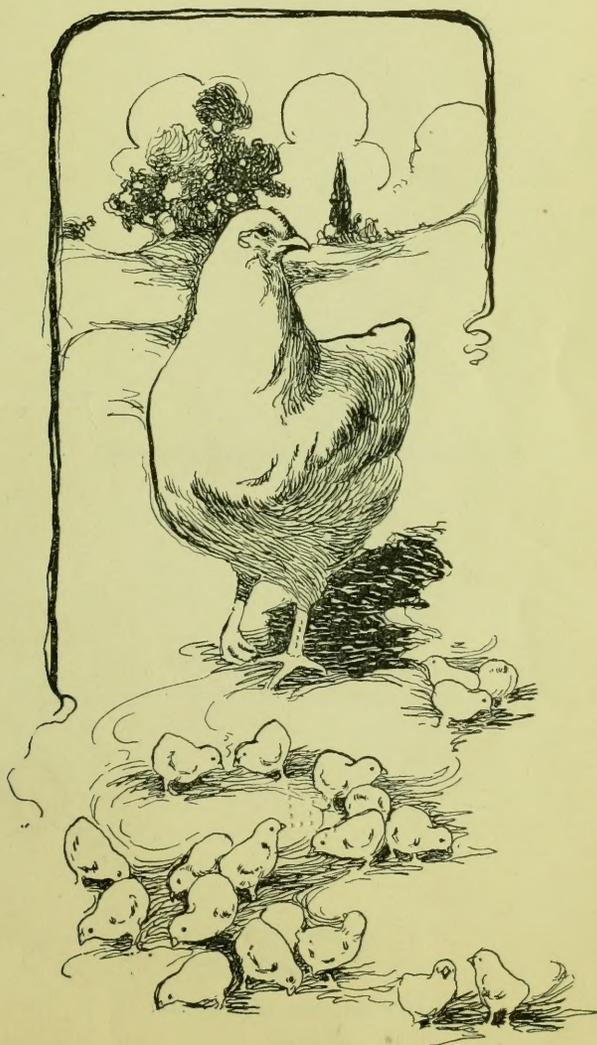


Essentials of
Successful Poultry Keeping

BY
E. J. W. DIETZ



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OF

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BY
E. J. W. DIETZ
Secretary National Exhibition Game Club

Published by
AMERICAN PUB. CO.,
736 Cornelia Ave., Chicago, Ills.

1912

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INTRODUCTORY

Everybody who has followed the development of the poultry interests in this country during the past few years knows that we have made wonderful progress in our knowledge and methods of caring for these profit producing animals.

This work has been taken up and carried on by both state and private parties and the results of these researches have given us a great mass of reading matter which is difficult for the beginner to analyze and understand; because the same results have been arrived at in so many different ways.

With a hope of classifying these various conclusions and pointing out the fallacy or showing how impractical some of these theories really are under our present average condition, I have undertaken to produce this book.

I do not assume infallibility in this subject but having followed poultry keeping from my childhood and having made some success in breeding and exhibiting various varieties of bantams—the most artificial and difficult of all the kinds of fowls to rear—and having been compelled to read and study many authors and confer with many practical men in order to make any progress in this art, I assume this task with confidence.

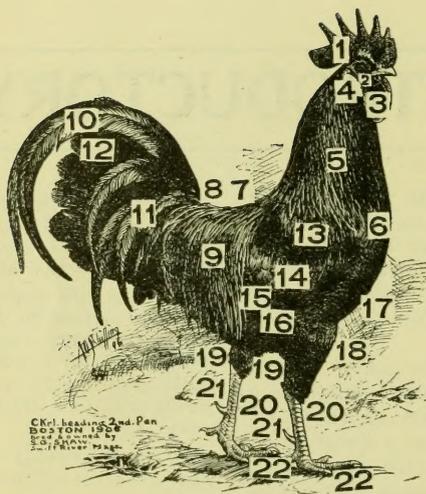
My fellow fanciers have honored me by causing my appointment as judge to place the ribbons on the Games and Bantams—the most artistic of all domestic fowls—on four different occasions in Chicago Poultry Show and every year I have been compelled to turn away invitations to judge and score poultry because it would interfere with my regular business.

Poultry keeping is easily learnt. The greatest difficulty is in picking out the essentials, and it is my hope in this work to give the specific secrets which will lead to success.

As it is essential in studying any art that the student first know the names of the necessary tools and implements, I have planned to give first, an outline of the various Varieties of Poultry; second, The Characteristics of Fowls; third, Feed and Feeding Facts and follow with chapters on the profitable Secrets of Caring for and Rearing Fowls.

I feel very grateful to all who have lent their aid in helping me to accomplish the details of this work and with the hope that it will prove a real aid in classifying some of our poultry secrets so my readers will reap richer rewards, I pass this work along.

E. J. W. DIETZ,
Chicago, Ills.

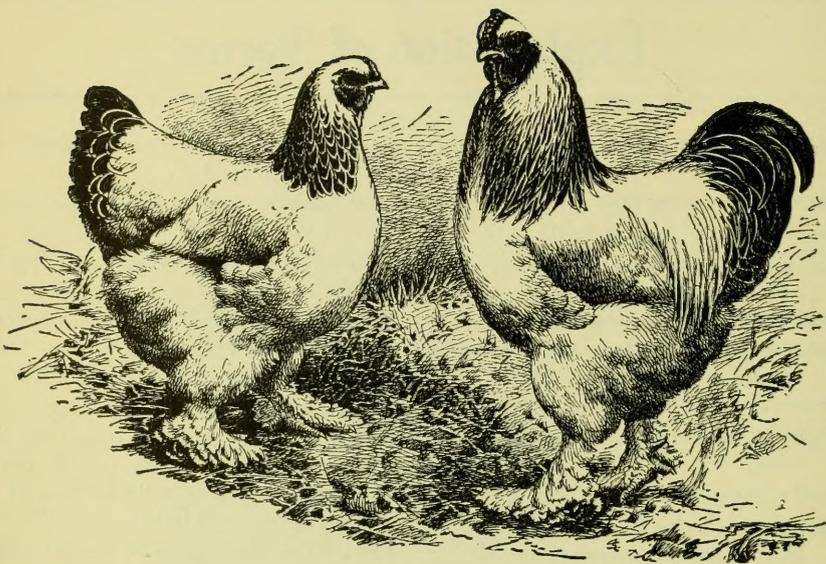


The Parts Named

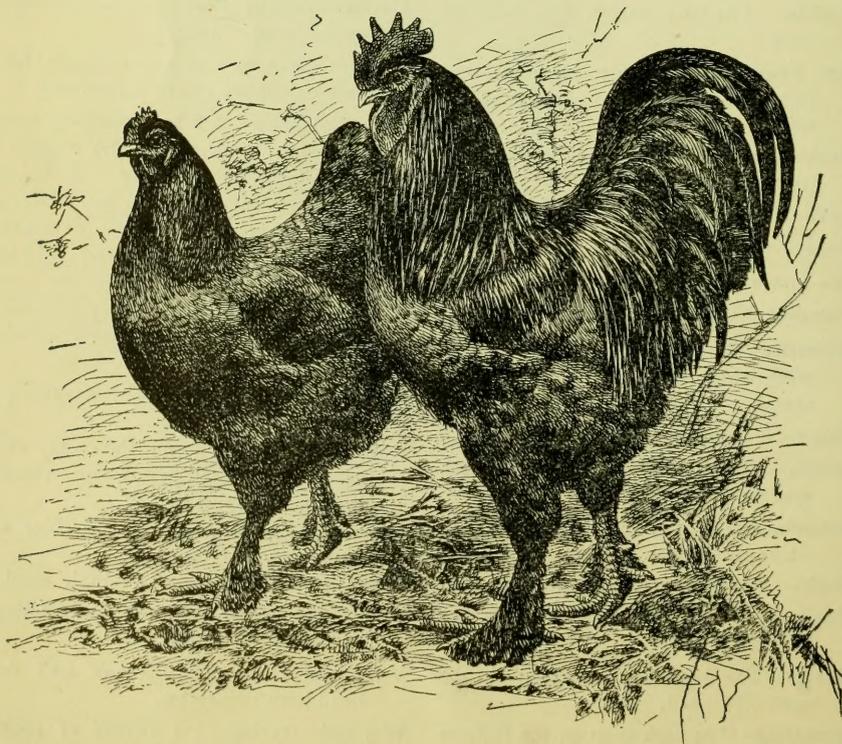
1. Comb; 2, Face; 3, Wattles; 4, Ear-lobe; 5, Hackle; 6, Breast; 7, Back; 8, Saddle; 9, Saddle Hackle; 10, Main Sickle Feathers; 11, Tail Coverts; 12, Main Tail Feathers 13, Wing-bow; 14, Wing Coverts; 15, Primaries or Flight Feathers; 16, Body; 17, Front of Breast Bone; 18, Thighs; 19, Hack; 20, Shank; 21, Spur; 22, Toes.

Explanation of Terms

- Clutch**—A setting of eggs or brood of chickens.
- Cockerel**—A young male.
- Crest**—A tuft of feathers on the head.
- Cushion**—The feathers which surround the tail in Asiatic breeds.
- Deaf Ears**—The ear lobes.
- Dubbing**—The removing of the comb and wattles.
- Face**—The bare part around the eyes.
- Flights**—The long quill feathers of the wing.
- Fluff**—The soft feathering below the tail.
- Furnished**—A bird is said to be furnished when it is fully developed in plumage and body.
- Gills**—The wattles.
- Hackles**—The long, narrow feathers on the neck.
- Hen Feathered**—A male bird is so described when he has the plumage of the female.
- Hock**—The second joint from the ground, intermediate between the foot and thigh.
- Keel**—The breast bone.
- Mossy**—Clouded markings.
- Pea Comb**—A triple comb.
- Penciling**—The fine markings on a feather.
- Primaries**—The long feathers of the wing which are concealed when it is closed.
- Pullet**—A young female bird.
- Saddle**—The short feathers on the back next the tail.
- Secondaries**—The hard feathers in the wing which show when it is closed.
- Shafts**—The quill of a feather.
- Shank**—The part of the leg between the foot and the hock.
- Sickles**—The long curved feathers in the male bird's tail.
- Spangling**—The dark spots on the feathers of certain breeds.
- Squirrel Tail**—A tail that is carried too much over the back.
- Tail Coverts**—The short feathers at the sides of the tail.
- Vulture Hocks**—Hard feathers attached to the hocks.
- Wing Bar**—The dark lines across the wings of certain breeds.
- Wing Bow**—The top part of the wing.
- Wing Butts**—The end of the wing.
- Beard**—A tuft of feathers under the bill of a chicken, or the tuft of course hair projecting from the upper part of the mature male turkey.
- Cape**—The short feathers on the upper part of the body underneath the neck hackle.
- Carnucles**—The small fleshy pertuberances on the head of a turkey.
- Chick**—The young of the domestic fowl before their sex can be determined.
- Disqualification**—A defect according to the Standard of Perfection which makes a bird unworthy of a prize. The common disqualifications are: lack of size or weight in the large breeds; characteristics which indicate crossing to gain size or color; deformities in any part of the body; missing feathers or artificial tampering with the natural condition of the bird.
- Parti-colored**—Plumage which has two or more colors.
- Rose Comb**—A low comb, flat on top and covered with small pertuberances, terminating in a spike behind.
- Self-colored**—Consisting of one color of plumage only throughout.
- Serrations**—The points of a single comb.
- Under-color**—The color of the downy portion of the feather.
- V-Shaped Comb**—Having two well defined horn like spikes.
- Wry-tail**—Having a tail twisted or positively turned to one side.



Light Brahmas.



Black Langshans

Chapter 1. Varieties of Fowls

Throughout this book I have shown illustrations of some of the leading varieties of fowls reared in this country. This will help to designate the various breeds, but the pictures can only show the general outline and give only a suggestion of the color so I will try to give a word description which will help to make the selection of the various breeds easier.

The pure-bred fowl to pass the poultry judge and gain a prize must conform to certain shapes and carry plumage of specific color or colors. "The American Standard of Perfection" published by the American Poultry Association and for sale at any poultry journal office or book store gives specific details about these required shapes and colors. But it will not be out of place to give here some explanation of their classification and some historical facts about the breeds which the "Standard" does not attempt.

Our domestic poultry is divided into two classes: Land-fowl and Water-fowl. The land-fowl comprise Chickens, Turkeys and Guinea Fowl. The water-fowl are the Ducks and Geese.

Chickens may be divided into three great divisions: 1st, those which tend to grow large and produce meat, as the Asiatic; 2nd, those which have as their strongest characteristic the tendency to produce eggs, as the Leghorn; and, 3rd, those which do not grow so large as the Asiatics, and yet have a goodly amount of meat and at the same time approach the Leghorns in their egg-producing tendency, as the American variety.

It seems a strange coincidence that while these three classes can be distinguished by their size as, 1st, large; 2nd, small; and 3rd, medium; they can also be determined by the size

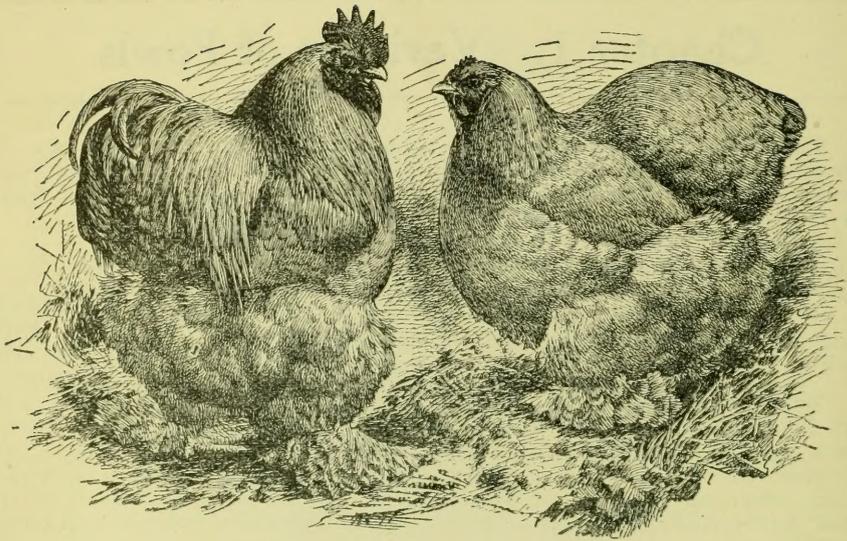
and shape of their tails. The Asiatic has a small and spreading tail, the Leghorn has a long tail, and the American a medium tail.

A.—ASIATIC.

COCHINS.—Large, deep-bodied, massive birds, well-furnished with long, fluffy feathers which enable them to withstand climatic changes. They endure confinement well, seldom flying over a three-foot fence. Cochins are considered inferior to Brahmas, both regarding egg-production and meat-growing qualities. Their sedate movements and beautiful plumage have gained for them many admirers. The standard weights are—cock, 11 lbs.; cockerel, 9 lbs.; hen, 8½ lbs.; pullet, 7 lbs.

BUFF COCHINS.—Color—a rich, deep, clear, buff or golden tan, uniform in both male and female. In breeding practice, however, we find few specimens which do not have either black or white in wing or tail feathers. Of course, this is undesirable, but as buff is a made color—it seems as soon as we breed out the black the white comes in—therefore birds intended to breed exhibition stock should be selected with great care.

PARTRIDGE COCHINS.—While of the same weight as the Buff, the Partridge are usually smaller in size and lower down in carriage. The males are similar in color to the Black Red Game or Brown Leghorn. The neck and back is a golden red, and the breast and under parts a glossy, greenish black. The neck feathers of the female are a golden yellow striped with black, and the rest of the body feathers are brown with two strips of black running through each feather parallel with its outer edge.



Buff Cochins

WHITE COCHINS have pure white plumage. **BLACK COCHINS** have pure greenish black plumage.

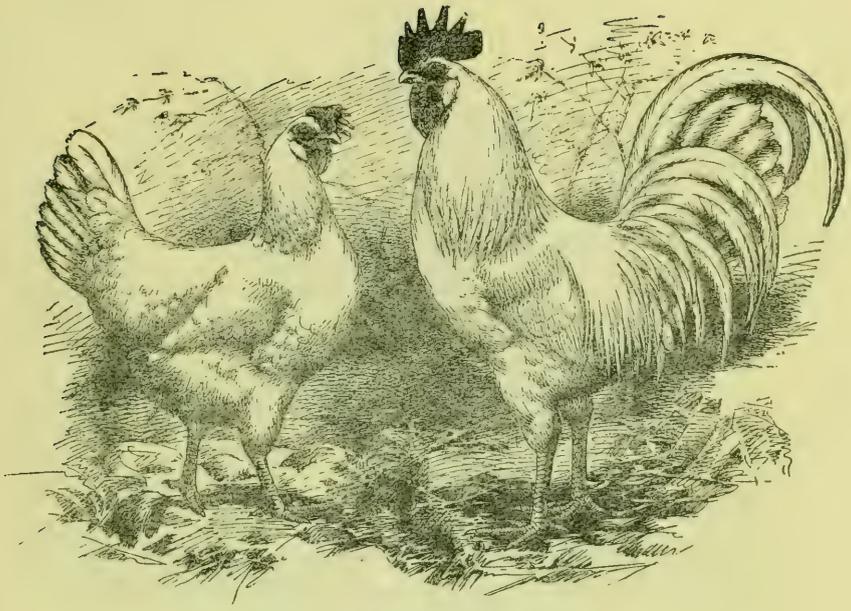
BRAHMAS are our largest variety of poultry—they lay large brown eggs, are good sitters, and do well in confinement. The standard weights are—cock, 12 lbs.; cockerel, 10 lbs.; hen, 9½ lbs.; pullet, 8 lbs.

LIGHT BRAHMAS are mostly white in color as seen in the cut, some of the feathers are laced with black, and in addition the flight feathers are black striped with white. It is a singular fact, and illustrates a defect in our poultry knowledge, that while every one looks upon the Brahma as a meat breed, one breeder at least has developed a Light-Brahma egg-laying strain that has eclipsed the Leghorn fowl, although the specimens I have seen of this breed were undersize and otherwise deficient in characteristic make-up.

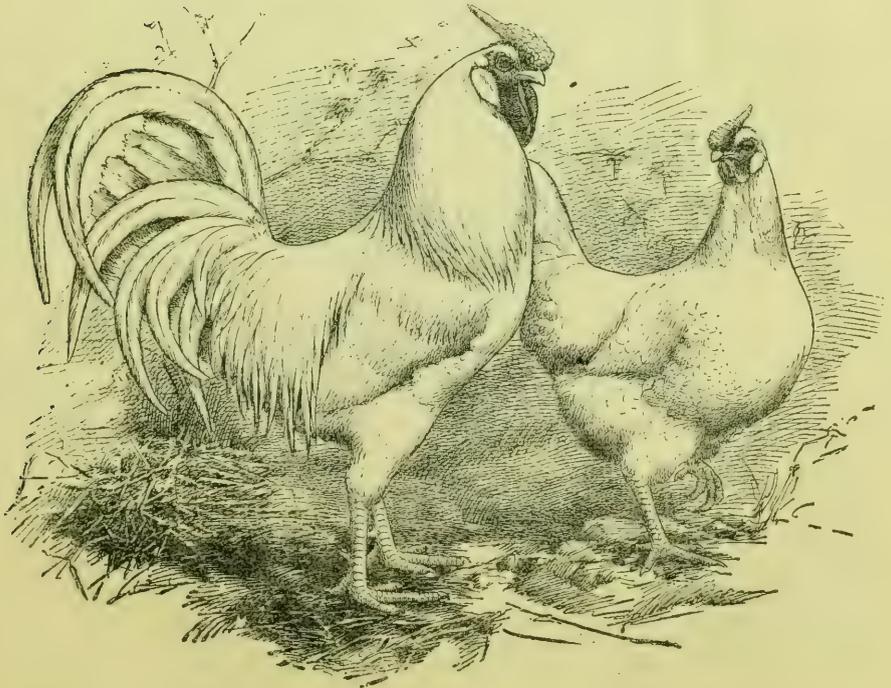
DARK BRAHMA.—These are similar to the Partridge Cochin in color, except where the latter male is gold and red, the Dark Brahma is silver, and the female instead of having brown and black striped feathers has silver and black striped feathers. Otherwise they conform to the Brahma description in shape and characteristics.

LANGSHANS.—A large, hardy fowl; good winter layers of dark brown eggs, with a purplish tinge; sitters, and full feathered, although the feathers are not as long and fluffy as the Brahma or Cochin. Standard weights are—cock, 10 lbs.; cockerel, 8 lbs.; hen, 7 lbs.; pullet, 6 lbs.

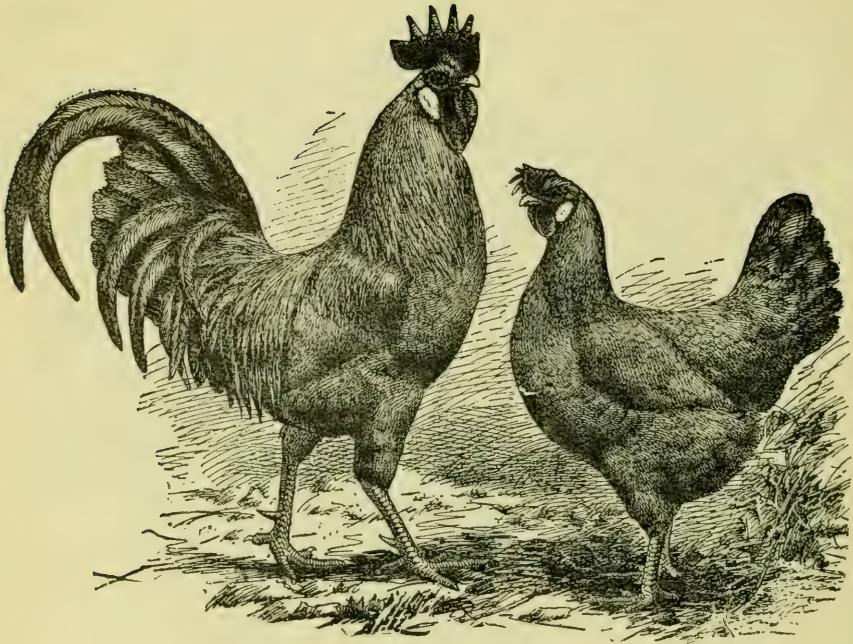
BLACK LANGSHANS conform to the above characteristics, and both male and female, when in good condition, have a beautiful bottle-green plumage. Their white skin and dark shanks are against them in American markets.



Single Comb White Leghorns.



Rose Comb White Leghorns.



Single Comb Buff Leghorns.

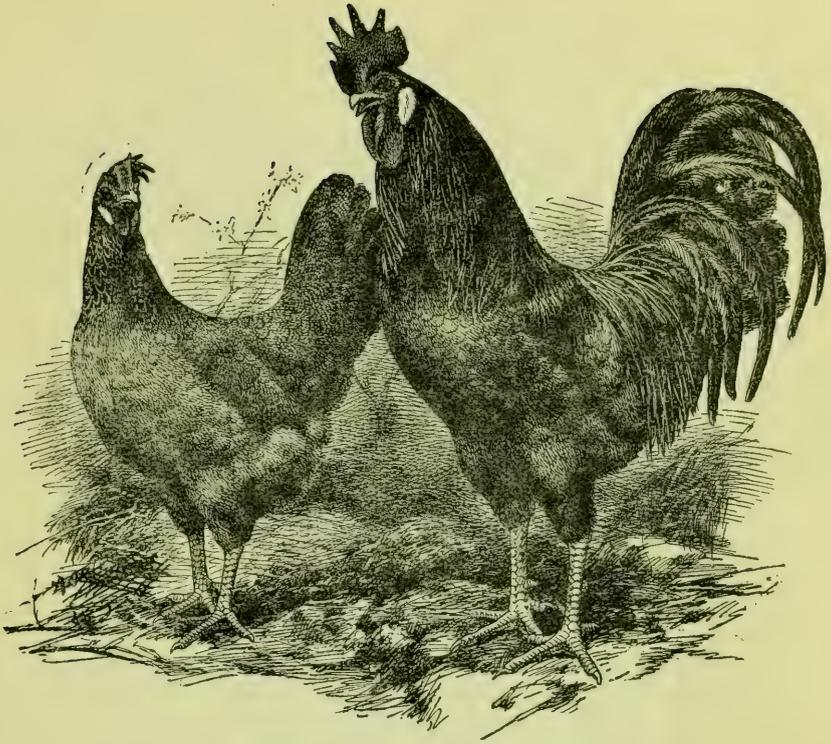
WHITE LANGSHANS are not kept in any great numbers in America, and for some reason are not popular. It would appear, however, that they have been used in developing the white varieties of poultry, especially where size is a consideration.

B.—EUROPEAN.

I believe I was the first to name this one class of poultry. It is well known that practically all the varieties of poultry originated and developed in Europe have the egg-laying tendency as a predominating characteristic, and therefore why not make a general class of these? And, if there are any varieties that do not fit this class let us put them where they belong, even though it disturbs some of our old-time-honored usages. I hold the European as a class which includes those varieties which have as a predominating characteristic the tendency to produce a large number of eggs. They are generally non-sitters, are small in size, and have large, well-developed combs and tails, and are active and good foragers.

LEGHORNS are a typical example of the European class. They lay a white-shelled egg, and seem to thrive under ordinary care. The Standard does not require any specific weight, but lately the tendency has been to increase the size. Whether the egg-yield will increase with the size is a doubtful question, but size does increase the value of the Leghorn as a table fowl.

BROWN LEGHORNS are both single and rose combed. In color the plumage of the male is similar to the Black Red Games and Partridge Coch-in. The hackle and saddle feathers are yellow with a black stripe down the center of each feather. The lower half of the flight feathers are bay; the wing fronts black; the back and wing bows bright red; the wing covers a greenish black forming a black bar across the wing; the breast and tail a brilliant greenish black. The female has hackle yellow with a black stripe down the center of each feather; back and wings are brown, pen-



Single Comb Brown Leghorns

ciled with a darker brown; the breast rich salmon; tail dull black except two top feathers which are penciled with brown.

WHITE LEGHORNS are both single and rose combed and both male and female are pure white in plumage.

BLACK LEGHORNS.—Male and female both have pure greenish black plumage and come with single comb only.

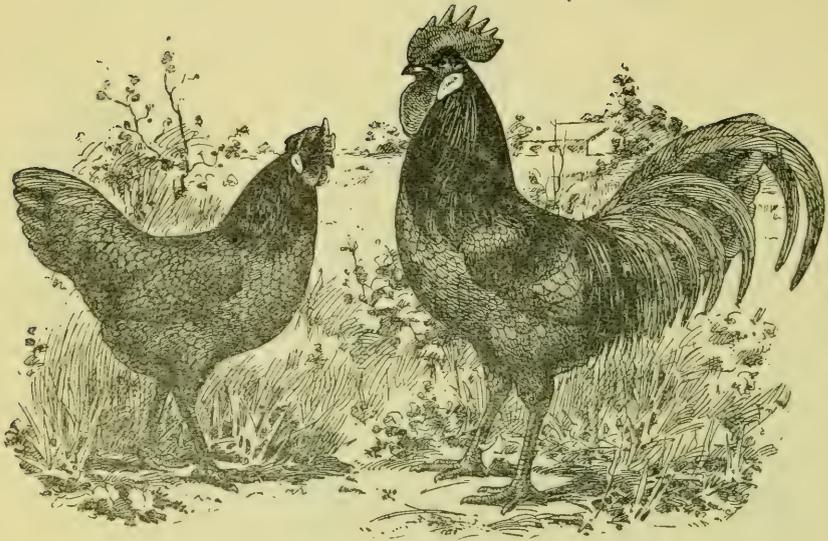
BUFF LEGHORNS are buff throughout like the Buff Cochins and are single comb only.

SILVER DUCKWING AND RED PYLE LEGHORNS are now coming into favor. In plumage they are similar to the Game varieties of the same name and single combed only.

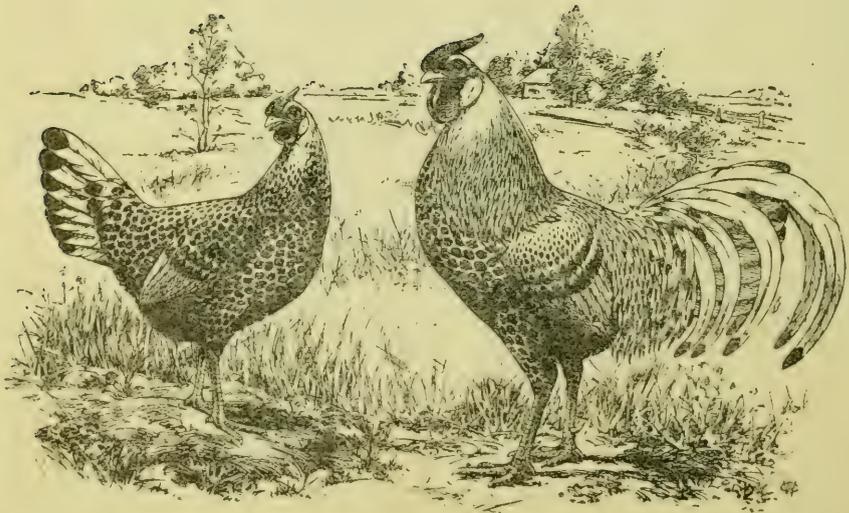
MINORCAS are a larger fowl than the Leghorns, although their general characteristics are similar. They lay a larger white egg, are non-sitters, and have standard weights as follows:

Cock, 9 lbs.; cockerel, 7½ lbs.; hen, 7½ lbs.; pullet, 6½ lbs. These weights apply only to the single-comb blacks. The rose-comb blacks and single-comb white are allowed one pound less for each specimen. Minorcas are only of two kinds, white and black, the white being a pure white throughout, and the black a greenish black.

SPANISH are known only in one color as the White-Faced Black, so named because of the peculiar growth of white in the flesh forming the face. In other respects they are similar to the Single-Comb Black Minorcas. The Standard weights are—Cock, 8 lbs.; cockerel 6½ lbs.; hen, 6½ lbs.; pullet, 5½ lbs. As chicks they seem to be delicate, but when a few months old they are hardy, generally speaking they require more careful attention than the Leghorns. They have long been a favorite fowl in Europe, especially in England.



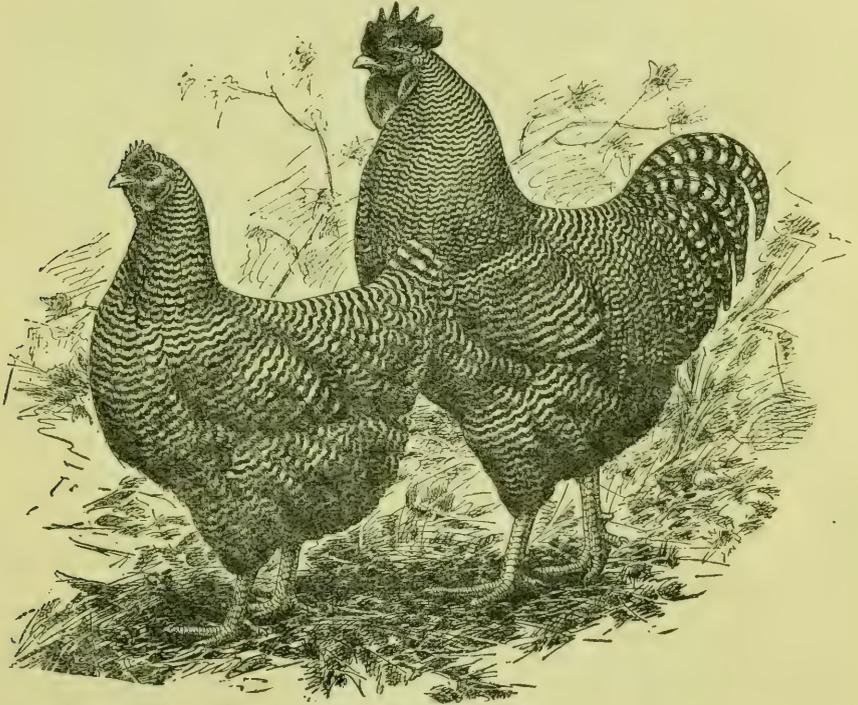
Blue Andalusians.



Silver Spangled Hamburgs.

BLUE ANDALUSIANS are another variety conforming to our description of the European class, and in many respects resembling the Minorcas. In fact, some have declared they have been produced by the blending of color of the White and Black Minorca. They are a slaty blue throughout in plumage, and have standard weights as follows: Cock, 6 lbs.; cockerel, 5 lbs.; hen, 5 lbs.; pullet, 4 lbs.

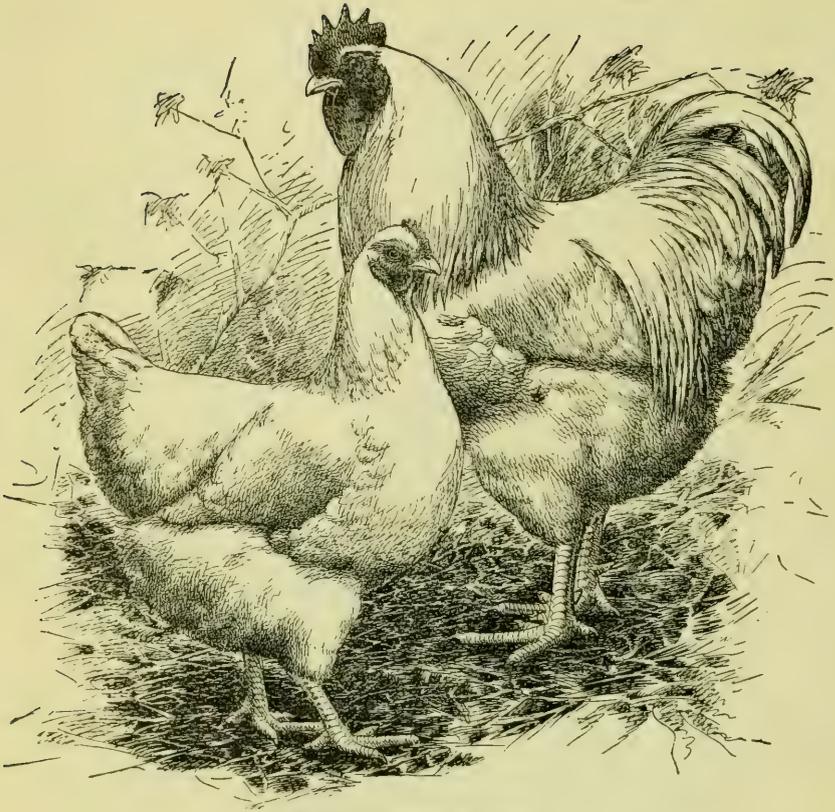
ANCONAS are another European variety, with a propensity for egg-production. The American Standard requires a shape the same as the Leghorn, but English descriptions and breeders favor the Minorca type of bird. The plumage is a greenish ground color, each feather being tipped and splashed with white. This gives the bird a beautiful mottled effect which is very striking.



Barred Plymouth Rocks.

POLISH, formerly called Polands on account of their "polled" or crested character, have been found in South Russia, where they were famous for their egg-production. They have not met with much favor in America because few of us know how to handle them successfully. They have a small V-shaped comb, and right back of the comb a regular chrysanthemum clump of feathers called a crest. During the

breeding season these crest feathers should be clipped closely so the bird can see its enemies. It is also claimed the eggs are more fertile when the crest is clipped. In color there are several varieties: White Crested Black, Bearded Golden (the bearded have a clump of feather instead of wattles), Bearded Silver, Bearded White, Buff Laced, Non-Bearded Golden, Non-Bearded Silver, and Non-Bearded White.



White Plymouth Rocks.

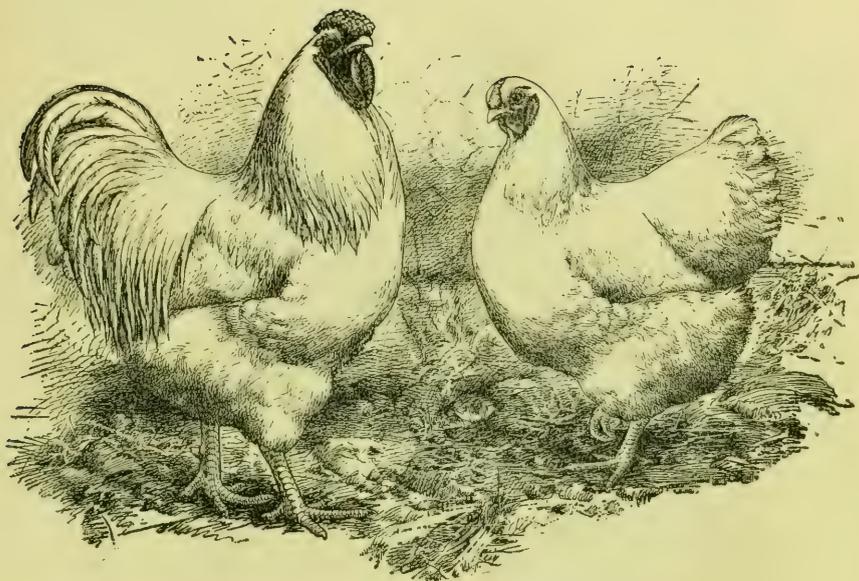
THE DUTCH OR HAMBURG are kept chiefly for their egg-producing tendencies. They are not as hardy as the Leghorn, are non-sitters, and lay a white-shelled egg. In color they are found as Golden Spangled, Silver Spangled, Golden Penciled, Silver Penciled, White and Black. The spangles are formed by a V-shaped black spot on the end of each feather, and the penciling is formed by a finely penciled bar across each feather.

ENGLISH RED CAPS are classified by the American Standard in the English class, but they belong, I believe, with the other European varieties. They are similar to the Golden Spangled Hamburg, only larger and coarser and instead of having a V-shaped tip on the feathers the black tip is moon-shaped.

The French have three varieties

of fowl which are recognized in the American Standard: The Houdan, the Crevecoeurs and the La Fleche. The Houdan belongs to our European class and is a good, practical fowl, although having a crest similar to the Polish prevents it from gaining favor among farmers, as a crested fowl can be caught easily by its enemies. They lay a white-shelled egg, are non-sitters, and their feathers are black and white mottled. Standard weights: Cock, 7 lbs.; cockerel, 6 lbs.; hen, 6 lbs.; pullets, 5 lbs.

The Crevecoeurs and La Fleche both show Polish origin, the latter have some appearance of Spanish in their make-up, so they properly belong to the European class. They are very rare in America and have lost favor in France, having been driven out by more profitable varieties.



White Wyandottes.

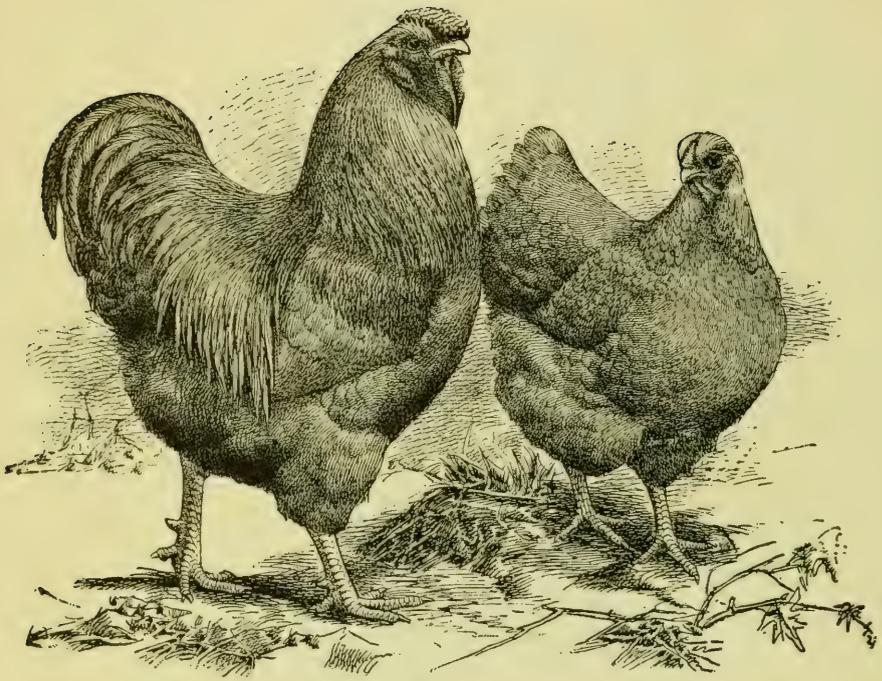
C.—AMERICAN.

This variety is the crowning glory of American poultry men and are our great utility fowl. They have been called American because they were originated here by crossing certain fowls which were quite numerous years ago and which have been developed into what are now known as Dominiques, with certain other varieties. The exact crosses have not been recorded, and if they were they would be useless because no one would care to start all over again.

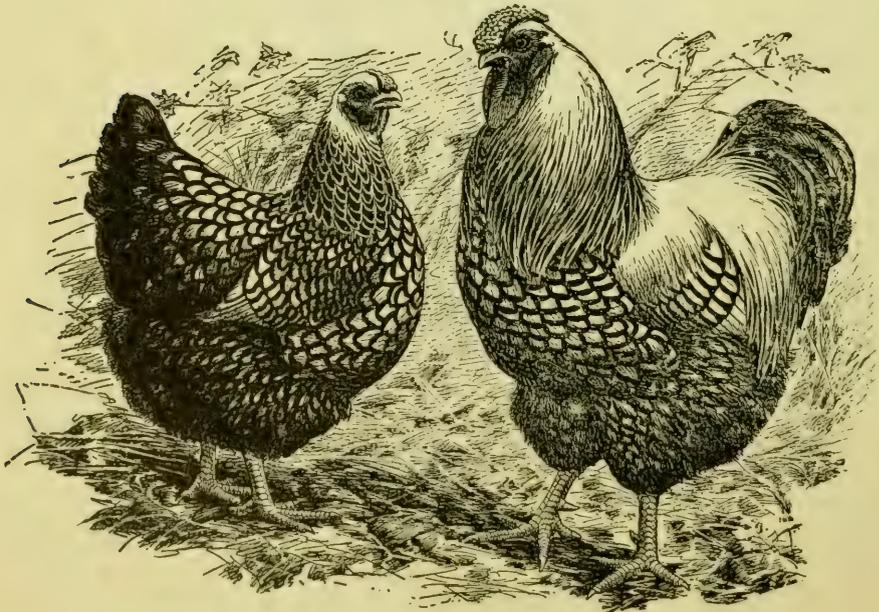
These varieties in the American class are, par excellence, farmer's fowls. They are hardy, quick-growing, good layers, good sitters and mothers, have flesh of rich yellow color and

good flavor, and are a fair, average size. The meat is not of as fine texture as the Cochin, nor as fine flavor as the Game. While they have not as much reputation as the Leghorns for egg production, yet in several contests in which Leghorns and other varieties were competing, American class birds have come off with first honors.

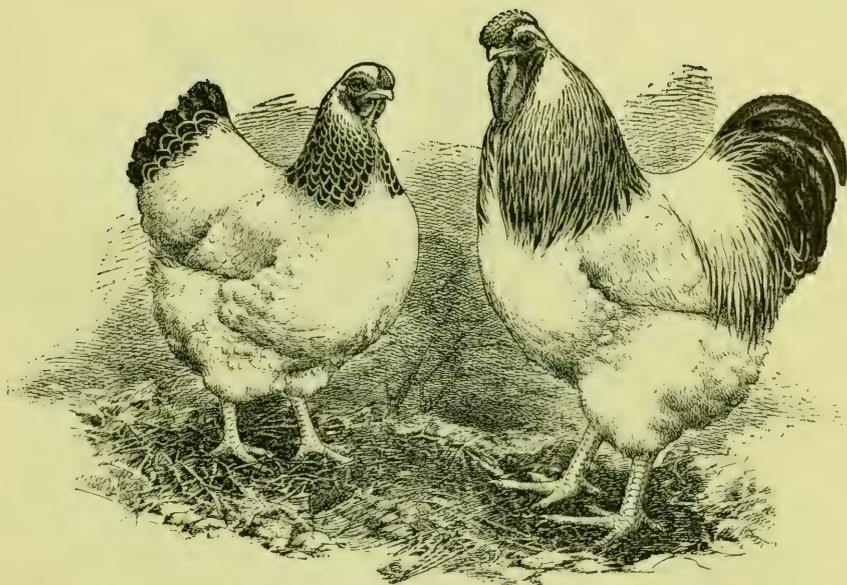
PLYMOUTH ROCKS were the first variety to gain favor. They lay a brown-shelled egg and Standard weights are: Cock, $9\frac{1}{2}$ lbs.; cockerel, 8 lbs.; hen, $7\frac{1}{2}$ lbs.; pullet, $6\frac{1}{2}$ lbs. The legs and toes are free from feathering and the flesh is a rich yellow. In color they are four kinds—Barred, White, Buff and Silver Penciled.



Buff Wyandottes.



Silver Laced Wyandotte.



Columbian Wyandottes.

WYANDOTTES are smaller than the Plymouth Rock and Standard weights are less: Cock, $8\frac{1}{2}$ lbs.; cockerel, $7\frac{1}{2}$ lbs.; hen, $6\frac{1}{2}$ lbs.; pullet, $5\frac{1}{2}$ lbs. In color we have Silver Laced. Each feather has a center of white and an edging of black. The back of the male is silver. Golden Laced in which the center of feather is golden red with black edging and top color of male is golden. White, Buff and Black are solid color throughout in both male and female. The Partridge is similar to the Partridge Cochins and Silver Penciled similar to the Dark Brahma, and the Columbian similar to the Light Brahma.

THE JAVAS are a fairly hardy variety resembling the Plymouth Rocks in general characteristics, and have the same standard weights. They are very rare and are found now only in two colors, Blacks and Mottled. The former being a greenish black throughout, the latter mottled Black and White. Years ago there was a White Java, but they are no longer recognized by the Standard.

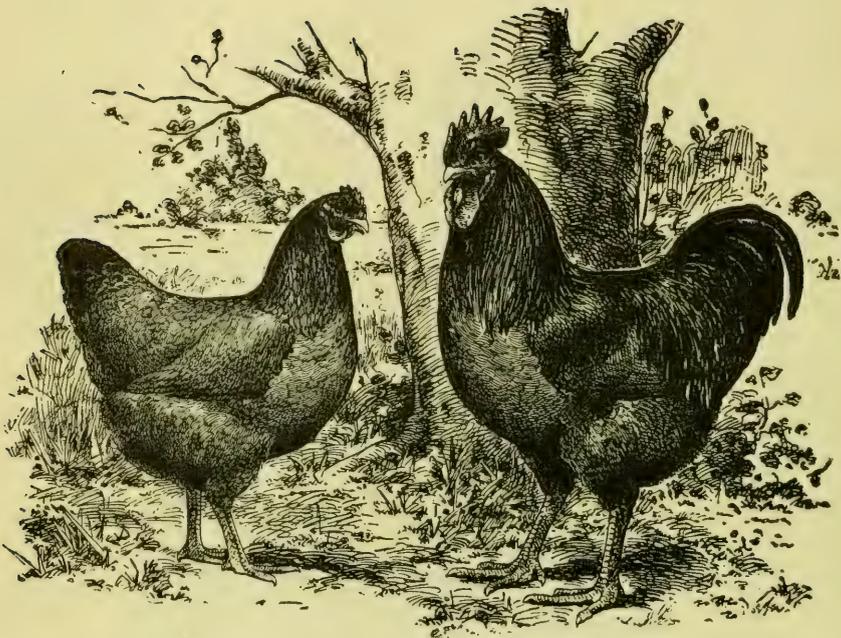
THE DOMINIQUES were at one time a very popular breed, but have been superseded by the Plymouth

Rocks which resemble them in color and which are of larger size.

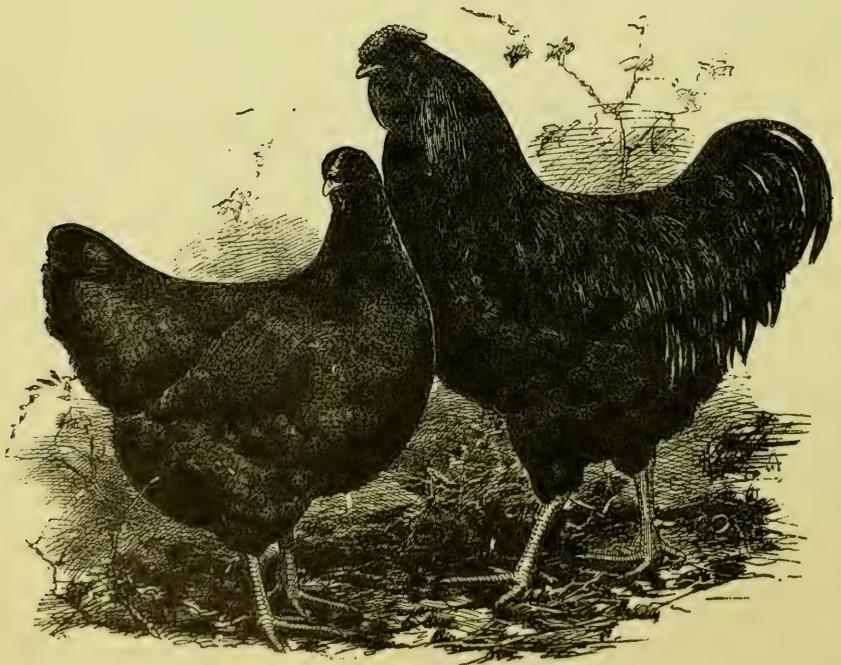
THE RHODE ISLAND REDS are one of the newer admissions to the Standard, although they have been bred in Rhode Island for a number of years. They have a rich, deep-red plumage with neck hackle tipped with black, and black in wing flights and tail. The flesh is finer grained than the Plymouth Rocks and of richer flavor, showing the Game characteristics. They lay a good sized brown-shelled egg, and are splendid sitters and mothers. Their hardiness, quickness of growth, the texture of their meat, their egg production and their brilliant red plumage have brought this variety rapidly to the front and by many are claimed to be the best utility fowl we have. The Standard weights are—Cock, $8\frac{1}{2}$ lbs.; cockerel, $7\frac{1}{2}$ lbs. hen, $6\frac{1}{2}$ lbs.; pullet, 5 lbs. There are two varieties, single comb and rose comb.

The Standard recognizes another variety known as Buckeyes, which are very similar to the Rhode Island Reds.

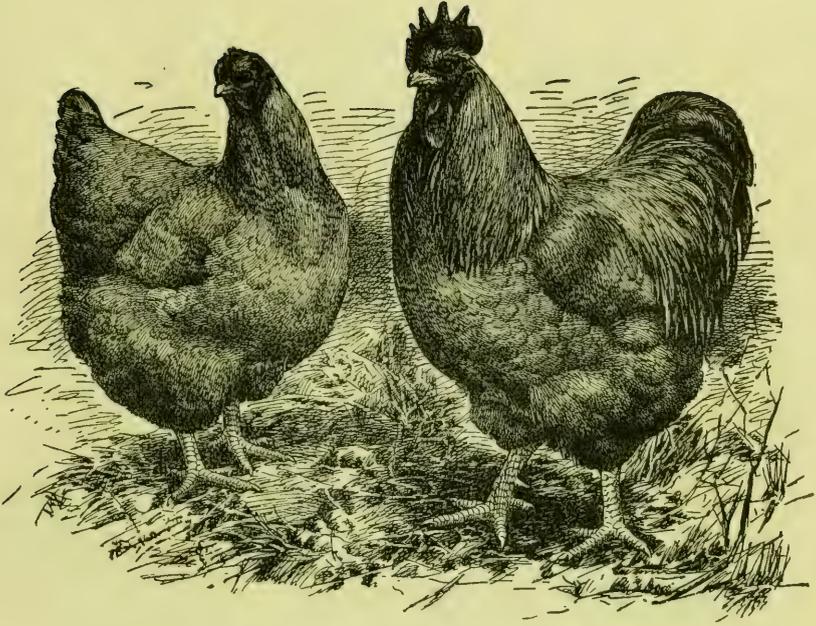
The above classification has included all the Standard varieties of poultry except the Orpingtons, Dorkings, Games and Bantams.



Single Comb Rhode Island Reds



Rose Comb Rhode Island Reds.



Buff Orpingtons

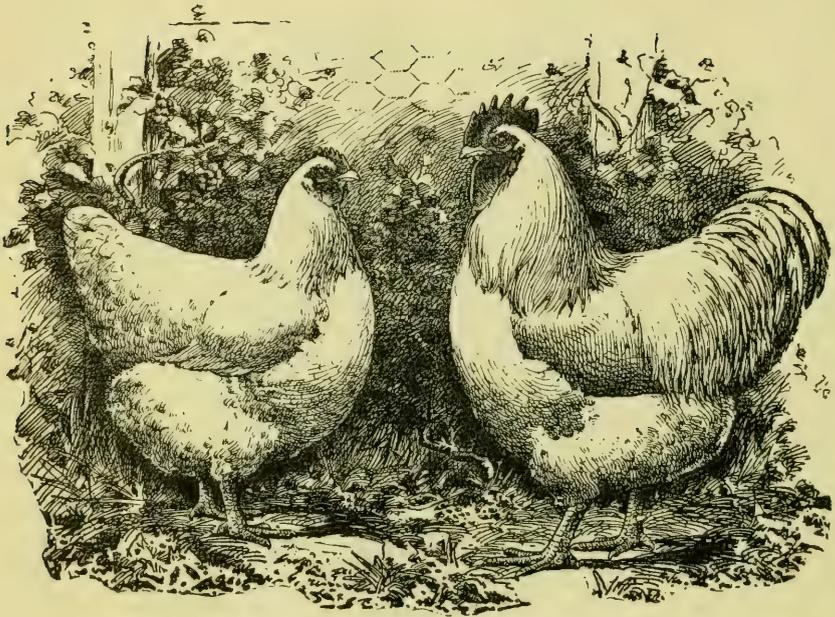
THE ORPINGTONS, although originated in England, would come under our description of the American class. They are a cross-bred fowl, and their purity consists in their being bred for several years without an out-cross which fact is true also of all the American classes.

THE DORKING is the Englishman's table-fowl, and has been bred as such for many years. If they had been bred and encouraged in egg-production, instead of putting on flesh and fat, they would be easily classified with the European varieties, as they have the general appearance of the Leghorn. Perhaps we can do no better than to say that they are an European variety developed for table purposes.

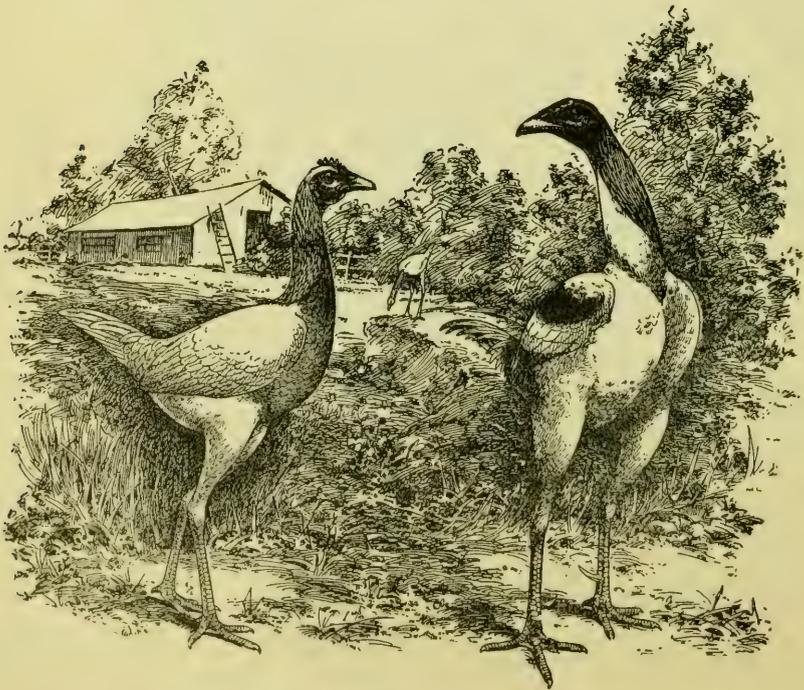
There are three kinds of Dorkings, White Dorkings with white plumage, rose-combed and red ear-lobes. Their standard weights are—Cocks, 7½ lbs.; cockerel, 6½ lbs.; hen, 6 lbs.; pullet, 5 lbs.

Silver Grey Dorkings are somewhat similar in color to the Dark Brahma. The male has silver colored hackle, wing, bays and bows and saddle feathers; the breast, fluff and tail are greenish black. The female has a silver hackle striped with black, the general surface color of back, wings and fluff is gray or silver stippled with black, the breast is salmon colored and the tail is black ticked with grey. The standard weights are: Cock, 8 lbs.; Cockerel, 7 lbs.; hen, 6½ lbs.; and Pullet, 5½ lbs.

Colored Dorkings.—The Colored Dorking male is similar in color to the Silver Gray male, but the feathers on breast and tail are splashed with buff or white. The female instead of being gray is a brownish black shade, striped with yellow, caused by the light shaft color of each feather. Colored Dorkings are the heaviest of all dorkings. Cock weighs 9 lbs.; cockerel, 8 lbs; hen, 7 lbs.; pullet, 6 lbs.



White Orpingtons.



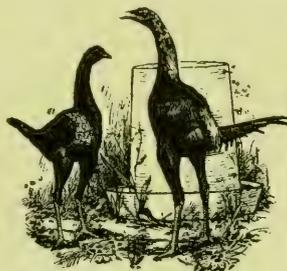
Red Pyle Games

GAMES.

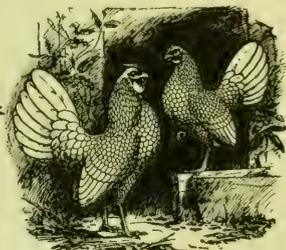
This leaves us with only the Games to account for, and it is not surprising that they are in a class by themselves, as they are the connecting link between the wild fowl of the jungle and all our domestic kinds of poultry. In fact, they are the only pure-bred fowls we have; all others have, within the memory of man, been crossed with some other variety of fowl for some specific purpose. Games are as delicate as young turkeys until about ten weeks old and then they are as hardy as any kind of fowl. Their meat also resembles turkey meat in flavor and texture.



Japanese Bantams



Game Bantams.



Sebright Bantams.

But it is not essential to dwell here upon this interesting subject. It is sufficient to say that the Game is a fancier's fowl and, while its great service has been to put color on many various breeds and texture and flavor in the meat, it has not gained favor because the "Standard" requires a fowl which is artificial and therefore unprofitable to produce for commercial purposes. They are found in five families: The Exhibition, the Pit, the Malay, the Cornish, Indian, and the Black Sumatra.

THE EXHIBITION GAME is a tall, stilty, crane-like appearing bird, having a walk like a turkey. The standard colors are Black Breasted Red, Brown Red, Golden Duckwing, Silver Duckwing, Red Pyle, White, Black, and Birchen. There is no standard weight required.

The **BLACK SUMATRA** games are similar to Cornish Indian only pure black in plumage.

As Bantams are, strictly speaking, a fancy fowl, I will not take space to

The **PIT GAMES** are used for cock-fighting purposes which is unlawful in certain states. They are similar in plumage to the Exhibition and are also found in many other colors, which have been obtained by crossing.

THE MALAY is similar to the Black Red, only more coarse and stouter built.

THE INDIAN GAME is a hardy fowl raised especially for table purposes. They are not generally liked because they are such poor layers. They are found in two colors—the Cornish and the White. The former are black with red stripes in the feathers and the latter are pure white.

say much about them here. They are the miniature of the large fowl and nearly every variety of large fowl have their representative among bantams. The bantam should weigh only one-fifth the weight of its large fore-runner. They have the advantage over the large fowls in that they can be kept in smaller quarters and do not require so much food.

With so many varieties of fowls, fulfilling specific requirements it seems folly for poultry men to place any dependence upon mongred fowls. Poultry fanciers have spent years in developing a pure-bred fowl with certain characteristics and it is a law of breeding that, only when you are breeding closely related animals, are you likely to get progeny in which the characteristics of the parents are intensified. Therefore, by cross-breeding the work of years is liable to be lost and the tendency of cross-bred fowls seem to be revert to the original ancestors which were small specimens, producing only a couple of dozen eggs per annum.

Chapter II. Characteristics of Fowls.

Successful poultry keeping depends primarily upon an accurate knowledge of fowls.

It is not enough to know that poultry require a house to protect them from the weather, feed and water. There is much more to be learned about our domesticated fowls which will be found useful in forcing them to yield a profit.

All of our fowls belong to what the zoologist calls the Aves or bird family and poultry writers divide them into two groups: Land and Water Fowl.

Of the Land fowls the chicken or Gallus family is by far the most common and the following varieties have been named as belonging to this family: (1) Bankiva or Ferrugineus; (2) Sonnerat; (3) Stanley; (4) Furcatus or Various; (5) Temminck; and (6) Aenus. But, Dr. H. P. Clarke, who has made a close study of poultry and who has visited the native haunts of these wild varieties, tells me that there are some other wild kinds which should be added to this list. He names the Black Sumatra which are found in the Island of Sumatra in a wild state and which are quite similar to the Black Sumatra Games as we know them in a domesticated state and which I have described in a preceding chapter. He also adds the Labao or Labuyu found in the Island of Minanao in the Phillipines; and the Chichalque, found in the Isthmus of Tehuantepec.

All of these birds in their native haunts are described as being hardy, great foragers living on bugs, seeds and fruits, fighting for supremacy and roosting in trees.

In addition to these varieties of the gallus family there are the Meleagris family from which we get our turkeys and guinea fowls; the Phasianus or Pheasant family: the Pavo or Pea Fowl; and the Columba family from which we get our pigeons and the Rhea or Ostrich family.

The Water fowls really all belong to the Anatidae or Duck family,

which includes the sub-varieties Anserinae or Geese and the Cygninae or Swans.

The history of our domestic fowls is so shrouded with mystery that it is difficult to trace the exact steps in the domestication of any variety; and even those who have introduced some of the very recent breeds of fowls have purposely or unwittingly kept the exact matings or method of production a secret.

But there is abundant evidence that our domestic fowls belong to these wild kinds which I have enumerated. They have been bred together successfully and this is considered by zoologists as the true test for determining a species of animals.

While all birds of the genus gallus will breed with domesticated fowls there has been more difficulty in crossing some of the varieties than others and as the Bankiva cross the most easily it is assumed that they are the real progenitors of our extensive family of chickens.

Now let us examine a fowl a little more closely.

A fowl is a two winged, two footed animal covered with feathers. The feet of the land fowl terminate in three long toes with claws and with only a little "web" between the toes; and one or two lateral toes. The water-fowl have only three forward toes and these are completely joined to each other by a "web" which makes of the foot a splendid paddle for propulsion in the water. Land and water fowl differ also in the character of their plumage. The land fowl's feathers are more fluffy near the quill than the water fowl, while the latter is furnished with auxiliary small feathers or "down" which is almost impervious to water.

Between land and water fowl there is another difference, namely: the beak or mouth. In the chicken this is pointed for picking, pulling and tearing the food. In the water fowl the

beak is broad and long and is suitable for swallowing minnows and small water animals.

Internally the anatomy of both kinds of fowls are much the same. The food first passes into a crop where it remains until thoroughly moistened with the water the fowl drinks and the secretions. The feed then passes to a gizzard where it is ground and prepared for digestion and assimilation in the intestines, from which the fibrous and mineral matter is voided.

Fowls also have a respiratory or breathing system; a circulatory system, with a heart; a urinary system with a gall-bladder which secretes a urine of whitish color which is voided through the intestines; and a generative system in which the embryo eggs or "yolks" form in grape-shaped clusters which, in the process of development, are dropped, from time to time, into the egg-canal where they are covered with the "white," the inner fibrous shell and the outer mineral shell. This egg canal is about 21 inches long and these three coverings are secreted consecutively around the "yolk" during its movement along this canal.

Fowls also have a nervous system which starts from a brain in the skull but this is very small and their reasoning powers are the smallest of any animal. In fact, a chicken has been known to live with the top of its head "chopped off." Such a bird was once on exhibition in our town.

There is a greater difference than the average person would think in the requirements of even the various kinds of land fowl and it is only those who learn to distinguish these differences as well as to discriminate between the appearance of a fowl in health or disease who can really expect to have the greatest success and obtain the greatest profits.

As these things are important I will take a little space to mention some of the points of difference which, I hope, will be help to the student of poultry keeping to develop this faculty of close observation.

Let me illustrate this point by explaining some of the differences between chickens and pigeons.

In chickens the males are polygamous, that is, one male will mate with several females, while with pigeons the males are monogamous; or, in other words they mate in pairs and a pair once properly mated will usually remain true to each other during their lifetime or until one or the other might get sick, when the well bird might mate with another of the opposite sex which did not have a mate. Pigeons and chickens also differ in their care of their young. A pair of pigeons will only lay two eggs, the male and female take turns in sitting on them to incubate them and when the young are hatched, nature has provided that the parent pigeons crop at hatching time will secrete a "milk" which they transfer to their young at "feeding" time. There is no such arrangement in the incubation of a chicken and the process of rearing is entirely different as I will explain in the chapter on caring for little chicks.

In poultry, as compared with four-footed animals, there are some striking differences. Their bones are much thinner and smaller in proportion to the amount of flesh, which is made possible by the more rounding shape of the body. The lungs are placed directly under the back bone and in the wild birds the air which is breathed is not confined to the lungs, but passes through and penetrates a number of membraneous cells and in some cases even extending to the pinions, bones of the thighs and other parts of the body. From this it will be seen that the amount of air taken into the breathing system of a bird varies considerably and seems to accommodate itself to the surrounding circumstances.

Under domestication, of course, this characteristic is greatly modified; but, it seems to me that many of our poultry authorities in the past have failed to consider this great lung capacity of a bird. In fact it is only recently that open air houses have been found to be a great improvement over the former closely built house, and, no doubt, this breathing capacity of a fowl is the specific reason for this improvement—it allows a greater development of this lung function.

Another great difference between birds and mammals is the formation of the eye. A bird or fowl's eye is

furnished with two membranes—an external and an internal—in addition to the usual membranes found in the eyes of mammals. These extra membranes affords the fowl great focusing power so that a bird can see farther and see also more minute particles than any other animal. This accounts for two things which every poultry keeper has often observed but which may have been more or less of a mystery. First the peculiar action of a fowl when it sees a large bird flying at a great distance overhead. There is no doubt that this is caused by the bird's eye being focussed upon the ground looking for minute particles sees the bird overhead many times larger than it really is and thus is filled with fear at the unusual sight. Secondly, this great magnifying power enables the fowl to see the minute particles of food many of which are invisible to the naked eye.

While a bird's breathing power, sense of atmospheric conditions and eyesight are greater than man's its reasoning power is much less. In fact a chicken is perhaps the most senseless animal which we have. When allowed to roam naturally they will return to their home at night with considerable regularity, and precision; but try to chase them home or "flusterate" them in any way and you have a task on your hands—they do not seem to have sense enough to go through a hole in the fence. Thus they are greatly dependent upon the care of their keeper.

Under domestication there has been change in these various kinds of fowls. This change, however, has been greater among the varieties of chickens than any of the other. They have responded more readily to man's care and manipulation. In fact all of the other kinds of fowls are today almost identical with their wild progenitors, excepting; perhaps, pigeons, which have been modified largely as to shape and color. But, when pigeons are allowed to breed indiscriminately they soon revert to the original type—the Blue Rock Dove.

With chickens man's efforts have been to increase size and egg production and the progress along these two lines has been really marvelous, especially when their wild progenitors only produce a couple of dozen eggs per year and weighed only about four

and one-half pounds. Whereas there are many flocks in this country today which have an average egg production of over fifteen dozen per annum and specimens which weigh 11 and 12 pounds each, as described in a previous chapter.

Just what factor has played the most important part in this development has not been determined and is now the object of the poultry investigators most careful study.

Probably the greatest factor has been selection. By selecting the best birds, the largest and best layers, and using them in the breeding pens we have gradually developed our fowls to a high degree of productive power. Naturalists tell us that progress is made in two ways: by inheritance and care in the development of the offspring. Or, in other words, a character which has developed in an animal, even though it was not apparent in its parent, is likely to be transmitted to its offspring. It is for this reason that close attention and great care should be given to the subject of care and feeding of fowls, for fowls which have been developed by careful attention will quickly degenerate when favorable attention is withdrawn.

Our knowledge of these things leads to the formulation of some general rules which should be studied and observed.

1. The land fowl should be made to "scratch" or "pick" or "tear" its feed.

2. It should be kept dry.

3. Its feed must consist of animal, vegetable and mineral matter with sufficient water to moisten it.

4. Its reasoning powers being small man must assist by placing proper feeds before it.

The water-fowl should have access to running water. I know this is an opposition opinion to what a famous duck raiser says, but water fowls for breeding purposes will thrive best when they have free access to running water.

All varieties of poultry will incubate their own eggs; although some of the European varieties do not "sit" until they are 3 or 4 years old.

Chicken eggs hatch in 21 days, Turkeys and Ducks in 28 days, and geese in about 30 days.

Chapter III. Poultry House.

The next thing to consider is the poultry house. Before deciding upon the style of house it is essential to decide upon the object or purpose of keeping poultry; whether for eggs, broilers, roasters or fancy.

In settling this question the location of the farm in reference to a good market is important. A farm near Boston or New York will do well producing broilers and eggs; while west of Chicago most of the farmers depend upon eggs and shipping adult birds.

It is difficult to decide for another which is the most profitable end of this business, and each must study his local market to determine what poultry product will sell best, and arrange his plant accordingly.

Regardless of the plan decided upon a laying-house will be necessary, and I will undertake to give some examples of such houses which experience has found to be satisfactory and profitable.

There are two kinds used for this purpose, (1), the long, continuous house divided into a number of apartments or pens; and (2), the detached house or colony system as it is called. Both have their champions and advantages. The long, continuous house is the handiest and saves steps, especially in winter time; but if disease once gets started in such a house nearly every fowl throughout the house will catch it. The continuous house requires less lumber, and therefore costs less, which no doubt is an important reason for its existence.

The nature of the fowl and practice has shown that chickens cannot thrive in damp or draughty quarters. So in building we should plan to make a dry and draftless house. To make a dry house requires a good roof, and good drainage below.

It is better to have a cold, dry house than a warm, damp house. The warmer the air the more moisture it

will hold. When this moist air comes in contact with a cold surface, condensation takes place which is often converted into hoar frost. The remedy, therefore, is to remove the moisture, as far as possible, by first cutting off the water from below which comes up from the soil. The water-table is the same under the hen-house as it is out-doors, hence the necessity of having the floor-level inside the house higher than surrounding ground-level, as shown in illustration,

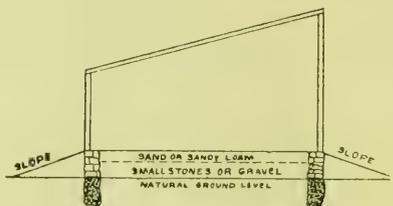


Fig 1. Foundation Plan.

Fig. 1. Especially is this necessary if the floor is of dirt. In filling in, if small stones or gravel are used for the bottom layer and a covering of clay for a floor, it will be much drier than if earth alone is used.

Personally, I favor a board floor, as it permits of thorough cleansing and scrubbing with a disinfectant which is necessary should disease get a start. A board floor can be made comfortable and satisfactory if the foundation is built tightly of brick to extend a foot or more above the ground surface. The foundation below the natural ground surface can be constructed cheaply of concrete, using the stones from the field or roadside. Common scantling will do for sleepers, and by making a trap-door in the center and letting a terrier dog down below for an hour or so occasionally rats will be kept away, if they ever do get in.

A cement floor has been recommended, but it is usually cold, and in

wet weather absorbs moisture and remains damp. If used, it will have to be kept covered with plenty of straw or similar scratching material.

There is an advantage in having the poultry house face the south because our severest storms come from the north and a south window receives more sunlight. The location of the windows can be determined by studying Fig. 2 which shows the position of the sun as determined by Cornell University. The size of the windows should be carefully considered. Too much glass makes a house too cold at night and too warm during the day because glass is a good conductor of

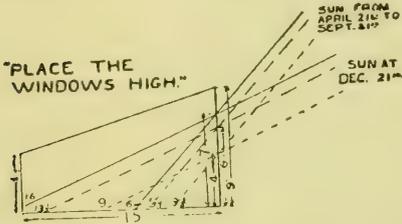


Fig 2. Showing the Elevation of the Sun at different Seasons.

temperature. The rule is about 1 square foot of glass to 16 square feet of floor space.

To overcome dampness in a house an experiment was tried as follows: The windows of three different rooms in a long poultry house were arranged as shown in Fig. 3. In No. 1 the windows were left closed; in No. 2, the top sash was dropped the length of one light and a curtain set in the place and in No. 3 the sash was dropped from the top and raised from the bottom, curtains being placed over the openings. During a winter room No. 3 was practically dry whereas in No. 1 there was much moisture and it always seemed "chilly." No. 3 was also found to be about 6 degrees warmer than No. 1.

A splendid form of poultry house is shown in Fig. 4 where there is a comfortable tight room for the coldest weather and an open front scratching sheds for bright days and warm weather.

Another plan is illustrated in de-

tail in Figs. 5 and 6, which makes a splendid house for winter layers. This house has a feed room 12x20 in the middle, and on either side of that a wing 60 feet long divided into five pens 12 feet wide. The divisions are solid as far as they go—from the back to within three feet of the front. This space between the divisions and the front is left open, and the birds can run freely from one pen to another. In each house 360 to 400 birds are kept. This house is 20 feet deep, but I think 16 feet sufficient and, by putting the roosts as far from the front as possible, it will be noticed in the illustration, that this plan gives a large

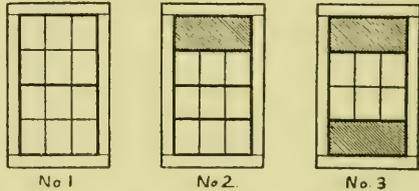


Fig 3. Showing Different Arrangements for Windows.

area in which there is no draught whatever. A drop curtain in front of the roosts can be used, but has not been found necessary in New York state climate.

Each 12-foot pen has three full windows with twelve 8x10 lights. The top sash is hinged and is swung out except on windy days.

Along the bottom there is a space below the two outside windows covered with shutters on the outside, and wire screens on the inside, one of which is also covered with unbleached muslin. The wire screens keep the birds in the house when the runway is closed. The runway to the yards is placed below the middle window, and this is kept closed in bad weather. On very windy days the shutters are kept closed, with the exception of the spaces covered with the unbleached muslin. During all other days both shutters are kept open, but are closed at night during cold weather.' '

Here is a "secret" or plan which will make money for some. We have

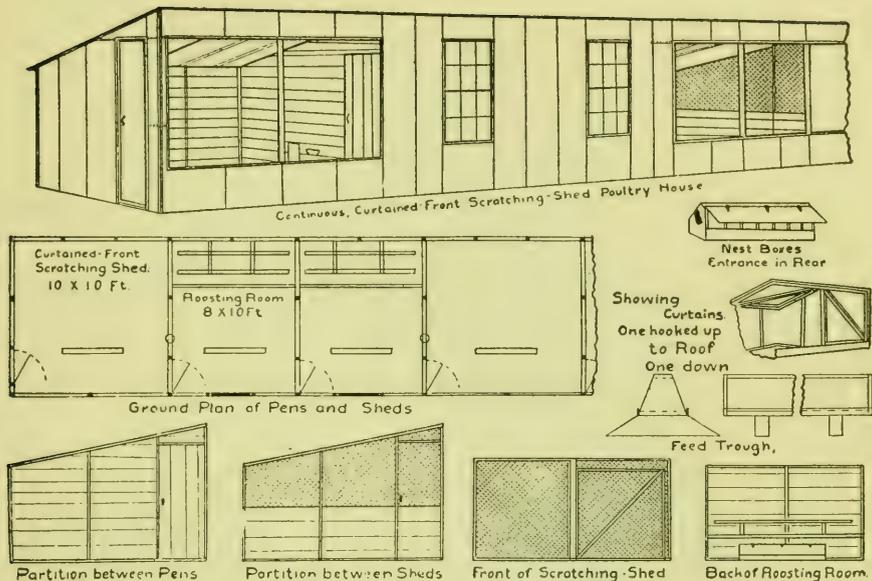


Fig 4. Showing Successful, Continuous Curtain Front Scratching Shed Poultry House.

been told of a farmer in England who had a pasture of 20 acres back of his barn, into which he turned his work-horses summer nights. In this pasture he put five colony houses with 50 hens in each. He fed them until they became accustomed to their quarters, after which they were not fed anything and only fresh water was given them. They laid an abundance of eggs, and the horses did not seem to mind them; in fact, after this plan was carried on for several years the horses seemed to go into the vicinity of the houses to eat grass, and more horses could be pastured than before this plan was adopted.

The colony house takes many forms to suit every fancy and is built of a great variety of materials, from rough boards, piano-boxes, paper, canvas covered, etc.

In one of the poultry papers for March, 1907, Mr. Tolman described a house used by him, which has since been called the Tolman "fresh air house". We give a view of the house as described and a plan of the floor.

The usual dimensions are 8x14 feet, with eaves 4 feet in front, 5 feet

in back, and 7 feet at highest point over the door. The front being low keeps out sunlight, but this is overcome by a door in the east and windows in the west which allows the early morning and afternoon sun to enter the building. The front of the house is enclosed with two-inch wire-mesh only. The roof and sides are of one-inch board, nailed to 2x4 inch studdings and rafters, then covered with sheathing paper and prepared roofing. In summer doors and windows are removed and frames covered with one-inch wire-netting used in their stead. The wire door could be attached on the outside like a screen door. The working of this house has been described as follows:

"The front of the fresh-air house is never closed. The roosts in the rear of the building being above the level of the bottom of the front plate (or eaves) insures the fowls against exposure to any winds which may blow in at the open front. They are protected at all times from drafts by the tight back sides and roof. The peak of the roof coming in just in front of the roosts insures a banking

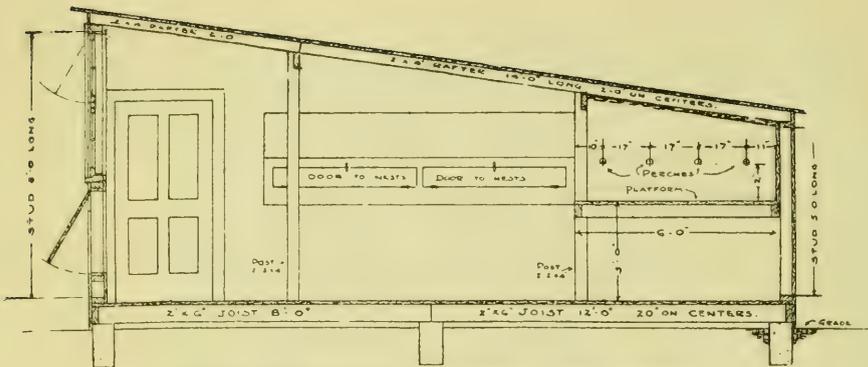
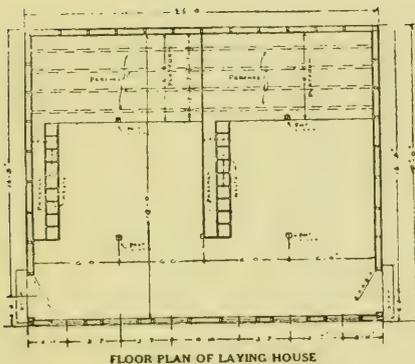
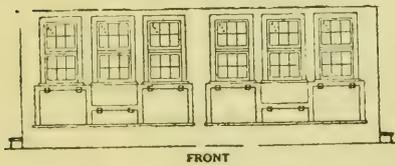


Fig 5. Side View of a Successful Poultry House.



FLOOR PLAN OF LAYING HOUSE



FRONT

Fig 6. Floor and Front Plans of House Shown.

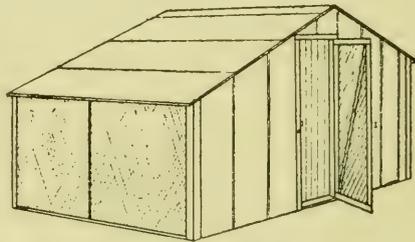


Fig 7. Exterior View of Talman Fresh Air House.

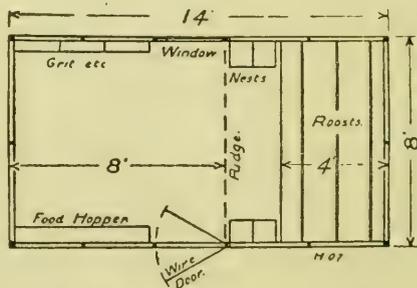


Fig 8. Plan of Talman House.

up of the warm air, (the warmth produced by the fowls themselves) in such a manner that the part of the house occupied by the fowls is the warmest place in the building, and this on the coldest nights in winter. It should be remembered that this warm air, while it retains the heat, also has an opportunity to lose the

impurities exhaled by the fowls, as it is a well known fact that while heat rises impure air does not rise but sinks to the bottom; the foul air that is dangerous to breathe will always be found nearest the door in a tight building. In a fresh-air house the

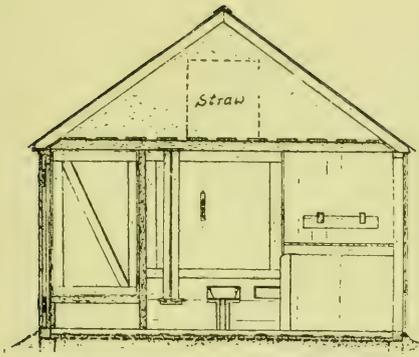


Fig. 9. End Plan of a Canadian Poultry House.

open front prevents any accumulation of foul air near the floor. One has only to go into a house of this type to have this fact practically demonstrated to him. He will find the house comfortable and warm, warmer than a shed-roofed type of building at the roost level."

The essential interior furnishings of a hen house is a roosting place, a nest box, a feed hopper, a water fountain and a dust bath. The best forms for these articles will be further described and better understood under the chapters on Care and Feeding.

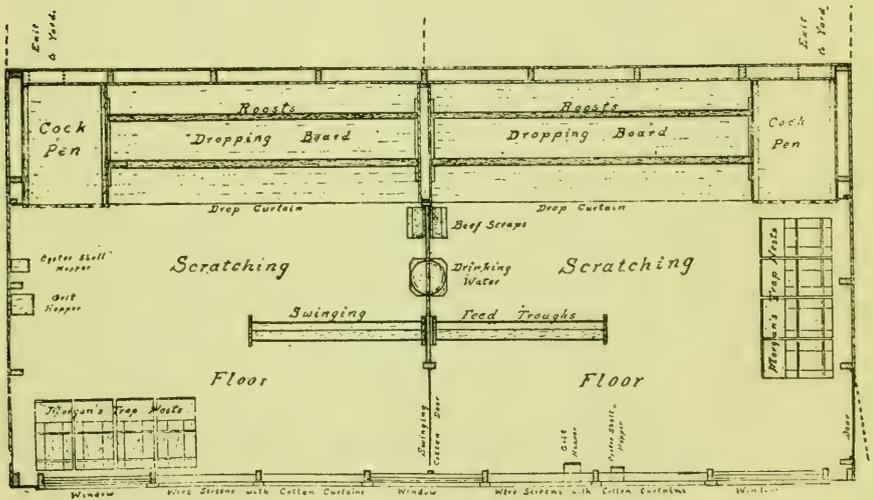


Fig. 10. Floor Plan of Successful Canadian Poultry House. See Fig 9.

Chapter IV. Feeds.

To understand animal feeding properly we must stop and study the various Feeds. This may be dry reading but it will pay and no one will ever get the best results from poultry until he or she thoroughly understands this part of the subject.

In Feeds there are three principal nutritive elements: Protein, composed of the protids, carbohydrates, fats, ash and fiber.

(1) Protein is the albuminous or nitrogenous matter; in grains it is known as gluten, in meat and blood it is known as fibrin, and in milk casein. It is nourishing food and supplies material for muscle, blood, bone and eggs.

(2) Carbohydrates are the sugars and gums in which carbon and hydrogen are the principal elements. They form the bulk of nearly all foods, and as digestion is a slow process of burning it is obvious that carbon or coal matter and hydrogen-gas are the principal sources of heat and energy.

(3) Fats or oils are found in practically all foods, and in digestion work with the carbohydrates, in furnishing heat and energy. As fat is used directly in digestion its value in food is two and one-fourth times as great as the same percentage of carbohydrates.

In addition to the above, there are some minor food elements, as follows:

(4) All feeds contain some lime and other mineral matters in small quantities called the ash, and in poultry feeding ash is useful to furnish material for egg-shells and feathers.

(5) Fiber which is found is husks and waste matter. It has no particular nourishing value, but is essential in giving the food a proper bulk, preventing it from packing so tightly that the digestive juices cannot reach it. The Department of Agriculture at Washington, D. C., publishes a bulletin Feeding Farm Animals, which gives a table of analysis feeding stuffs.

From these tables it will be seen

that the foods have what is called a heat or potential energy. In the table the nutritive value of field corn is given as 1:7.9 that is one part of protein to seven and nine-tenth of carbohydrates and fat; and has a potential value of one hundred and six.

It has been calculated that when food has one part of protein to about five of carbohydrates and fat (or 1:5 as it is usually written) it is called a balance or a balanced ration.

Wheat is an ideal grain for poultry and is the bread and butter of the poultry household. It will be seen from the table that its nutritive value is 1:6.3 and this is a good average ration for laying hens.

Corn has a food ration of 1:7.9, which is considerably higher in carbohydrates, or heat and energy producing substances. It has several advantages; it is sometimes cheaper, and if the fowls are kept active by having to hunt in straw or litter for finely cracked corn they seem to thrive and do well on it. It is a splendid food on cold nights, and no matter how much a fowl has eaten it will run after more corn. Corn, then, is a "candy" for poultry. Corn-meal is useful in mash, and if hay or green food is unobtainable, bulk may be added to the mash by grinding some of the cobs.

Wheat-bran is used considerably in all mashes of ground grain. In the patent process of milling, it varies considerably, some containing a very small percentage of flour. Bran is useful in fowl constipation, as it acts as an irritant to the bowels. Middlings and shorts are useful, although their quality varies as does bran. They make the mash sticky, or doughy, so should not be used in large quantities.

Oats have a feed ration of 1:6.1 which is about the same as wheat, which makes them a splendid summer feed and are found commercial as hulled oats, ground oats and oat-meal. The U. S. tables state that oats contain about twice the percentage of

ash as corn or wheat. This ash makes this grain of great value to use as a food for growing stock, as the ash tends to strengthen the bones, and this gives a good frame work for the fowls. Oats also may be "sprouted" as explained in the chapter on feeding.

Barley has a nutritive ratio about the same as wheat, but has more ash or bone-forming substances. Chickens do not like it, which is, no doubt, due to the hulls. They seem to enjoy hulled barley

Rye, although about the same composition as wheat, is not generally fed to poultry in America. It is used considerably in England. Rye seems to physic some fowls, which is perhaps the reason some feeders do not like it. But rye-bran or rye-flour would be a valuable addition to the mash.

Buckwheat is fed considerably where it can be purchased cheaply. It has a food-value about the same as corn, but its shape makes it difficult for poultry to pick it up, hence it is more readily eaten if fed on straw or soft earth.

Millet seed is rich in flesh-forming materials, or protein, but also has a large amount of fiber which causes trouble in little chicks, if fed exclusively. It is a good grain to mix in mashes.

Kaffir corn has about the same food value as field corn, but is valuable because it requires the fowl to pick oftener to get the same quantity of grain.

Hemp seed is especially rich in carbohydrates, and is useful in toning up birds for exhibition, as it puts a fine gloss on the feathers.

Canary seed is used considerably by Bantam breeders as it tends to keep the birds small.

Linseed meal and cotton-seed meal are very rich in oil, and where fed in the mash act as a lubricant in the digestive system and also improve the plumage.

Sunflower seed is especially rich in oil, and is said to be a good egg-stimulant, and puts a good, healthy gloss on feathers.

Meat foods are necessary and useful, especially to stimulate egg pro-

duction, and consist of the following:

Green bone, ground or cut by machinery. The great difficulty with this food is that it is so rich that many over-feed with it. It should be mixed with corn-cobs or clover hay, or other bulky foods which will distend the crop and allow proper digestion.

Raw, lean beef also is too concentrated, and is usually too expensive, although it is a great egg-stimulant.

Fish scraps and fish intestines are fed to poultry on the sea coasts. While they have high nutritious value, they impart a fishy odor to the eggs.

Beef scraps or dried blood manufactured by our packing houses are perhaps the best and most economical source of protein. They can be obtained quite generally, and are in such a shape as to be readily mixed in the mash.

Those who are fortunate enough to live near a city where they can obtain stale bread from hotels or restaurants can thus secure a very good food for poultry. A mixed lot will give great variety, and some poultrymen use no other mash food. Soaked in warm water and thickened with corn-meal or bran, with a little beef scraps added, makes it a very good mash.

Cracker crumbs are also very good, and the soda in them is often useful to correct intestinal troubles.

Eggs are a good, but rather rich and concentrated food.

Vegetables are valuable in feeding fowls, especially in winter when they supply the green grass elements, and nearly all are relished by fowls.

Potatoes are rich in carbonaceous matter, and are best when boiled.

Onions have a tonic effect, and when fed raw tend to give their odor to the flesh and eggs, therefore they should be boiled. When boiled, as much as five pounds to one hundred hens may be fed daily without causing any trouble.

Cabbage makes a splendid winter green food and is useful to furnish exercise by making it necessary for the fowls to pick it.

Beets, mangels, turnips and carrots are likewise best fed raw and

placed where the fowls can pick at them.

GRASS AND HAY—It is surprising how much grass a fowl will eat in summer, and when fowls are allowed to run on the grass in summer the eggs seem to come in greater numbers. Just why this is so has never been fully determined, but the green pigment in grass also seems to intensify the color in the yolk of the eggs, making it richer looking.

Of hay, the clover is the best. Alfalfa, which is of the same family as the red clover, has many friends. I have noticed, however, that alfalfa is not relished by fowls like red clover, and believe this is due to the bitter taste which it has. Both alfalfa and red clover are rich in protein, and make splendid foods. When ground to a meal they can be mixed with the mash. Some makers of alfalfa meal are mixing molasses with it, and this, no doubt, overcomes the bitter taste. Molasses of itself has splendid food and tonic qualities.

Milk in all forms—sweet, sour, buttermilk, curds or whey—is good for fowls. It can be given to drink or used to moisten the mash. When milk is used for this purpose it will not be necessary to use as much grain as when water is used.

Few fully appreciate the real value of fresh skimmed milk, especially that obtainable from a separator before it loses its animal heat. It has great bone and flesh growing properties; in fact, the Percheron horse owes much of its size and fine qualities to the sweet skim-milk fed to the colts.

All poultry supply houses now carry grit for poultry. In the Central Western States where the surface soil is a black loam, grit is indispensable and must be furnished to supply the gizzard with grinding material and also furnish the silica to

produce feathers. Commercial grit contains silica, magnesia, sulphur and lime.

Oyster Shell—Some use this in place of grit, but as it is composed mostly of lime, grit has some advantages over it.

Dry bone is useful for the phosphates it contains, but is not used as much now as formerly, due largely to the increased use of green bone.

Charcoal is almost pure carbon, and is useful as an aid to digestion and as a blood purifier.

We have spoken of certain feeds as tonics and stimulants and, of course, it is understood that these are only mild, and in no way injurious. On the market, however, there are for sale condimental foods known as condition powders, etc. In a commercial poultry plant these all have a place. Our own foods without salt or pepper would taste flat, and would soon nauseate us; in fact, we could not live without salt, and it is required by all animals in greater or less quantities. Of course, we do not recommend condition powders to fowls which are doing well without them. But during changeable weather, in spring, fall and winter, and during the molting season, fowls will do better if fed a good condition powder in the mash food.

It is surprising how much grass a fowl will eat in summer, and when fowls are allowed to run on the grass in summer the eggs seem to come in greater numbers. Just why this is so has never been fully determined, but the green pigment in grass also seems to intensify the color in the yolk of the eggs, making it richer looking.

These various feeding stuffs are given here for reference. In practice it is unnecessary to use all of them although I am a strong believer in the theory that variety has many advantages for fowls as well as the human family.

Chapter V. Feeding Secrets.

As various kinds of poultry at different seasons require varying foods, it will be seen that to feed successfully a flock of chickens is no child's play, but requires the greatest care, observation and good judgment.

The rules for feeding are almost as numerous as the poultry feeders—some thinking only of the fowls, and others thinking only of their own convenience.

It is apparent from what I have said that fowls having extensive range require a different course of feeding than those in limited quarters. The former will do well with plenty of drinking water and very little grain, while the latter require green stuff as well as mash, water, grit and grains.

Successful feeders are like artists—the best are born, not made. Successful feeding is an art which, while based on the science of foods, requires long practice before one masters all the details, so that the eye knows whether the food is too rich or is given in too great quantities.

Of course, when a careful egg record is kept, and when the fowls are weighed occasionally, these matters can be determined accurately. But this involves considerable labor, and in these days the labor costs.

There are, however, four things to observe:

- The Fowl,
- The Feed or Feed-Box,
- The Dropping Board,
- The Egg Yield.

The healthy fowl has an appearance of its own which everyone should know, or get some poultryman to point out. It is active, alert, "skeery," runs at the appearance of strangers, etc., the comb is red and the appetite ravenous. The fowl that hustles the hardest and goes to roost last with a full crop is the producer. There are very few exceptions to this rule.

THE FEED OR FEED-BOX.—The successful poultryman does not throw down so many measures of feed and pass on. He pauses a moment or two and notices the eagerness with which the fowls partake of their food and later goes through the pens again to see whether all of it has been eaten up.

Watch the dropping board, it is the secret of proper care and will reveal the physical condition of the fowl. Normally the droppings should be firm, grayish black mass, terminating on top with a light grayish substance which is the secretion of the gall-bladder. If the droppings are soft and of a yellowish or brownish color, it indicates too much carbohydrates or lack of meat. Too much meat will produce droppings that are watery, with dark red splashes of mucus. A greenish, watery diarrhea usually indicates unsanitary conditions in the surroundings, the feed, or the water.

The successful poultry raiser, also studies carefully any fowl that is killed for the table. By examining the crop and gizzard of such fowls much can be learned concerning the general condition of the flock. The quantity of fat around the intestines will show whether there is too much fat forming matter in the feed. In considering this it must be remembered that some individual specimens in a flock will have more of a fat forming tendency than others and this tendency is always strongest in the fall months.

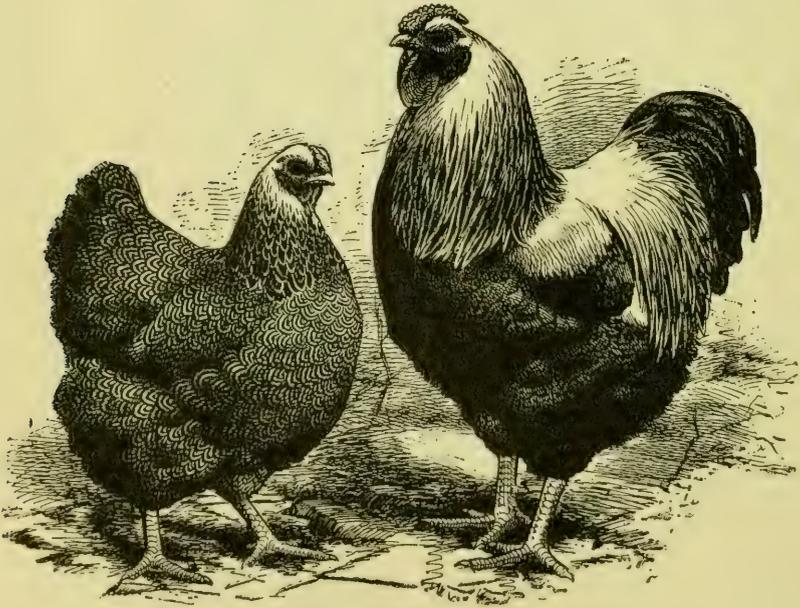
Recent investigations show that many hens have diseased egg producing organs and cannot lay. Some have placed this average as high as 15 per cent. It is known also that pullets that suffer from roup or other serious poultry disease are slow in recovering the egg producing faculty. To get the best results you must have pullets that have been properly raised and

that are strong, healthy, vigorous "rustlers."

Of late years much has been written about hopper feeding. The styles of hoppers are too numerous to mention. There is no question but that they are useful for feeding little chicks especially in a brooder as they are likely to get hungry at a time when no attendant is near. For adult fowls they save labor, but as the egg production depends upon activity I prefer to make the fowls get practically all their food by scratching for it

in the natural method. On the other hand, for fattening or growing fowls I approve of hopper feeding.

Cooked foods have some advantages. Fowls do well on vegetables and table scraps. They like potatoes, turnips and carrots but cannot break them very well, hence such vegetables should be cooked and fed in the mash. I do not like to feed hot foods in cold weather, it makes fowls "mope" around which is opposed to the greatest egg production.



Silver Pencilled Wyandottes.

Chapter VI. Feeding for Eggs in Winter

Fresh eggs in winter are a delicacy and as I write the newspapers announce that such eggs are bringing considerably more than "storage" eggs. American hens have never produced enough eggs to supply the demand and every year importations are made from Canada. It is quite evident that if all eggs could be stamped to indicate their freshness the demand would be greatly increased.

The secret for getting winter eggs is proper stock, feed them the proper elements and make them "scratch."

The proper stock will consist of April hatched pullets and yearling hens, in good health. There is a difference of opinion as to the variety but to me it is not so much variety as it is proper care.

In winter I prefer giving a moist mash feed for first meal as it is ground and being moist passes quickly into the gizzard. Do not feed too much. Let the hens be hungry enough to scratch for additional grains. The mash feed formulas differ with different localities and accessible grains. The following are two good ones:

Good wheat 200 lbs.; cornmeal 100 lbs; middlings 100 lbs; gluten meal, 100 lbs; linseed meal, 100 lbs; beef scraps, 100 lbs; to which may be added 5 lbs ground charcoal and 5 per cent. sand or grit.

Another formula is 2 parts cornmeal, 2 parts wheat middlings, 2 parts beef scraps, 1 part wheat bran, 1 part alfalfa meal. Remember its the happy hustling hen that "scratches" that lays the egg.

About noon I feed the grains in the litter. I like to get as great a variety as possible as I think variety causes the hens to do more hunting. The first time over they will not get all and will keep at it. I prefer cracked to whole corn because it makes the hen pick oftener to get sufficient food. In extremely cold weather I like to

throw them some whole corn just before roosting time; but you must remember whole corn is a strong fat producer and too much will produce fat and not egg. Further, quick, light, active hens can partake of more corn without serious disturbance of egg production than the large sluggish fowls.

Of course, fresh water, grit, oyster shell and a dust bath should be accessible at all times and be sure there is no vermin in the pen. Chicken lice is a great enemy to egg production.

The water should not be hot nor should it be allowed to freeze.

The dust bath is best when made from road-dust and wood ashes, with a little air-slacked lime and flour of sulphur.

Green food must be supplied in winter if the best results are to be obtained. For this purpose a cabbage suspended from the ceiling by a string, just high enough so the chickens can reach it will do wonders, a turnip or mangel cut in two lengthwise and nailed to the side of the house will furnish good "green" food also.

Sometimes I use sprouted "oats." They are prepared by placing some oats in a box having sides about 6 inches high and by moistening the oats and keeping them in a temperature of 70 degrees F., they will sprout. In about 7 days they will be fully twice the size and much more relished by the chickens than whole oats and much more beneficial. By having seven boxes a continuous daily supply can be kept up.

The oats should be first soaked over night in luke warm water then spread in the boxes about two inches deep and moistened daily. They should be stirred daily until they start to sprout after which moisten only. In seven days the sprouts should be about six inches long making a matted

mass which can be broken up and scattered in the pen or mixed in the mash feed. Chickens will not hurt themselves eating too much of this feed.

For a small flock a six inch flower pot will do and seven of them are

not out of place on a kitchen window.

After emptying the growing pans they should be washed thoroughly with a disinfectant and dried or the growing oats will develop a "mould" which may prove injurious to the fowls.

Chapter VII. Incubators.

With so many firms advertising incubators it would seem unnecessary to add anything but there are some differences in makes of incubators and perhaps a suggestion or two may not be out of place.

The incubator is a great aid where fowls are to be raised in large numbers. I would sooner care for one incubator than ten setting hens and then, the incubator is ready when you want it. It also enables you to have early hatched chicks or late hatched just as you prefer. It is a wonderful help on a farm as the machines can be started and chicks ready to go on grass before the regular summer farm work begins.

Those who have never used an incubator cannot comprehend its advantages, and those who have used one invariably tell me they would not be without it. Of course, we must recognize a difference in incubators as found on the market today, and they are not all perfect by any means. But the best machines will, if proper care is used and the directions followed, hatch nearly as large a percentage of healthy chicks as the hen.

Let us pause for a moment and study the egg. As found in the nest the egg is an oval sphere larger at one end than the other, and the outside covering or shell is made up of prismatic particles, so arranged as to leave pores between them. Upon breaking the shell, we find a yolk surrounded with a white semi-liquid. But if an egg is incubated for a few days, and then hard-boiled and cut in halves

lengthwise, much more will be revealed.

The process of the development of the chick has been described as follows:

"A few hours will enlarge the central spot, which becomes oval with a furrow down the center and blood-veins appear around it. Then a double membrane called 'amnion' appears, which later entirely encloses the embryo along with what is called the 'amniotic fluid.'

"By the second or third day the tiny embryo enclosed in the amnion can be clearly seen. A magnifying glass will then reveal the eyes and pulsation of the heart. At or soon after the third day another growth, called the allantois, begins to develop on the digestive canal of the embryo, between the two coats amnion and at a later period also encloses the embryo.

"By the fifth or sixth day the allantois can be clearly seen as a bag or sac protruding from the navel independent of the yolk-sac. By this time rudiments of the wings and legs can be clearly seen as buds or small clubs standing out from the surface of the body which has grown a good deal.

"At the tenth or eleventh day signs of the feathers can be distinguished, and motion of the animal is often perceptible when the egg is opened.

"Generally about the nineteenth day the beak ruptures the membrane which divides off the air-chamber, and the chick for the first time breathes air through the lungs, after which the chick's blood gradually ceases to flow

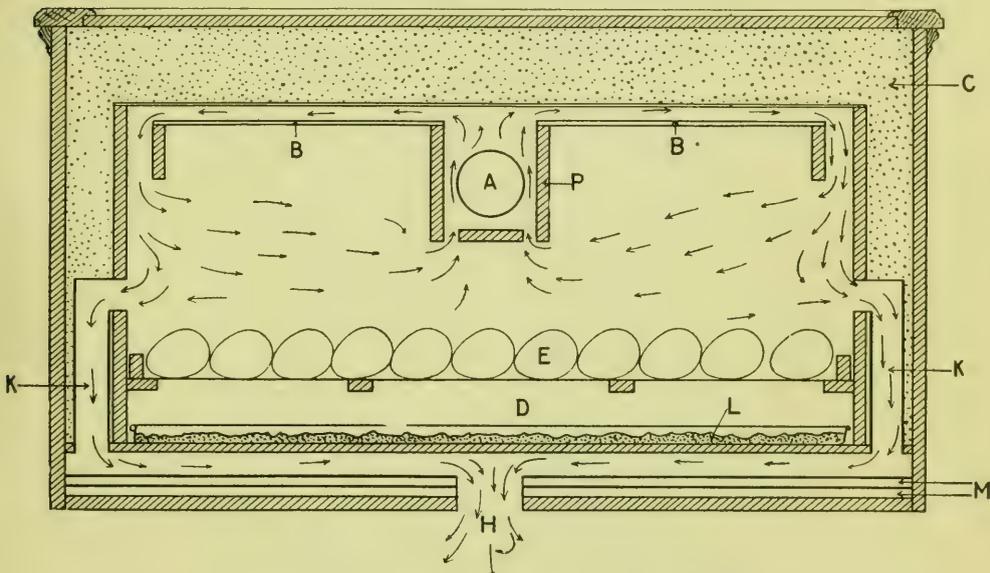
into the veins of the allantois, which has completed its work and is no more needed.

"Finally on the 21st day the chick breaks its shell by the aid of a sharp-pointed hard scale, especially provided for the purpose at the tip of the upper beak.

"During the process of development the embryo has at first been lying as a small object on the upper

passes through the yolk-sac in this process.

"Shortly before hatching, the entire remaining nutritive material of the egg is gathered within the considerable shrunken yolk-sac, and during the last few hours it is rapidly drawn into the abdomen, where it furnishes food for the newly-born chick during the first day of its indifferent existence."



Prairie State Eddy-current Distributor and System of Ventilation.

Patented March 10, 1908. Patented 14, 1909.

- A—Inlet pipe from heater, which discharges air into box or enclosure, P.
- B—Metal radiators in the top of egg-chamber.
- C—Cotton-batting filling between inside and outside cases.
- D—Nursery.
- E—Eggs.
- H—Discharge outlet of the ventilating current of bottom of incubator.
- K—One of four pipes to discharge air from the above level of the eggs in the egg-chamber to false bottom underneath nursery.
- M—Strawboard dead-air space insulation in bottom of incubator.

surface of the yolk; later on, as it increases in size definiteness of form, it is clearly apparent that the neck of the yolk-sac is in connection with the umbilicus or navel. The material needs for growth is therefore derived primarily through the yolk; but as the original yolk-mother is absorbed, it is replaced by fresh material from the albumen drawn through the delicate membrane. The albumen forming much of that of the chicken, but it

From the above it is obvious that eggs intended for hatching should be handled with care, or some of their membranes will be destroyed. They also should be turned occasionally so that the yolk does not settle to one side through the albumen or white as it must be completely surrounded by the white or it will not hatch.

There are two methods of hatching—the hen and the incubator.

Let us first study the hen. If given

an opportunity the hen will lay her eggs away in some dark, secluded spot, and sit on them. Such actions, which are caused, it is said, by instinct, show us what kind of a place is best to set a hen in. The Ontario Agriculture College has been conducting some experiments and studying the process of incubation, and, while their experiments have not gone far enough to determine all they hope to determine, they have shown that the hen in the process of hatching, gives off carbonic acid gas, and that the atmosphere under the hen is by the process of condensation, saturated with moisture a number of times each day. It is therefore apparent that a nest on the ground in the shade, where it is nearly always moist, is the place a hen will choose for herself, and is also an ideal place for scientific reasons. We know there are exceptions to this, as a hen's nest in the hay-mow, but new hay contains some moisture, and the aroma from the hay is a gas and who knows but what this gas plays an important part in incubation?

Therefore, in setting a hen, choose a shady room as near the ground as possible. I use a box about 16 inches square and six inches deep. The inside of this is painted with carbolic lice-killer; then I put some moist earth in it, making it hollow in the center, and cover the earth with straw.

These boxes are set side by side with tight-board partitions between them, and several hens are set at one time. If the hens are all from one flock, and there are just as many nests as hens, there will not be much trouble if a little care is exercised the first day or two to see that only one hen gets on a nest. I always put the

sitting hens on the nests after dark.

I usually test the eggs the tenth day and if there are any unfertile ones, they are removed and the fertile ones doubled up and some of the hens are given a new lot of eggs.

Testing eggs easily can be done by egg-testers, which are now offered for sale. They are made of tin and shaped like a lamp-chimney, with an opening on one side just the shape of an egg. By putting this chimney on a lamp, and holding an egg to it in a dark room, it easily can be determined whether the egg is fertile or not. If fertile it will be dark except at one end; if infertile it will be perfectly clear.

When the chicks come they should be left in the nest until they are thoroughly dry. They should not be fed until twenty-four or thirty-six hours after they are hatched. I will explain later about feeding them.

The incubator method is better understood from what we have said of the hen. The machine, if it has been used before should be washed out and aired so it will be "sweet" and clear. Every incubator manufacturer furnishes directions for operating the machine which should be followed closely to get the best results.

Fresh air in the incubator room is essential.

I cannot say which machine I would purchase if I were getting a new one as there are a number of good makes on the market. My choice, however, would be a hot air machine, with moisture sand pans and the best made machine possible. Because with moisture within there is expansion and contraction of the wood which, unless the machine is well made, will open the joints and let heat leak out.

Chapter VIII.

Secrets for the care of little chicks.

The care of little chicks divides itself in two methods—the “bidly” or hen method and the brooder or foster-mother method. Have you ever noticed that when the chicks are only a day old, if the old hen is lifted off from them she will make a peculiar noise and the little ones will huddle down as close to the ground as possible. This indicates that they have already learned the mother call, and with the old hen the care and feeding is comparatively simple. I prefer leaving the chicks in the nest until the second day.

When taking the hen from the nest I dust her with a good death-to-lice powder and greese each chick on the head and under each wing with head lice ointment.

I prefer putting the hen in a coop with a slat front so the hen can reach out and teach the youngsters to pick grass. I boil the infertile eggs and use the yolks crumbled in oatmeal for the first food, which is generally given the first morning after the chicks are hatched. By evening I give dry grain cracked fine, which is sold almost everywhere as chick food, and this food is given exclusively for practically the first three weeks. There is quite a difference in the quality of these foods. They should contain cracked wheat, hulled or cracked oats, cracked corn, beef scraps, and grit. Some use millet seed and kaffir corn but a little of the millet seed goes a long way and it is hard to digest.

The little chick must have good care and attention until it gets its first feathers and watch must be kept to prevent chicken lice which are fatal to the little fellows.

In the brooder the litter should be cut clover or chaff so if the chick does eat it, no harm will be done. When about seven days old the brooder chicks can be said to distinguish be-

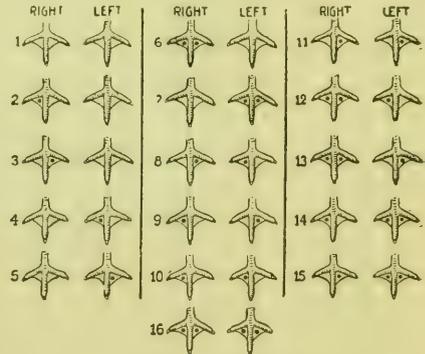
tween feed and non-feed.

Do not over-feed little chicks is the secret of success. As I have shown the yolk has been absorbed into the abdomen of the little chick and this is sufficient to maintain life for several days hence it is not necessary to worry about the little chick starving during this period. They should be fed lightly four or five times a day. Be sure the first feed contains some grit or you will have indigestion. The crop is the point to watch. When it is full stop feeding. The last feed at night should be the heaviest.

Do not feed too rich food. Green bone should not be fed to brooder chicks until after 10 days old.

Summing up, the care of brooder chicks is divided into three periods.

First, a continuation of the period of incubation, which lasts three or four days, while the yolk is being assimilated. During this period the chicks require as high temperature as the incubator or about 100 degrees Fahrenheit.



This diagram shows 16 different ways of toe making young fowls.

Second, the foolish or stupid period, before they fully learn to discriminate between what they should or should not eat, which lasts from seven to ten days. During this period the

brooder chick should not be given a chance to eat anything that is not beneficial. At this time they will pick at almost anything bright, such as a tack, salt or grit. Of course, the latter will not hurt them—the others will kill them.

Third, the selective period, or the time after the chicks are from ten days to four weeks old. From this time food may be left before them all the time, and if the food is before them, they will select what is best, and practically balance their rations. At the end of this period, or at four weeks old, they should be well covered with their first feathers, and therefore be able to protect themselves from cold and sudden showers. If the weather is favorable, they should then be allowed as much run on grass as possible. The young chick should have feed of a small size proportionate to itself. A number of poultry supply houses carry such feeds ready mixed and which also include grit.

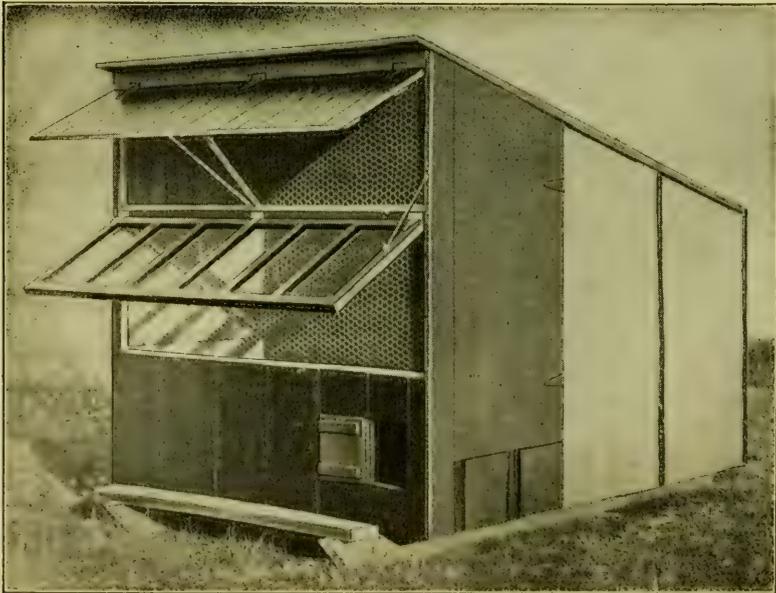
Cracked wheat, 25 pounds; cracked

corn, 12 pounds; millet seed, 10 lbs.; oatmeal (steel cut), 10 lbs.; kaffir corn, 25 lbs.; rape, 3 lbs.; cracked peas, 10 lbs.; cracked rice, 2 lbs.; hemp seed, 2 lbs. Grit or beef scrap are often added, but as more grit and animal food is needed in some places than others, it is just as well to feed them in hoppers with charcoal, and let the chicks help themselves.

After chicks are six weeks old a good scratching food will contain the following: Whole wheat, 25 lbs.; coarse cracked corn, 20 lbs.; millet seed, 10 lbs.; oats, 25 lbs.; barley, 10 lbs.; kaffir corn, 25 lbs.; cracked peas and buckwheat, 10 lbs. each, may be added and a small quantity of sunflower seed is beneficial.

If it is desired to force the chick for market the following makes a good food: Corn-meal, 5 lbs.; bran, 2 lbs.; beef scraps, 2 lbs.; middlings, 1 lb.

As the chicks get older the grains used may be larger and at ten weeks they can eat almost any of the whole grains.



Type of portable colony house used in Prairie State Experimental Plant—6 by 8 feet in size. Open front style. Six feet high, four feet in rear, with dropping-board two feet from the floor. Two roosts. Tight wooden partition in front—two feet high—to protect chickens from wind. This house is practically of the open-front type, but owing to the position of the glass sash and wooden awning, prevents storms and rain from blowing in and wetting the straw, which is the great fault with the ordinary open front houses. Wet litter is undesirable scratching material. This house may be used for laying birds for rearing young chicks in the summer-time and for a portable broodhouse in the early spring when fitted with Universal Hovers. The peculiar construction makes it adaptable to almost all sections of the country, both north and south.

Chapter IX. Pure Bred Stock.

Pure-bred or Standard-bred poultry has advantages over common stock for four purposes. It is more uniform both alive and when dressed for market. It has certain definite characteristics and if all the qualities desired are not found in one breed two breeds can be kept. It grows more rapidly on less food and the best specimens can be sold at many times the market value of such fowls. There is no advantage a cross-bred fowl has over the average pure-bred fowl. Pure-bred fowls, raised on range are generally as hardy as any fowl could be. Of course, there are many breeders who coddle their fowls and consequently have sick chickens, but if the poultry houses we have described are used and a balanced ration is fed, there should be but little difficulty.

It naturally follows if pure-bred fowls are kept, they will be taken to the fairs and poultry exhibitions. Anyone desiring to do this, should get a copy of the Standard of Perfection which is for sale by all farm paper and poultry journal publishers, and study the requirements of your variety. If fowls are kept on grass runs, they will be fit to show almost any time, but if there is no grass, white fowls will have soiled plumage and should be washed. This washing requires three tubs of luke warm water; one with suds to thoroughly soap the fowl, and two for rinsing purposes, so all the soap will be rinsed out of the feathers. The fowl will have to be immersed, leaving its head out of the water, of course, and while the feathers are damp, they can be scrubbed with a sponge or soft brush until all the dirt is removed. Ivory soap or "Wool" soap is the best. When the feathers are clean the fowl should be rinsed in the other tubs and placed near a fire to dry. Be careful to keep them on clean straw or they will get their fathers soiled again.

The bird should be kept standing near a warm stove or over a hot-air

radiator. If it is a white bird some indigo may be added to the last rinsing water, not quite as much as used in the laundry (indigo does not contain the acid which is usually found in ordinary liquid bluing). Breeders of white birds also sprinkle their birds with corn starch when it is nearly dry which helps to dry the bird and gives him a fluffy appearance.

At the winter shows a little butter rubbed on the combs and face of the fowl improves its appearance. Care should be taken, however, not to use too much. There is no law against thus grooming the fowl and it is perfectly fair to do so.

Mating fowls for the purpose of producing high-class pure-bred specimens is an art which is difficult to master and, really, it is never mastered, because no one has yet been able to produce a specimen which has scored one hundred points. But this need not prevent us from trying to do our best.

Prizes are won only by fowls which conform to certain rules and descriptions which are found in the American Standard of Perfection. The makers of these rules plan ideal descriptions to please the committee's taste in accordance with the specimens found at our leading exhibitions. They ask us to strive for certain characteristics which are remotely possible with the hope that perfection will be obtained.

The problem which confronts the pure-bred breeder is to take specimens which are not perfection and attempt to produce perfection.

There is a general rule in breeding that "like producers like." This is more generally true when the fowl is like its ancestor and strong in vitality. The vigorous male is not difficult to pick out; he is shy and when caught will struggle to free himself, he will crow often and lustily, his comb will have a healthy red appearance, his body will be broad and there

will be plenty of meat on the breast bone; deficiency in any of these characteristics indicates weakness. The female is a little harder to determine but the hen that scratches vigorously, that "sings as she works" and has a good healthy red comb is generally of strong vitality.

LINE BREEDING.

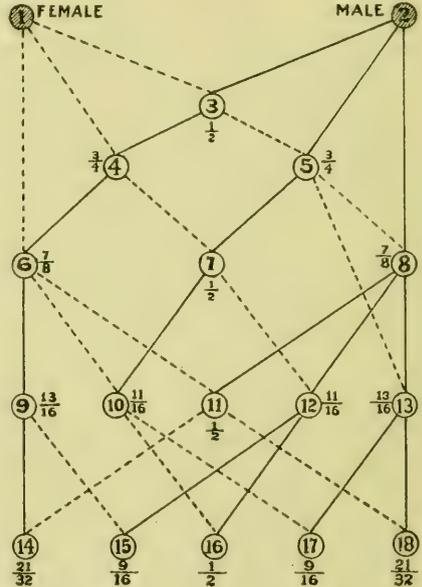
The best method to follow is what is known as "line-breeding" which is best explained by referring to the attached diagram, Fig. 2. Select six or eight good yearling hens with typical shape and good color and let them be represented by spot 1 and spot 2 represent a first class male especially good in color. The progeny of this pen will be spot 3 and if the females were full sisters the youngsters would be half the blood of each sex.

The second year we have three pens if desired. No. 4 consisting of the original females mated to a Cockerel from No. 3; No. 5, the original male mated to pullets from No. 3, and No. 3 which will consist of a cockerel mated to the remaining pullets. These matings will give progeny with blood relations as indicated by fractions. Or if you only have room for two pens, a cockerel may be mated to the hens and the cock to the pullets. If you should happen to know the dam of the cockerel, she may be left with the cock. The offspring this year will be a study and will give the breeder valuable lessons. He will see the tendency of his flock. Some of the old hens will have molted and the feathers will have faded and appear off color. The hen that has good standard color after moulting is the strong colored bird. You will see by this time that your flock is getting too dark or too light. If the birds are any color except white perhaps some white feathers will have shown themselves. Discard such specimens in most breeds, especially in the males.

As a general rule we look to the male for color and the female for shape.

The illustration indicates the original females may be bred to their own sons for two generations and the third season crossed with a cockerel from

No. 11 which is half the blood of the females and which will give offspring which is 11.16 the female blood. If this plan is followed the next cross, or four years from starting, you will have both cockerels and pullets which are 21.32 the female blood in pen No. 14, and 21.32 the male side in pen No. 18. In pen No. 16 you will have some



of both sexes that are 1/2 the blood of the original male and half the blood of the female.

Hence if you could have had four pens each year, in five years you will have a strain of your own.

It is assumed that each year you have selected the best and discarded all specimens that were mismarked and disqualified.

If you have not the room for four pens join with some neighbor in breeding a standard variety and exchange birds each year.

Another way and an economical one, is to buy a setting of eggs or a pen of fowls from a good breeder. I believe most good breeders of purebred poultry are honest men; in fact, their whole success depends upon giving good value for their money. A business like this that is built up by advertising can be very easily

killed by a very few "kickers," hence breeders must, in the great majority of transactions, give a fair deal.

If you have pure-bred birds now and wish to improve them, I would recommend picking out ten or twelve of the best females and putting them in a pen by themselves; buy a first-class mate to go with them, and use their eggs to hatch the chickens intended for breeders next fall. If the hens were divided into two lots, the male changed from one pen to the other each day and the eggs from each pen kept separate and hatched in

separate lots, no more males need be procured, as a cockrel from one pen could be mated to the hens of the other and the old cock bird mated to his best daughters. In this way a strain of uniformly shaped birds could be made in three or four years.

If, however, your females were not of good shape and had any serious defects, it would take a long time to produce high class exhibition specimens.

The first plan of buying as good birds as your pocket book will permit and building up a strain of your own is the most satisfactory.

Chapter X. Marketing Fowls.

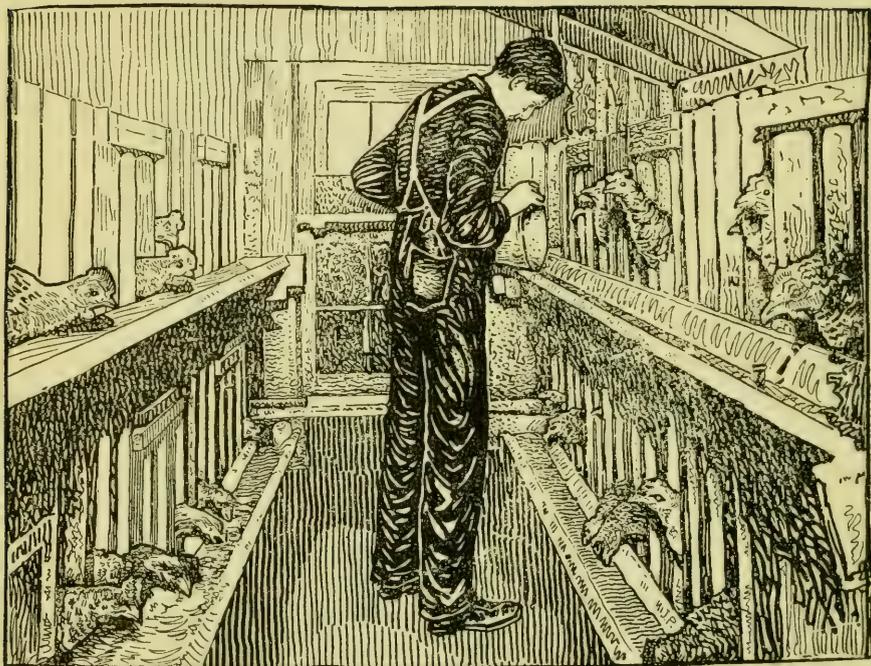
There is no subject of more importance to poultry raisers than marketing. Upon the poultryman's ability in this direction depends the success of many poultry plants, and there are a few general rules that will apply to the various cities located in different parts of our country. It seems, however, that the cities of both the Atlantic and Pacific States offer a better market than our central state cities. This being so makes it difficult to treat this subject explicitly. It is easier to see why a large city with its flat-dwellers is a better market than a country village, and, therefore, all large cities have a better market and pay higher prices than small towns.

Those who have studied the market conditions for the past ten years will have noticed a marked increase in the demand and the tendency has been for better quality, consequently the prices are better. Experience proves that anyone living within one hundred miles of a large city, who has the desire to raise high-class market poultry or eggs easily could find a market for them at profitable prices. There have been only two drawbacks to this kind of business. First, many have engaged, or practically secured, a market before going into the business, and when they finally got their poultry plant in operation they failed ignominiously in accomplishing what

they had planned to do. The second difficulty arises from poultrymen not realizing the volume of the demand. I have been told of one poultryman who went to a large hotel to try to sell broilers, and who thought he could furnish one hundred per week. He was surprised to find that in the broiler season that hotel would need at least one hundred per day, and occasionally they might have a banquet when they would need three or four hundred more.

MARKETING BROILERS.—Broilers should be ready for the market at about ten weeks old. The last week they should be kept in close quarters and given all the forcing mash and cracked corn they will eat. Corn puts fat directly under the skin, and in markets calling for a yellow-skinned fowl, this is a great advantage. Some markets prefer them alive. When they are to be killed they should be killed by cutting the jugular vein inside the mouth with a poultry-killing knife, and dry picked. Leave shanks on and do not draw them. You must study what the people want and try to keep the quality uniform. For this purpose a standard breed of fowls has the advantage over a lot of mongrels, and almost any of the American varieties are useful for this purpose.

MARKETING ADULTS.—Here again we must study the needs of



This illustration shows how to convert a shed into a fattening house.

purchasers, and unless fowls are to be marketed in large quantities, it is perhaps just as well to market them alive. They can be improved materially by close housing and giving them a liberal feed of whole corn, grit and fresh water. Some have taken the trouble to fatten the fowls. To accomplish this they are put in coops and fed a mash in troughs.

The Iowa agricultural college recently conducted an experiment along this line as follows: Several dozen Barred Plymouth Rocks cockerels were purchased from the local produce man at 13 cents a pound. They averaged $3\frac{1}{2}$ pounds. They were placed in slatted crates $6\frac{1}{2}$ feet long, 20 inches deep and 16 inches high, divided into three compartments. Each compartment held four birds. For convenience, portable houses 8 by 12 feet, that held four crates, were used. In practice any shed that affords shelter and fresh air without drafts may be used. The birds were fed in troughs just in front of the crates. These

troughs were removable, so they might be easily washed and cleaned.

The ration which gave the greatest as well as the most economical gains was made up of equal parts by weight of corn meal, ground huller oats, ground hulled barley and beef scrap. To this was added twice its weight in buttermilk. No water was given. The same amount of well-soured milk in place of the buttermilk gave nearly equal results. This ration gave better results when mixed and allowed to stand 12 hours before feeding. The birds were first starved 24 hours and then fed twice daily as much as they would clean up in 20 minutes. The high art or secret of fattening poultry seems to rest with the feeder's ability to know when the fowls have had almost enough. When that time is reached, the food should be removed at once. It is better to underfeed a trifle than to overfeed. If fowls are overfed, they "go stale" and refuse to eat well, and so fail to make good gains.

At the end of two weeks the birds that had received the above ration had gained more than 20 pounds to the dozen. The cost a pound gain did not in any case exceed 6 cents and was generally nearer 5 cents. We sold the birds to the same man we bought them of at 15 cents a pound, although the price for springs had dropped half a cent. The difference paid was because of improved quality. In round numbers the profit over cost of feed was 25 cents a bird. This was made in a western town of about 4000 inhabitants and is a conservative figure. If situated near a larger place, where quality brings a greater premium, the margin would naturally be greater.

It is necessary to keep the coops and feeding troughs, as well as the shed, absolutely clean. If a contagious disease should be introduced, it would have an excellent opportunity to sweep through the flock. The danger of disease, however, where the farmer raises his own birds and raises them right is less than it is where one is buying promiscuously. It was found that it stimulated the appetites to give the fowls some succulent green food, as young clover, two or three times during the feeding period. Grit and charcoal were also fed twice during the period. The type of bird that has fattened best has been of the stocky, short-shanked, broad and deep-bodied, wide but short-headed sort. The narrow-bodied, long-legged, crow-headed kind will not fatten well.

CAPONS.—There is a constantly growing demand for capons, and this furnishes a splendid market for surplus cockerels. All manufacturers of caponizing tools furnish full directions for caponizing free, so it is hardly worth while to explain the process here. In marketing, however, the neck, wing and thigh feathers are left on, and only the body feathers plucked. They usually bring three

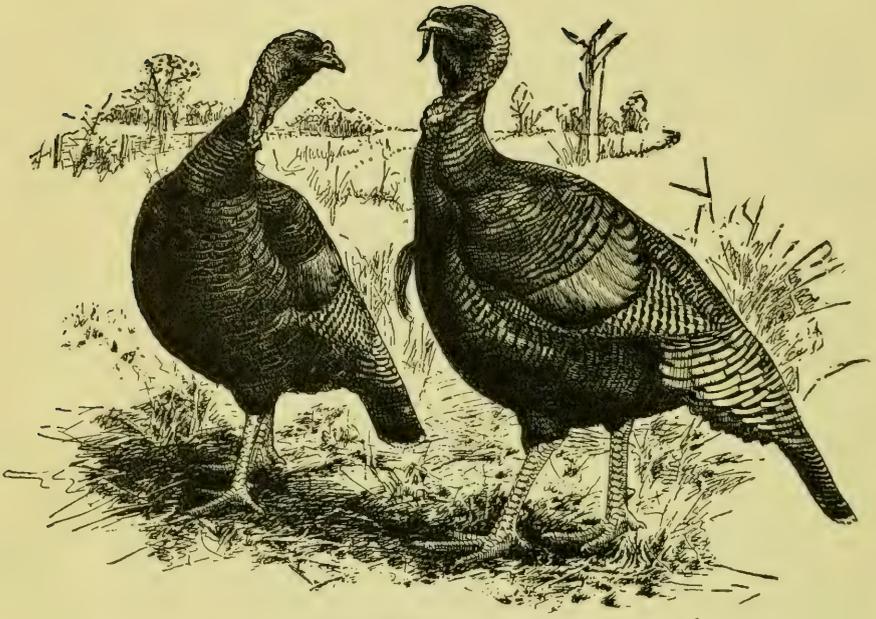
or four cents per pound more than other poultry at the same season, and, besides, when a cockerel is caponized he does much better, grows larger on less feed, and is not so troublesome.

Capons and fattened poultry should not be marketed alive as they loose weight very rapidly. They should fast 24 hours before killing, and should be killed by bleeding in the mouth, and, preferably, dry picked. They always look nicer packed in boxes than in barrels, and if the weather is warm, they should be packed in ice.

In England and France the fowl is laid in a trough called a "shaping board", and a weight placed on it, giving it a peculiar shape which seems to attract attention and bring better prices in those countries.

MARKETING EGGS.—There is good money in producing eggs for market and if they are gathered fresh every day, so that it is known that they are fresh, there will be no trouble in finding customers for them. The great mistake egg-farmers make is to think, when they have a trade established, that anything will do. Even the best will fail sometimes. I once found an egg soft-boiled within two hours after it was laid to be bloody inside around the yolk, due probably to the rupture of some part in the laying process. If this had gone to a city consumer, who was paying a high price, it would have caused untold damage to my trade. Hence, only eggs from carefully fed hens should be sent to market. They should be clean, and, if soiled, should be washed.

If you are sure your fowls or eggs are of first quality it is a good plan to put your name and address on the package. This is one of the simplest forms of advertising and probably the most effective. There is a great advantage in business in a good reputation, and the only way to get a good reputation is to produce good goods and put your name on them.



Pair of Bronze Turkeys.

Chapter XI. Turkeys.

Every poultryman should study turkey culture. The average poultryman will tell you that turkeys "are hard to raise." This is, no doubt, to a certain extent, true, but it is largely due to the fact that we poultrymen have not fully learned the habits of the turkey.

Our turkeys are direct descendants of the wild turkey which still inhabit some parts of the United States, and it is said that some of the largest specimens we have were produced by crossing large tame toms with wild turkey hens. This shows us the great difference between turkeys and chickens. Chickens have been undergoing a process of domestication since before history began. Columella tells us the Romans kept poultry for pleasure and diversion, and records in India indicate that the Indian fowl was domesticated 1000 years B. C. Hence, it appears our chickens have been do-

mesticated nearly three thousand years, but turkeys have been domesticated since the discovery of America. Is it any wonder then that when we apply similar methods of care and feeding in rearing turkeys as we do in rearing chickens our efforts prove fruitless?

Turkeys are like our game chickens, they are more susceptible to the parasites than are our other classes of fowls which have been longer bred in domestication and require food more similar to that which they would obtain if they ran wild, that is, more animal matter in the summer months and seeds and berries in fall and winter.

Turkeys are bred in the following standard varieties: Bronze, Narragansett, Buff, Slate, White and Black.

From the farmer's standpoint the desirable characteristics are large frame, deep body and broad, full

breast. The fancier further requires that the bird walk with a stately carriage and that his eye shall have an alert expression.

The author admits that he has not tried raising turkeys, hence he has consulted various famous turkey raisers and gives below a summary of the pointers which they have given.

The turkey grows slowly and the Bronze variety does not reach maturity until about four years old. One noted breeder says she started with three pure-bred hens and a tom and recommends starting on a small scale and growing into the business.

The turkey hen usually lays about thirty eggs per annum. Pullets from sixteen to twenty pounds and old hens from eighteen to twenty-three pounds are said to be the best breeders. Turkey hens at laying times will pick up nearly all the food they will need and many who get poor results are themselves to blame because the turkey hen is too fat.

As turkeys do best when allowed free range a place should be fixed for them in a piece of timber or wood lot. A house boarded up tight on the east, north and west sides and having a good roof will make a splendid roosting and feeding place. If the roof is a shed roof and the high part is on the north side, a fence rail about three feet below the roof will be about right for a roost.

Some have had trouble in getting the turkeys to use the houses prepared for them, but when cold weather and frost come if they are fed under such a shed, they will soon learn to occupy the roost prepared for them.

Sugar barrels make an ideal nest for turkeys. One breeder described the nest as follows: She saws out two or three staves between the middle hoops and sets the barrel open end up in some dark corner. She puts straw in the bottom—and I would recommend dusting this straw thoroughly with some lice powder or painting the inside of the barrel with a lice killer paint. Tack an old piece of gunny sack over the opening on the side and also over the top. Now put in some dummy eggs and your nest is

ready for the setting turkey hen. If care is taken to wait until quite dark before removing the hen and she is gently carried under the arm and placed on this nest, no trouble will be experienced in getting her to sit, provided, of course, she is broody. Next morning put food in the front of the barrel and raise the curtain. If she comes off all right—and when she goes back on lower the curtain again. If, however, she does not come off in a half hour, lower the curtain and wait until the following day and raise it again. If she does not come off for three days she may be lifted off gently and placed beside the food and left to go on the nest alone, when she is through eating.

When the little poults appear—the first thing to do after they are dry is to grease their heads and under the wings with a good lice ointment. The hen may also be dusted with a lice powder.

If you have plenty of range it is best to let the turkey hen run at large with the poults. She will rear as many as you will with all the coddling you can give them. The dew on the grass will furnish all the water they will need and the roadside will yield a supply of bugs snails, etc., which are ideal food.

May is an ideal month in which to hatch turkeys, as it will give time enough to get a good growth before fall.

Another breeder feeds young poults as follows:—Mix milk curd with onion tops cut fine and pepper grass cut fine seasoned with black pepper and fed morning, noon and night. Table scraps and raw eggs (infertile eggs may be used) are added when obtainable. Young turkeys should have grit before them at all times and after a day or two sound wheat may be mixed with the food.

Some prefer to let the poults run with the hen as soon as taken from the nest, while others recommend keeping them in close quarters under shelter until they are six weeks old. I believe this depends largely upon the climate and season and kind of shelter in the run. On prairie land,

with few trees, perhaps it would be best to confine them.

Care should be taken not to over-feed and if confined—the coop should be painted once a week with lice paint especially in July and August.

Turkeys should be fed and kept separate from other fowls especially young turkeys as a pick from a chicken is apt to kill the poults.

One writer has summed up the care of turkeys as follows: "First, have vigorous parent stock, not over-fat. Take care the poults are not

chilled the first two or three weeks of their lives. Be careful not to over-feed the poults, as they require very little feed during the first three weeks; after that feed all they will eat three times per day until they are ready for market. Be sure and keep them free from vermin. It is almost impossible to cure a droopy poults. If one is droopy, try to find the cause and remove it before the flock is affected. Growing turkeys will do better with no human attention than with too much."

Chapter XII. Ducks.

There is no fowl—from what I have seen—that appears to be so little understood as the duck. As raised on a good many farms, especially in the West, they are a great nuisance; but in other sections, where their requirements are understood, they are the most profitable variety of poultry. Where else in animal creation do we find a fowl which can be made to grow from a duckling just hatched to more than 5 lbs. in eleven weeks, as has been done with Pekin Ducks, time and time again?

The Standard breeds of ducks are the Pekin, Aylesbury, Rouen, Black Cayuga, Colored Muscovy, White Moscovy, Gray Call, White Call, Black East Indian, Crested White, and Indian Runner. Of these varieties the Call duck and the Black East Indian are the Bantam or miniature, and the Crested is purely ornamental. All of the other varieties are considered profitable.

Of the market varieties, undoubtedly there are more of the Pekins raised in this country than any other, but in England the Aylesbury and Rouen are much in demand. The Indian Runner is a new breed noted for its egg-laying characteristics.

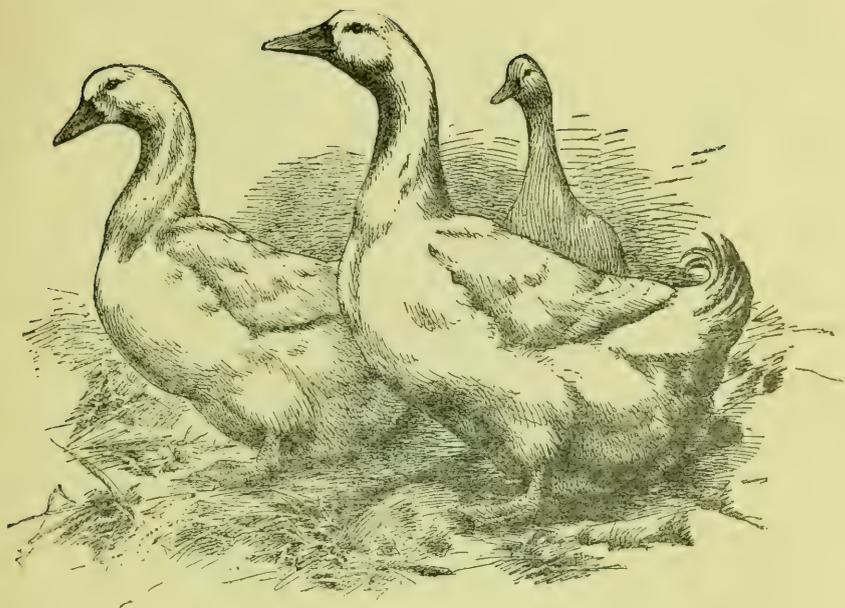
As the weight of the several varieties is an item from a market standpoint, I add the weights of the leading market varieties.

The Pekin adult drake should weigh 8 lbs., young drake 7 lbs., Adult duck 7 lbs., and young duck 6 lbs. The Aylesbury and Rouens should weigh one pound heavier for each specimen than the Pekins.

The Muscovy adult drake should weigh 10 lbs., the young drake, 8 lbs.; the adult duck, 7 lbs., and the young duck, 6 lbs.

The Indian Runner drake should weigh 4½ lbs., and the duck 4 lbs.

As was said at the beginning of this chapter, many people do not understand ducks. They differ from poultry in that they seem to do best on low wet land, and are just in their element when there is a shower. Further, while poultry thrive and get fat on whole corn, the Pekin duck will really lose flesh if fed nothing but hard-shelled corn, as is done by a good many farmers. The duck requires a much more bulky food than poultry, and the proportion of ground grain to the coarse feed should be about the same as is fed to dairy cows where they feed about a forkful of hay to a gallon of ground food. Of course, the duck will not enjoy dry hay, and as it has no teeth the hay will have to be chopped into half or three-quarter inch lengths, and when so chopped a forkful will not make such a great bulk, after all.



White Pekin Ducks.

A splendid feed for adult ducks in laying condition is as follows: Fifty per cent (dry measure) corn meal, 15 per cent wheat bran, 15 per cent green foods (cooked vegetables, such as potatoes, turnips or chopped clover hay), 12 per cent beef scraps, 8 per cent coarse sand or grit. Mix with water to a crumbly state and feed twice a day—morning and evening. After the laying season is over, the corn-meal may be reduced and coarse flour or ground oats added.

A duck does not seem to mind the cold, as they are found puddling in the frozen lakes if there is any opening in the ice, although excessive cold retards their laying. It requires room to exercise, and is very restless, always being on the move. Therefore, while in making a poultry home I like the idea of going from pen to pen, in duck culture I prefer a passage way so the ducks will be disturbed as little as possible by the passing of attend-

The Pekin duck is very easy to

handle and seldom gets over a two-foot fence. On some of the large duck farms the floor of the duck-house is of cement, sloping to the opening through which the ducks pass in and out. On the higher part of the floor some straw is placed as a resting place for the ducks during the night.

A water supply for ducks is very essential. It is not necessary to have water to swim in, although some strongly advocate it for ducks intended for breeding.

If the food is fed dry and crumbly as directed, it will be noticed the ducks will eat a couple of mouthfuls and then run to the water and drink a little, and will thus pass to and fro through the meal. Therefore, it is necessary to replenish the water supply at each feeding time. A shallow trough is a very handy contrivance for this purpose.

Duck eggs require twenty-eight days to hatch, and for feed for the young ducklings I have found the following to be excellent:

1. From the time of hatching to seven days old, feed equal parts (dry measure) corn-meal wheat bran and No. 2 grade flour, with ten per cent of this bulk coarse sand. Mix with water to dry crumbly state and feed four times a day, commencing at 6 a. m. and then each four hours.

2. From seven to fifty-six days old, feed equal parts (dry measure) corn-meal, wheat bran and No. 2 grade flour; adding to this 10 per cent of the bulk beef scraps, 10 per cent coarse sand, and 12½ per cent green foods (green rye, clover, oats, etc.). Mix with water to dry crumbly state and feed four times a day.

3. From sixty to seventy days old feed two parts (dry measure corn-meal, one part wheat bran, one part No. 2 grade flour, 12½ per cent of the bulk beef scraps, 10 per cent coarse sand, and 12½ per cent green food. Mix with water as before described and feed three times per day, morning, noon and night. Give the last feed just before sundown.

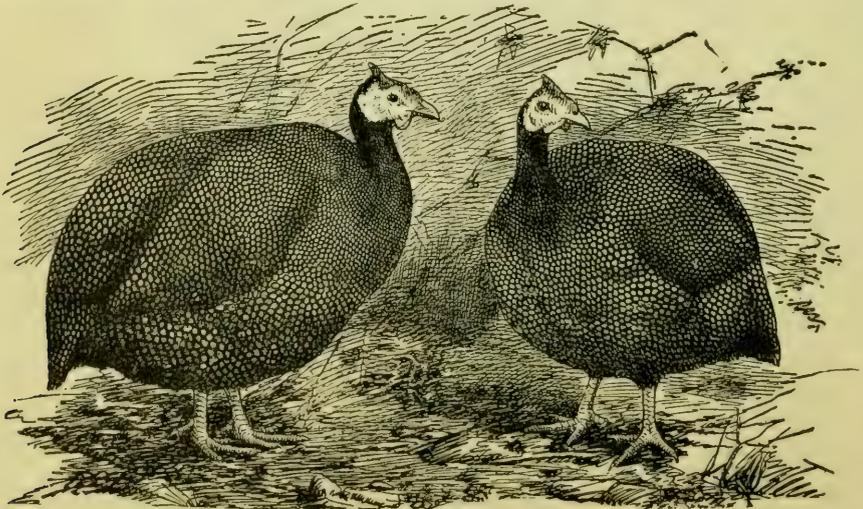
If your ducks are Pekin of good stock, you should have at the end of seventy days a duck weighing about 5 lbs. The other varieties will not grow quite so fast.

Among the eastern duck raisers dry picking of ducks for market seems to have the preference, and pickers, when once they get their "hands in",

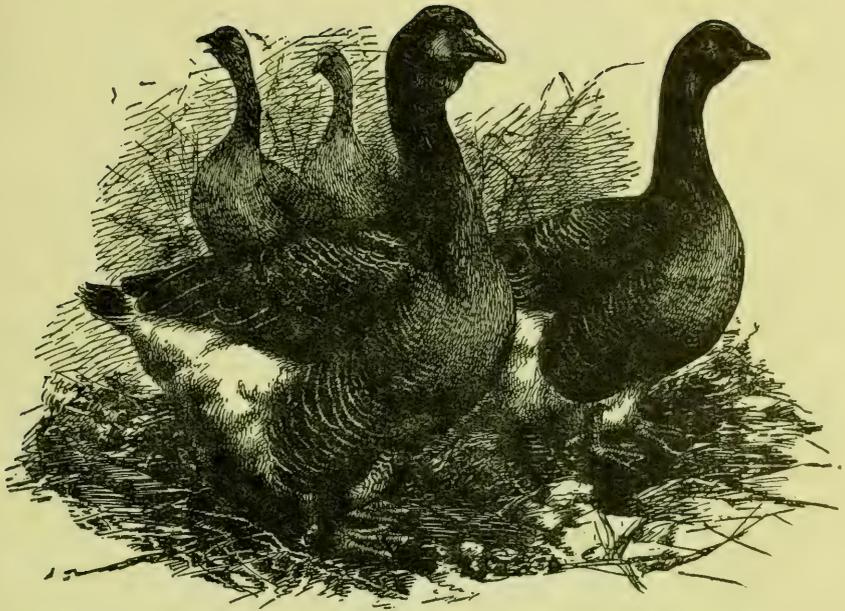
are able to pick about three dozen per day. The picker's outfit consists of a chair, a box for feathers, and a couple of knives, one knife sharpened on both edges and point for bleeding, and one dull for picking the down and pin feathers. The bird is taken between the knees, and, holding the bill open with the left hand, a cut is made across the roof of the mouth just below the eyes. The bird is then stunned by hitting it on the head with a sharp blow with a hammer handle. The picker then sits on the chair and holds the duck in his lap with its head between one knee and the feather box. The feathers should be carefully sorted while picking; the pins are thrown away, and the body feathers with the down are thrown in the box.

After the birds are picked, they should be carefully washed and plumped by placing in a barrel of ice-water. They should remain on ice until it is necessary to pack for market. In packing, the bottom layer should be packed back down, then a layer of ice, and all the other layers should be breast down with some chopped ice between each layer.

When we remember that a four or eight pound duck can be produced in about ten weeks, and when ducks bring some thirty cents a pound in Boston—in February—it would seem as though there was some money in raising ducks.



Guinea Fowl



Toulouse Geese.

Chapter XIII. Geese.

Geese, like ducks, are comparatively easy to raise, and yet by some farmers are considered a nuisance on account of the large amount of grain they eat. But geese should not be fed much grain; in fact, during the summer, if allowed to run on pasture, they will get sufficient nourishment from the grass, and all that it is necessary to supply is drinking water. Of course, if there is a brook in the pasture, the artificial supply of water will be unnecessary.

There are seven varieties of geese recognized by the American Poultry Association: The Toulouse, Embden, Gray African, White Chinese, Brown Chinese, Gray Wild or Canadian, and Colored Egyptian.

The Gray goose is grayish shading into black on neck, back and breast, and on under part of body, and fluff are white.

The White goose is white all over. The standard weights of geese are:

	Adult Gander	Young Gander	Adult Goose	Young Goose
	lbs.	lbs.	lbs.	lbs.
Toulouse	20	18	18	15
Embden	20	18	18	16
African	20	16	18	14
Brown China	12	10	10	8
Canadian	12	10	10	8
Egyptian	10	8	8	6

There are many farms with waste-places on them which could be turned into profit by using these waste-fields for geese pastures, especially if they have a pond or spring on them. In such a place they need practically no care except perhaps to keep them from wild animals, and the simplest kind of houses will do for shelter, as there are very few days in winter but what geese will enjoy being out in the open air.

Geese have been known to attain the age of forty years, and they retain their laying and hatching qualities through life, but ganders should not be kept for breeding after three years.

In mating—some mate in pairs and others mate two geese to one gander—but the pairs need not be kept separate. The breeding stock should be two years old, and should be procured in the fall and turned at once on the pastures where they will find food sufficient until frost comes.

During winter a splendid ration can be made from equal parts (by measure) of bran, middlings and corn-meal, add about 5 per cent of this bulk of beef scraps and 10 per cent of green food. This will make a good morning food, and at night some cracked corn will do very nicely.

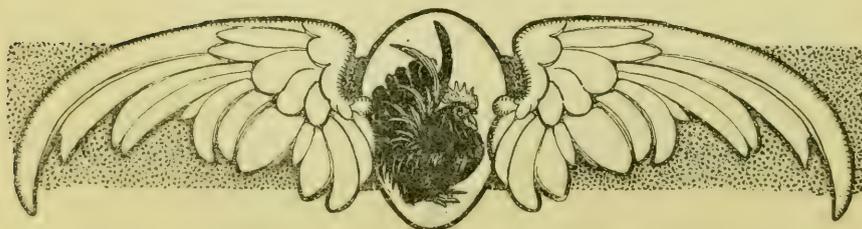
The breeding season really begins in February; they will make their own nests of straw and feathers, and when they have laid a dozen or more eggs, they will become broody. A broody goose is easily broken up if placed in a dark box and fed only water for three days. The first and second sittings can be placed under hens, but the goose should be allowed to sit on the third sitting. It takes thirty days to incubate goose eggs,

and it is said that about twenty or twenty-five days after setting it is well to dip the eggs for one minute in water heated to 104 degrees Fahrenheit.

When the eggs are hatched, leave the goslings in the nest for twenty-four hours, when they should be thoroughly dry. They can then be removed to a roomy coop. The first feed should be clipped grass, after which a little corn-meal, slightly moistened, can be given. This ration will do three times a day for the first few days, after which equal parts (dry measure) of bran, middlings and steamed cut clover or cooked vegetables is the proper food if fed three times daily until about eight weeks old, when they can be penned to be fattened.

While fattening they should be kept as quiet as possible. They will fatten on almost any grain, such as oats, wheat or corn, and, of course, give them plenty of fresh water to drink. Some fatteners recommend only ground food mixed as follows:—Corn-meal with beef scraps; ten measures of the former to two of the latter. By this process at ten weeks old they should be ready for market, and weigh between eight and ten pounds.

Killing and dressing is done similar to the method described for ducks.



Chapter XIV.

Poultry Diseases and Some Remedies.

If all the directions, given in the foregoing chapters, are followed, the stock should be healthy, but the best of us are often troubled with diseases in our flocks, which come from unknown sources. To guard against this care should be exercised in buying fowls to get healthy specimens.

Poultry troubles are listed as follows:

1. External, as poultry parasites and accidents.
2. Digestive troubles.
3. Respiration troubles.

It takes a little experience with fowls in order to be able to determine at first glance just what is the trouble, when a fowl is sick. All fowls will sit around and look dull for a few minutes or even an hour a day, and during the moulting season they loose their appetite and are generally dumpy. But in the summer and even in the winter the healthy fowl, if properly cared for, will be generally alert and active.

The main things to look for in trying to diagnose the disease of a sick chicken are chicken lice and catarrhal troubles which I will try to explain in what follows.

The over fat fowl is usually short winded and in catching such a fowl they will generally get out of breath, breath hard and their comb and wattles will turn purple. This is not a disease, although I have been called upon by poultrymen to tell what ailed such fowls.

For a general rule on the farm the best remedy for accidents or diseases is the hatchet, as the time consumed in fussing with a sick chicken is usually worth much more than the fowl is worth. Therefore, this chapter on poultry remedies will be more in the nature of preventive remedies than cure-all remedies.

The greatest trouble the average poultryman experiences is from the body-louse which infest the fowls. These are usually found around the hen roosts and nests. Where the first louse comes from, and how it gets on the hen, we do not know, but its object in getting on the fowl is to suck its blood and next morning it is known as a red mite—it is colored red by the blood which it has sucked from the chicken. Later the blood turns a dark brown and the hen-louse turns color also. About this time it is ready to lay its eggs, and how many it lays I do not know, but they will be found on the end of the roost and along the cross-pieces, looking like a fine white powder. In cold weather it takes them a long time to hatch, but in August they will multiply very rapidly. I have noticed that a hen set in June on a box which had been painted with carbolic paint just before setting, has been literally covered with lice in twenty-one days.

When there are only a few they infest the fowls only at night, and hide in some crevice on the roost during the day, but as they multiply they are found all over, and any one going into the house at night is liable to get some on his person. They cause the fowl to become pale and look tired from loss of blood, and restlessness.

To rid the poultry house of these pests, there are three methods. Some inventors have constructed traps under the roosts into which these mites will go during the day, and they are killed by maceration.

Others have recourse to insecticides, either liquid or powder. These articles are effective because the chicken louse breathes directly through its sides and cannot live in an atmosphere permeated with these odors or particles. The liquid can be purchased as cheaply as it can be made. The powder depends largely

upon being pulverized minutely, hence it is best to buy this ready mixed also.

SCALY LEG.

Another parasite is known as scaly leg. This is a yellowish substance which gathers or grows under the scales on the feet of the chicken. They can be removed by soaking the feet in water into which some good antiseptic (such as peroxide of hydrogen) has been put, and then allowing them to dry. After they are dry they may be anointed with carbolized vaseline. One cause of scaly legs is damp quarters.

BUMBLE FOOT.

Bumble foot is a hard sore or corn which comes on the ball of the foot of poultry. Some varieties seem to be bothered with this more than others, and it is said it is due to the bird alighting from the roost on some hard substance.

Here is a case where the fowl might just as well be got rid of, because if it is a male he will not breed in this condition, and three or four weeks well be lost in doctoring.

A treatment, however, is to wash the foot with warm water, then paint it with iodine, and wrap up with a soft cotton bandage. It should be treated with iodine daily. After a few days it will become soft. Then lance it and squeeze out all the pus, and be sure to get the core. If the core cannot be found, anoint with carbolated vaseline, and bandage. The core will come out in a day or two. After the core comes out the foot will heal and get well.

ACCIDENTS.

A broken leg or similar accidents to farm poultry is sufficient excuse to kill the fowl and put it out of misery.

FIGHTING.

Some time male birds will become quarrelsome, and begin fighting. If their heads or combs are badly torn, wash them with boracic-acid water, made by putting a teaspoonful of boracic acid into a cup of water, and bring to a boil. After washing dust some boracic acid on the wound.

DIGESTION TROUBLES.

The chief source of these troubles are mouldy feed, or feeding on contaminated ground on which poultry

has run for several seasons, or from feeding a ration which does not give the fowl proper nourishment.

The remedy here is to remove the cause. Procure sound grain—plow up the runs, or get the food element that is missing. This trouble, however, is not noticed until the fowls are dumpish or sick. If they are in this condition, I would procure some good poultry food which has the proper proportion of condiment and spices and use as directed. Some people argue against condimental feeds but as we do not expect a fowl to live a natural life I can see no harm in feeding anything which will increase its growth or egg production.

Formulas to stimulate growth, digestion and egg production are very numerous. A number of stock foods and stock tonics are offered to the public. The worst difficulty with such tonics is the average breeder is apt to overdo and feed too much. For fowls which are slow to moult and run down in the late fall months I give the following formal which can be obtained locally and mixed at home:

Powdered Fenugreek	8 oz.
Pottassium Nitrate	4 oz.
Powdered Gentian	16 oz.
Powdered Ginger	4 oz.
Sulpher Flour	2 oz.
Sulphate of Iron	2 oz.
Black Antimony	2 oz.
Flax Meal	8 oz.
Common Salt	8 oz.

Mix thoroughly. A heaping teaspoonful mixed thoroughly into a quart of mash feed is about right for 20 adults fowls.

CHOLERA.

Indigestion or bowel trouble has sometimes been called cholera, but cholera is an entirely different disease due, no doubt, to a parasite which gets into the digestive canal. Several have advertised a cholera cure. The worst feature is that when chickens or turkeys have real cholera they are nearly all dead before you can get the remedy. I believe if the soil is not contaminated and if the fowls are not weakened by body lice the ordinary poultry food described above will ward off cholera. If, however, the fowls

once get a real case of cholera they had better be destroyed, and a new flock procured,—after the buildings and quarters have been disinfected with either a disinfecting candle or a spray of disinfectant or a coat of white wash, and the grounds sprinkled or sprayed with air slaked lime or a solution of some good disinfectant.

If these rules are adopted it should stop the trouble. Feed some of the condition powder it will help to stimulate the digestion. But, if this does not stop it a pill made of Rhubarb 5 grains, Chalk 5 grains and Cayenne 3 grains given each fowl morning and night will correct the trouble. This is an old English remedy.

Respiration Troubles.

Perhaps the most common trouble with poultry is troubles of the lungs or nose or the breathing organs of the fowl.

This is largely due, no doubt, to our method of confining under domestication. The fowls are normally an outdoor or fresh-air animal, and when we confine them in warm, close quarters for a while, and then let them out in the cold, or when there is a very sudden change of temperature, they are liable to take cold, and it invariably settles in the nostrils, throat, or lungs, and they have roup, canker, or consumption.

Now what shall we do? We should build our houses on the fresh-air plan as described, and not coddle the fowls too much. Have you noticed the men who work out-doors all day in winter? They become hardened to the cold, and really are healthier for it. But one who works indoors, where the thermometer is about 70 all day, will easily take cold if exposed to a draught or bad weather. So with fowls. Further, a plant raised under glass is never as hardy as one raised in the open. This is due, it is said, to the fact that glass prevents the violet rays of the sun's light from reaching the plant. Likewise animals are susceptible to this lack of violet light, and of course a curtain front or open front permits this.

I have not yet seen a book which definitely describes the difference between catarrh, roup and canker. They

seem to be different degrees of the same thing, although catarrh is the mildest form, and, if proper remedies are used, can, no doubt, be cured.

There are two methods of treatment. In the first place a fowl with catarrh of the nostrils is apt to communicate this trouble to all others of the same flock by dipping its bill in the drinking water. Therefore some drug should be put in the drinking water, and as such fowls have great thirst some medicine can be added. A good common remedy is Powdered Sulphate of Copper, a teaspoonful to three gallon of drinking water, or put a tablespoonful of permanganate of potassium in a pint bottle of water and add a tablespoonful of this solution to the drinking water. In addition feed some stimulating poultry food as described above.

If catarrh is not fought and corrected it soon turns into roup, in which the discharge is a yellowish, cheesy matter having a very offensive odor. To cure this requires a hospital in which light, heat, moisture, etc., can be fully controlled. Therefore I recommend to all to use the axe and chopping block and dispose of the fowl, as the feed, time and labor spent will be practically wasted.

Canker is a similar looking and smelling trouble as roup, but is usually local. I have had birds with a swelling in one spot on the face, probably between the nostril and the eye. If this is allowed to come to a small whitish head-spot, it may be lanced, and the matter squeezed out; and if the wound is thoroughly cleaned with disinfectant it will heal up as though nothing had happened. But if the fowl is only worth a few cents it is hardly worth the trouble.

Diphtheric roup is somewhat different, it affects the throat, and is, I believe, generally due to damp quarters. It usually comes so quickly that your fowl is dead before you know it. If you pry open its mouth you will find its throat stopped up with rousy matter. Such a fowl should be burned or buried in some out of the way place, and its companions moved to more comfortable quarters. The whole flock should be fed wholesome food,

and be given the tonic feed as well as plenty of grit, charcoal, beef scraps and oyster shell.

These are the general diseases, and it will be noticed that it is usually more profitable not to bother much with a sick chicken.

Chapter X. Advertising and Selling Suggestions.

Everyone who raises pure-bred fowls has the opportunity to sell stock and eggs at prices ranging higher than the regular market prices. But to do this will require some advertising and letter writing.

The first step in advertising is to place a sign on your "gate post" or some other conspicuous place.

The next step is to place a card in your local paper during the egg season. I have a neighbor who disposes of all of her hen's eggs in March April and May at from 60 cts. to \$1.00 per 13 according to the quantity taken. It takes just about as much talk, letter writing and trouble packing to sell one sitting as it does to sell 50 eggs.

In the fall surplus stock can be sold in the same way.

As you improve your stock and after you have won some prizes at a poultry show—the more prominent the show the better is your opportunity—you can then go into the poultry papers for some general advertising.

Here is a secret about poultry paper advertising. It is better to go into one paper big than to several poultry papers small. The size of the advertisement will depend upon two things: (1) What you have to say, and (2) the character of the other advertisements in the paper.

What you have to say is: "Who you are, What you are and Where you are." What you are or what you have to sell is the most important and should be most conspicuous; the other points are secondary, and yet many poultry men advertise themselves rather than their poultry. Your advertisement to be successful must inspire confidence and convey some reason why others should prefer your

stock or eggs.

The other advertisements all have a bearing on your advertisement. If there are any irresponsible advertisers in the paper or advertisers whose announcements indicate a "fake" by extravagant claims or otherwise, you had better look for another paper. Again, if your competitors are using page advertisements it will be difficult for you to tell a convincing story in favor of your fowls or eggs in one inch single column.

Advertising will bring correspondence and to lessen the letter writing you will want to get up some kind of a circular.

For this purpose the folder or pamphlet that conveys general statements of your flock and what you personally are doing will be the most effective. The size and shape will depend upon what you have to sell and tell.

The plain statement of facts will be the most effective and remember to give details—your customers want to know everything.

There are two seasons in the poultry business. During the fall and winter you will have calls for stock and during the spring is the time for eggs.

The value of a bird is difficult to determine. One hundred dollars for a pen of fine first class birds is not an out of the way price. I have often said that if I wanted to start in some leading variety on a big scale I would visit the leading breeder in that variety, find from him his best birds, ask the price and pay it, provided he would give me a certificate that the birds I purchased were the best he had.

A record should be kept of your inquires so the future wants of your prospects will not be overlooked.

Chapter XVI.

How to start in the Poultry Business.

The great majority of failures in the poultry business are directly traceable mistakes in getting started right and by failing to estimate the amount of capital required. Most men figure that if they have enough cash in sight to see them through the first twelve months that they will have plain sailing. They will, if they have figured conservatively and have no disasters; but they will have a much easier time of it if they start out with sufficient capital for two years.

I am going to quote here some suggestions from a book which is being widely circulated and then point out some of the "rocks" which must be avoided. He says:

"With \$1,000 to invest in the egg farming business, and \$500 additional for living expenses the first season, you can earn eighty-one per cent, in return for your labor and the use of your capital. About an acre of ground is needed; and a chicken house 14x85 feet facing the south, which will cost about \$400.

"This eighty-five foot contains a ten-foot feed room and floor space enough for 400 adult birds. Starting with 1000 day old chicks at 13 cents each, in ten pens, each equipped with moveable hovers, etc., there would be an expense of \$228, as shown by the following account: Raising 80 per cent of the chicks to the age of three months would give you 400 pullets and 400 cockerels, at a further cost of \$144 for feed (6 cents each a month.) Interest and insurance for three months would amount to \$15.00 Selling 380 cockerels would bring \$114 and leave you a flock of 400 pullets and twenty cockerels to grow to full maturity and remain fourteen months longer in the house at a monthly expense of 10 cents each for feed, or a total of \$559. By the end of the fourteen months these 400 pullets will have laid during the last 12 months 144 eggs each. At 3 cents a piece the income from

eggs would be \$1728. Marketing the flock at the end of this season would return \$252.

"Including interest and insurance at the rate of \$5 a month the first season's business will have cost \$1445; and you will have taken in \$2,094, leaving you cash in hand to the amount of \$649, and a building and equipment valued at \$470."

Such is the plan suggested by one and while I do not say it is impossible for an experienced poultry man to do this, there are few beginners who can come anyway near such results. I must point out some discrepancies. In the first place an acre of ground is required, but nothing is said about cost, neither is there any allowance for rent of this land nor any figures given for cost of labor. It is a pretty good poultryman who can raise 80 per cent of the brooder chicks and it must be remembered that the prices are those obtained in New York and Philadelphia.

Now with this plan the man starts out with \$1500 and at the end of 14 months he has \$649 cash and a building valued at \$470 or \$1,119.

Personally I cannot see any big money in commercial poultry farming as an exclusive business unless sufficient capital is on hand to start on a large scale. It is quite apparent, however, that if pure bred fowls were used many specimens and eggs could have been sold at much higher prices than market quotations, and there are a number of men in this country who are adding to their income by living in the suburbs on an acre or so of ground and raising pure bred fowls.

There are many ways of getting started in such an undertaking. The only difference from commercial poultry farming will be in the quality of the birds procured for breeding purposes—the houses and methods of feeding will be the same—and then you have a useful pastime which

draws your mind away from business cares and the outdoor exercise equips you to stand the strain of office or shop.

Breeders of pure bred fowls usually sell enough offspring to pay for the feed and advertising so that the

eggs for hatching is practically all profit.

In starting with pure bred fowls do not hesitate to buy the best pedigreed fowls obtainable even though the price seems high and follow closely the system of line breeding.

Chapter XVII. The Man and his Methods.

There are two methods of poultry culture:—Intensive and Extensive. The intensive method is keeping a large number in a small space; and the extensive is scattering them in corn fields and on range. The former is the city man's necessity, the latter is the farmer's opportunity. The former requires much more labor and the houses must be cleaned and disinfected every day, while the latter requires practically no attention—a thorough cleaning once a week in summer is sufficient.

There have been some intensive methods described in the poultry papers and in certain books as systems and they work out very well the first year. But the second year's experience has been disappointing generally because of lack of proper sanitary rules. If fowls are to be kept in closely confined numbers I would recommend covering the entire floor with concrete with proper drainage and once a month remove all litter and thoroughly renovate and disinfect using some good cresol disinfectant.

I have tried to show in the preceding pages that poultry-keeping is a simple undertaking. It is looking after details. These details are many but are easily mastered.

The real secret or measure of success, however, is in the man himself. To get the best results there must be cleanliness and regularity.

Dirt has been defined as "Matter out of Place." Chickens can follow after any other animal with advantage but compel them to live in an atmosphere contaminated with their

own filth and trouble will begin at once.

To poultry "dust" is not dirt. They thrive in road dust—it helps them to rid themselves of vermin and is their method of taking a "dry shampoo."

Regularity depends upon the man or attendant. Poultry and especially young chickens should be fed shortly after they come off the roost in the morning—this is about sunrise.

It requires some care and attention to do this but if persevered in, it will lead to success.

Perhaps the question most frequently asked about poultry keeping is: How to Make the Most Money out of Poultry?

I have no hesitancy in saying that by using this book as a guide and adopting any method that fits in with this plan should make a profit for you from your fowls whether you have 20 or 20,000.

Right here let me say that the commonest error made by beginners in figuring on starting in the poultry business is in estimating the number of fowls one man can care for. I figure you will need one man to each five hundred adult birds to properly care for them, and do the hatching and rearing of their offspring.

No man in business when he has success the first year in a store expects to have a proportionate success the second year by multiplying his facilities a thousand times. It takes time to do this. You must remember that because fowls go in flocks and drink out of the same vessels that by increasing your numbers you increase

much more largely your liability to disease.

There is more money in pure-bred stock than in mongrels. Single specimens have changed hands at three figures. Many specimens sell every year for \$100 and in England £250 or \$1250.00 has been paid time and again for prize specimens.

Pure bred birds also produce large profit from their eggs for hatching. \$5.00 per sitting is a common price and for sittings from choice matings \$100.00 is regularly being asked.

If you have the facilities you can make good profit in selling day old chicks.

Another success secret is keeping a record of what you are doing. For this you need four books, (1) A journal in which you record every cash transaction; (2) a ledger in which special accounts are kept or certain pages so you may know what each item, stock, feed, eggs, etc., yields in profit; (3) a diary in which you should keep a record of the weather, and when you set fowls or start incubating, etc.; and (4) an egg record so you may know what certain pens are doing—a workman's time book is handy for this purpose. This book also should contain the band numbers of special fowls for handy reference.

Chapter XVII. Miscellaneous Suggestions

HOW TO DESTROY RATS.

Rats have cost me several hundred dollars and are the poultryman's worst enemy. Cement floors are good but the house should rest on a good foundation that goes below the frost. I put a cement floor in a house that rested on sills and next winter the rats got under the floor and made a comfortable home for themselves.

I have tried traps to destroy rats but the best thing is a good cat. A cat can be trained to leave chickens alone with patience and perseverance. It does not require a stone or a stick to frighten a cat. If it knows your voice it knows when you scold.

The cage trap is good as the fowls cannot get into it and I have caught as many as nine in one night.

Poisons should be used with care and must be placed inside a box with a hole so small as to prevent fowls from getting into it. Poisoned rats must be buried as soon as found or you will loose your fowls also.

The time to exert the greatest care is in the fall as that is the time rats come in from the fields.

Dogs, such as the Terriers, are also good ratters. Spaniels being bird dogs will give you trouble by catching chickens and it is difficult to break them from this habit.

Disinfectants and cleanliness around the chicken house will help to tell Mr. Rat that he is not wanted; and by keeping all the grain or other feed which rats like in rat-proof bins you will not have much trouble keeping these pests away.

ENCOURAGING MOULTING.

It is natural for most animals to put on a new coat of hair or feathers in the fall. Fur covered animals shed their long hair in the spring but fowls do not moult until fall. By feeding well we encourage egg production and postpone the moulting season. But as eggs are more valuable in the winter it is best to slack up on the feeding about September for a couple of weeks and this will cause the feathers to "dry up." By starting again with full feed with plenty of grit and rich food like Sunflower Seed, Hemp Seed, gluten meal or beef scraps, a new coat of feathers will start and the old ones will drop off. The male birds

had better be shut up by themselves during this period..

WHITEWASH ONCE A YEAR.

Whitewash is the most suitable means for "house cleaning" a poultry house and this should be done at least once a year. August is a good time for this, and who can say how many thousand chicken lice eggs you may destroy by applying this cleanser at this time. The best whitewash for outside or inside use is made by following the U. S. Government formula which is as follows:

Half a bushel unslacked lime, slack with warm water, cover it during the process to keep in the steam; strain the liquid through a fine sieve or strainer; add a peck of salt previously well dissolved in warm water three pounds of ground rice boiled to a thin paste and stir in boiling hot; half pound of powdered Spanish whiting and a pound of glue which has been previously dissolved over a slow fire, and add five gallons hot water to the mixture, stir well and let it stand for a few days, covered up from the dirt. It should be put on hot. One pint of the mixture will cover a square yard, properly applied. Small brushes are best. There is nothing that can compare with it for outside or inside work, and it retains its brilliancy for many years. Coloring matter may be put in and made of any shade, Spanish brown, yellow ochre, or common clay.

HOW TO KEEP MALE BIRDS FROM FIGHTING.

It may sometimes be necessary to put males that have been separated for some time into the same pen. In accordance with their natural instinct they will quarrel and fight—at least many breeds will. This may be prevented by putting a "hobble" on them. Use a stout cord and fasten their legs together so they can only take short steps. To fight they will have to run and after they fall over a couple of times it will take the fight out of them.

The English game breeders have found that by trimming the point of the bill of the most quarrelsome bird will tame it instantly.

FEATHER AND EGG EATING.

Fowls sometimes form the habit of eating each others feathers. I have seen a male with nearly all the feathers pulled off the neck by his mates. When fowls do this and when they eat the freshly laid egg it indicates improper feeding, generally due to lack of green stuff. To break these habits add cut alfalfa or color to the mass and omit some of the corn from the grain food; also put oyster shell and grit into the mash, adding enough so you will see pieces of it in the feeding trough after all the rest of the mash is eaten. In England they add powdered sulphur to the mash feed, as much as three teaspoonsfull to 20 fowls.

HOW TO BREAK UP BROODY HENS

The best way is to take them as soon as they set on the nest at night and put them in a box with slats on the bottom and which is elevated off the ground. Keep them in such a box for two days without food, but give them water to drink. The third day they should be put into a pen well littered with straw. By making them scratch and keeping them hungry they will soon give up setting and begin to lay again.

SOME BROODER DONT'S.

Don't allow brooder chicks to huddle together; the hover should be made to prevent this.

Don't allow the drinking water to get foul. It should be always clean.

Don't let the hover get too cold; with the hen the chick always has a warm hover.

Don't let the chicks get wet. Dampness, Disease, Death—Three steps to ruin.

Don't crowd the brooder, fifty chicks fill a "one-hundred-click" brooder nicely.

Don't let the chicks get too hungry. Feed little, and about four times a day.

Don't feed sloppy foods. Dry grain will do the work if the mixture is right, so why take chances with wet mashes?

Don't be afraid of over-feeding a chick. A dry mash in a hopper will save lots of steps.

Don't forget that chicks must have grit; it is needed to make feathers and bone, and aids digestion.

SEPARATING THE SEXES.

When the chicks are about three months old, the cockerels should be separated from the pullets and kept separate until the breeding season. This is better for both sexes. The cockerels do not quarrel so much, and the pullets are not "bossed" so much and thrive better. A splendid colony house for this purpose is described as follows:

Ground measurement 7x4 feet; front 4 feet, rear 2 feet. The front has a door in the center and is all covered with one-inch mesh wire netting to keep out enemies. An outside door hinged at the top so it can be swung up like a porch roof during the day and let down at night in cold weather, completely covers the front. The back and ends are built of flooring or drop siding, and the roof is matched boards covered with roofing paper. Such a house will accommodate twenty-five to thirty pullets.



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