown, healthy and improving and that will give hatchable eggs. The rest, perhaps, the buyer must take on trust, but the seller refers to a well-known source of good stock as the source of his own, and he states that he trap nests, selects, works for vigorous health both in raising and in winter housing; and, he does not make the mistake of charging for his circulars. Moreover, his prices are very attrac-



Getting Ready to Be Advertised. (Cornell "Strong" Chicks)

tive. A certain "book" offered the public uses half its pages in lauding the stock of the writer of it, who in addition asks two stamps for his price list. Exploiting the public, this, with a vengeance!

I take it for granted that the Beginner is keen to know the very worst mistake an advertiser can make. In my view, it is to present himself to a stranger with a palpable untruth on his lips. Many experts consider a convincing argument to be the acme of good advertising. It seems to me that the advertiser who makes a statement false on the face thrusts *this* argument full into the reader's mouth: "If this man lies in getting my attention and telling me about his goods, would I not be an idiot to believe that he will be honest when he fills his orders?"

The public advertising mediums themselves do not always set the best of examples in this respect. Hardly one of them bidding for patronage but will insist that, no matter how many times an advertiser has been disappointed, *it* will make good for him. A few periodicals have offered to repeat advertisements free if their claim prove untrue, which is in effect selling at half price, advertising which may or may not prove of value.

Beside the picture of a man who seems to be trying to look two ways at once appears, in a modern advertisement, a voucher for the value of a certain guide to the poultryman, — "With more sound, practical information in it on the things you want to know than *any other book published.*" *All* the problems are solved, *all* the secrets revealed, in this marvelous book — yet just under my eye lie two *similar* books, one sold through several editions at five dollars per copy, each of them claiming

to inculcate *all necessary knowledge* into the would-be learner and each as positive in its statements as the English language permits. Each claims, moreover, to show *the only* correct method of handling domestic fowls for profit, and *each is the exact opposite of the other in the most "essential" points* noted.

A few pages over, in the same periodical, I turn to a big incubator advertisement telling how a customer won the prize with the machine there offered, "against all other machines," by hatching every egg to the entire capacity of her machine. This incubator is accompanied by a brooder guaranteed to raise more healthy chicks "than any other brooder made." The whole shored up by an iron-clad guarantee to refund money after a three months' test if the machines are not "exactly as represented" in the advertisement.

Just beyond this is the offer of machines from a company claiming "the largest egg farm and chick-hatching plant in the world." It offers a "perfect equipment." Its hatcher will out hatch any other incubator (see *ante*) and its brooder is the best substitute ever devised for Nature's method of chick raising.

A little farther on a company says proudly, "We are the originator of a flannel to lay on the chicks' backs." No need, perhaps, to add that this company's brooder "stands above all in correct brooding principals."

The next to demand extra attention contains every one of the good features recommended by government experts for a first-class machine and "is the only incubator that does contain them all." This advertisement is accompanied by a quotation in duplicate of the six requirements named. This is a rather good advertisement

and as reasonable in its statements as one of experience would expect an advertisement to be—yet it says that failure and disappointment are *impossible*, and that it “makes good every claim in every hatch,” while its book gives “the whole truth on the incubator question.”

Over the leaf is another whose manufacturer “expects to revolutionize the industry” because he has discovered a new insulating material. He has never seen or heard of any other incubator that *could even rival* his own.

The next one is guaranteed as the best hatcher on the market at any price, and affirms that the buyer of it takes no chances.

Soon comes another manufacturer who says that he will let his machine stand on its record. Marvelous, of course!

Still another has a regulator that never has to be touched. “The most perfect ever invented” and is *the only* machine “that’s right.”

The next one “hatches and broods perfectly.” The next guarantees perfect workmanship, perfect material, and perfect operation.

The next is “without a doubt the most careful incubator made.” It is “*the only* machine that is scientifically correct.”

The next that comes to my eye has a new phrase which recalls the framers of our Constitution—“They hatch alike in the hands of women, beginners, and experts.” Surely this is the phrase to meet our need in this chapter! They are “the highest-grade incubators built anywhere by anybody,” and one needs no previous experience to operate them successfully.

If the Beginner should wade through the slush of



An Effective Planted Windbreak. A Windbreak may Increase Egg Production, or Preserve the Beauty of Fancy Birds. (Government Year Book)

words, words, words, that fill so many pages of advertising in his favorite poultry papers, he might, with sufficient study, work out a principle of advertising that would form a working model for himself. No one can deny that the advertiser who must meet so much competition must make his advertisements *tell*—*what* they may “tell” is another story.

Careful scanning of the spaces of these big advertisers will show that they fall into two main classes, viz.: (a) those who try to prove themselves better than all others and spend much space drawing invidious comparisons; (b) those who utilize all their space in telling the good points of their machines and show why they are good. These latter advertisements are usually far more dignified than the others and in the long run more convincing. I notice, too, that the manufacturers of machines known to be the leaders are not, as a rule, too free with their guarantees.

As an example of what a machine that is “perfection” when it meets the buyer can do for his faith later, I might tell the brief story of a recent Beginner. This Beginner sought advice from me, but admitted that he was favorably impressed with the machines offered by a certain city department store. They were beautifully described, fully guaranteed. The machine was to be the best incubator the buyer ever saw or even heard of, and guaranteed to hatch every egg that was both fresh and fertile, and also by some peculiar power to bring stronger chicks than any other incubator could do. Despite my positive advice to let department store incubators strictly alone, my get-rich-quick Beginner bought this attractive machine. Before the first hatch

was out, the unseasoned wood of which it was built had shrunk until a finger could be laid in the cracks.

This matter of advertising is an exceedingly important one for the Beginner, because the average person may throw away money in advertising far faster than he can make it through poultry raising. To compose an advertisement with such brevity that it does not tell its story is to throw away all money expended on it. A buyer must be spoken to very clearly, and courteously, if positively, and he must be offered some kind of a lure. This does not mean deceit, but it does mean that the advertiser must look into the buyer's mind; must see mentally what the buyer wants; and must offer just that if he has it, in terms which make it attractive.

Imported stock, heavy laying strains, *anything, in fact, that is difficult to get*, is a lure to the buyer. If the Beginner has *begun* so that he has it, he is to be congratulated, even though he has had to pay good prices, for he can advertise it with a clear conscience, with confidence and with dignity, and he need not fear to speak too strongly provided that he keep within the bounds of truth and of dignity. Dignity, the dignity of self-respect, is not "offishness"; *that* is a bar to the buyer. "Friendliness" is one of the best words for the Beginner who would make for himself a place in the Fancy.

Low prices are a lure, chiefly to other Beginners; yet Beginners *must* charge comparatively low prices, until they have proved the value of their goods in competition. An expert breeder is likely to cast aside an advertisement that puts prices too low, because he knows that the average Beginner, not knowing well even the good points of the stock he sells, does not know how to

select birds. Exhibition stock prices are always "a matter of correspondence." Fancy values are in a sense fictitious, and the character of the shows, the strength of the competition, the number of buyers present, etc., all have their effect on prices; also the number of birds equally good in the breeder's stock at home. The bird priced at \$500 in the catalogue may not get any valued place under the Judge. "Prohibitive" prices in the Show Catalogues save the specimen to its owner, while impressing the public.

In most breeds, there is a certain "run" of prices, a knowledge of which will make fanciers say a certain bird is "worth" about so much. Birds of small breeds have lower prices than larger ones, as a rule; breeds having a "boom" on, command more exceptional prices than others, even as exceptional birds always do. Two and three dollars are prices freely asked for "utility stock." "Fair breeders" may bring from three to five dollars, stock rating as strictly high-class breeders anywhere from ten to fifty dollars, this depending on the buyer's needs and purse. Exhibition birds may bring any price upon which the buyer and seller may agree, up to hundreds of dollars. These are only rough statements, and the law of supply and demand is not a dead letter, even in the exhibition room. The winner of the "blue" in a popular breed may have the "supply," but, if only one buyer demands the bird, the price may fall far below that possible when many buyers compete for the blue-ribbon specimen.

SHIPPING TO NEW YORK

Requirements of New York Market—The Perfect Product — Producers' "Price Current" — Details of Dressing — Details of Packing — Dry Picked Stock not always Highest in Price — Shipping Details — Where many Fail — Orange Boxes for Eggs Faulty — The Standard Package Helps Sales — Basic Principles of Shipping Eggs — Important Market Seasons — Dealers Buying Outright

THE requirements of the various large cities differ quite materially in some points. But, inasmuch as more people probably ship to New York than to any other city, I give New York methods and requirements. These will prove a good basis for any one who wants to ship to any city, as they will give an idea of the points necessary to cover. The one seeking information can then write to a commission man in the city of his choice, and will receive, from good firms, all the help they can give him. This is not, however, the best way to prepare for shipments; because, a visit to the commission district in the city to which he desires to ship would be in the nature of a revelation to any would-be shipper, and would save him from the possibility of making mistakes at points concerning which he might never think of making inquiry or of suspecting difficulty. When such a visit cannot be made, such information as this chapter contains may save from many pitfalls, and may turn a shipment from loss to profit, in many an instance.

The Beginner in shipping needs to get firmly fixed in his mind first of all that condition and appearance *count against everything else*, in a city market. The finest of goods in quality are likely to go at a loss to the shipper, unless these two points are in his favor. When they are, he makes more than a sale, more than a profit; he



Leghorn Chicks Fledge Early: A Fifty Dollar "Specimen" or a Market Bird; Who Can Foretell?

makes, in addition, a customer who will call for his goods again (if he has stenciled them properly), and he makes an interested friend in the commission man, *who is as keen to find good stuff to sell as any producer is to find a market*, and for the same reason, — his living depends on it.

Many factors go to make up good condition and appearance in a shipment, especially of poultry car-

casses. The ancestry, the growth, the fattening, the manner of killing, of scalding and of picking, the manner of packing, the package, the filling material, all help to make up that perfect product which reaches the market *just when* and *just as* the market desires it; or that undesirable which figures so often in the market reports at the very lowest price, and is lumped in with "Nearly all lots arriving are poor in quality or condition" and goes at a forced sale. You would be surprised to know how often I heard the statement, so emphatic as to imply that it was an end of argument, "They are not wanted," in the course of a two-hour round of the commission markets of New York City. You need to learn first of all that to furnish *what the market wants* is the way to competence. The market will pay highest rates and more than the highest quoted rates for goods which are the best grade of the kind of stuff it wants. This is why country buyers throw out so much that is offered by producers: they have learned the lesson.

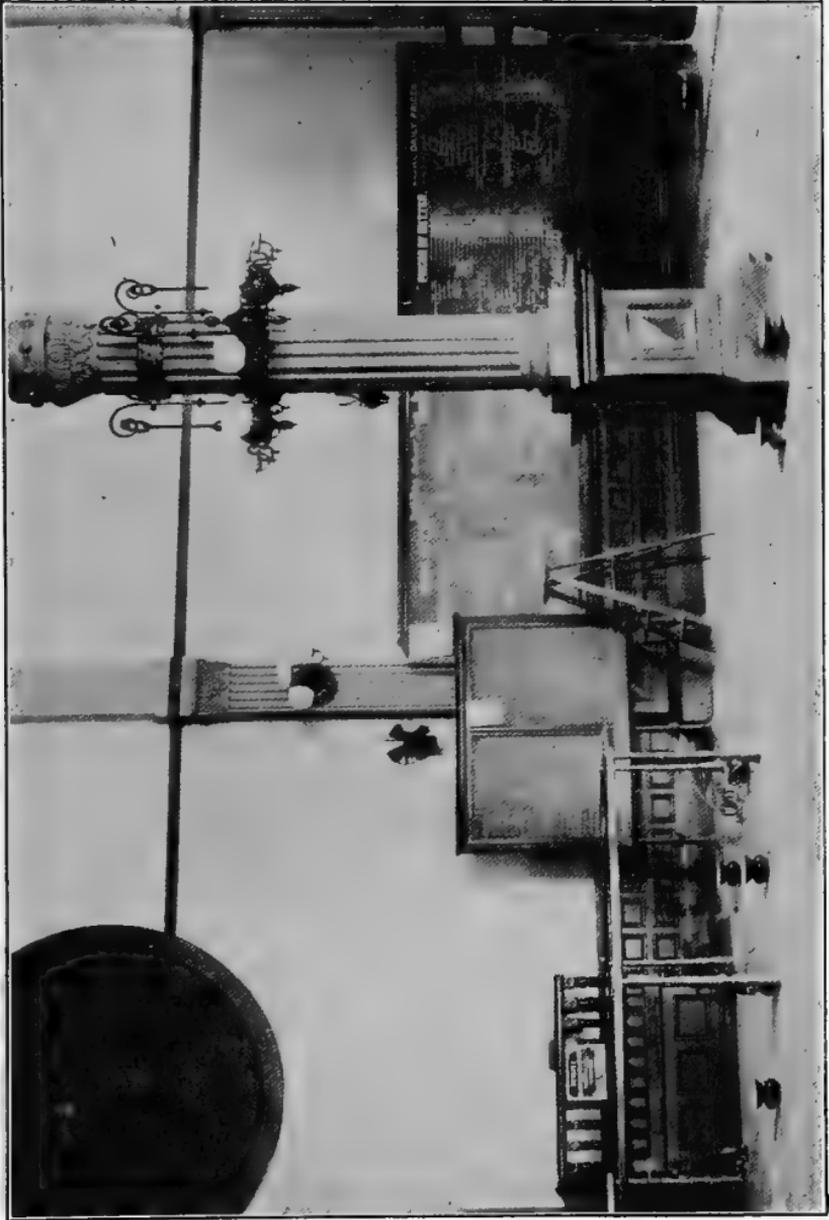
The Producers' Price-Current Supplement, of New York, gives explicit instructions on all points. Having found a Commission merchant whom he has full reason to believe is reliable, the expecting shipper should write him, asking the conditions of the market and special instructions. He can have from this source stencils, for marking, gratis. The Commission people prefer, always, the customer who will send regular shipments, so that they may know something of what they have to depend on.

In turkeys, none should be dressed that weigh less than seven pounds, in September. Later, eight pounds should be the smallest. Thin, "framy" birds are al-

ways a drug. Spring chickens should not weigh less than one pound, and this weight only very early; as soon as chickens are in fair supply, nothing less than one-and-one-half pound weights will find favor. Since Long Island can send young ducks, full grown, very early in the season, and ships them by the ten thousands, it is but folly for any other shippers to try to meet this competition with stock less than the best and of full size or nearly so. "There is no call whatever for stock weighing less than 3 and 4 pounds each."

In all handling, extreme care must be taken to avoid bruising or defacing the carcass. A cardinal point, preparatory to packing, is to get rid of the animal heat. A process called "plumping" finishes the preparation of scalded stock. It consists of dipping the birds into hot and cold water alternately. But even with this, there is a right way. The first dip is into water just under the boiling point, for about two seconds. The cooling from this must be gradual, lest the drain of blood be stopped short. Hence, cool water, of natural temperature, follows the hot dip, for a twenty-minute bath. If to be packed in ice for warm weather shipment, a second, cooler bath of an hour or less follows the first, and the ice-water bath of eight to ten hours follows and completes the process. Is it any wonder that cold-stored poultry lacks flavor, when it has all this soaking at the very start?

Poultry or sugar barrels are used for shipping this class of goods, the latter being carefully washed to remove traces of sugar. The first layer (bottom) is of ice, then poultry and ice alternately till the barrel is almost full. A piece of burlap and a final layer of



Interior of Mercantile Exchange, Showing Posting of Prices

cracked ice follow, on the top of which is laid a large chunk of solid ice. All is hooped down close by a last piece of added burlap. The fowls are packed in rings around the outside the barrel, heads down, legs straight, and pointed toward the center, so that the next layer of ice will fall between the poultry and the staves. The middle of the layer is filled in at will, just as they seem to fit most closely.

The water for dressing should be at boiling point, but not boiling. To overscald makes the yellow outer skin graze off; to underscald increases the chances that the stock will become slippery on the way to market.

In cold weather, poultry is packed dry, without packing between, or with only clean, hand-thrashed, bright wheat or rye straw, which must also be dry. If no packing is used, thick manila paper lines the barrel. Whether scalded or dry-picked, two points are vital: every bit of animal heat must be out of the stock, and the bodies must be perfectly dry before packing. If not, bad conditions will shortly develop.

The customary belief and advice that dry picking is always the only first-class method, is a fallacy. Thin poultry brings more when scalded, as it thus looks a bit less thin. Offerings of chickens and turkeys may be dry picked only when very fat and of fine quality. Ducks and geese should always be scalded. This is done by sousing them up and down in water just at boiling point three or four or more times, till the water penetrates to the skin. They are then wrapped in blanket cloth about two minutes; this makes the down roll off with the feathers.

Packages should be clean, neatly made, and as light



Cold Storage Chicken. (Government Year Book)

as the size will bear. The latest New York information sheet at the time of writing says: "Use either barrels, or cases holding about 200 pounds. The latter are best for turkeys and geese." In dry packing, the birds are stowed in very snugly, breasts down, and legs out straight, the package being a little overfull, so that the cover will press down on the contents.

I notice that Cornell is approving and manufacturing a smaller package, to hold two dozen fowls. Dr. Pennington, the government representative, favors this type. The shipper who learns all he can, from *every* source, will be the one most likely to win out.

Careful addressing, plain and neat marking, naming of contents, gross weight and tare, and the shipping mark of the shipper or his name all tend toward satisfactory business. Express receipts should be taken and forwarded, with full invoice of shipment, by mail. In forwarding by express, a letter of advice should be put in one package, and marked "bill" on outside. This double care insures that the firm shall get the advices straight, in case anything befalls one of the duplicates.

I asked a commission merchant, of wide experience, where most shippers of eggs failed. He said, "In the matter of packing and packages," mentioning the use of orange boxes as one of the bad habits of the small shipper. Having seen shipments go from the farm end of the line, I knew how the economical farm mind looked upon the orange box with fillers, as "just as good" as the more expensive crate. In fact, a rather large shipper had recently told me that he used such packages, cutting the boxes in two parts, if a half case were needed. I knew, too, how often the farm shippers complained

that they did not receive full market quotations, when they sent the best of goods; and that they were charged with incredible losses.

The merchant clarified the situation by saying that the orange box is too thin. It is springy, and permits heavier boxes to crowd the eggs till there is often much breakage. It is also a package not "standard." Not even the poultry show world is more devoted to its "Standard" than are merchants who handle market stuff in many and large lots to a "standard" package. Figuring, space, and other necessary detail can be fitted to a standard package instantly, and without loss. The principle is the same as when the farmer becomes devoted to the bushel crate that just fits so many of his needs, and also the rack he has had made on purpose to carry them. I saw a fine, special rack, made by adding a few boards to a flat hay rigging, on which a New York farmer was contentedly drawing fifty crates of apples, all on one level. He dragged me out to the barn, just in order to see how nice they looked. They were *shoved* from the rack, almost, in unloading, and he took back a load of empties, clean and bright. There was a "why" behind his satisfaction with this way of selling apples. The shipper, if he cannot follow instructions without it, must look for the "why" of the commission merchant's requirements, and he must look till he finds it.

"Eggs must be clean, and of good size; these are basic principles of successful shipment," went on the dealer who knew the New York market through a lifetime of selling on it. "What do you mean by good size?" "I mean not small." I laughed, and suggested, "Not under the regulation two ounces?" "Yes."

“What about washing?” “*Never wash an egg ; they must be produced clean.*”

New York's needs are so great that a day or two may clean out a big stock of stuff, and thus it comes about that only a day or two may work much change in a market quotation, if inshipments clog up somewhere, or cease suddenly. The railroads try to avoid piling too much stuff on one market, but this sometimes occurs. A frequent shipper needs to watch the market, to use telephone and telegraph for quick information as to changes, and to know about the markets which are recurrent, yet special.

The important holiday markets for dressed stuff are Thanksgiving Day, Christmas, and New Year's. *You want a good fowl — one a little extra, at these times. Please note: so docs every one besides you!* This explains the fact which confronts the commission merchant, that the holiday call is largely for the very finest grades. Up to Christmas, big turkeys have a call; after that, the smaller sizes are preferred. The preferred holiday market for chickens is New Year's; while geese sell best at Christmas.

There are eight Jewish holiday periods, which are variable, but concerning which advices can be had from the dealers. Some want all kinds of fowls. Others specify. For instance, the market sheet states that for the Feast of Weeks, good fowls are especially wanted; for Purim, “fowls and prime hen turkeys.” During these holidays, the demand for live poultry is much larger than is usual.

The tendency is everywhere to simplify handling. The farm demands it, because labor is not to be had for



Freshly Killed Chicken, with Plump Flesh. (Government Year Book)

any price. The city markets demand it, because time is precious, delay costly, and labor also costly. I inquired about the proposed selling eggs by weight. Commission men said that it would, if enforced, cause them infinite trouble and loss. One firm of very large commission handlers said that they would drop the whole business were such a law enforced. They believed it would cause grocers less trouble, because the tendency is to sell all small stuff in small baskets, or rather trays, of a standard size. The weight of these being known, they would be sold, when full, as always of a certain weight, without weighing the sale.

I know at least one firm of Boston dealers who furnish coops for live poultry, rebating their cost when they are received full of poultry. They take all kinds of stock, and make it as easy for the shipper as they can. These are not commission men; they buy outright, and offer a stated price per pound. I hope this method of buying will spread. It is far more satisfactory for the producing shipper, who hates bitterly to pay commissions. I judge by its development each year since beginning, that the business is also satisfactory to the firm. Strong, light coops in which the fowls can stand easily upright, are recommended. If large, they should be partitioned. It is stated that overfeeding on the start is likely to make the poultry dumpish and sick, but that light feeding may be indulged in, when shipping from one-day-distant points. New York law does not permit the sale of poultry with food in the crop.

XXXI

FEATHERS AND THE MOLT

Down Developing into Feathers — What Makes Color in Feathers? — Prohibition of Wearing Song-bird Feathers Helps Sales of Commoner Feathers — Shop-made Trimmings — Ducks for Feathers First — The Dress of Birds for Protection — Feathers as Affecting Laying — Experiments with Molting Hens — Foods for Feathers — Feathers Add most Value to Fowls

THE fancy fowl is pretty largely a creature of fine feathers. But there is more to the question of feathers than many are aware. Feathers are really but modifications of the skin. The down, the "hair," the barbules, which hook together and make up the flat web of what we call a quill feather, all are part of the same wonderful covering. The close down upon the infant chick is extended and shows itself as fluffy tips upon the first natural feathers which follow it. These facts have long been known. A more curious one is that the coloring of the coats of birds is not always caused by pigments in the body of the bird. Many times it is so caused. In other instances it is caused by this color substance, in combination with a special arrangement of the outer surfaces of the feathers. And again, as in the case of the brilliant humming birds, it is due "to the structure of the outer surface alone. White is not due to pigment, but to the presence of innumerable air cells in the substance of the feather." A study of feather structure, by

means of a pocket microscope, ought to be of considerable aid in making up fancy matings in some breeds.

More and more the States are coming into line in prohibiting the wearing of song-bird feathers. Each year skill in producing handsome and effective millinery trimmings, neckwear, and other decorative feather work increases, till it now seems almost like wizardry. Each year the "back-to-nature" cry increases the demand for fancy fishing tackle. All these things mean more demand for feathers of all kinds. Just common feathers and brilliantly colored feathers.

Not far from my home lives a quiet man who manufactures fishing tackle. He is keen for brilliant feathers of many kinds, particularly the half-length grades, like hackle feathers. In millinery, glossy feathers, and those of any brilliant and beautiful colors, as well as all well-formed white feathers in perfect condition, are in large demand. The substitution of "wings," "breasts," etc., for ostrich feathers is greater as each autumn comes around. Great quantities of these are now artificial—shop-made. It is to the interest of any Beginner to study the question of feathers before he selects his breeds, especially if he expects to become a large producer. When fowls are marketed dressed and in large numbers, the feathers become a goodly item, either of waste or of income, according to the method of handling.

Even the little Indian Runner duck will give, when matured, nearly one fourth of a pound of feathers to a picking. If duck feathers are sixty cents a pound, this means fifteen dollars for every hundred birds dressed, and will pay for expert dressing, more than twice over. If the early ducks were retained and picked three times



Below, a Starting Feather and Its Sheath. Above, Full-grown Down

in a season, *it would mean an income from the feathers greater than the profit on the majority of chickens sold.* The feed necessary to carry them on must, of course, be considered. Intended breeders should not be plucked, unless at a period when the feathers are falling natu-



Ostriches Five Months Old. Fluffy Skirt Dancers which Give Up their Own Decoration to Decorate Miladi. (Government Year Book)

rally. It is stated that plucked ducks will not lay as early, nor as many eggs; nor will the eggs be as fertile. In other words, growing feathers is a drain upon the entire system.

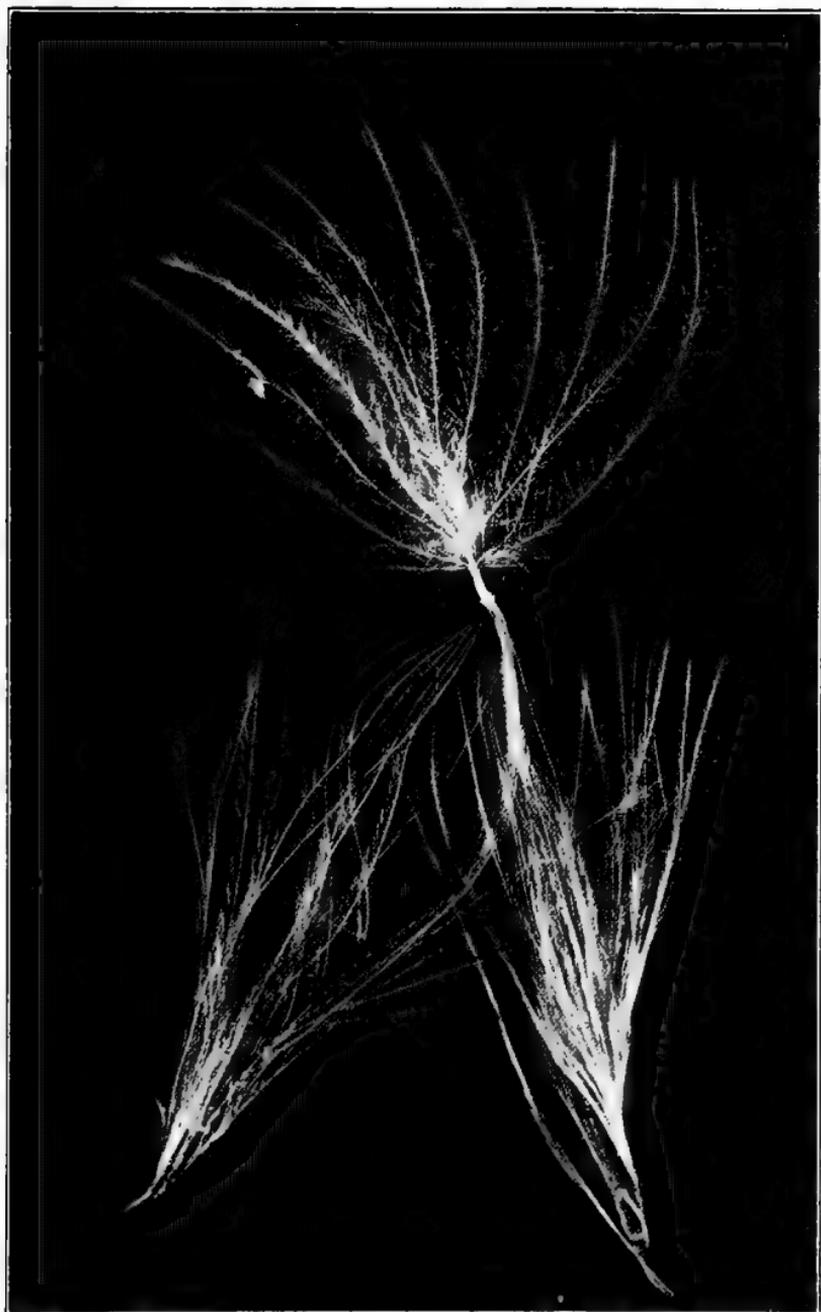
The plummy dress of the birds is a decoration whose worth we value fully only when we see a bird which has lost it. But it is far from being decoration only, and, beyond the matter of protection, feathers have a direct bearing on egg production. The fowl with too thin a coat is not a good winter layer in a cold location; yet the one with too heavy a coat is not likely to fall into the class of best layers at all. Those birds of the American breeds which are more heavily feathered than the average of their kind, are apt to fall below the average of the breed in laying capacity. Since feathers manipulated properly by the breeder who is working up a strain, may give any appearance desired, the feathers are likely to be encouraged. And, since feather growth requires much the same nutritive material as egg production, it is easy to see how a too heavy growth of feathers might work against a heavy egg output. A moderately heavy, close-lapped coat of feathers is the ideal protection for a laying fowl. The wind cannot easily penetrate such a coat, and it takes only the necessary nutriment to provide.

Some studies in molting made at Cornell University Experiment Station by a careful young woman from one of the Short Courses, Miss Clara Nixon, showed that maturing birds may grow several coats of feathers in a single season. The owner of the highest (claimed) record for Indian Runners showed his faith in his stock by entering some of the descendants of the bird making the record in a public laying competition. They made an average record of over two hundred seventeen each in twelve months. He accounts in part for this "poor showing" — as he calls it — by the fact that they passed

through two complete molts during the twelve months' test. Indeed, the Secretary's report stated this fact. It is well known that hens seldom lay during the heavier part of the molt, and the fowl which lays on until late autumn usually molts in the later fall and winter. This shows something of the bearing of feather making upon egg production.

Late molting appears, from some of the work at Cornell, to have a bearing different from that which is usually supposed, in that the *late molters*, while not laying nearly so many eggs in winter as those which molted earlier, did molt in less time, and also *did lay more eggs during the year*. From this one experiment it must be adduced that the late molting bird is the better one to keep, since the extra eggs laid by these, even at lower prices, made an added profit of about \$47 per hundred hens above that of the early molting birds. The fowls in this experiment consisted both of those whose molt had been "forced" by a period of partial summer starvation, followed by a heavy feeding, and those which had not been so treated. A point strikingly shown by the charts given, is that the line showing food consumed climbs upward in almost exact sympathy with the upward trend of the weight lines, and the egg production lines; except that food consumed and weight are always a little in advance of increase in egg production, all increase together, — a good hint for the feeder. *All fowls in the experiment "consumed a larger quantity of food and increased in weight before beginning egg production."*

It has long been a belief among poultrymen that a hen would molt later with each year of age. The Cornell experiment did not prove this, but showed that the old



Specimens of Down. That Above, Old and Frayed with Wear. Note the Barbules

hens took more time for the molt, one-, two-, and three-year-olds using an average of eighty-two, one hundred one, and about one hundred four days, respectively. Various expert breeders testify that age, prolificacy, season, and individual variations all affect the length of time required.

In this experiment, two pens of trap-nested hens laid an average of but twelve eggs each during the molt, and only three per cent of the hens laid while molting most freely. Let no one berate the hen for not laying during the molt, till he has fully considered that the new coat of feathers, to be put on at least once a year as long as she lives, contains (estimated) one tenth as much nitrogen as her egg product for the whole year, and one fifth as much as her body. If increase in egg production and increase in weight both demand increase in food, the inference is unescapable, from all the facts, that to lay during the molt, the birds must have large supplies of food, which is both easily digestible, and richer than usual in nitrogen. Since feathers contain above fourteen per cent of nitrogen, while the body contains less than one fourth as much, and the egg only about one eighth as much, as stated in some analyses, it takes but short thinking to reach the conclusion, not only that extra nitrogen should be added to the feed during the molt, but that even with this, hens should not be expected to lay heavily at this time. And, since eggs appear to average about ten times as much lime content as the body of the fowl, the contention of some of the food manufacturers that certain mineral constituents render their product superior for laying hens "appears" to be supported. The valuation of domestic fowls rests on

their weight, their product in eggs, their conformation (largely determined by the sight of the plumage), their coloring, and their worth as pets. But the greatest



Sharply Laced Feathers, Silver Wyandotte, Required by Standard

additions to cash value are due to the bird being feathered to Standard requirements for her variety. "Fuss and feathers," from the fancy point of view, have far greater value in dollars than any other attributes. The "fuss" belongs to the fancier, the "feathers" to the fowl.

THE QUESTION OF SUPPLIES

Many Questions about Supplies — Cornell Manufactures Some Specialties — Stock of a Big Supply House — Supplies Valuable to Many — The Supply Habit — Seasonal Trade Means Early Orders — Descriptions of Various Supplies — Testing Eggs — A Home-made Tester — Mortar and Pestle

SINCE it has more than once been my lot to answer letters asking how to mark chicks for identification, how to test eggs, where to get portable houses, etc., I feel full warrant for giving some detail about poultry supplies. A large part of the work of Cornell Experiment Station in giving direct aid to poultry farmers consists in making them acquainted with the best poultry supplies. Many such have been devised by the Cornell workers and are described in bulletins. Some of these may be duplicated by any handy man, and dimensions are given in order to facilitate this.

It would be a great thing for poultry farming in New York State if all the farmers and poulterers could apprehend the eagerness with which Cornell works to get into touch with them. It may be expected that the advertising and the increased facilities which the 1910 legislative grant of ninety thousand dollars to strengthen poultry work at Cornell for the farm benefit will give, will aid greatly in bringing Cornell and its poultry farming contingent together. The Farmers' Week, now an established function, has its very liberal and full share of

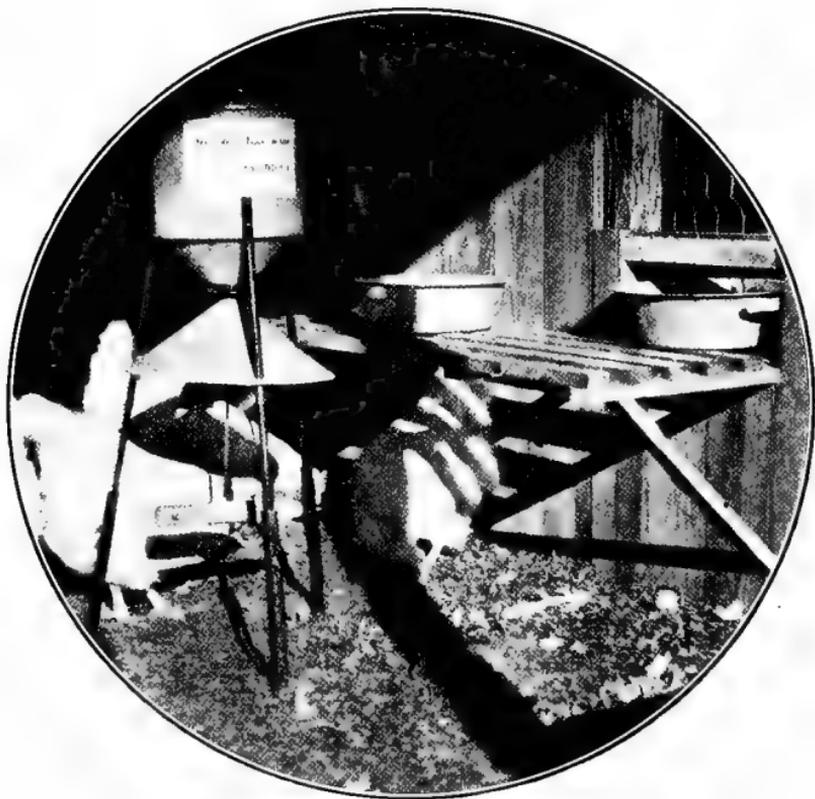
poultry work, and Cornell's aim is no less than to train leaders who will aid in the uplift work all along the line. Incidentally, they will be a link between the University and the farms. This will be touched upon again in another chapter.

Special models put forth by Cornell Experiment Station include fresh-air and winter houses, coops, shipping boxes, rat-proof feed hoppers, etc. Photographs of all helpful Cornell appliances appear in the bulletins, and clear descriptions accompany these. Duplicates of the pictures are sold for a nominal price; they may be used in other publications, due credit being given.

The development of the modern poultry supply house is one of the accompanying wonders of the amazing enlargement of the poultry industry. It is the Beginner who pays for far the greater part of these varied offerings. The stock of such a house comprises, in some cases, about all the legitimate poultry books published; in others, a supply of the cheaper ones in each division (breeds, houses, squabs, eggs, covies, profits, specialties, etc.)—perhaps described as “a large portion of the most popular poultry books.” One such list before me contains not even one of the newer and better books.

Aside from books, the supplies cover incubators, brooders, and fixtures, portable houses and weaning coops, patent roofings and building papers, specially manufactured feeders, foods, mills, and cutters for various purposes; shipping boxes and coops, poultry exercisers, fountains, sieves and screens, spraying machines, nests and nest eggs, disinfectants, song bird supplies,

lice killers, wire nettings and staples, medicines, etc., besides mineral paints and numerous small handy supplies. Such are the foot-punch marker for distinguishing chicks, numbered leg bands in large variety, egg



Automatic Feeder. Used at Connecticut Agricultural College

testers, the pinfeather picker, and the poultry gun. Sometimes general garden and small farm tools are added. In short, the aim is to keep everything the town poultryman and Pet Stock Lover, and the Beginner are likely to want.

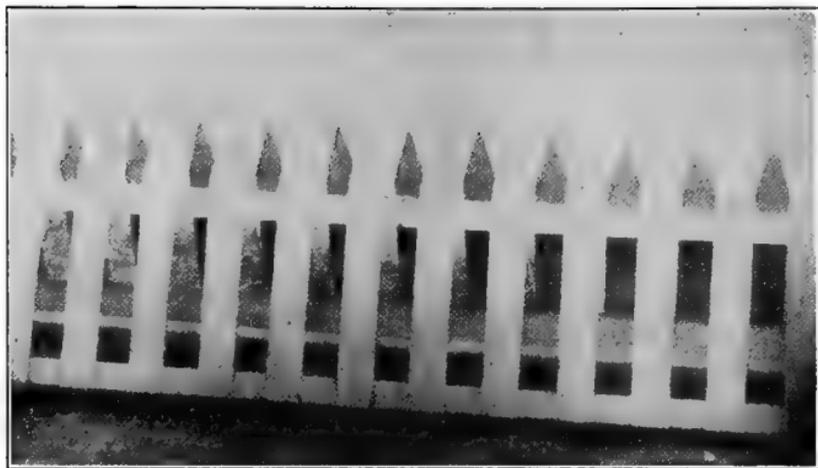
Stock and eggs are usually supplied, also; sometimes these are kept in stock; oftener, they are bought of near-by breeders who are considered reliable and whose stock is known to be good.

It almost goes without saying that a big trade in medicines is handled by most of these stores. The drugs are very likely to be the same as are in common household use, but at an advanced price. One may use household remedies for fowl diseases, the usual dose for a grown fowl being about one half as much as for a person, and many of the supplies may be fairly well duplicated by home-made articles. But the man who raises poultry "before and after dark," as many a business man must, if his wife and children are not interested, has no stomach for such work. It is infinitely better for him to buy the poultry supplies, which, except in the case of medicines, are usually quite fair in price.

The "supply habit," however, is one against which many Beginners need to be warned; as the purchase of too many of these conveniences may devour all the profits of the venture. But I hold that the business man who raises poultry for itself and who desires to supply fresh eggs and poultry meat for his table does not need to make a real profit, other than the "profit" in having these things. If his household supplies balance the expenses in value, the venture is a paying one for him, even though no extra dollars go into his pocket.

There are many supplies, especially of the larger sort, which may be had in several styles, so that the buyer has very good choice. Some models are much

better than others. In the case of incubators and brooders, it is generally common for a supply house to "take up" one make only, usually one of the best, according to popular consent.



A Patented Feed Trough. No Place for Fowls to Roost on This

The one point which the Beginner who must have his stuff shipped from the supply houses needs to note, especially, is that the exigencies of the supply business are many, and the houses are often behind on their orders for the most popular goods. Much of the trade is seasonal, and all customers want the goods at nearly the same period. This means that if you want the stuff *when you want it*,—and some people *are* made that way!—you need to order well in advance. For incubators and brooders, two or three months ahead is pretty safe—less time may or may not be. In March of a certain year, I heard from behind the scenes of a big New York supply house that even the manager's

letters were being ignored by the main office in another city. "Probably behind on their orders for machines and giving every ounce of strength to them" was the New York manager's explanation of the unpleasant facts.

Incubator thermometers and hygrometers have been the subjects of much wear and tear of gray matter on the part of manufacturers. One manufacturer, who believes himself singularly immune from the error germ, avers that none of the (other) hygrometers made for incubators have much value. One of the newer makes of incubator thermometers has the mercury bulb set in the middle of a celluloid egg, where it is guaranteed to give the exact temperature at the center of the real eggs, in any make of incubator, and no matter what the method of heating: by diffusion, radiation, or what not.

The supply houses talk a bit about many defective regulators on machines. I have not found trouble of this sort, in using four different makes. I am inclined to think such difficulty may come from carelessness, where the regulator is on the top of the machine. It might possibly come, in certain machines, through gross overheating of the machine.

An egg cabinet and turner supplied with a wire pocket for each egg, and holding, as to size, from fifteen dozen to eighty-four dozen is a very handy appliance. The eggs can be rotated at will through a one-half turn of the swinging body portion.

There are cheap egg testers, usually at twenty-five cents in the stores or thirty-five cents by mail. An electric tester is also offered. It is said to give a much



Laying Compartment. Rear of One Pen, Half of House Lined to Prevent Drafts. Five Trap Nests for each Pen of Five Birds. The "Stoneburn Trap Nest," developed in the work at Storrs. (Courtesy of Professor Frederick H. Stoneburn)

stronger light than a lamp tester, and costs perhaps five dollars. All the testers I have seen work fairly well; which really means little more than that they give light enough for the work. A home-made tester can be made that will do practical work. A hollow tube through which one looks toward the light, the eggs being held singly against the end farthest from the eye, answers the purpose of many. Better, is a cylinder of tin or tough, elastic pasteboard, large enough to set over a lamp carrying a Rochester or similar burner.

One of the most interesting supplies is the rotating cylinder hung in a frame, and known as "the lice-killing machine." I used one of these for some years and found it to do its work well. The chief objection to it was that it frightened the chicks sadly; but this can be partly obviated by turning the cylinder very slowly. The chicks are placed, together with a safe lice powder, in the cylinder, which is then turned by a crank, just as you would turn a corn sheller handle. It is easy to see that the chicks may be far more thoroughly cleaned in this machine than by hand, even though one tried to be very thorough indeed with the latter method. Tobacco makes the chicks' eyes smart, but I think insect powder is not so much open to objection. The machines are made in several sizes; when using the chick size, a goodly brood can be put in at once.

The foot punches and leg bands make distinction of special birds so easy that no one who raises poultry in any numbers should be without them. They are an almost necessary adjunct to the trap nest, which is of little value unless the fowls can be distinguished, each from the other.

Every one who has farm antecedents or who is situated on the farm, will doubtless be glad to learn that there is a cast-iron mortar with concrete pestle, designed for crushing crockery, brittle bones, etc.,—I saw this priced at three dollars; the size, as given, was nine inches square on the floor and a foot deep, the pestle handle being four feet long, so that the user could stand while working.

A wire stretcher, with steel grips, is another of the handy tools which the poultryman, who has much wire fencing to put up, can scarcely afford to be without. There is also a special kind of pliers for staple pulling.

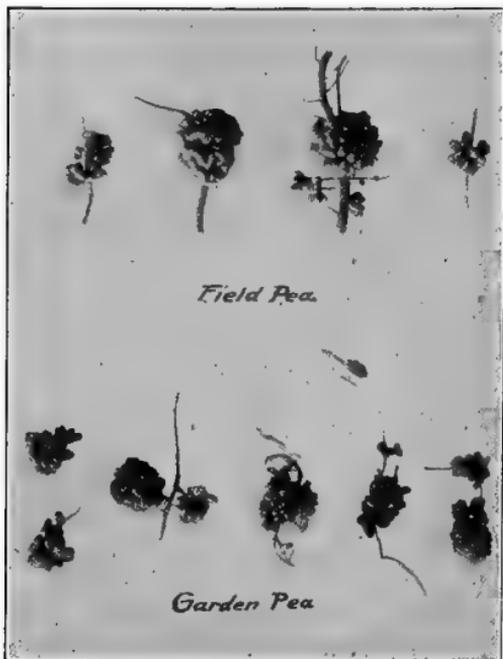
XXXIII

EFFICIENCY THE KEY TO SUCCESS

What Ought To Be and What Is — A Lesson from Life — Locating Inefficiency — Reform — Applying Efficiency Principles — Revolution through Efficiency Methods — Three Selected Efficiency Principles — Oversight a Vital Point — Tabulation for Efficiency in Poultry Work.

IT has been said again and again in our public prints that *most* business enterprises fail. The men who figure have put the per cent of successes as one out of 20. Doubtless, the failures in poultry keeping do not count as high as this; yet poultry keeping is commonly considered unusually risky. Some business folk who profess to be especially well informed in this matter affirm that the "efficiency of capital investment in industrial plants" is seldom found to be above 30 per cent. That is, calling what *ought to be* as 100, *what actually is*, in the working of the plants, *must be called thirty*. Putting poultry keeping as a commercial venture on the same plane, the figures which you work out so laboriously as what ought to be, will dwindle, in the actual handling of the business, to less than one third; your profits will be one third of what you figured them! This — just this — is the weak point; this is the crucial reason for so many failures. And still you ask, "Why?" The firms which now sell efficiency, as one may say, assert that it is because of *waste* — of energy, of time, of nerve force, of money.

An illustration from the life of to-day will show exactly what is meant. Not far from my home, a large contract job is being done. A public building is being moved, and a larger main part put up adjoining. I



Planting Efficiency: Good Poultry Feeds, and Nitrogen Gatherers. The Root Nodules Fix the Nitrogen

have heard contract building or contract jobs in general referred to as "the biggest gamble in business life." In this specific contract work, the roof was removed from this large building of which I speak, the shingles being deposited in a heap near by. The lot is rather small for the proposed building, which may be a part of the reason for the way things work out. Whatever the reasons, the

fact is that the heap of shingles has already been moved three times, and is now so located that it must inevitably be handled at least once more. Somebody, then, pays for four handlings, when one would be sufficient under proper management. Inefficiency, here, traces directly to the man in charge. If you will study different cases, will you not find that *inefficiency always traces to some man or men back of the work?*

I have in possession the booklet of a firm of "Business Tinkers" located in New York City whose entire work is to study the business of any firm which may engage them, and figure out *where the inefficiency is*, and *what is required to change from inefficiency to efficiency*. In some cases, this means only from small profits to large ones; in others, it means a change from losses to good profits. And I heard a representative of this firm say that their work was equally forceful and effective in all lines of business: factories, stores, stock-keeping, rail-roading, and what not. This is because it is founded on principles.

It is because principles are underlying things and can be applied by any one who understands them and will go at it systematically, that I am putting this most modern of business advances into this book for Beginners in poultry keeping. One who is systematic and keen and *honest with himself* can apply these principles to his own business as certainly as can the expert. But, his eye is not so well trained, his experience is less, and he will be tempted to give himself the benefit of the doubt. For these reasons, it is far better to try to apply these principles *before beginning instead of after having made the blunders of inefficiency*; not to mention the saving in money and in wear and tear.

The Efficiency Experts, in their booklet, apply their principles to a case in which a man intends to go into honey producing as a business. By questioning him, they find out:

1. That he expects to secure 25 pounds of honey a year per colony;
2. That he thinks of settling on the seashore, where he has relatives;



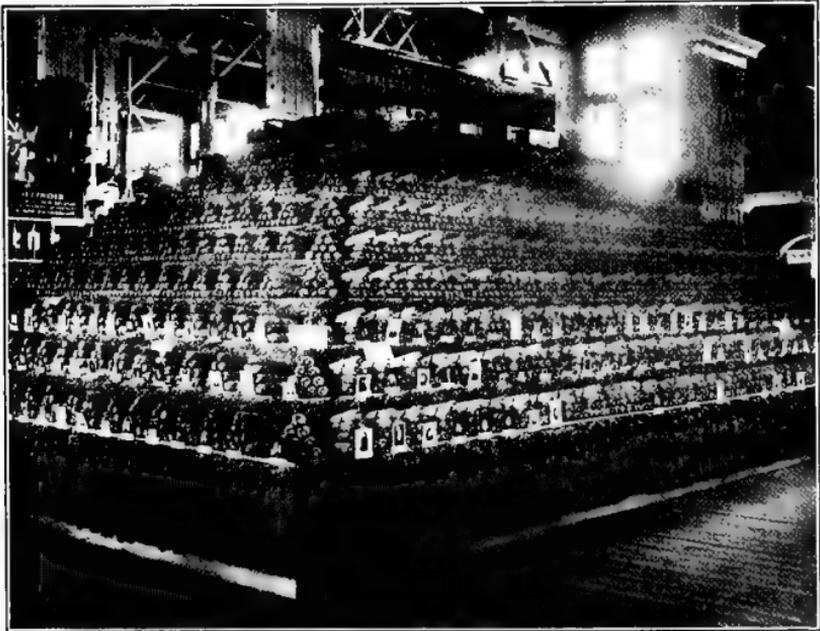
Principles are Underlying: Nodules of Velvet Bean. A Nitrogen Gatherer which Prepares the Ground for Other Legumes

3. That he does not know the life habits of bees ;
4. That he will not employ skilled help ;
5. That he does not intend to subscribe to bee periodicals, or call upon other helpful agencies ;
6. That he has not studied " the spirit of the hive " ;
7. That he will not use Italian queens, nor watch out for feed and for their enemies, but *expects only to sell honey*, while the bees take care of themselves ;
8. That he plans only to keep records of the weather ; not of the bees, their needs, products, etc.

Though possibly this case is exaggerated, as an example, I think it is not worse than the vague state of mind of many of those who would like to go into poultry as a money-making opening. The above system always includes a schedule, first, of the efficiency of the business plans, or the actual working of a business as the Experts find it in operation. In such a schedule, they mark this bee man ten, twenty, thirty, and, in one case, fifty per cent lacking, according to his answers to the questions. On one number they mark him below zero. This was the " fair deal " for the bees. He gets about a fourteen per cent rating as to efficiency, and the expert comment is that the intending investor is, on his own testimony, foredoomed to failure.

Much has been said about the " fussiness " of women, especially when they try to do serious things. But no woman, at her fussiest, was ever so fussy as these business experts of the trousered sex. In a large company, I heard one of them tell how he would go to work to add efficiency to the kitchen end of the home. He instanced a kitchen, having the stove on one side the room, the table on another, a closet for the kitchen

implements some feet distant from the table, etc., and with the table too low, so that a strain was constantly on the back of the worker. He showed how the housewife, working in this illy arranged "shop," would walk seven feet and back, from six to a dozen times, merely in assembling her baking materials and tools. He referred



"Graded" Corn, The Staple Poultry Feed, as Grown and Shown by Midwest Boys. Getting in Line for Efficiency

to the lost motions in not reducing bread making to a system of movements always performed in the same way and in the same order. In applying the system to her needs, on two or three different days the expert would watch this worker, record her movements and her steps, tabulate all, and work out a plan to cut out possi-

bly 75 per cent of the useless motions and steps. I heard a college woman say, afterward, that her housework would be revolutionized from that day forth because of this fifteen-minute talk. Another said that one house in which she lived had at least 25 feet of distance between the flour bin and the molding table, and another had the width of three rooms between the kitchen stove and the molding board built in at the farther end of the long pantry. Nothing could more clearly show the need for women as kitchen architects or the mission of the kitchen cabinet. The Expert who gave the address urged that women apply the principles of the work which his firm was doing to the details of their daily work, for themselves.

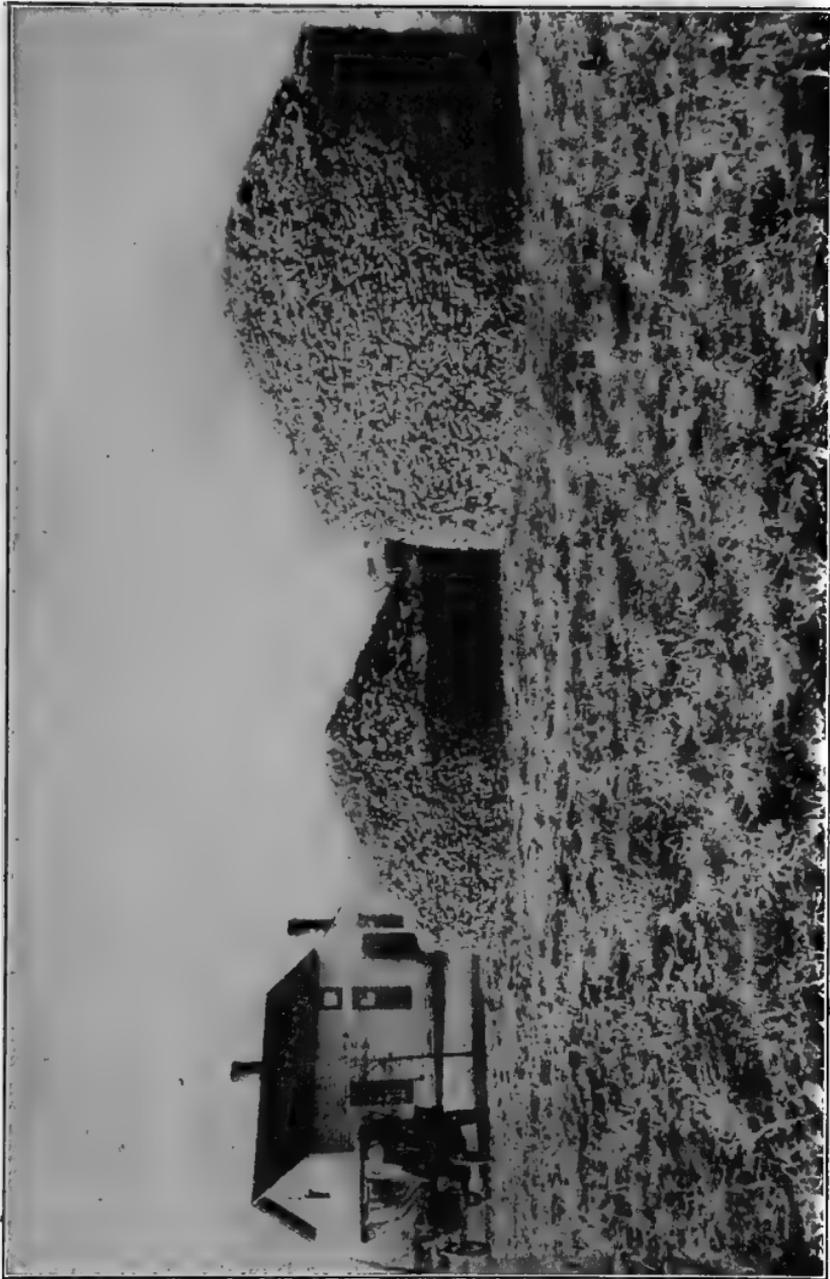
Whether the underlying principles are few or many, depends somewhat on how they are stated. The firm of which I speak names twelve, and states, in addition, that some would condense them all into the single word, "common sense." The three which I wish to bring especially to your notice are the necessity for records of what is actually being done, the necessity of "a fair deal," and the necessity of what is called an "efficiency reward." The records, it is demanded, must be "reliable, immediate, and accurate"; the fair deal applies to the under workers chiefly; the efficiency rewards are a premium paid to the employee for doing "Standardized work." The form is not so essential as the fact, since without hope of reward "even the best weary in well-doing."

Employers here and there have had visions of efficiency, before the rise of modern firms of efficiency experts, and have managed their own business by these principles, perhaps before they were ever tabulated. *We may well wonder whether the successful five per cent*

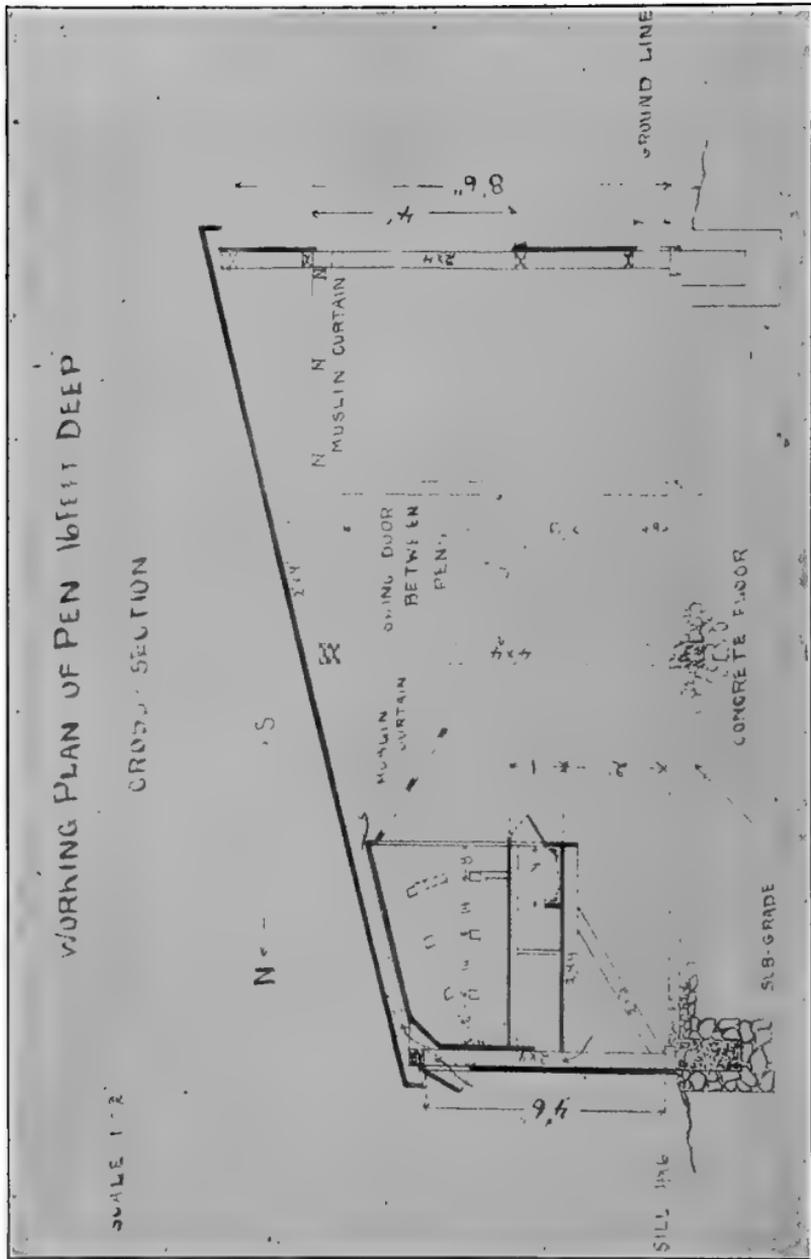
were not principally composed of these! Recently, a man died in Michigan, who had made his name familiar to the public all over the United States as a special grower of strawberry plants. He stated in his circular that one reason why his business was reliable and successful was that his employees were especially trained. Every worker allowed to help among the plants was trained as soldiers are drilled, viz., to perform all motions — in setting a plant, say — in the same order and exactly in the same way and perfectly. One cannot help seeing how this would simplify the work of the foreman, who would have a definite standard to which to hold the workers.

Many of the things which have been said in other chapters of this book fall directly under this idea of efficiency in work. The men who have been succeeding with poultry have been those whose nature it was to be efficient. Webster defines efficiency as “the quality of producing effects.” Young America abbreviates it to “gets there.” Another way of expressing it is, “the ratio of product to energy expended.” “Energy,” in a business sense, meaning time, money, work — all that is invested in aiming to get an expected result.

We might make an efficiency tabulation of our own for poultry. In it would come keen oversight as a leading force. The smaller the items of a business, and the smaller the output of each individual concerned, the more need for oversight, that the little foxes may not “spoil the vines.” Location, and saving in steps in the daily routine, would be important. Saving feed, saving losses in young stock, saving unnecessary expenses all around, would count much. A fair deal to the birds would be a main necessity, also. Understanding of the



Wire Netting Cribs for Curing Sweet Corn, an Especially Good Poultry Feed



Detail of Pen Construction, New Jersey Experiment Station. Accuracy One Key to Efficiency

laws of life for fowls, and of the laws of business in general, would both be necessities to efficiency. *Profits often inhere chiefly in the savings and the extra incomes of good salesmanship.* First, last, and all the time, study of life in general, of human nature, of bird nature, of psychology, etc., is a necessity. A natural "law" is as unvarying as the sun in its course. As it acts once, so it acts always. On such laws, a poultryman may count; for they are stable. Looking these points over, dare you say that *you* will be *an efficiency man?* *An efficiency woman,* as a poultry keeper?

I have been greatly interested to note that two thirds of the points which these Business Tinkers demand tally exactly with the divisions of the work which I have outlined for the Beginner. Conditions, planning, records, common sense, the "fair deal," which depends on understanding the nature of the birds, the "competent counsel," which consists in finding out what you do not know *from some one who does*, — all these appear in the expert plan for "Business Efficiency."

Tabulating the efficiency points noted, as applied to poultry, we might have something like this: —

Location and Plan.— Saving in steps, in feed, in chicks.

Oversight.— Of workers, or of Stock.

A Square Deal.— Including comfort and working material, for worker birds.

Understanding of Laws.— Of life — Of business.

Salesmanship.— Knowledge of men — Of markets.

Study.— Of all that touches life or business.

Records.— For efficiency reference.

Checking Up.— Owner and employees especially.

THE BEGINNER'S FOES AND HIS FRIENDS

Systems, and Gullibility — “A Dollar a Sell” — How Things Hinge Together — A Basic Fact and Geometrical Progression — False Premises Insure False Conclusions — One Square Foot per Bird — “Books” which are not Books — The Weak Spot — A Safe Place to read “System” Books — Conservation of Common Sense — Good Germs and Bad — First Aid to the Beginner — Good luck to the Beginner!

No undefended Beginner who comes under the zone of influence of any poultry or farm paper, in these modern times, is safe from the “germ” which riots through the systems of the inoculated, to the sure end that they invest in one or several “System” books. System — just plain system — is such *an indubitably good thing*, such a rock foundation of a successful poultry business, that it deserves every laudatory adjective in the average vocabulary. But “Systems,” in the specific, modern poultry-world sense, are in the most nauseating bad odor with all but the gullible. The chief openings to gullibility are ignorance and curiosity. These, then, the “Systems” set out to capture. “None other need apply” would be a most excellent wording of their attitude toward the world.

Some one writing in an agricultural paper sounds the warning thus: “Be careful from whom you buy. Have nothing to do with those whose promises are obviously impossible. If a man advertises that his flock has

averaged more than 250 eggs per hen yearly, avoid him. Speaking of a certain "System," the same man says: "Any man possessing a grain of sense knows that if this person had a 'System' by which he could make the



Plucking the Ostrich: Plumes are Legitimately Worth Much More than "A Dollar a Sell"

immense profits that he claimed to have done, he would have kept it to himself and have gone right on clearing \$50,000 from every acre instead of selling his 'System' at a dollar a Sell."

“A dollar a ‘sell’” might be considered a complete commentary on the whole matter, but the first “sell” is not the end of the “System”; for it usually includes selling to the novice books, supplies, even incubators and brooders, besides the book which was the original entering wedge.

The way all these things hinge together is utterly unsuspected, it may be, by the Beginner. For instance, at a big show, I saw a very large display of supplies by a firm which does big advertising. That is, of course, perfectly legitimate. I had noted, with great surprise, as I passed the booth, that it was offering a certain book which ranks among “Systems,” as far and away the best poultry book published. Noting the firm name, however, I saw that this was its own book. I have this book in my possession, and it was given me by a near Beginner, who, having paid his good money for it and read it eagerly, pronounced it absolutely worthless. I did not entirely agree with him, because there is much really good workable advice to the uninitiated, in its pages. But, first and foremost, it was an advertising medium for the stock, etc., of the firm putting it out. To call it the best book ever offered to poultry raisers was an insult to the Beginner, to the regular writers of *genuine poultry books*, and to the Colleges which put out legitimate literature month by month.

There is one fact which every Beginner ought to think much on, if he wishes to save himself from what we have come to call “exploitation.” The basic truth underlying a large number of the systems is the same, and it cannot be controverted. This is why it is possible for them to state without absolute falsehood that exor-

bitant amounts (judged by the common standard) of money *can* be made in a back yard by any one with a few hens. "Any one can do it," they say; and no one can give them the lie, without explaining at considerable length just what he means.

The basic truth referred to is, that, if every egg which every vigorous hen lays is incubated and the resulting chicks are raised and turned off as quickly as possible, or the females turned into layers, season after season, the astounding result is as sure as any other tremendous growth by Geometrical Progression.

Take just one "System" statement as a starter, and see how easily we can figure a competence: "All well-cared-for hens should lay an average of 200 eggs a year." Fifteen such hens will, of course (since figures do not lie), lay 3000 eggs; which, *if* turned into chicks and raised to maturity, must give the worker 3000 fowls, worth at least a dollar apiece, when they are of the right kind. Here is your \$3000, from fifteen hens, in a single season and not a hair turned! Every inference is incontrovertible *as it stands*. Haven't you *proved* it by arithmetic, the most exact science known to man?

But, here is another statement, which every person living, be he chicken crank or just ordinary flesh and blood, ought to ponder; ought to ponder till it becomes his full panoply against every false argument: *Any absurd and false assertion which any person may elect to make can be proved (by logical argument) if the premise upon which that argument is based is untrue, or misleading.*

It is upon the false premise that the deceitful "System" is so securely based. Very many of them are based upon the assumed premise that it is practicable for "any

one" to hatch all the eggs from any specified number of hens, and raise all the chicks therefrom.

How are you, on your small city lot, going to handle these 3000 birds, assuming that you hatch and raise them? Have you capital enough for the feed? For the supplies? It will take hundreds of dollars. Have you time enough and strength enough to spare for all this work? Have you figured that 3000 fowls need 3000 square feet merely to stand on; while your lot, if it be 25 feet by 100 feet, one fourth occupied by a (small) house, has only 1875 square feet to offer? Or, if you discount the laying and the hatching, etc., till you have only 1875 birds, or even sell down to 1000, do you think they will keep in health in such conditions, even though you strain your good backbone through continual spading and cleaning, in addition to the regular work of feeding and watering? Come, now, do you really *desire* earnestly to spade that entire city lot of yours, every day of your life? That is a part of the requirements of the "System," and if you don't follow the rules, you release the "party of the first part" from the responsibility for your failure.

If I speak feelingly in this matter, it is because I have on my desk as a part of the day's mail a series of questions from a man in the largest city in the United States, all about starting into back-yard poultry raising as a money-making business. He tells me a lot of facts (?) about several breeds, which betray his ignorance, and I see his finish before he begins! Upon what other business would a sane man expect to enter, when every possible condition was utterly unfavorable? And in connection with what other would he part with his common sense before entering upon it?

Even many so-called "books" which do not offer a "System" are more and more a snare to the Beginner. Books which are essentially nothing but an advertising circular for the stock of their writers flood the market, and are offered as the Beginner's one hope at 75 cents and one dollar a copy in paper covers. The best way to judge the probable value of any book is to learn something about the author: his knowledge, his character, and his possession of the teaching faculty. On these three points rests the possible value of informative books of every sort. Ninety per cent of the books offered in *some* fields of work, if not in all, would be thrown out as not good enough, if subjected to the above test.

But, suppose the man who sees both sides says: "They do, however, give plenty of good advice *to any one who is competent to pick it out.*" (I have seen this argument used.)

This, I think, strikes at the real weak spot in all the Systems: they have so much of "buncombe," so much exaggeration, so much depreciation of all other methods, that they simply make pi of the ideas of any novice, who is, in the nature of things, easily confused. Possibly it is true that *some* give *more information* for the money than can be had in other ways for the same money. But their defect is that the information is not all reliable. And *who is to pick out the good* from the other kind for the puzzled Beginner? A question and answer book, of which there are several, would be less likely to do him harm; because these, at least, try to keep within the experience of the great majority of poultrymen, in giving their information.

There is, perhaps, one place where a novice might

revel in System and Secret books, and come off scot-free; this is, at an Experiment Station where he was taking a poultry course. Being then able to ask questions of those of stable mind and experienced hands, and to discuss every questionable statement with those who were interested in the same thing, and many of whom would have more experience than himself, he would find the sawdust pulled out of practically everything that might be "stuffed," and the real inwardness of it laid bare to an inquiring public. And just this is the treatment required by hundreds of schemes that spring upon us out of the shady paths of life, from coöperative rubber plantations and gold mines and cigar stores and whisky stills and scores more, to gold mines that the faithful hen digs out of the lap of that dear Mother Earth, who feeds all her creatures with something. Let us hope none of us may bite on sawdust or tenpenny nails when we have supposed ourselves to be chewing carefully and Fletcherly on "nutriment."

We have reached the point where a large part of the efforts of the state and federal governments in the Agriculture Division is expended in trying to protect the Beginner and the farmer from those who would fleece them. Ignorance makes any man vulnerable, and good judgment must be based upon knowledge and experience. Is it not a time for us to "conserve" our common sense, to increase our knowledge, and, if we cannot protect ourselves, at least to flee to those who can protect us, and not into the open arms of our Exploiters?

Every Beginner with poultry is surrounded by a legion of invisible "influences," who might be named, as a certain Health System names the invisible workers



Social Joys

within the body, "devs" and "angs." These last are the germ legions; both the enemies, and the armies of "good germs" which repel them. Presumably, the above-quoted new-coined terms are short for devils and angels, which may be strong meat even for those who would like to characterize fittingly those who prey upon the Beginner, and to separate them by a clear line of demarcation from those who would help him. But a term sufficiently strong, yet not too strong, is difficult to find.

The Beginner is supported and braced on all sides by the work of a thousand experienced ones who have gone before him, many of whom are in the state Experiment Stations, working ever, day by day and month by month, in his interest. We, the people of the States, pay them to do this, and they do it with right good will thrown in. There is also a goodly group of writers who are doing their best to make clear, open paths in which all may walk toward fullest success. The Beginner is the most important person in the poultry business, from one point of view; because, if he ceases, the business will soon come to an end by natural limitation of the life of man. It is to the real interest of every honest worker with poultry that the Beginner shall be a Success. Let us all, then, wish him good luck and a steady, level head! And let us do him every good turn possible.

GLOSSARY OF BREEDER'S SPECIAL TERMS

- Admitted*: accepted by the American Poultry Association as having conformed to its requirements, and placed in its Standard.
- American*: a class containing certain breeds originating in America (all general-purpose birds).
- Beard*: a tuft of feathers on throat or breast. In turkeys a tuft of hairs on the breast of males.
- Bird*: any domestic fowl.
- Brassy*: showing yellowish tinge on white plumage.
- Breed*: a distinct group of fowls which perpetuates its own special characteristics. "Shape makes the breed" is a common fancier's maxim. Breeds include "varieties."
- Brood*: any lot of young fowls hatched or brooded together.
- Carriage*: the attitude of a bird, in standing or moving. The way of holding wings, tail, and head and the balance of the bird help to make up carriage.
- Class*: in the "Standard" sense, a group comprising certain breeds, placed together because of origin, likeness in some traits, etc. The Standard of Perfection groups breeds into fourteen classes.
- Cock*: a male bird one year old or older.
- Cockerel*: a male bird not yet one year old.
- Colony House*: A detached house, carrying only a few birds, used without yards.
- Condition*: the state of the fowl as to (a) health; (b) plumpness; (c) plumage.
- Conditioning*: giving especial care to put into the best condition, especially for showing.

Coverts : half-long feathers, covering others and filling out the form in various sections ; as, "tail coverts."

Cultures : fluids in which germs have been artificially developed, for study, or other specific purposes.

Disqualified : judged unworthy to compete for prizes, because of undue defects.

Ear lobes : somewhat circular areas of bare skin, red, white, etc., below the ears proper.

Egg duct : the soft tube in which the egg is conveyed from the ovary, toward the point of exclusion.

Exclusion : expulsion from the egg duct.

Face : the bare skin about the eyes of a fowl.

Faking : preparing a bird for exhibition with an effort to deceive the judges as to its real quality. (Example, artificial coloring of feathers.) The dividing line between "grooming" and faking should come at the point where improvements in appearance deceive as to the breeding quality of the specimen.

Fancy, The : the people interested in breeding and exhibiting fancy fowls.

Flights : the outer, long quill feathers of the wing, used in flying.

Fluff : short, soft feathers, appearing like down, on the posterior parts of any fowl's body.

Gapes : an affection of the windpipe caused by threadlike worms, which choke the birds, especially the young.

Gosling : the young of the goose family.

Hackle : the half-long feathers depending from the head and about the neck, above the "cape," which is formed by the first feathers of the back.

Hen : a female bird one year or more old.

Knock-kneed : having crooked legs, approaching each other at the joint at upper end of shank.

Laced : having the feathers edged with a contrasting color.

Mandibles : the upper and lower parts of the beak.

- Penciled* : marked in contrasting lines, often concentric. Said of feathers.
- Pea Comb* : triple combs, joined into one at the base.
- Points* : arbitrary values given to various parts of the fancy fowl — 100 points indicating perfection. Each class has its own "Scale of Points."
- Primaries* : see "Flights."
- Pullet* : a female fowl not yet one year old.
- Purple Barring* : cross lines of purple sheen, often appearing on black where full greenish sheen is demanded.
- Recognized* : acknowledged as a Standard breed.
- Rose Comb* : a low, broad, solid comb, usually covered with blunt beaded points.
- Roup* : a contagious disease of the head and eyes, akin to diphtheria.
- Scale of Points* : an arbitrary allowance of the number of points belonging to each of fifteen sections.
- Scaly leg* : an affection producing roughness of the legs, from the presence of mites beneath the smooth scales of the shank.
- Section* : a division of the body of a bird, especially for the purposes of judging at exhibitions. Judges are instructed to consider carefully every section of any bird to be judged. They "must" do so.
- Shank* : that section of the leg just above the foot, covered with scales.
- Sickles* : the pair of long feathers floating above the true or main tail.
- Silver-laced* : Laced with silvery white, as the hackles in Silver Wyandottes.
- Spangled* : blotched at the end of the feather with contrasting color.
- Squirrel Tail* : a tail carried forward of the line perpendicular to the back at its junction with tail.

Standard of Perfection: the book containing the authorized descriptions of all recognized breeds, according to the American Poultry Association's demands.

Tom: the male turkey.

Variety: a division of a breed, usually differentiated by color only.

Wattles: fleshy, pendent growths from the throat, near the bill.

Weaning coop: the larger coop which receives a brood when weaned from the hen, or brooder.

Web: the flat, plumy surface portion of the feather, with barbs interlocked.

Wing Bar: a bar of contrasting or especially brilliant color extending across the wing made by markings on the wing-covert feathers.

Wry tail: a tail turned to one side by accidental or other deformity.

ACTING HEADS OF STATE AGRICULTURAL COLLEGES

These names are from the list sent me by the Agricultural Department late in 1911, upon my request for the latest available. Some of these officials are Presidents, some Acting Presidents, some Deans of their several colleges, and two or three are Principals. But a letter addressed to these names will bring any information available which any man may properly ask from his own state workers. In special instances of position or of need, many of the schools will also send to inquirers without their states.

- Alabama.* — Auburn: CHAS. G. THACH. Normal: W. S. BUCHANAN. Tuskegee Institute: BOOKER T. WASHINGTON.
- Arizona.* — Tucson: A. E. DOUGLASS.
- Arkansas.* — Fayetteville: C. F. ADAMS.
- California.* — Berkeley: E. J. WICKSON.
- Colorado.* — Fort Collins: CHAS. A. LORY.
- Connecticut.* — Storrs: C. L. BEACH.
- Delaware.* — Newark: GEO. A. HARTER. Dover: W. C. JASON.
- Florida.* — Gainesville: J. J. VERNON. Tallahassee: NATHAN B. YOUNG.
- Georgia.* — Athens: ANDREW M. SOULE. Savannah: R. R. WRIGHT.
- Hawaii.* — Honolulu: J. W. GILMORE.
- Idaho.* — Moscow: W. L. CARLYLE.
- Illinois.* — Urbana: E. DAVENPORT.
- Indiana.* — La Fayette: J. H. SKINNER.
- Iowa.* — Ames: E. W. STANTON.
- Kansas.* — Manhattan: H. J. WATERS.
- Kentucky.* — Lexington: M. A. SCOVELL. Frankfort: J. S. HATHAWAY.

- Louisiana.* — Baton Rouge : THOS. D. BOYD. New Orleans :
H. A. HILL.
- Maine.* — Orono : R. J. ALEY.
- Maryland.* — College Park : R. W. SILVESTER. Princess Anne :
T. H. KIAH.
- Massachusetts.* — Amherst : KENVON L. BUTTERFIELD.
- Michigan.* — East Lansing : J. L. SNYDER.
- Minnesota.* — University Farm, St. Paul : A. F. WOODS.
- Mississippi.* — Agricultural College : J. C. HARDY. Alcorn :
L. J. ROWAN.
- Missouri.* — Columbia : F. B. MUMFORD. Jefferson City :
B. F. ALLEN.
- Montana.* — Bozeman : JAS. M. HAMILTON.
- Nebraska.* — Lincoln : E. A. BURNETT.
- Nevada.* — Reno : JOSEPH E. STUBBS.
- New Hampshire.* — Durham : WM. D. GIBBS.
- New Jersey.* — New Brunswick : W. H. S. DEMAREST.
- New Mexico.* — Agricultural College : W. E. GARRISON.
- New York.* — Ithaca : L. H. BAILEY.
- North Carolina.* — West Raleigh : D. H. HILL. Greensboro :
JAS. B. DUDLEY.
- North Dakota.* — Agricultural College : J. H. WORST.
- Ohio.* — Columbus : H. C. PRICE.
- Oklahoma.* — Stillwater : J. H. CONNELL. Langston : INMAN
E. PAGE.
- Oregon.* — Corvallis : W. J. KERR.
- Pennsylvania.* — State College : EDWIN E. SPARKS.
- Rhode Island.* — Kingston : HOWARD EDWARDS.
- South Carolina.* — Clemson College : W. M. RIGGS. Orange-
burg : THOS. E. MILLER.
- South Dakota.* — Brookings : R. L. SLAGLE.
- Tennessee.* — Knoxville : BROWN AYRES.
- Texas.* — College Station : R. T. MILNER. Prairieview : E. L.
BLACKSHEAR.

Utah. — Logan : J. A. WIDTSOE.

Vermont. — Burlington : ELIAS LYMAN.

Virginia. — Blacksburg : P. B. BARRINGER. Hampton : H. B.
FRISSELL.

Washington. — Pullman : E. A. BRYAN.

West Virginia. — Morgantown : E. D. SANDERSON. 'Institute :
BYRD PRILLERMAN.

Wisconsin. — Madison : H. L. RUSSELL.

Wyoming. — Laramie : CHAS. O. MERICA.

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