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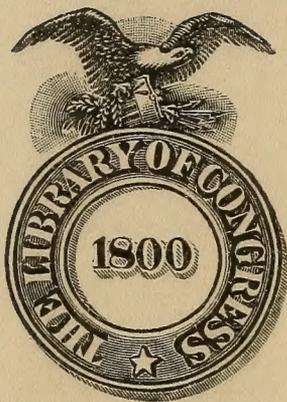
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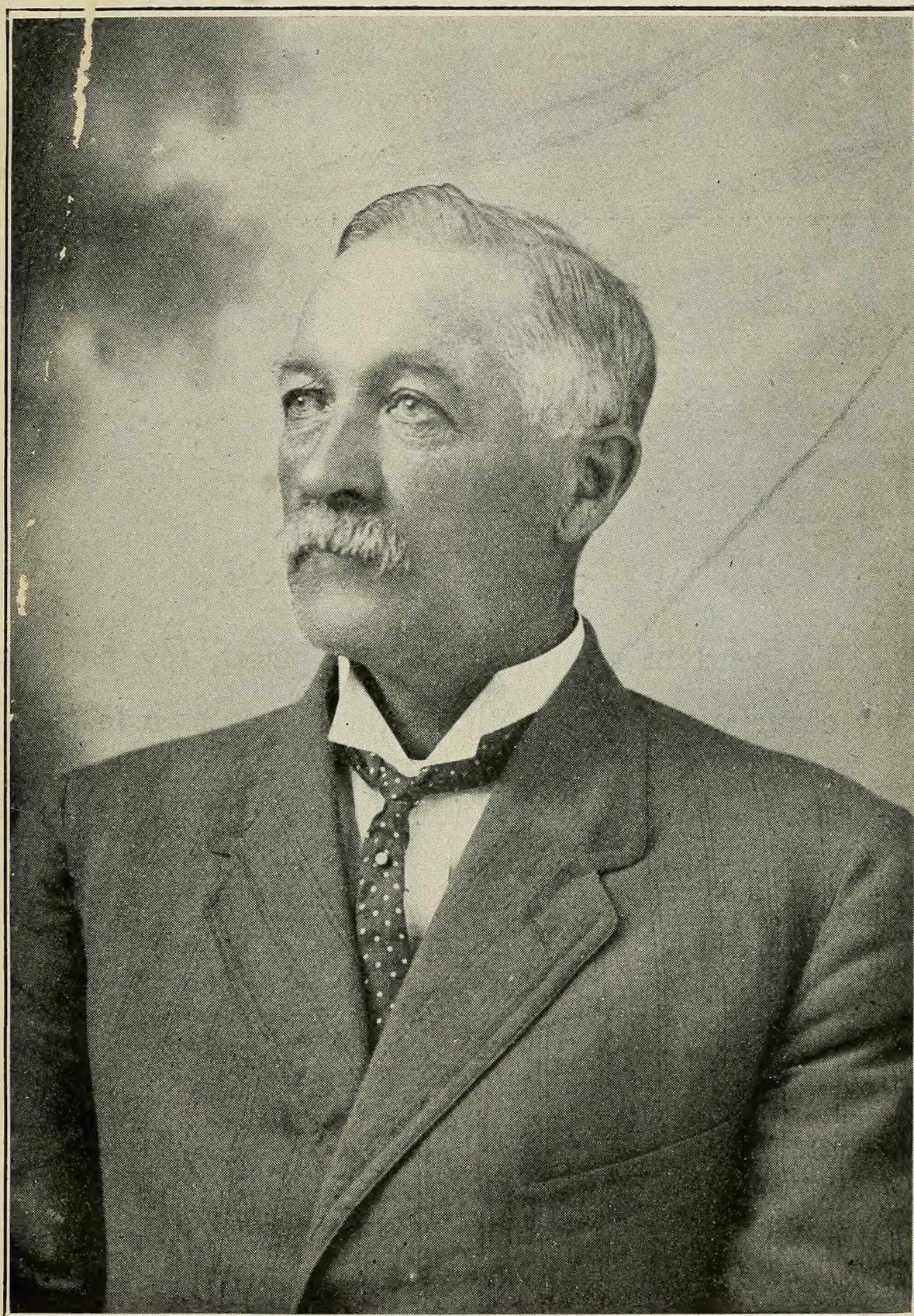


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Edal Kusselman

TO MY WIFE:

My constant companion, my helpmeet, my partner,
my councilor, I inscribe this little volume as a token of
appreciation of her devotion to me and our feathered pets.

THE AUTHOR.

Southern Poultry Guide

OR

Forty Years With Poultry

ILLUSTRATED

A PLAIN PRACTICAL TREATISE ON
THE CARE AND MANAGEMENT OF
POULTRY FOR PRACTICAL PEOPLE

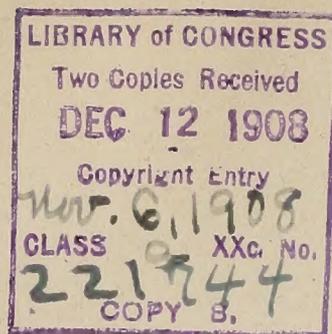
BY

A Plain, Practical Poultryman
(CAL HUSSELMAN)

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Richmond, Va.



PREFACE.

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In the preparation of this volume the aim has been to eliminate every difficult and technical feature in every step of the work and to give plain, practical facts based upon practice and experience.

In the classification of the various breeds similarity of type has been deemed desirable rather than geographical grouping.

Numerous plans and devices have been tested and many methods of feeding and housing have been studied during the fifty years of farm life of the author and the most satisfactory combinations only are given.

This experience includes the management of a small flock with natural incubation, as well as the care and management of a very large flock and the use of artificial incubation and brooding.

All of the breeds named in the three classes have been bred and tested under favorable and unfavorable conditions and the deductions are made from personal experience without prejudice or bias.

This volume is written for the practical poultry people of the South in the hope that it may prove helpful in creating a greater interest in an industry that may be made a source of much profit to the farmers of this favored section.

Heartly appreciation is extended for the courtesy, encouragement and co-operation of the Editor and Business Manager of the Southern Planter in the publication of this volume.

CAL HUSSELMAN.

Richmond, Va., Oct. 17, 1908.

J.P.R. Dec. 16, 08

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CHAPTER I.

LOCATION, SIZE OF FARM, SOIL, ETC.

The history of North America shows that every section has its native birds. Many of them are migratory in their habits, while many other species are more permanent in their habitat. Longitude and latitude seem to have very little influence on a very large percentage of the native feathered tribes found in the United States.

The wild turkey was originally found in almost every state in the Union. The goose, the duck, grouse, quail and partridge found congenial conditions everywhere from the Atlantic to the Pacific and from the Great Lakes to the Gulf. The Prairie chicken was common on all the great open country west of the Ohio river and birds of lesser size were plentiful in every forest and glade. This is evidence of naturally favorable conditions of climate, soil, water, food, and all other natural conditions necessary to the existence of birds and fowls.

In the settlement of this vast domain by civilized man we find the domestic fowls well represented in the home and on the farms of the pioneers in every stage of the development of the country. The common barnyard fowls have been a source of pleasure and profit to every community from the earliest settlement on the shores of the Atlantic to the present time. From this we may learn that fowls may be kept on any kind of soil, in every section of this great country. There is no difference in natural conditions so great that it interferes with the business sufficiently to make it unprofitable or even uncertain.

Every farm, every home in fact, with a very limited area, anywhere in the United States, can be made the home of some useful species of domestic fowls. Hence it follows that the location of a poultry farm is simply a matter of individual desire and taste. No one need be deterred from entering the business because of imaginary isothermal lines.

The great centers of population are not always the best markets for poultry products. North and South, East and West, practically every man, woman and child everywhere is a consumer of eggs and poultry and many thousands of dollars are annually sent from our shores for poultry products that could be produced at good profit by the people of the various States.

The Great South, lying south of the Potomac, Ohio and Missouri Rivers, is especially favored by climatic conditions favorable to the profitable pursuit of this industry. The short, mild winter season, the rolling, open, porous character of most of the soils in this great area, together with the unlimited supply of pure water, the great variety of grasses, grains and leguminous crops that can be grown, as well as the close proximity by land and water transportation to the great mining, manufacturing and commercial centers of consumption make this the natural home of every kind and species of land and water fowls.

With a climate similar to that of Spain, Italy and France, with better soil and better markets, there is no reason why this great section should not produce all of the eggs and poultry products required for home consumption and some for export.

The farmers produce grain, beef, pork, butter, lard

and other animal products for export and why not eggs, live and dressed poultry?

But two conditions are absolutely necessary in the successful management of poultry plants and farms and these can be secured almost anywhere. These two conditions are, dry, roomy quarters and absolute cleanliness. If one is locating a business and can select a well drained, gravelly soil with a southern or eastern exposure, so much the better.

Convenience to transportation facilities should also be considered. However we must always bear in mind that poultry products are concentrated products and may be transported more economically than the more bulky products like grain, hay and vegetables and, many times, the difference in cost of land, lumber, grain and other necessities will justify the selection of a location somewhat remote from trade centers or transportation facilities. One can easily carry five crates of eggs of forty dozen each on a small spring wagon with one horse a distance of ten miles. The eggs will bring on an average twenty cents per dozen or forty dollars, whilst to market forty dollars worth of grain, hay or vegetables a similar distance would require much more time, labor and equipment.

Many people have sold their homes to locate elsewhere thinking to better their conditions only to find later that they have gained in some particulars and lost in others. The selling of one's home is a serious matter and should be carefully considered.

The ideal location, like the ideal fowl, exists only in the mind and imagination of the dreamer. This book is written for plain, practical people with moderate means to invest, and the author well knows that everyone cannot

select ideal conditions. Make the best use you can of the location you have or the best location your means will permit.

The land is of minor importance. Rather buy cheaper land, having a larger range, better buildings, better equipment, and better stock. Much is said and written about intensive poultry culture, keeping large flocks on limited areas. The author of this book does not indorse this system. Failure is almost sure to follow. The soil *must be kept pure and clean* if best results are obtained and this cannot be done where hundreds of fowls are kept in close quarters any more than humans can be kept in packed tenements and enjoy good health.

Fowls consume more air and food per pound of live weight than animals or man and must have more room, more air, and more exercise. Much of the loss from disease can be traced directly to this matter of narrow quarters and close confinement. It is true that fowls may be kept in limited quarters and kept healthy, -but it adds very much to the labor and increases the risk very greatly.

The aim should be to locate where one has ample room, dry soil, good drainage and good water.

CHAPTER II.

HOUSING THE FLOCK, YARDS, ETC.

There are two distinct methods in practical use on the various poultry farms in this country. The colony house plan, and the long narrow house accommodating from 300 to 500 laying hens. Both plans have advantages and objections. Some prefer the colony plan and some the large single house plan with free range.

Several large two-story houses have been built in different localities with fair success. After long and careful use and study of these various plans I am inclined to the large open front house for this country, excepting possibly the extreme northern portions of the United States and Canada. For the South and Southwest certainly no better house can be designed than the plain open front house shown in Fig. 1.

I deem it wise to give photo-engravings of all houses, yards, coops, nests, feed boxes, etc., and full directions and instructions for building them in footnotes to each figure. This will enable the reader to take the engraving and accompanying notes and see at a glance how to construct anything desired. Every engraving in this book is made from photographs from houses, etc., in actual use by the author and found to be practical.

This house should be built facing the South or Southeast, on a dry, well-drained, open place. Poultry houses should never be located under trees or in a grove. A dry sunny exposure is best.

Where possible four square feet of floor space should

be allowed for each mature bird, thus a house fifty feet long by twelve feet wide would accommodate 150 laying hens, and a house 100 feet long by twelve feet wide will



FIG. 1.—This house is sixty-four feet long and ten feet wide, with roost poles four and one-half feet long, the entire length. The dropping board is five feet wide. This will accommodate 500 laying hens of the small breeds, or 400 of the large breeds. It has four clusters of nests of eight in each cluster. This is room enough for such a flock on free range, but, where yarded, not more than half this number should be kept in a house of this size. The ends and back wall are double boarded, and the front is boarded with ordinary house siding lumber.

To build this house with stud frame, studs two feet from centers requires: Thirty-three pieces 2 in. by 4 in. by 6 feet long, back wall; eight pieces 2 in. by 4 in. by 7 feet long, ends; nine pieces 4 in. by 4 in. by 7½ feet long, posts front; twenty-four pieces 2 in. by 4 in. by 4 feet long, short studs front; thirty-three pieces 2 in. by 4 in. by 12 feet long, rafters; eight

pieces 2 in. by 4 in. by 16 feet long, plates; 800 feet drop siding, or to double board, 1048 feet $\frac{3}{4}$ -inch by 8 inch, back and ends; and, 300 feet house siding for front; 768 feet sheathing; eight squares roofing, and 320 feet for dropping board; 160 square feet wire netting; twenty-two yards drilling; twenty-four yards $\frac{3}{8}$ -inch Manila rope; 100 carriage buttons.

For grouting wall it will require: 2 barrels Portland cement, 14 barrels coarse sand and gravel. Labor, eight days. Roost poles and nests can easily be calculated. For the medium and large breeds, the roost poles should be eighteen inches apart, and, for the small breeds, sixteen inches. If three-ply tar paper is used for roofing, it should be thoroughly coated with hot coal tar and Portland cement made into a thick paint and put on as fast as laid. Lay one course and then apply the coal tar and cement while hot. Use a short stiff brush and put on quite thick and brush out smooth. This will make a very satisfactory roof. Renew the coal tar and cement every two or three years.

give ample room for 300 laying hens. Where ample range can be given, 500 of the smaller breeds may be kept in this large house if it is kept clean and the fowls are allowed free range and fed and watered outside during mild and clear weather.

These large houses are adapted to free range or very large yards only. Where the area is limited or where several breeds are kept I advise the colony house plan.

In constructing all houses for mature stock the earth should be graded so as to bring the surface eight or ten inches above the general level of the land to afford good drainage away from the house in every direction. This will give a good dry floor of earth, the best floor for all purposes. The best foundation for the building, as well as the cheapest, is a four-inch cement wall twelve inches high. Dig a trench six inches wide and eight to ten inches deep the exact length and width of the foundation. Make a form with plank to receive the concrete and hold it in the form until it sets hard. This concrete need not be

very rich, one part Portland cement to eight parts coarse sand and gravel. Mix thoroughly dry, then make into a stiff mortar with water and tamp into the trench and form until level on top. Trowel top smooth and leave in form four to six days when it will be ready for the frame. This makes a good, cheap foundation that will last for all time, keep rats and minks out and will keep gravel straw or any scratching material in the house. The house may be built by setting posts in the ground and spiking the frame to these, but the concrete is nearly as cheap and much better. Some advocate the use of concrete for the entire structure, but it makes a damp house and a frame is preferable.

The house should be six feet high at the back and seven feet and six inches in front. The back and end walls should be double boarded, or matched lumber should be used for siding and the front should be boarded up tightly four feet high with a watertable on top, then leave thirty inches open, with a good strong six-inch board at top. Cover this open front with one-inch mesh netting and make a drop curtain thirty-six inches wide out of good heavy drilling with a three-eighths-inch rope sewed into lower edge to stretch taut and fasten to buttons on upper cornice board. If this drilling be painted with hot parafine it will last much longer, but will not ventilate the house nearly so well. The roof should be sheathed with surfaced boards and covered with tin or some good composition roofing.

Roost poles four feet six inches long should be put along the back wall on a level, the entire length of the house. These roosts should be made in sections ten feet

long in such a way that they may be removed easily for cleaning. The best arrangement for this purpose is to put screw hooks into the studding of the frame at the back and into the rafters for the front side of these sections. Then cut a one by four inch board in sections ten feet long and bore half-inch holes at the proper distances to receive the hooks at the back and suspend the front on wire cables from the hooks in the rafters. These boards placed edgewise, with nine iron pins one-fourth inch in diameter and four inches long driven in the upper edges sixteen inches apart, and driven into the board one inch, leaving them projecting upwards three inches to receive the roost poles. These should be not less than three inches in diameter with one-fourth inch holes bored in each end at proper places to receive the iron pins. If these holes are one inch deep it will leave a space two inches between the rail and roost poles. This not only serves to secure the roosts in a rigid, immovable position, but also prevents mites from collecting between the roost poles and the railing. By covering these pins with a thin coating of coal tar two or three times during the year, mites cannot reach the fowls from any part of the house and the poles can be lifted off easily and dipped in kerosene oil occasionally, thus effectually cleaning them from mites. (Fig. 3.). A dropping board or floor should be laid of dressed lumber fourteen inches below the roost poles at the back and sixteen inches in front. This floor should be five feet wide and the entire length of the house. Have this floor three and one-half feet from the ground. This makes it very convenient to clean and leaves plenty of room underneath for the hens to exer-

cise and scratch in the straw and litter, which should be liberally supplied during the winter season.

All corn, wheat, oats and seeds should be scattered into this straw litter. Figs. 2 and 3 are cuts of the interior arrangement of such a house and will be very help-

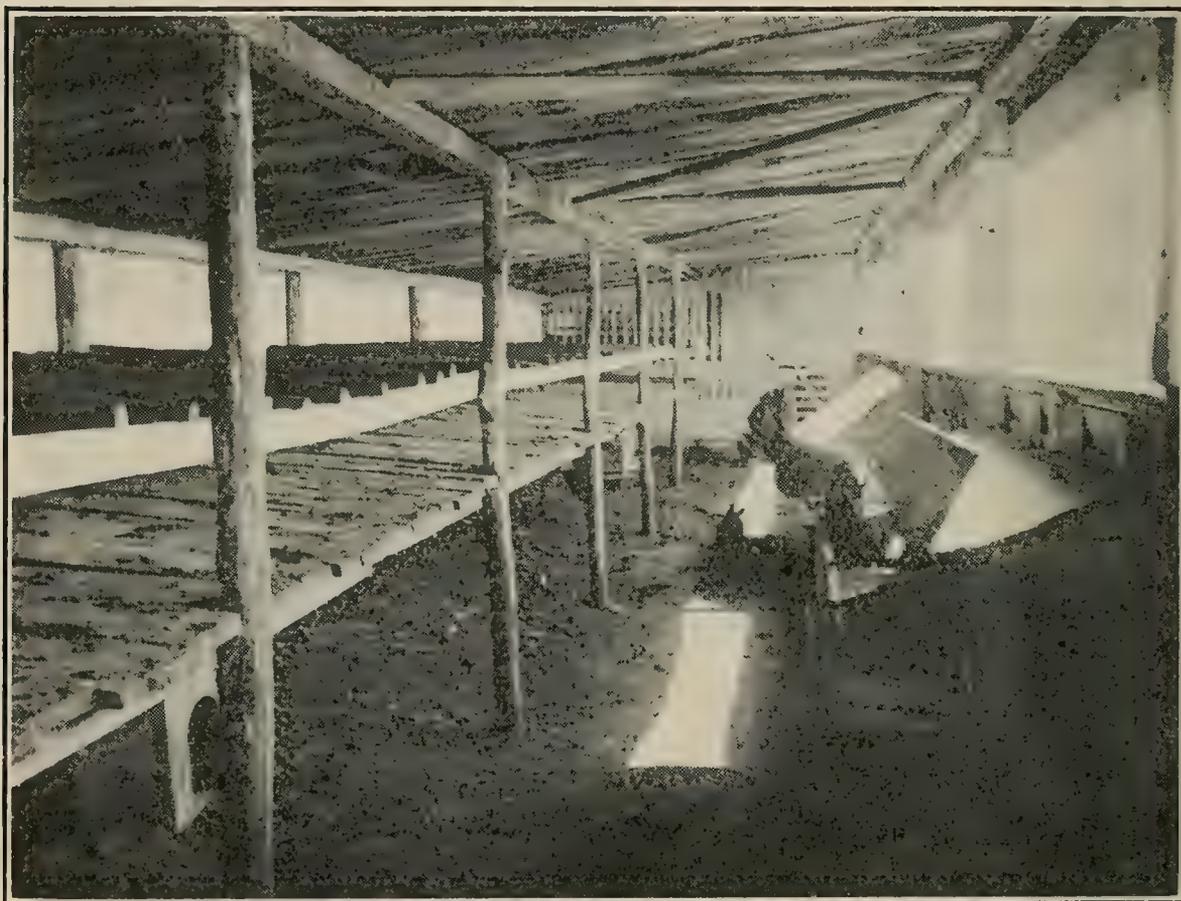


FIG. 2.—This cut shows interior of this house. The arrangement of roosts, dropping board and nests is clearly shown. Ten feet at rear end of house is separated by lath partition for broody hens when needed. Nests can also be placed under dropping board as shown.

ful in showing the construction. This kind of house can be built any length, always preserving the same sectional proportions.

I have kept 100 Light Brahma hens in such a house twenty feet long during four months of very cold weather

in the Northwest and did not have a single case of colds, roup or catarrh.

NESTS.—A single cluster of eight nests should be placed in the front of this house for every twenty feet in length. These nests should be made in clusters of six

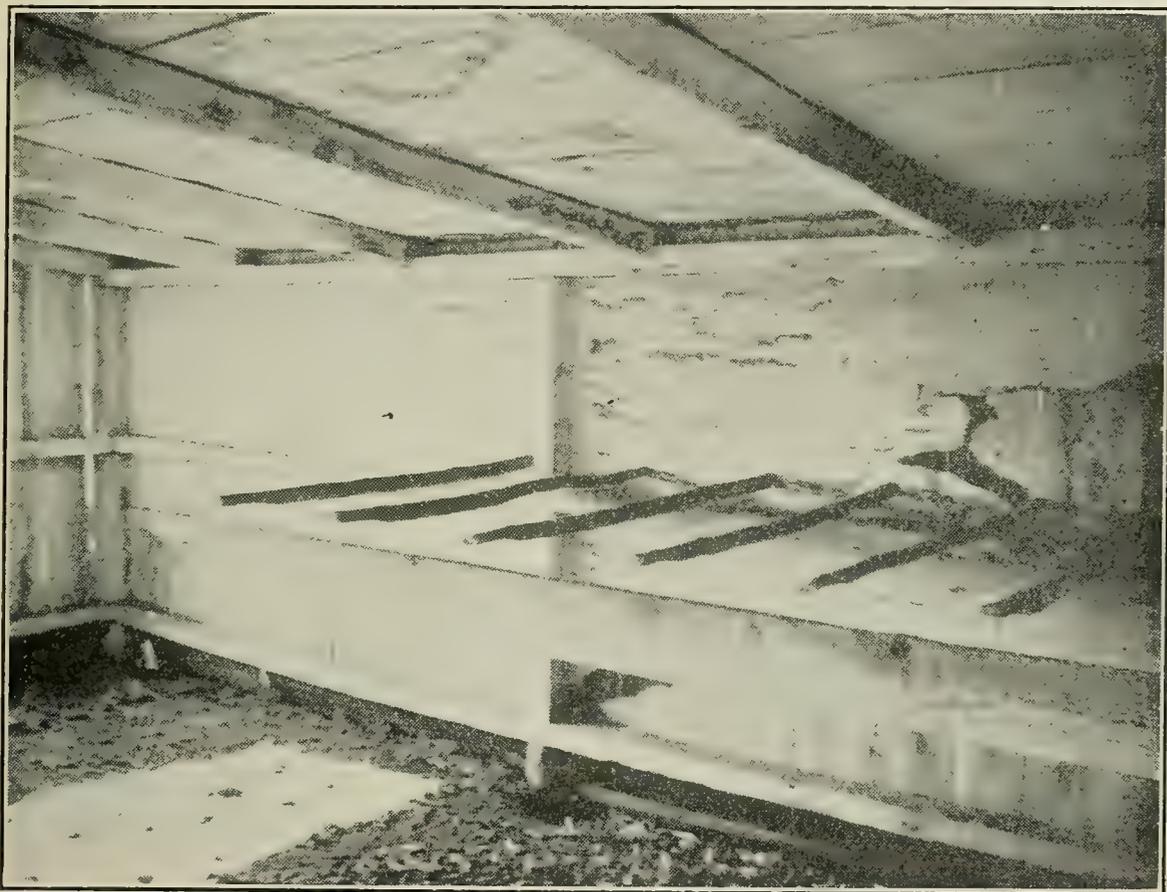


FIG. 3.—Shows interior of house with roost poles and close view of arrangement of iron pins and wire, with floor removed.

or eight (see Figs. 4 and 5) and be placed on brackets secured to the front wall sixteen inches from the ground. Lay a tight floor on these brackets nine feet six inches long by twenty-one inches wide. Make nests thirteen inches square, inside measure, and twelve inches deep at front of lowest side. Make cover at an angle of forty-five degrees and hinge lower cover board at upper edge so it can be

lifted up to gather eggs, etc. This top is simply placed on the floor and can be removed when necessary to clean and spray inside. Sweep and spray the floor, turn clus-

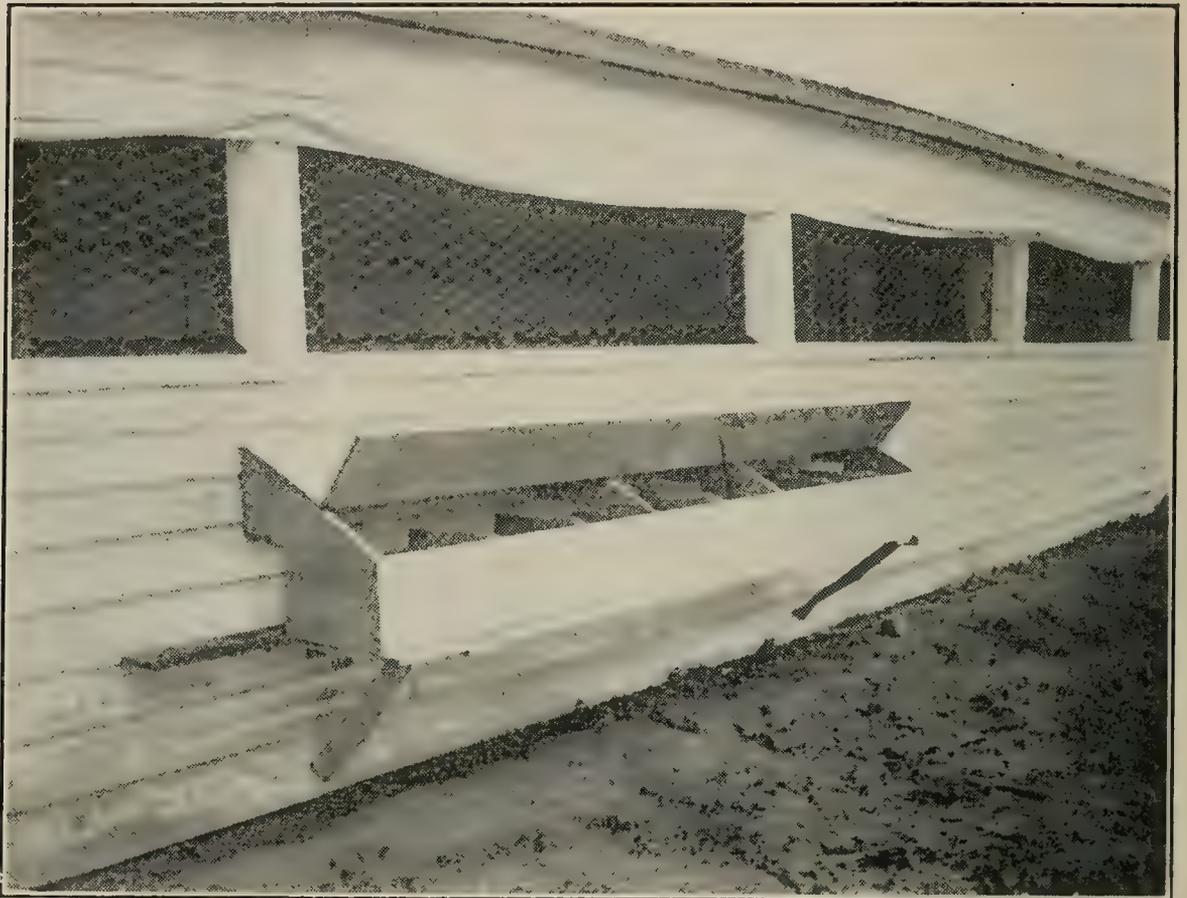


FIG. 4.—This illustrates cluster of eight nests placed outside of the poultry house to get a clear view, with hinged cover open. Make floor nine feet six inches long by twenty-one inches wide. One floor board seven inches wide should be two feet longer. Place this board at rear of floor. This will project out one foot at each end for hens to jump up on when entering nests. This board serves as the runway for all the nests. Lumber cut for this nest should be three-quarter-inch boards; six pieces nine and a half feet long by seven inches wide, two for floor, four for cover; one piece eleven and a half feet long by seven inches wide, long floor board; one piece nine and a half feet long by twelve inches wide, front of nests; one piece nine and a half feet long by six inches wide, inside for nests; nine pieces thirteen inches long by twelve inches wide, ends and partitions; four pieces twenty-one inches long cut to square mitre, or 12x12 pitch. Nail together, as shown in figures 4

and 5 and hinge lower cover board with three four-inch strap hinges. Brackets nailed to studs, sixteen inches from ground, to receive floor. Three brackets should be used for each cluster of nests.

ter of nests on edge and spray inside, replace on floor and put in clean nesting material and it is done. Figs. 4 and 5 will make this plain.

Self-feeding boxes for grit, oyster shells and dry mash can easily be made along the front of this house by boarding up the space between two studs three feet high with a small opening into a V-shaped trough at the bottom.

WATER.—Pure, clean, fresh water is an absolute necessity. The best device I have ever used for a large

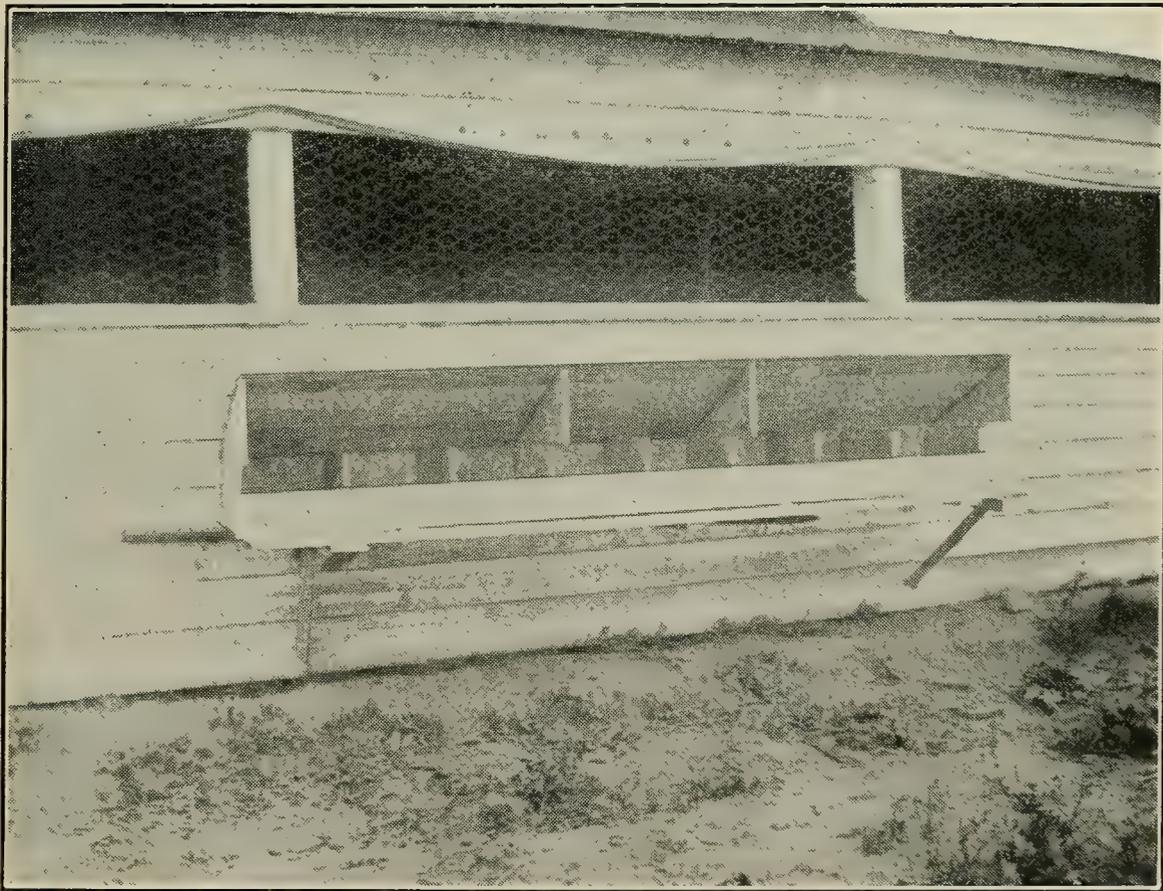


FIG. 5.—Inside view of nests, showing arrangement of partitions.

flock is made as follows: Procure a good sugar or oil barrel and saw the staves off around the barrel between the second and third hoop. Paint the short end thoroughly inside and out and place this tub under the dropping board midway of the house on a floor raised one foot from the ground on small posts. Next procure a wine or brandy cask holding ten gallons. Paint outside thoroughly. Cork tightly by driving a plug made from some soft wood like poplar or white pine into all openings. Bore an inch hole in the middle of one head and fit a good cork tightly into this hole. Bore a three-fourths inch hole into the side of the cask four to five inches from opposite end of cask. Fit a cork into this also. Set this cask on end with the hole in center of head up, into the tub described above, close the lower opening, open the top and fill the cask by pouring the water in the chine of the cask. When full cork tightly, fill the space in the tub around cask with water to the lower cork; then remove the lower cork. As fast as the fowls drink the water out below the three-fourths inch hole, air will enter the cask and water will flow out. This hole should be two inches below the top edge of tub. The raised floor will keep the tub well above the straw and litter and thus keep the water clean. (See Fig. 6.)

COLONY HOUSES.—In the construction of colony houses the same general principles should be observed. I do not advise the use of small, low houses.

Every house should be made high enough to allow the attendant to stand erect, and long enough and wide enough to give room for the flock during inclement weather. For twenty laying hens it should be eight feet wide by ten feet long and not less than six feet high. This

will give room for nests, water, etc., and floor space enough for them to exercise. Such a house can be made with portable fixtures and can be used as a brooder coop



FIG. 6.—Water fountain for large flock. See description, page 19.

for one brooder and 100 chicks. It should have a gravel floor, open front, inch mesh screen door and be built tight, warm and neat.

With a long, narrow double run such a house will easily accommodate twenty to twenty-five laying hens and two males. By having two runs the males may be allowed to run with the flock on alternate days and much better results will be obtained. Fig. 7 shows such a house with feed room attached.

YARDS AND RUNS.—It is very desirable to have the yards located so the drainage will be away from the houses if possible, thus if the drainage or slope of the

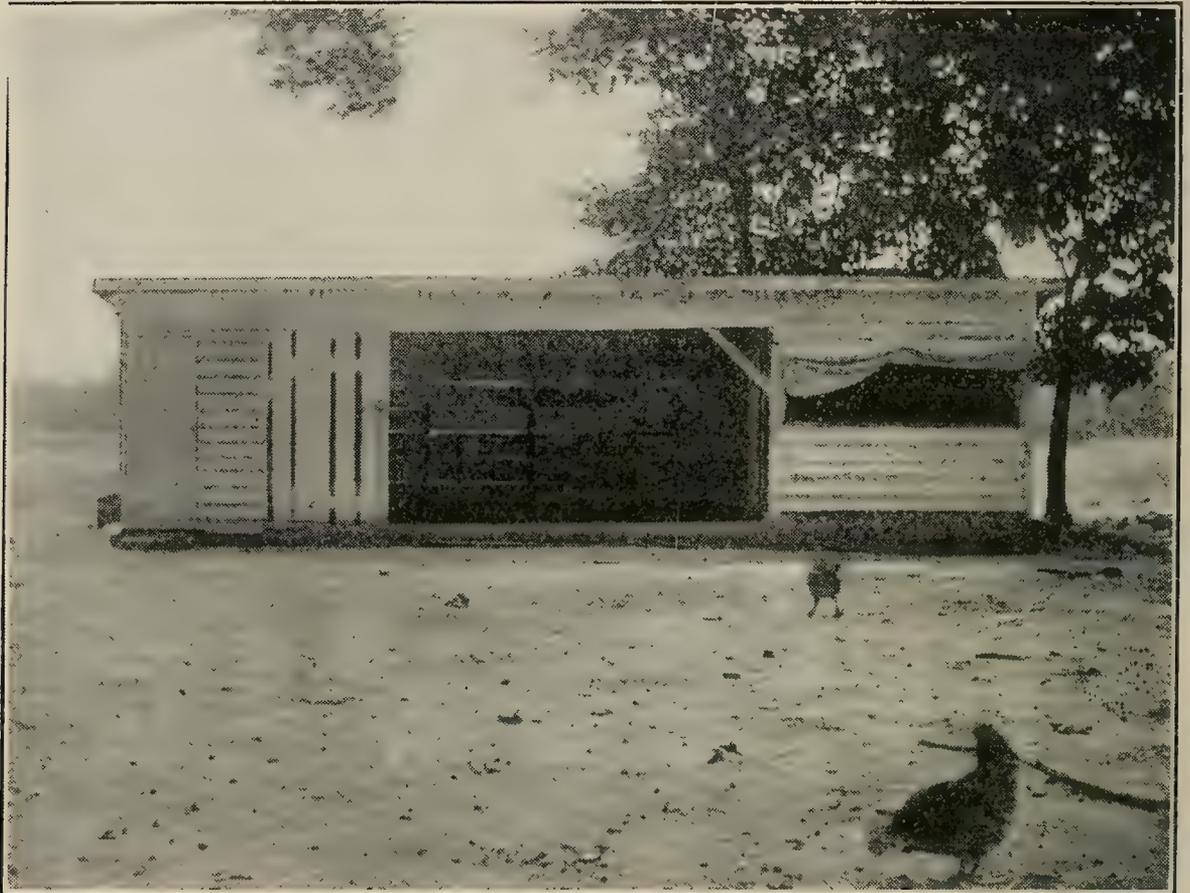


FIG. 7.—Colony house, with yards in rear. This house is twenty-four feet long by ten feet wide. Roosting room, eight feet by ten feet. Open shed, twelve feet long by ten feet wide, enclosed with two-inch mesh screen and door. Feed room, four feet by ten feet. Same general construction as Fig. 1, for roosting room, with shed open to South, and boarded with common stock boards on North side. Feed room is floored with boards, and barrels or boxes used for different kinds of grain and feeds. This room is not built in unless colony houses are remote from general feed supply. This house will accommodate forty hens for breeding purposes, or more for common laying stock.

Material for such a house, concrete foundation: One barrel Portland cement; seven barrels coarse sand and gravel; twelve pieces 2 in. by 4 in. by 6 ft. long, rear wall; five pieces 4 in. by 4 in. by 7½ ft. long, front wall; sixteen pieces 2 in.

by 4 in. by 7 ft. long, ends and partitions; seventeen pieces 2 in. by 4 in. by 12 ft. long, rafters and plates; 450 feet house siding; 312 feet sheathing; 315 feet roofing; 40 feet flooring; one piece wire mesh $2\frac{1}{2}$ feet wide 8 feet long; three yards drilling; four yards $\frac{3}{8}$ -inch Manila rope; one piece wire mesh six feet wide, nine feet long. Hinges and rim locks for three doors.

ground is to the north, east or west the house should be in the south end of the yard.

Make all yards and runs long enough and wide enough to allow the use of a horse and plow. Twelve to twenty feet wide by sixty to one hundred feet long will give room enough for a flock of twenty-five. By having two such yards for each house and flock the land can be plowed and oats, wheat, rye, clover, turnip, rape, mustard and other seeds be sown which will keep the land clean and furnish all the green succulent feed for the flock. Sow the grain very thick and not too deep and when it shows well above ground turn the fowls in and they will have green feed and sprouted grain.

The size and shape of these colony houses and yards may be adapted to the area to be used, but the same general principles should be observed throughout. Houses and yards must be dry, roomy, well ventilated with plenty of sunshine reaching into every nook and corner. There is no germicide known to science that is more effectual in its operation than the direct rays of the sun.

Glass should be used very sparingly in all poultry houses. Open windows with sash or frames covered with muslin are much more sanitary and practical than glass. Where glass is used a close-fitting frame covered with muslin should be used on the inside of every window during cold nights as the glass will radiate the heat from the sun during the day and the air will become warm

and moist, then at night the cold glass will reduce the temperature very rapidly and this moist air will chill the fowls very quickly and colds, catarrh and roup will follow. For this reason the use of glass is not advisable in poultry house construction. If one wants to test this principle of heat and cold radiation from glass surfaces let him sit in a closed room with the back close to the window with a clear sunshine striking the glass. The heat will soon be oppressive. Next sit with the back close to the window on a cold, cloudy day or a cold night and a cold current of damp air will soon be felt and in a very short time the body will be uncomfortable and a cold will be the result. The old, dark houses or coops were no more objectionable in many respects and not so dangerous to the health of the flock as many of the modern glass front structures. Fowls are very susceptible to cold currents of air but will endure a low temperature if the air is dry and free from draught.

FENCES.—The best and most economical material is a close wire mesh fence. One-inch mesh should be used at the bottom. Posts should be set fifteen to twenty feet apart and not less than four feet high with a cross arm bolted or nailed crosswise of the line of fence at the top. This cross arm should be three feet long and extend half the length on either side. Staple a two-foot wide inch mesh fence at the bottom, then a two-foot wide two inch mesh of some kind of woven fence that has straight, horizontal wires with a heavy top and bottom wire. This can be stretched taut without top and bottom boards and the two widths fastened together at two or three places between posts with wire loops, or a better way is to procure pig rings and a pair of ringers, and ring the two to-

gether. In this way it can be done rapidly and neatly, leaving no wire ends to mar the appearance, or injure the fowls or attendant.

For a partition fence procure two-inch mesh or three-inch will do, three feet wide and stretch this horizontally from cross arm to cross arm and staple fast. This will project over and make an effectual cap to the fence that will keep the flyers enclosed and separate much better than a fence six feet high.

For the heavy non-flying breeds, this cap need not be put on, as they will not fly over the straight forty-eight-inch fence. The inch mesh at the bottom will keep small chicks from getting out and rats and other small rodents from getting in, and the wire cap over the posts is a very effectual protection against hawks and jackdaws.

Where land can be had, these yards can be made wide enough to plant a row of small fruit trees in the middle of each yard. These will give shade for the fowls and add very much to the appearance as well as yield a good profit. Plant plums, apricots, damsons, peaches and dwarf apples and pears. The fowls will keep the trees and fruit free from insects and the soil can be worked and seeded, as noted in a former paragraph, and thus utilize the land and keep it clean.

By having the yards double for each house, the fowls can be changed from one to the other when seeding down, and also at fruiting and picking time.

All things considered, the cost of houses, yards, equipment, labor and feed, it will be easily understood why I favor the large house and free range plan. This brings the feeding, water and cleaning all into one house, and the expense of fencing is reduced to a minimum.

By this system only one breed can be kept, which I consider a very great advantage, especially where egg production is the aim. The one great cause of so many mixed fowls and chicks from pure-bred parent stock is this custom of keeping different yards of the various breeds. These various breeds are allowed to run together during the fall and winter months and are yarded a few weeks prior to the hatching season. This is a fatal mistake and will be fully treated in the chapter on breeding.

CHAPTER. III.

BREEDS AND BREEDING.

Every one of the pure-bred strains of fowls has its friends and admirers. Every one has its superior qualities and faults. None are perfect. No one has all the good points, and it is not the purpose of this book to discuss any particular breed, but only the three types of fowls in general use in the United States. I will classify the breeds very differently from the general custom. The utility points only will be considered. We will consider the general farm stock under three classifications, viz.:

The small breeds, the medium breeds, the large breeds.

In the first classification we find all of the Leghorns of every comb and color, the Minorcas of every comb and color, the Spanish of all kinds, the Houdans, and the Games. In the second classification are the so-called American breeds. These include the Plymouth Rocks of every shade and color, the Wyandottes of every shade and color, the Rhode Island Reds, and that great nameless breed, the Mongrel hen, or cross of every known breed, and the number of this class is legion.

In the third class we have the Brahmas, all colors; the Cochins, all colors; the Langshans, all colors, and the Orpingtons, black, white and buff. The first class is generally referred to as the laying breeds.

I wish in this connection to correct this seemingly incorrect appellation. All the breeds are laying breeds, and experience has shown conclusively that fully as much

depends upon the particular strain as upon the breed. Food stuff and care also enter very largely into this factor and characteristic.

This class has been bred for many years for egg production and non-sitting traits, yet I have had strains of Leghorns that were very moderate producers of eggs and persistent sitters. The same is true of certain strains of all the breeds named in this class, hence I think it best to refer to this class as the small breed, and to various strains in this class as laying strains of the particular breed named.

For profitable egg production, there is no question that certain strains of the several breeds in this class lead all others. The leading egg farms of this country are nearly all breeding egg producing strains of some of the breeds named in this class, and where commercial egg farming is the prime object, some of these breeds are used as the main dependence.

I deem it unwise and unfair to boom any particular breed and aim to give facts only. In classing these breeds as "small" I would not be understood as meaning diminutive in size only; relatively, I have seen and owned some excellent layers of the Leghorn family that weighed, when in good laying condition, nearly six pounds, and five pounds in weight is very common, the average, however, of the breeds in this class will probably be about four pounds for mature birds in good laying condition. All of the breeds in this class are very active, good foragers, reliable breeders and grow rapidly, mature early, feather fully when quite young, and are very hardy. They will grow to broiler size (twenty-four ounces) as quickly as any of the large breeds and will be plump and

fully feathered at eight to ten weeks old. The quality of the flesh in the young birds cannot be excelled, and, in mature fowls, is excellent, when in good condition. This is especially true of the Games and Houdans.

Many people make the mistake of judging the table qualities of the mature stock in this class when the carcass is lean from long continued laying.

All the breeds in this class should be fed liberally on fattening feed at the close of the natural laying season for some weeks before marketing. This will not only increase the weight, but improve the quality.

Neither one of the breeds in this class can be said to be reliable sitters or good mothers. A few individual hens may be steady enough, but the great majority are too nervous.

The eggs laid by all three breeds in this class are large and white-shelled, and bring top prices everywhere and a premium in some markets. The hens in this class yield profitable returns until four to five years old. This class may be said to fill the same place in the poultry industry as the Jersey, Guernsey and Alderney cows hold in the bovine family. None of them can be said to be profitable as a market fowl.

In the second classification we have two very popular breeds and a third forging to the front rapidly. The Plymouth Rock is perhaps the most numerous of any of the pure breeds in America to-day. The various colors have been bred long enough to fix the standard and give a fairly certain result in mating.

The Barred Rock is a fine specimen of the parti-colored fowl, and the white and buff breed reasonably true to type and feather. The inclination to run to brassiness

in the white, and yellow and red in the buff is not so marked as a few years ago.

Careful mating must be the watchword if color and type are desired in the medium breeds, because they are all comparatively new and the tendency to reversion is much greater than in class one.

The Wyandotte has many good points as a general utility fowl and much to commend it to the general farmer as well as the specialist. This breed matures more uniformly than any of the breeds in this class, is close feathered and feathers young, and makes a splendid foundation stock for broilers. The Wyandotte has a broad, deep breast development and makes a fine, attractive carcass when dressed. As foragers, the Wyandottes and Rocks are equal to the native stock of the country and may be said to be good general-purpose fowls, fairly good layers, good size, hardy, vigorous and quiet in disposition. Some strains are good layers and nearly all are good sitters and mothers. The Rhode Island Reds are a new creation and growing in popularity. They are of good size, a pleasing color, good layers, especially in winter, reasonably good foragers and quite hardy.

The three breeds in this class are good table fowls, fairly good layers, quiet in disposition, easily confined and reliable in every way as a farmer's fowl, and some of the new varieties of the Wyandottes are a fanciers fowl. The Reds are new and not fixed in type or color, but are rapidly coming to the front as a utility breed.

These three breeds lay brown-shelled eggs.

The common barn yard hen of America is after all the most numerous of any of the distinct types, and this proclaims her to be the most popular.

She may be found in all the valleys, on the slopes, the hills, the mountains, the fertile plains, the dismal swamps, the sandy deserts, in the hut of the foreign immigrant, the home of the poor man, the cabin of the negro, on farm and town lots, in the yard of the rich—everywhere may be seen the variegated colors, ringed, streaked and speckled; long legs, short legs, yellow, green, blue and black, every color of leg and feather, with a dash of the blood of every known breed and type in her veins, she stands to-day as the real American type par-excellence. One cannot get away from the notes of her song or the staccato of her cackle. Some one says, "scrub." Yes, the scrub hen lays the most of the eggs of commerce. Why? Because she is ten times as numerous in the United States as any of the pure breeds. Why? Because she came here with the first settlers; because she was a pioneer in every State and Territory. She has no fixed type or color, no standard qualifications, no one to sing her praises in the show-room or advertise her wonderful achievements in the newspapers or periodicals. Yet she lives and sings and cackles, and, if she had good care, selection and feed, she would rival her cousins and aunts among the aristocratic Rocks, the wonderful Wyandottes and the royal Reds. Her eggs are every shade, from white to dark brown, and her skin from blue to yellow, and, like Hamlet's ghost, "she will not down." Why is this? Because she is a thoroughbred scrub. She is hardy and practically self-supporting and the great mass of mankind thinks a hen by any other name would be a hen just the same.

Some of the strains of pure breeds have been inbred to fix the type or characteristics and the vigor of them

impaired. People have bought eggs and stock from such foundation stock and were disappointed and have gone back to "old spreckle" because she would live and lay five or six dozen eggs per year without any special care or feed.

The average farmer is satisfied with this result providing she will roost in the trees, in the barn, in the tool house, anywhere, and forage for her living and steal her nest away and raise a few chicks to frying size.

I have nothing to say against any class or breed, but I know from experience that any of the pure-bred fowls with ordinary care in breeding, fair treatment and good feed will yield a much greater profit and be a source of pleasure to the owner. No more pleasing sight greets the eye than to behold a flock of pure-bred fowls of uniform shape and color.

There are special breeds for special purposes and this is an age of specialties and specialists, and we must cut loose from the scrub in every form and improve our every effort if we may hope to succeed.

The breeds composing the third class are large in body and fluffy or loose feathered, with small combs and wattles. They mature slowly and do not attain full weight until fully one year old.

The breeds composing this class are known as Asiatics, with the exception of the Orpingtons, and they undoubtedly get their size and fluffy feathers from the Cochins.

All the breeds in this class are moderate layers of large brown-shelled eggs. They are persistent sitters, very slow and quiet in their disposition, indifferent foragers, easily confined. We have frequently kept Brahmas, Cochins and Orpingtons in separate enclosures with a

thirty-inch fence. Their large, bony structure and quiet habits make them very desirable for soft roasters and capons. The hens of some strains of this class can be made to weigh as much as twelve pounds, and capons frequently exceed this weight by five pounds.

This class requires different care and feed from the small and medium classes. Every means must be employed to make them exercise during the breeding season to keep them from getting overfat.

Heat and fat-producing feeds must be avoided as much as possible. This will be treated fully in the chapter on feeds and feedings. A few strains have been developed that are fairly good winter layers, but, as a laying breed, they are never satisfactory. They are a profitable fowl to breed for a class of trade that demands a large, soft, well-matured, fat carcass. The writer has sold Brahma capons weighing sixteen pounds at twenty-four cents per pound. It costs but little, if any more to produce a pound of this flesh than it does to produce a pound of pork or beef, yet it always sells for two or three times the price of these staple products.

The Orpingtons are a cross-bred type, and the eggs show the characteristic colors of the parent stock, varying in color from very light brown to dark brown and almost lavender and are not uniform in size. The quality of the flesh of the Orpington is thought by some to be better than others of this class, but this is no doubt largely imaginary, or is the result of careful feeding.

BREEDING.—For practical results, the “hen that lays is the hen that pays.” The great mass of farmers do not care for the fancy points so dear to the eye of the fancy

breeder. Very many people do not know one breed from the other, only as white and black and yellow chickens.

It is true that more people in America know the barred Plymouth Rock than any other breed, and it is also true that the barred Rock has been more largely used to cross on the native hens than any other breed, and the native stock has been materially improved by this cross.

The author of this book does not advocate cross-breeding any fowls or stock, as a rule, but there may be crosses made that from a purely economic standpoint are advisable. The mule is an instance of such a cross, but we cannot conceive of any necessity for such cross-breeding in poultry. We have to-day pure-bred fowls of every type and color and for every place and purpose that fowls are used for, and there can be no reason for cross-breeding except the production of new types or breeds, and this is the work of a class of specialists and will not be considered in these pages.

For the general farmer we have pure breeds and special strains that may be had that are superior to any cross that can be made.

Great egg production and large carcass cannot be combined in one breed or be made possible by crossing. One or the other must predominate, hence it follows that those who find egg farming more desirable than the production of market fowls will naturally in time be driven to one or the other of the small breeds, and vice versa.

Location, environment and taste are the determining factors in the selection of the kind of fowls that the individual should select. Having determined this, then a breed and strain should be selected that will fill these conditions and should be bred pure, and im-

proved in the direction of the end to be attained. If egg production is the prime object, then make every effort to breed for early maturity, large egg yield, non-sitting characteristics. The size and color of the eggs must not be neglected or overlooked. We want quality in eggs as well as quantity. Uniformity in size and color count very much in the sale of fancy eggs. This result can be attained by careful selection of the breeding stock. If one will select the pullets from a flock that begin to lay first, and those of them that lay large, uniform eggs, and breed these to a male from a similar strain, great improvement will follow, and the strain will increase in value with each generation.

The same is true in the production of broilers and market fowls. Early maturity, rapid growth, plump bodies, with good breast development, clean legs, small heads and, above all, the color demanded by your market in the dressed carcass.

Quality counts for more in this branch of the business than in egg production. The trade requires the best, if top prices are to be realized, and the man who breeds for the form, color and size demanded by the trade and then feeds well will be rewarded twofold—quick sales and top prices. Long legs, white or blue skins, lean, lank bodies long necks, large heads show low quality and are the last sold at the lowest price. For market purposes, breed close, compact bodies, yellow legs and skins, short legs, short necks, small heads, and then have them fat and in first class condition on the market. Such stock will gain a reputation for the breeder that will be worth many times its cost.

This book is written by a business poultry man, not

a fancier, and for business poultrymen. The fancier has his books and is in a class by himself and has done incalculable good to the industry and cannot be dispensed with under any consideration, but that great army of business poultrymen and women for whom this book is written want to know how to make poultry pay, and it is the purpose of this book to tell them in plain and truthful terms.

CHAPTER IV.

HOW TO BEGIN.

This question has been asked many times. Now that we have the location, the houses, yards, etc., and have selected our breed let us consider this question: How must I begin? Shall I buy eggs or breeding stock? Shall I hatch my chicks under hens or in incubators? Shall I buy common stock or fine stock? Shall I begin on a large or small scale? All these questions and many others will arise in the mind of the prudent man.

The poultry business is pre-eminently a business that requires practical knowledge and this practical knowledge is the greatest asset that one can have. This cannot be bought or acquired in any other way than by experience. It will be plain then that to experiment in a large way would be very hazardous, therefore begin in a moderate way. Many people have an idea that anyone can succeed with poultry. Many have made a success with a few hens and reason that the only difference in the care and management of a few hens and thousands is the extra room and feed required for the larger number. They find when too late that this is the pitfall that has entombed many good men.

Fifty to one hundred hens can be kept on almost any farm without danger to the health of the flock, but when we increase to five hundred or one thousand we increase the ratio of risk ten fold as well, and much more care will be necessary than with the smaller flock. The natural parasites will increase, the soil will become polluted,

the natural supply of grit, insects and grass will become depleted and disease will appear. The man or woman who wants to engage in the poultry business to make a living therefrom must begin in a small way and learn the business step by step. Books and poultry papers will be a great help but the business must be learned.

Where one can spare the means the best way is to buy breeding stock. Select the breed desired then buy from some reliable source as many yearling hens as needed, say ten or twenty, and one or two good cockbirds or cockerels.

The fall of the year is the best time to buy this stock. Get it into winter quarters early and learn to feed for good, fertile eggs. This will enable you to know exactly what kind of eggs and stock you will have. It will also guarantee you fresh eggs for hatching early in the season and at lowest cost. Twenty hens will supply enough eggs to keep a 250-egg size incubator at work all the time. In the South we can begin to hatch Jan. 1st. Suppose we make eight hatches. We will then have used 2,000 eggs and should have 1,200 to 1,500 chicks. By the time the last chicks are out of the shells the pullets from the first hatch will be nearly mature and will demand extra care, feed and room. Enough should be realized from the sale of cockerels as broilers to pay for all the feed for the entire flock to maturity.

The hens may be sold, but if the stock from this mating be satisfactory, it would be wise to keep them another year. Select the best pullets and give good care and feed. Within one year one may easily raise a flock of 500 first-class pullets.

Then it becomes a business proposition and must be pursued as such. If we expect to make eggs a specialty,

then we must push every pullet with all possible speed to maturity that we may get eggs when the best prices prevail. When one has mastered all the problems of this first year he is in a position to double the flock the next year.

By this method one has time to note many things that will be helpful and also to make such houses, yards, etc., as will be found necessary, whilst on the other hand expense and risk have been reduced to the minimum. It will be evident to all that at this point the two branches of the poultry business diverge and each becomes a distinct line in a sense. One cannot raise hens for egg production without raising about an equal number of cockerels to be sold as fryers or broilers, but if one intends to devote his time and energy to table poultry it will not be necessary to keep so many layers. Two hundred good hens will supply eggs enough to operate a 5,000 broiler and soft roaster farm and this is about the limit of one man and his family. We cannot depend on nature to hatch our chicks if we expect to make a living out of the business, but if we only want to keep up a farm flock of about 100 layers this may be done very satisfactorily by natural incubation. This will be discussed fully in the chapter on incubation.

Where one wishes to begin at the very fountain head with very little capital it may be done in another way. Buy a small, good incubator and 100 eggs of the breed selected. Buy good eggs. Hatch them and raise the chicks for the breeding stock then proceed as intimated in the foregoing. It is very poor economy to buy cheap stock, cheap eggs or cheap incubators. It will pay far better to have good stock, good eggs, good incubators and cheap houses.

CHAPTER V.

FEEDS AND FEEDING.

This is a problem that will never be solved. No two men see exactly alike. No two eat alike. One wants more salt, less sugar; one wants everything sweet or sour. We do not want the same food all the time. Watch a hen on a free range and see how she will roam from place to place and take a taste here, a mite there, a pebble at one step and an insect or a worm at the next. If she can get plenty of young grass and clover, insects and worms she will eat very little grain.

Watch that old hen with her brood for an hour some sunny day. Give her the range of the barn-yard and watch her carefully and you will learn how to feed baby chicks. Busy from daylight till dusk. A bit of grass, then a minute seed, next an angleworm, then a beetle, here children, is a small, sharp bit of stone, there is a sprouted weed-seed, oh! here is a great find, a whole head of millet seed, look, there goes an ant, run, get that May beetle, here is a good morsel, just arrived, that grasshopper will be enough for your dinner, get that fat cricket, quick, before he gets away. So it goes all day long. Run here and there. See them scratch and dig at that big turf. What do they find? Small insects, bits of stone, root stems, grass, weed seeds, a grain of wheat.

When they have a good range call them and give them a handfull of sloppy cornmeal and note how much they will eat. Very little.

When we confine them in yards and pens we stuff

them five or six times a day with some soft mash and they live a week or two and then mope around a few days and are "gathered unto their fathers." This feed is the same every day, every feed.

Let us see if we cannot come nearer to nature and save these little beauties. First, see how the old mother hen hovers them. They creep into her feathers and get their backs against her warm body. They may be standing on the cold, damp ground, possibly on snow or ice. That don't matter so their backs are warm and against some warm substance. There are not more than twenty of them in that flock. If you give her more they will almost surely dwindle away to this number. They have all outdoors for fresh air. What do we do? Put 200 in a box near a lamp. They stand on a warm floor, in a warm atmosphere, with nothing but imagination to put their backs against. We have just given them all the rich concentrated food they could cram into their crops in a few moments. They have no grit, no meat, no grass, no earth for them to scratch in, no exercise, but they have plenty of feed. They become so hungry for animal food that if one is injured in any way and the tiniest speck of blood appears the others will devour it. We drive them to cannibalism. They want something warm on their backs and they creep under each other, pile up and smother. We say they are cold and turn on more heat. They get too warm and steam and sweat then come out, get chilled and bowel trouble begins and they are gone and we have "bad luck" with chickens. We blame the brooder and the brooder manufacturer blames your breeding stock or the weather or, if it is campaign year, he may say it is caused by the political agitation. Suppose

we make a brooder in small sections with a warm, wooly cloth on, have this cloth down low so they must creep under it, have them stand on the ground or some dry sand and gravel, put about twenty or twenty-five in each section, have an enclosed run for them, put cut straw, hay, chaff, lawn clippings, a few shovels full of fresh earth into this, then strew some millet, hemp, clover, timothy, rape and mustard seeds into this litter. When they begin to eat these add cracked wheat and corn, some pin-head oats or oatmeal flakes, burn some corn black and have it broken in bits small enough so they will eat it, throw a few hands full of chick grit into the litter and watch them work. Hear the contented peep, peep, peep. See the dust fly. Exercise and feed. No weak legs, no bowel trouble. Get some good, sweet beef scrap and put it in an earthen dish and pour boiling water over it and leave it to stand over night. In the morning rub enough shipstuff into it to make it dry and crumbly. Throw this into the litter and see them have a picnic. Will they find it. The smallest speck. What more? Clean fresh water and a little run on grass or some clover or alfalfa meal steamed over night. Continue this treatment and in two weeks whole wheat, coarse cracked corn may be given at night and by the eighth or tenth week they will try to crow and will be ready to be exchanged for good hard cash.

Any system of feeding that will keep chicks healthy and make them grow will be ideal for the laying stock. An egg is a chick in embryo. The hen must be healthy. To be healthy she must have good feed, plenty of exercise, sunshine and fresh air. Never feed her musty, mouldy, or rotten grain. Give her as great variety as

you can. "Variety is the spice of life." Buy all grains and seeds from first hands if possible, or, better still, grow them. The prepared chick and poultry feeds are a delusion and a snare. You do not know what they are. A few acres of land will produce all the special crops necessary and wheat, corn and oats can always be bought from first hands at market price.

For laying stock a good variety can be made by using wheat, oats, buckwheat, sorghum, kaffir corn, millet seed, cowpeas, soja beans, sunflowers, cabbage, rutabagas, clover and alfalfa. This will give a good variety and with wheat bran, shipstuff, corn and meat meal may be varied so as to produce combinations of feeds to promote growth in young stock, egg production and fat as desired.

When we know and remember that wheat, oats, buckwheat, millet, cowpeas wheat bran and meat meal are flesh forming feeds and consequently egg producing food, and that corn, kaffir corn and sunflower seeds are fat formers and the clovers, grasses and vegetables are largely health promoters, we can combine these feeds to make such combinations as will give us the results desired and give variety as well. We must always remember that a certain part and proportion of the food consumed is used by the fowls to maintain their normal condition, and all in excess of that amount eaten and assimilated will make either eggs or fat. We can feed the different classes with the necessary elemental products to effect our purpose. Hence, in feeding the small breeds we can feed more corn and starchy food than when feeding the large breeds because we must supply a given amount of heat producers and the small breeds require relatively more of these elements than the large breeds, owing to their more active

natures and the natural tendency of the large breeds to convert the starchy elements into fat, heat.

We grow the pig with milk, shipstuff, clover, peas and other like feeds rich in proteinoids, flesh formers, and fatten him with corn. We can apply this same rule to the hen when we remember that an egg contains all the elements necessary to life and growth in approximately the right proportions. It necessarily follows that if we feed corn largely or wholly we fatten the hen but she cannot lay eggs because she lacks the constituent elements necessary to the formation of every part of the egg. We hear it said many times that hens are too fat to lay. This is not the true reason. She is getting a one-sided ration and consequently is putting the fat in her body. Experience has shown that if we feed a less fattening food to these hens they will begin to lay and will give us excellent returns. It is wise to feed the growing stock in such a way and with a ration high enough in fat-forming material to keep them in good condition all the time and at the approach of maturity to increase the flesh producing content of the ration and in this way stimulate egg production. For this reason we feed green cut bone and meat meal, which is rich in this element, more liberally during the laying season than at other times.

Regularity in feeding is also very important. Hens on free range should have a mash feed early in the morning, rich in protein, but should not be fed enough to gorge the crop. Feed shipstuff, corn meal, crushed oats and meat meal at this feed. A noonday feed of wheat, oats, buckwheat and vegetables may be thrown into the litter and the grains, corn, wheat and oats should be fed at the evening feed, and this feed should always

be a full feed. Be sure the fowls go to roost with full crops.

Good clean, sharp grit, always before the fowls is an absolute necessity. Very many people do not realize the importance of this and their fowls fail to give profitable returns when the feed is all that could be desired. Hens will not eat a full ration if grit is withheld and if they do consume the food it will not be digested and indigestion will follow and the fowls will be seen standing about in a listless, indolent, sleepy stupor. More grit and less feed is the remedy. Many of the mixed poultry feeds on the market give good results simply because they contain ten to twenty per cent. of crushed stone. It is certainly very foolish, or bad judgment at best, to pay over two cents per pound for grit when it can be bought for one-fourth of this sum. Lime must also be given in some form to make bone and shell. Crushed oyster shells are a very convenient way to supply lime but broken limestone will answer the purpose fully as well and be cheaper in some sections. Near the coast where shells may be had for the hauling they may be easily converted into available condition by heating them red hot, then when cool they will break easily. Grit and lime are necessary for the little chicks as well as the laying stock. It strengthens the bones and aids digestion and thus promotes health and growth.

Good sound grain, grass, vegetables, clover, meat in some form, grit and lime are the essential elements in feeding, and variety and regularity the potent factors in maintaining health. One of the best substitutes for green feed is sprouted grain. This may be sprouted oats, wheat, rye, corn, or even the peas and clovers. To make

this, two sets of boxes and trays or shallow boxes are required and a room of even temperature with good light will be very helpful. Take an amount of grain sufficient to make a good allowance for the flock for several days and put it in a tight box or barrel and cover the grain with warm water. Leave it in this box or barrel until it begins to show signs of sprouts, then remove it to the shallow box or tray with a little drainage in the bottom. Place this tray in a sunny, warm place if you can and spread the grain over the bottom about two inches thick. Sprinkle daily until it becomes a mass of green. When the sprouts are about two inches high cut the mass in squares and feed to the hens. They will eat the sprouts, grain and roots and will repay the extra cost many fold in the increased yield of eggs. This can be made of mixed grain and makes an excellent feed for young chicks that are raised in small enclosures as well as for laying hens in winter when succulent grass and clover is not much in evidence.

CHAPTER VI.

NATURAL AND ARTIFICIAL INCUBATION.

As noted elsewhere, the method of hatching is determined by the number of chicks to be reared and the purpose for which they are intended. Where one simply wants to renew an ordinary farm flock of medium size, the natural method of hatching is very satisfactory. Where one can get all the chicks wanted by hatching 300 eggs or less, nature's way will undoubtedly be most satisfactory. Where one of the small, non-sitting breeds is kept exclusively, it would undoubtedly be best to buy a sufficient number of native hens or yearling hens of some of the large breeds to hatch the chicks and raise the broods. These hens could be fed in such a way whilst rearing the broods to have them ready for market by the time the chicks would be large enough to do without motherly care. A good way to manage these hens is to put them into a colony house and run as early as possible. Feed for eggs and get them to laying early. Allow no males with them at any time. Make nests uniform in size and shape for the hens, one for each. Encourage them to lay in separate nests as much as possible, and when they begin to show signs of broodiness, close the entrance to the occupied nests with a wire screen. Keep the hen on the nest without eggs until several are broody, then give them the eggs all at one time. Before giving them the eggs, clean the nests thoroughly and dust them with some good insect powder. Put some moist earth in the bottom of each nest and on this put a small amount of nesting material. Put a moth-ball in ground of nest and no mites will enter it. If one can set five or six hens in this way the eggs can

be tested the fifth day and the infertile ones removed and the fertile ones put under four or five hens, and the remaining ones can be set on a new clutch. This means a gain of ten to fifteen chicks for every five or six hens. Have these nests arranged so the hen can be enclosed without trouble. They must be fed and watered daily and at a regular time during the day. A very convenient form of nest is shown in Figs. 8 and 9. This nest is made large enough to allow the hen some exercise and really the hen may be shut in the entire period of the hatch, and then it can be used as a brood-coop. If these nests and brood-coops are painted with a coat of cement paint at the close of the breeding season and kept stored in a dry place they will last many years. The coop and nest should be made two feet square and eighteen inches high, with a floor one foot wide across the rear side. Nail a narrow board on this floor edgewise and another crosswise, making a shallow box twelve inches square for the nest. Cover the front with one-inch wire mesh and cut a small door three and a half by three and a half inches in one end for the chicks to run out and in. Hinge this door so it may be closed securely. Put a good gable roof on with dowel pins, as shown in the figure, and you have a very practical nest and brood-coop combined at very small cost. With small, movable wire yards covered with two-inch mesh netting, the hen and chicks can be moved daily and be secured against all kinds of chick enemies and have a dry, comfortable shelter. The hens should be thoroughly dusted several times during the three weeks to make sure they are free from lice. Take some insect powder and vaseline and rub it together and then rub some of this ointment into the short, fine feathers of

the heads and necks of the sitting hens to kill the head lice. Do this just before the chicks begin to hatch and

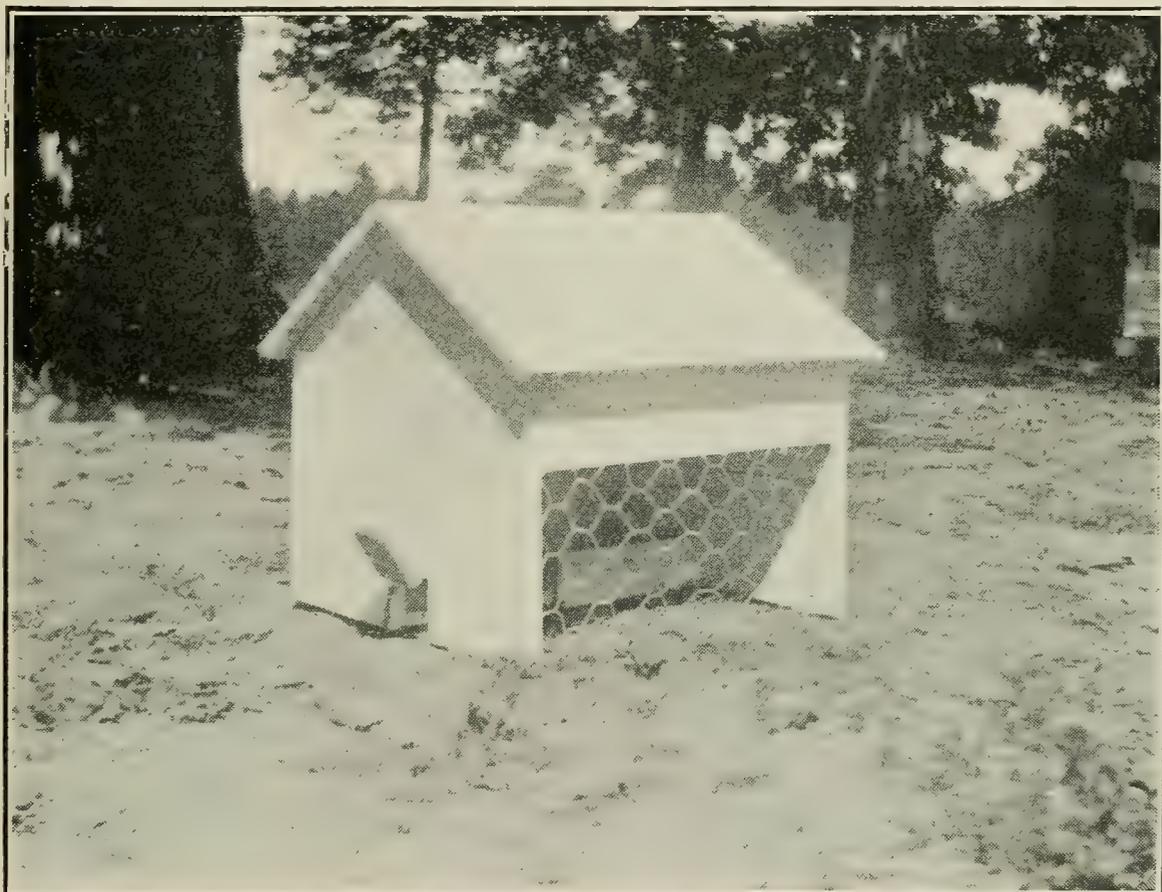


FIG. 8.—Nest and brood-coop. This nest and brood-coop is made two feet square, inside measure, and eighteen inches high to square.

Use $\frac{3}{4}$ -inch lumber, 9 inches wide; four pieces 2 feet long for ends; three pieces $25\frac{1}{2}$ inches long for back and front; one piece 2 feet long by 13 inches wide for floor; two pieces 13 inches long by 4 inches wide for nest box on floor board; one piece screen 9 inches wide 2 feet long. This completes the nest.

For top, cut two boards 2 feet long by 9 inches wide, and cut to point at each end from center for gable ends. Use $\frac{1}{2}$ -inch lumber for roof boards and cut them 28 inches long. Nail on to gable end boards, as shown in cut, and cover with some good roofing material. Put two dowel pins of No. 9 fence wire in gable end boards to fit in holes in lower section, as shown in Fig. 11. Cut door in end $3\frac{1}{2}$ by $3\frac{1}{2}$ inches square and hinge, as shown in cut. Paint two coats inside and out.

again four or five days afterward. Lice powder will not kill these head lice and we want to make sure that the hens are free from them before the chicks are hatched. These head lice kill more chicks than all other vermin and diseases combined. After the chicks are hatched rub some of this ointment into the short feathers on the



FIG. 9.—Showing nest and brood-coop open.

shanks of the hens as these same lice will sometimes be found there. This treatment will rid the hens of these pests effectually and will save many chicks and much trouble.

Some advise giving two or more broods to one hen and setting the other hens a second time. This is not

advisable. One hen cannot hover more than 15 chicks and a hen will seldom hatch a second clutch satisfactorily. Some advise hatching in the laying nests but it is much better to have individual nests for each hen and have them separated as much as possible.

With these individual nests the hen may be moved to the yard the day before hatching and in this way isolated so that there will be no disturbance of any kind when the chicks begin to peep. Whilst in the double nests when the first peep is heard every hen will be disturbed and nervous. They will many times leave their own nest and go from nest to nest to find that first born and many eggs will be broken and spoiled. Whatever kind of nests, houses, yards, etc., may be used the main object to be secured is to get the hens isolated as much as possible. Have them in cool darkened nests where they may be enclosed easily and arranged so the nest and hen may be moved. Get the hens and nests free from lice and mites before the chicks are hatched.

ARTIFICIAL INCUBATION.—This is a very old art and was practiced by the ancient Egyptians. It is comparatively new in America. The incubator of to-day is a very different affair from the great ovens of the Egyptians. We cannot consider their methods for present day needs. We want incubators now that will hatch eggs by the use of oil, gasoline, gas or electricity. The incubator of the near future will be equipped with electric radiators, regulators and automatic turning and cooling devices that will do the work automatically. We have many styles and kinds of incubators on the market to-day, each one with the stereotyped claim of being the "best." All of them will hatch chicks if directions are followed

and conditions are right, but none of them are satisfactory under all conditions. Taking the average of the hatches of all the incubators in this country we will find that it takes fully 5 eggs to produce one chick to maturity. With special equipment of houses, cellars and skilled operators the per cent. of loss is not so great but the fact remains and is patent to every one familiar with the subject, that artificial incubation and incubators are far from perfect.

It is comparatively easy to construct an incubator to produce and regulate the heat within five or six degrees of the supposed correct temperature, but to surround the eggs with this temperature is not *all* that is necessary. Chicks die in the shell at all stages of the hatch and millions of them die between the sixteenth and twenty-first days of the hatch. There is something lacking somewhere that the ingenuity of man has not been able to discover. It is at this stage of the hatch that the greatest mortality manifests itself. Many plans and devices have been advertised as remedies but the mortality continues.

That it is the fault of the incubator has been proven many times by taking a certain per cent. of the eggs out of the incubator on the sixteenth day and putting them under hens with the result that very few, if any, would die in the shell, while the eggs left in the incubator till the hatch was completed would show from 10 to 75 per cent. of loss. The author of this book has had many years of experience with every kind and character of incubators, under various conditions of seasons, climate and altitude and finds the facts to be as noted. The same machine may make one or two fairly satisfactory hatches and then without apparent cause the chicks will die in

the shell for several hatches in succession and then will make good again. No one expects every egg to hatch into a good strong chick; the mother hen cannot do this, but where the chicks are almost fully developed or quite so, and fail to get out of the shell it is evident that the fault is in the machine. Some manufacturers doubtless make the best machine that can be made and poultrymen owe much to these men for bringing incubators to the present stage of development, but no manufacturer can truthfully say that his machine will hatch every hatchable egg. They will not do it and everyone who has had experience with incubators knows this to be true.

There are really but two principles in use in heating the eggs in the egg chamber: Hot water circulating through pipes or tanks and hot air, either from a heater dome or hot air tubes or both.

As noted, the heating is comparatively easy but there remains unsolved a principle or law of nature other than heat. Until this problem is solved we must be content to use the best we have and study how to attain best results. Generally speaking, one will succeed best by following directions furnished with each particular kind of machine, yet this is not always best as shown by the fact that the manufacturer changes these instructions from time to time as experiments show him the error in former instructions. Altitude, climate and season also have great influence on the final result. No one can give specific directions or instructions for operating incubators under any and all conditions and all that can be said in a work of this kind is to get the best eggs obtainable and this can usually be done by having the stock in your own care. Eggs intended for hatching

should be kept in a cool, dark place where the temperature does not vary much and does not go above 70 degrees. The eggs should be moved or turned every day or two and should not be over two weeks old. They should be clean and great care exercised to keep all grease and oil from the shells. The eggs should never be turned or handled in any way while filling or trimming the lamp as kerosene oil will penetrate almost any substance and one cannot fill and trim lamps without getting more or less oil on the hands. This makes it necessary to be careful about handling eggs when trimming or filling the lamps.

Uniformly better results have been obtained in our experience by bringing the temperature to the desired degree very slowly, and not exceeding 102 degrees of heat the first week of incubation and by turning or moving the eggs three or four times per day during the first week. By observing the hen during the entire period of incubation it will be seen that she moves and rolls the eggs very many times the first six to eight days and very little after the fifteenth day.

During the first period the germ rises to the top of the egg where the heat is greatest and after the fifteenth day the chick remains practically stationary.

Much is said about moisture and ventilation in the catalogues and each one has the correct idea or theory on paper, but the fact still remains that many chicks will be found dead in the shells, not from lack of heat or excess of heat, but from other and unexplained causes. The theory of gases and air compounds is not tenable because in the open ground nest, in the loose straw or excelsior nest there can be nothing to confine these gases or air

compounds, and yet the hen hatches under these conditions without much loss. Experience also proves that the moisture or water of the egg should not be evaporated to any very great extent. Where the egg is evaporated to an extent of one-fifth the contents the chick may live to get out of the shell, but it will be very small and weak as compared to chicks hatched under hens from the same eggs. May it not be possible that there is an invisible, unknown influence conveyed to the living germ and embryo by the living warmth and contact of the mother's body that no machine can have? Warm air to keep the body warm and comfortable, must be many degrees warmer than good soft woolen clothes, yet the clothes will give the greater comfort and be far more conducive to perfect health.

Incubators should be operated in a room of reasonably uniform temperature and free from moving currents of air, but should be well ventilated and darkened. The room should not be a living room but may be, in fact should be, very convenient to a living room that the machine may be seen frequently and any material change in temperature corrected by the attendant. Regulators cannot be depended upon to take entire care of the temperature.

Experience has shown that where any moisture is needed it is better to apply it directly to the eggs. Take the trays out of the machine and spray the eggs with warm water two or three times between the fifteenth and twentieth days or just before the eggs are pipped. This may be done with a whisk broom or an atomizer. Give them a thorough wetting and put them into the machine at once. This spraying seems to make the shells more

brittle and thus enables the chicks to exclude themselves from the shells with less exertion. It is not advisable to open the incubator at hatching time and in very rare instances is it advisable to help the chicks out of the shell. Where the chick is too weak to get out of the shell unassisted it will seldom live when taken out.

CHAPTER VII.

FEED AND CARE OF THE CHICKS.

As already intimated in a former chapter, the chicks should be given natural conditions as much as possible. One very great advantage in hatching in incubators is the fact that such chicks are free from lice and mites. This is a very great advantage both in guaranteeing the general healthfulness and thrift of the brood and the subsequent care and labor necessary to care for the flock. The chicks should remain in the incubator until they are thoroughly dry and strong. This will usually be about the middle of the twenty-second day. Extra ventilation should be given after the hatch is over and the egg trays with shells and dead chicks removed. Leave the chicks in the nursery trays and open the ventilator slides wide open where the incubator is provided with such arrangements. If the machine has no extra ventilation provided open one of the doors slightly to admit fresh air and to allow the foul air and odors to escape. Do not attempt to feed the chicks until they are two days old. Have brooders ready for them by the time they are all twenty-four hours old. Keep a thermometer in the incubator while the chicks are in and gradually reduce the temperature to about ninety degrees on the chick trays and have the temperature of the hover apartment of the brooder as near this degree as possible.

The brooder must be clean, free from vermin, bad odors, lamp fumes and gases. It must have perfect ventilation and a cool floor. It must be so arranged that not

more than fifty chicks will hover in each section and half that number is better. The long, narrow, hot water pipe brooder is the best system because the heat can be controlled better, and the lamp located in such a manner that no gases or fumes can enter the brood chambers. Young chicks need and must have artificial heat. They need and must have pure warm air. They need and must have exercise. These factors enter into the health of the chick more potently than the feed and feeding. The chick that is sick or diseased from any cause will not eat, digest, and assimilate any food. The chick that is strong and healthy, full of life and vigor, will eat, digest and assimilate almost any kind of food. This makes it plain that we must provide the right conditions for health first, then supply such food as experience shows to be the best adapted to the promotion of vigorous growth.

The brooder should have two apartments, the hover and a covered section large enough to feed the chicks in for some days. This covered section must be well lighted and dry and warm, but not as warm as the hover by twenty degrees. Here the chicks can be fed and given exercise and water until they are old enough to be allowed to run in the yard. No one should attempt to raise chicks in a brooder out in the open air. A house or enclosed shed should be provided. (See Fig. 10.) When the chicks are put into the brooder they should be confined to the hover for a short time until they know where the warmth is, then they may be allowed to come into the feeding apartment where cut hay, straw or chaff has been provided for them to scratch in. Never use sawdust for litter as the little chicks may eat some of it and trouble

will speedily follow. Cover the floor of this apartment with the cut hay or chaff to a depth of several inches. Be sure to put some chick grit and crushed oyster shell into this litter the first day. Small seeds, such as millet, and hemp seed, pinhead oats, oat meal flakes, dry cracker crumbs, dry bread crumbs, wheat screenings, cracked

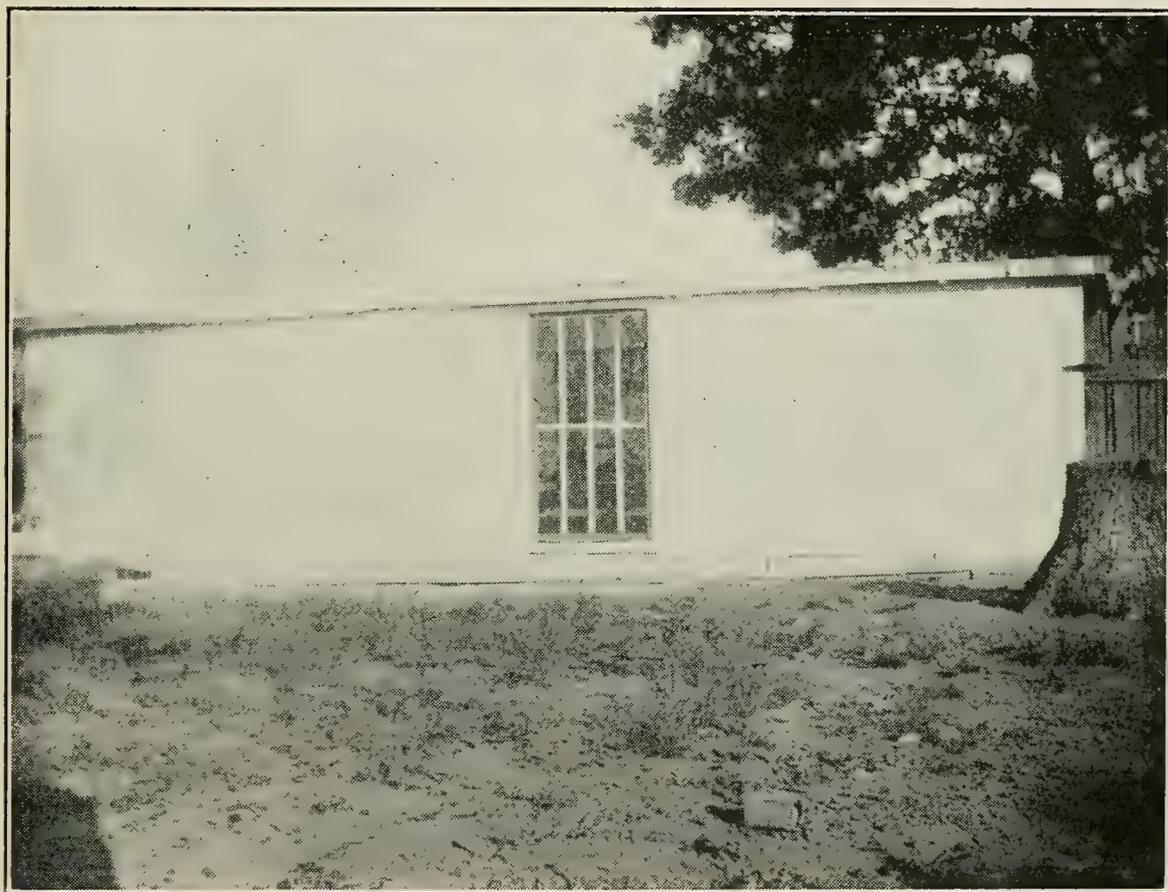


FIG. 10.—Brooder house. It is unwise to attempt to raise chicks by artificial methods without suitable house room. Figure 10 shows one section of a house for this purpose. This house is 40 feet long by 12 feet wide. Has two large glass windows in South side with drilling cover or shade on inside. This house is built like Fig. 1 in every respect, excepting front, which is boarded tight, and windows instead of open front. The inside of walls are covered with heavy building paper to make it warmer. Such a house will accomodate three of the brooders shown in figures 11 and 12, and 1,000 chicks have been kept in this house until three weeks old.

wheat, finely broken corn (not meal), should be scattered into this litter and a small water fountain filled and

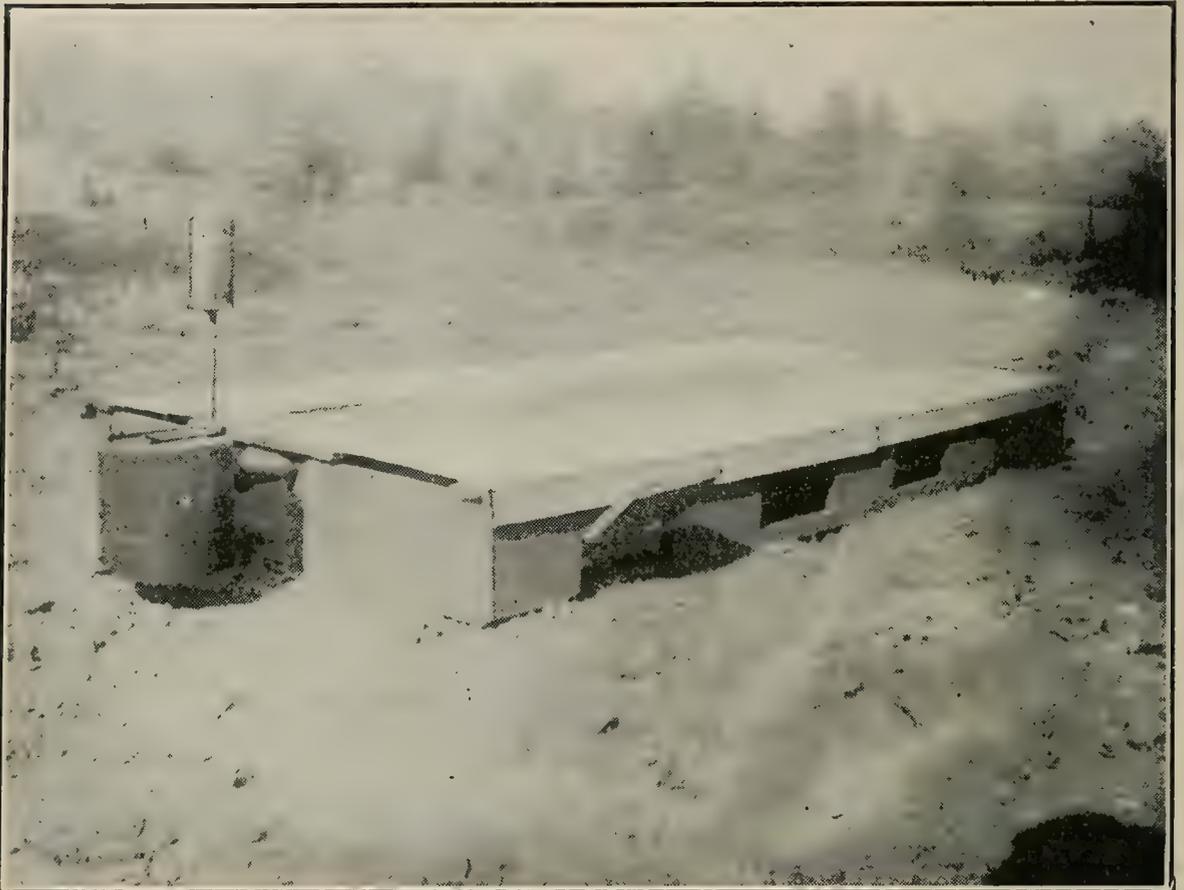


FIG. 11.—Hot water pipe brooder. This brooder may be made any length up to sixteen feet. The one shown here is 54 inches wide and 16 feet long. A temporary floor is made in four sections and is put in during cold weather. The cut shows a six-pipe coil, but I prefer a four-pipe coil made with one inch galvanized pipe and a copper tank 10 inches high by 6 inches in diameter with a two-inch flue through the center. Locknuts should be soldered on side of this tank, one at top and one at lower edge of side, to connect with pipe. Three permanent partitions are put in and four half-inch screen partitions are used. This makes eight divisions or sections of two feet each. The pipe coil should be 16 inches wide and be covered first with a heavy sheet of asbestos and then a double layer of narrow half-inch boards with tarred paper between. Cut eight pieces in circular shape, as shown in Fig. 12, and nail under pipes on inside of ends and on each side of the three partition boards. Tack a heavy wool felt hover cloth

on these and to edge of hover boards in such a way that it will come down to within two inches of floor and a curtain hover cloth on each side of hover boards to drop to the floor. Cut this curtain hover cloth in four-inch strips half way from floor to top for chicks to creep through. In this way the chicks have a warm hover 2 feet by 18 inches in each section, and by putting in short partitions on alternate sides a run 18 inches by 4 feet long may be given to each lot of chicks, or the wire partitions may run entirely across and thus give a small run 18 inches by 2 feet on either side of the warm hover. It will be seen that by this arrangement there are no corners for the chicks to crowd into and pile up and smother. The runs on either side are covered with drilling put on rolls to stretch over the runs and thus give a warm place for the chicks to exercise and feed during cold weather while they are small. Two of the doors on each side are made to swing out and two to swing in, so that two may be closed permanently when the brooder is used as a four section brooder. While the chicks are quite small, it is advisable to confine them under the hovers during cold days and nights. The best device I have ever used for this purpose is made by nailing two pieces of half-inch boards, eight inches wide, together like a V-shaped trough as long as each section, and put these in inverted and close to the curtain hover.

I use an ordinary two-flame oil stove to heat this brooder and have no difficulty in keeping a steady temperature. Have the temperature under the hover 80 to 90 degrees for day-old chicks, and gradually reduce this to 65 by the end of the second week. I prefer to use this brooder with a natural gravel bottom, but where this cannot be done, put the movable floors in place and cover one-inch deep with dry sand or loam. I have repeatedly raised 400 chicks to three weeks old in such a brooder with a loss of less than 3 per cent.

placed where they can reach it will be all that will be necessary the first week. Feed enough can be put into this litter to last several days. All that will be necessary will be to see that the hover is warm and clean and that the chicks go in and out freely and frequently. By the end of the first week the litter should be removed and new clean chaff or hay put in. Before putting the new litter in dust the floor with a little air-slaked lime, then put the new chaff in. Grit and oyster shell as before

and a fresh supply of feed every day. By this time the chicks may be allowed to run into a small wired yard, always keeping them in separate yards and runs. Never allow them to run in large flocks but keep each brood separate.

Figs. 11 and 12 with notes show the construction of

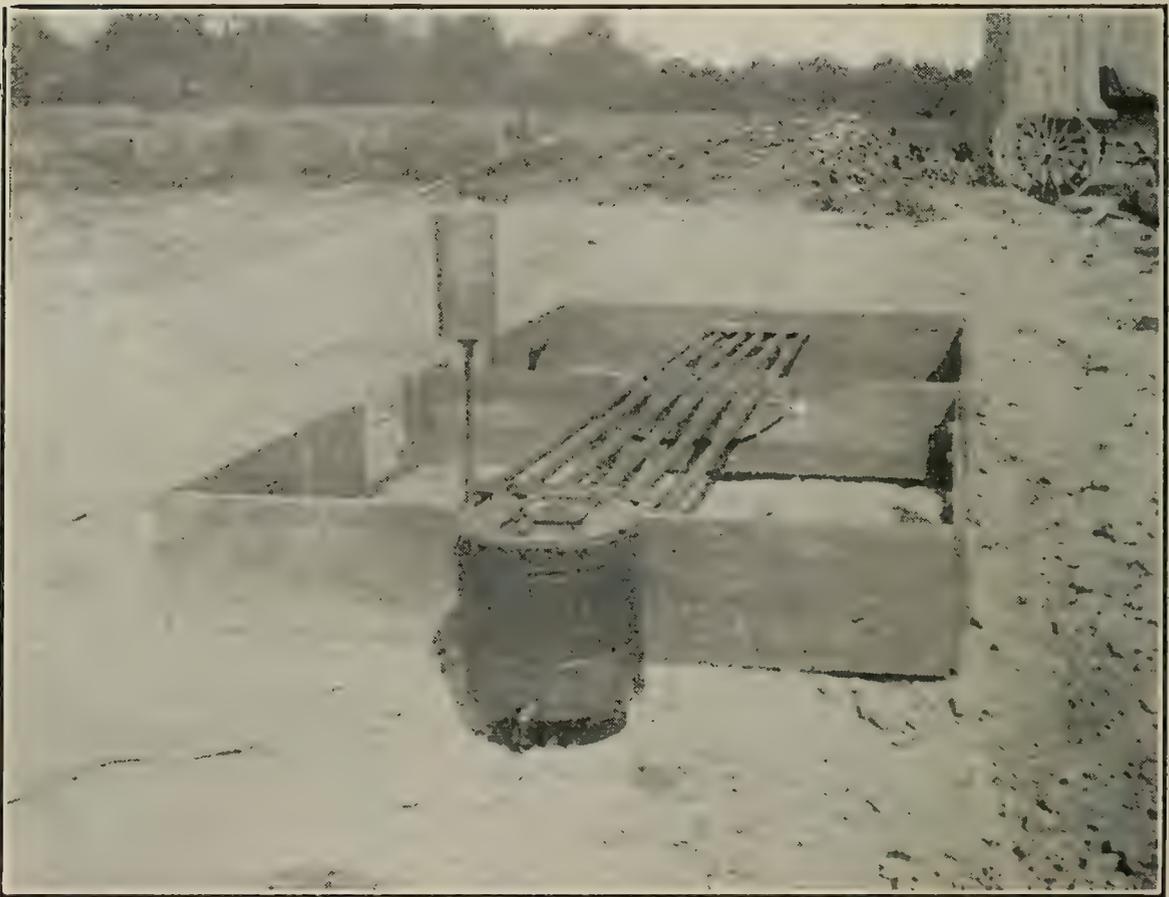
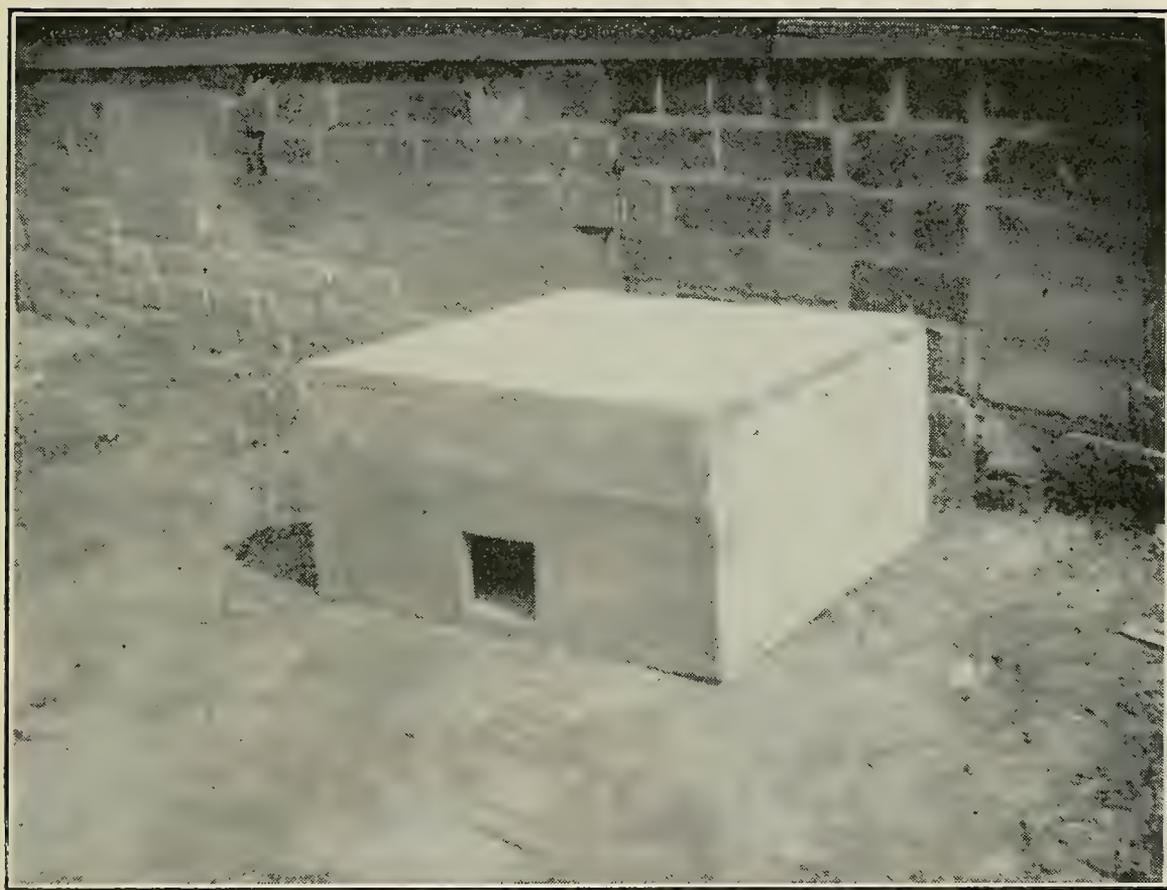


FIG. 12.—Showing frame, pipe system and heater tank of hot water brooder.

such a brooder and runs. This brooder may be made any length up to sixteen feet and will accommodate twenty-five chicks per lineal foot.

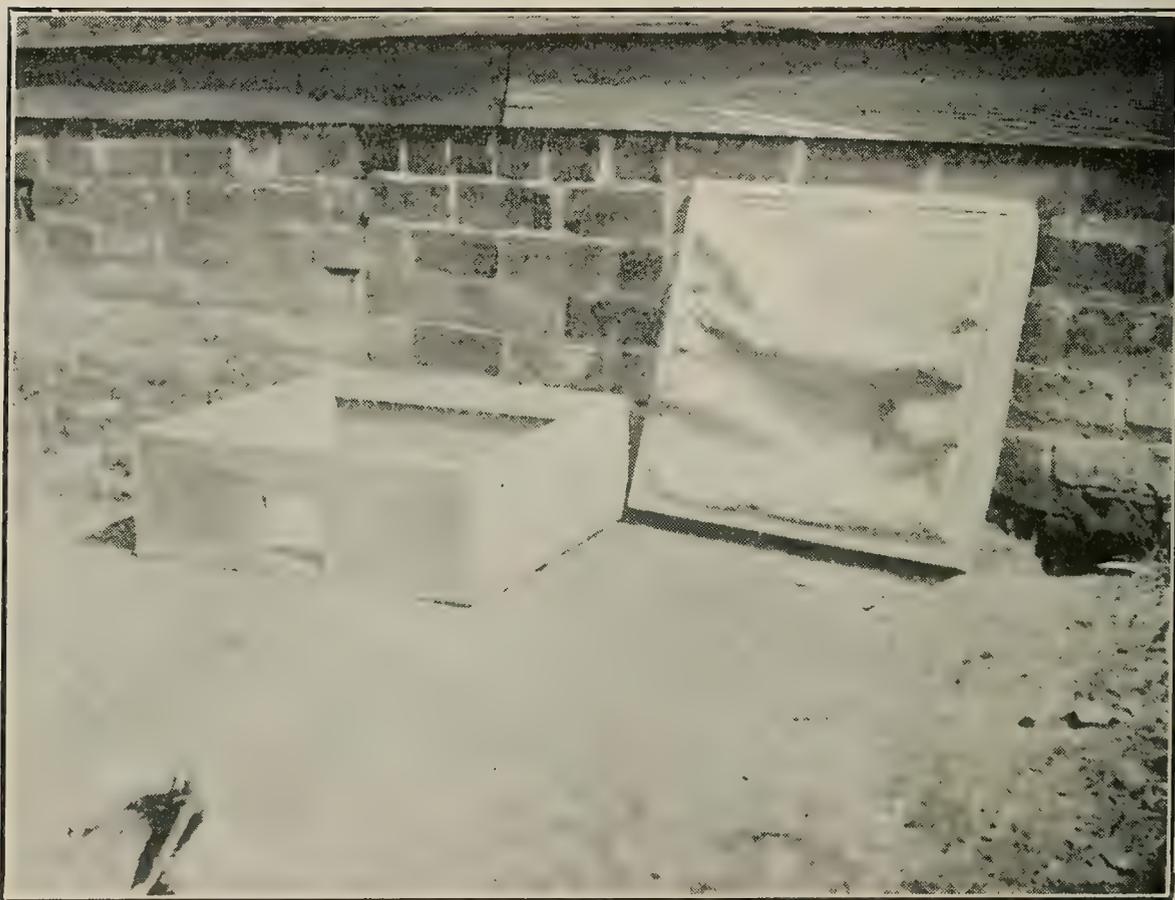
When the chicks are three to four weeks old they may be removed to small lampless or cold brooders placed out of doors with movable yards or runs for each flock.

These brooders without artificial heat may be used for the newly hatched chicks during warm weather and are cheap and easily made. Figs. 13 and 14 with notes show the construction of this brooder.



FIGS. 13 & 14.—Cold brooders may be used for chicks after they are three weeks old, or during May and June for newly hatched chicks. We have used this kind of brooders for many years and find them very satisfactory as a place for extra chicks in small runs. We make them two feet square and ten inches high with the lower section double wall with half-inch air space between inner and outer wall. The lower section is six inches deep with a hole cut in one side 4x4 inches square, covered with ordinary window screen to close at night. Top is three or four inches deep with tin or ruberoid cover. This top or cover is made large enough to slip over lower section where brooders are to be used out of doors. This will effectually shed rain. Cut three-quarter-inch strips and tack or nail around inside top one inch from lower edge and fasten hover

cloth of heavy wool felt loose enough to bag down three inches or more in the middle. Bore two or three one-inch holes in opposite ends of this cover for ventilation. Fifty-day old chicks may be kept in such a brooder for a week or two, when the number should be reduced to twenty-five. Put chaff or cut hay or straw on floor of brooder and keep it clean and dry. The cuts show one of these brooders that has been in use a long time. When not in use, they are stored in a dry place. They are made from three-quarter-inch lumber throughout and are easy to handle and clean.



By the end of the second week the chicks should have meat in some form and some good, sweet, dry brand of beef scrap or meat meal should be used as fresh meat is too expensive and too perishable. This dry meat meal or beef scrap should always be soaked in hot water over night, then rub wheat bran or shipstuff into the meat to make a dry, crumbly mash and feed while fresh and

sweet. This may be seasoned occasionally with salt and pepper, red pepper is best, to make it appetizing. This meat may be fed daily as a morning ration but begin with a very small allowance, not more than a tablespoonful of the dry meal to twenty-five chicks. Increase gradually. This is very rich in protein and will promote rapid growth. Chicks fed in this way will eat whole wheat at two weeks old and there is no better or more economical feed. Corn meal made into a stiff batter with milk, a pinch of salt and soda and baked dry and hard in a slow oven makes a good fattening food after the chicks are four weeks old. Feed liberally but always be sure that the chicks have plenty of exercise. It is next to impossible to overfeed chicks after they are four weeks old if dry feed is used and they have a good supply of grit, oyster shells, fresh, clean water and plenty of exercise. The sprouted grain mentioned in the chapter on feeds and feeding may be fed to the chicks after they are three weeks old. Never change feed abruptly but always begin on any new feed gradually. Charcoal should be fed in some form as it keeps the bowels healthy. The best form of charcoal is made by burning corn on the cob until it is quite black, then shell it and grind or crack it so the chicks will eat it. This can be kept before them all the time in one of the small self-feeding boxes. This subject is treated fully in a separate chapter because it is the most vital subject to the poultryman and the one subject that means the difference between success and failure. If one fails to raise the chicks all the labor of caring for the breeding stock, the hatching of the chicks, the cost of incubators, brooders, oil and feed are lost and disappointment and discouragement will be inevitable.

If chicks are hatched right and fed and cared for as outlined in this chapter the loss will be insignificant and the growth and health of the chicks will be all that can be desired and the reward will be sure and satisfactory.

CHAPTER VIII.

HEALTH AND DISEASE.

This chapter is headed health and disease because health holds first place in the poultry business. There is no use trying to keep fowls if one cannot keep them healthy. There is nothing more helpless, more forlorn, more worthless than a sick hen. Fortunately, the hen is one of the last creatures to get sick if she has good, dry quarters, wholesome food, pure water, fresh air and sunshine. When she has dark, damp, filthy houses and runs, is crowded for room by day and by night, has her life blood sapped by lice and mites, is fed damp, musty, mouldy, rotten feed, is allowed to breed in and in generation to generation and has no special care from year to year, she will in time become weakened in vitality and vigor that she becomes a victim of disease. When disease overtakes her under such conditions she quickly succumbs to any attack. She refuses to eat, her comb turns black or a livid purple, and death speedily relieves her of her miserable condition and surroundings. Her sisters and cousins having the same conditions and surroundings speedily follow in her wake and the owner pronounces it an outbreak of cholera and condemns the poultry business because hens are so susceptible to disease, especially cholera.

If we would give our fowls nearly as good care as we give our horses, our cattle, sheep and swine or the dog, this chapter would not need to be written, because a sick chicken would be a rarity and the great array

of nostrums or so-called medicines and condition powders would never have been compounded, and one of the great American fakes would never have been sprung upon the credulous public. Fowls and birds in a state of nature are never sick. It is only when we confine them in limited quarters that we see them droop and die. This is the one potent argument in favor of free range. Some writers claim wonderful results from hens kept in limited quarters, and such results are possible for a short time, but when we undertake it as a permanent business we find stern nature against us and it is only by the exercise of the most scrupulous cleanliness that we can ward the grim monster from our flock. Thousands of men have tried this intensive method and thousands have failed where very few have found it profitable. The small farm is pre-eminently the place to keep poultry.

The question is often asked, "How many hens can be kept on an acre of land?" Some authorities place the number at 1,000; many at 500; while the more conservative put the number at 200.

Let us reason together for a moment and make some calculations. Take an acre of land that is eight rods wide and twenty rods long. This will make ten yards, each two rods or thirty-three feet wide by eight rods or 132 feet long. This will make 4,352 square feet of surface for each yard, or 43,520 square feet of surface on the acre. If we put 1,000 hens on this acre, each hen will have a plot of ground practically four feet wide by eleven feet long. Confine a hen on such a plot and see how long it will be until it will be bare of every vestige of green. Wire grass, honeysuckle, Canada thistle, any of the most troublesome weeds would fade away

under the constant pick of that beak and the industrious scratch, scratch of those toenails and the incessant tread of the cloven feet of that hen, to say nothing of the burning, scalding effect of the twenty ounces of liquid and solid manure distributed daily over this limited area. Think of the condition of this plot at the end of twelve months. Long before the twelve months had rolled past, the hen would be gone to that bourne whence hens have never returned. Every inch of that plot would be the most virulent poison to the hen. If we but stop a moment to consider we may know this could not be done. The extreme limit should not be over 200 hens per acre. Having the ten yards each two rods wide by twenty rods long, we could put forty hens in each of five of these yards. Seed the other five yards with grain, grass and clover and in four weeks change them to these yards and plough and seed the five that have been in use. In four weeks change again. Used and managed in this way, the 200 hens will be healthy and profitable and should lay at least 160 eggs per hen in the year. This would give us 32,000 eggs, worth at two cents a piece, \$640.00. If we would attempt to put the 1,000 hens on this acre, contagion and disease would be inevitable and loss and disappointment the result.

The three principle causes of disease are vermin, filth, and dampness. These are all preventable. Houses should be so constructed that all interior fixtures can be easily removed. This should be done at least twice each year and the interior thoroughly sprayed or washed with hot limewash, to which concentrated lye should be added, one pound to every ten gallons of the limewash. This will rid the house of lice and mites and make it

clean and sanitary. Spray or wash all fixtures and put them in place. Keep the houses clean by cleaning the dropping board at least once every week, every day is better. Dust the roosts and dropping boards frequently with carbolized land plaster. Take a peck of land plaster and pour into it eight ounces of crude carbolic acid. Mix thoroughly and dust the roosts and dropping boards with it. This is a germicide and disinfectant and will assist very much in preventing disease. If the houses are constructed as outlined in Chapter II, dampness will not cause disease. Admit the sunshine into the open front every day. An ounce of prevention is worth many pounds of cure in the poultry business. This is why special stress is laid on the subject of health. Occasionally a tonic is advisable or necessary. When fowls show symptoms of indigestion, indicated by loss of appetite, dark combs, yellowish colored droppings, a tonic should be given, made by dissolving eight ounces of sulphate of iron (copperas) in one gallon of hot water. Put the copperas in a stone jug and add the water. When dissolved add one ounce of sulphuric acid. Shake well and keep corked. Put one-half pint of this solution in two gallons of the drinking water for the fowls. Many times serious trouble and loss may be averted by the timely use of this tonic and a general cleaning of the houses and yards. Charcoal should also be kept where fowls may have free access to it. The long list of so-called poultry diseases may be shorn of its terror if we but observe the laws of nature in the management of our flock. If a bird shows any symptoms of chronic or hereditary disease remove it from the flock at once. We approach the list of diseases with great reluctance

because we have very little faith in remedial agents or medicine.

CHOLERA.—We will consider the disease known as cholera first, because it is regarded as a very common disease. Many times disease manifests itself in a flock and fowls die and it is called cholera, when it may be simply an aggravated form of diarrhea caused by change of feed, colds, dampness, or by the fowls eating decayed vegetables or some poisonous seeds or plants, like nightshade. Cholera is a germ disease and enters the system only by the mouth. It is exceedingly contagious and fatal. It runs its course in from one to five days. The first symptom of the disease is, in a majority of cases, a livid purple color of the comb, a yellow coloring of that part of the droppings which is usually white, followed by violent diarrhea, high fever, indicated by excessive thirst, the wings droop, a general stupor, loss of appetite, great weakness, and death speedily follows. When these symptoms are present it may be said to be cholera. As this is a specific germ disease, it must always be introduced into the flock by other fowls or by crows and buzzards. As soon as the disease is recognized, the sick birds should be killed and their carcasses burned. The well ones should be confined in limited quarters and these quarters thoroughly disinfected by using a solution of sulphuric acid or carbolic acid, one ounce of the acid to one gallon of water. Use an ordinary sprinkling can and do the work thoroughly. Give the fowls the tonic solution mentioned for indigestion. Treatment of the sick birds is not recommended. Feed well and observe them closely and remove those affected as soon as the symptoms appear. Kill and burn.

Disinfect daily. Scrape the excrement up carefully and burn it. In this way the disease can be stamped out. The malady will run its course and can only be stamped out by killing the germs, by destroying the diseased birds and all excrement from diseased birds. Use only earthen drinking vessels for drink and medicine and scald and disinfect everything in use.

DIARRHEA.—This is usually caused by sudden change of temperature, dampness, wrong feeding, poisonous substances, lack of grit, stagnant water, sour mash, over-feeding with concentrated foodstuff like dry meal, and lack of exercise. Remove the cause and feed sparingly for several days. Let the fowls have all the dry wheat bran they will eat. In brooder chicks the cause of diarrhea is usually change of temperature in the brooder. The brooder hover must be kept warm enough at all times so the chicks will not pile up and huddle together. Keep it warm enough so they will spread out under the "mother" and not pile up. Chicks brooded and fed as indicated in Chapter V will not have diarrhea if the temperature is maintained. With hen-raised chicks diarrhea is usually caused by the hen leading them into wet grass or not brooding them when cold, and the chicks get chilled. Keep the hen in the brood-coop until they are three to four weeks old.

GAPES.—This is really not a disease but is caused by a worm that hatches in the windpipe or trachea. These worms obstruct the passage of air through the windpipe and this causes the chick to gasp or gape for breath. The trouble seldom attacks chicks after they are four to six weeks old unless it is very prevalent. Mature fowls may have these worms, but, owing to the

trachea being much larger, they do not show this characteristic gaping. If chicks are kept in a dry, warm brooder and dry runs they rarely have this throat trouble. Air-slaked lime strewn in the runs is a good preventive. It is communicated from one to another by the chicks eating and drinking from the same vessel. If the chicks show the symptoms, feed them fresh raw pork cut in fine bits. Another simple remedy is to put a few drops of kerosene oil in the drinking water. It is much better to avoid this trouble by keeping the chicks on dry floors and runs than to undertake to cure the trouble. Gape worm extractors, horse-hair loops, feathers and bluegrass tops, dipped in lard or kerosene oil are recommended by some, to be put into the windpipe and thus dislodge and kill the worms. This usually is successful in killing the chick so treated, but does no good in stopping the spread of the pest.

ROUP.—This is a very common disease in poultry. It is caused by a bacillus and is therefore infectious and will run through the flock if not arrested. A flock that is rousy and has once passed through this disease never recovers its former vigor and should be replaced by young stock from healthy stock as soon as may be. The symptoms are hoarseness in breathing, swelling about the head and eyes, a mucous discharge from the nostrils, which dries and clogs the air passage, so that the fowl breathes through the mouth with a gasping movement. Unless the fowl so affected is very valuable it is far better to destroy it at once and burn the carcass. To attempt to doctor roup is very nearly useless. The fowls may apparently recover, but at the first recurrence of a slight cold or any sudden change in temperature

they will again have the malady. This disease, like cholera, must be kept out or stamped out by cleanliness, disinfectants, and dry, sunny quarters. Fowls that roost in crowded houses where cold draughts may reach them are very liable to have roup. They crowd together for mutual warmth and then, when they are warm, a cold draught of air strikes them and the trouble is started. It may be present in a flock for days before the symptoms are noted, because the germ may lodge in the throat. It resembles diptheria in many respects.

If the fowls are worth treating, remove them to close, dry quarters and treat them by local applications. To dope them with medicine is useless. To undertake to cure them in advanced stages is folly. In the early stage they may be treated successfully by spraying the head, nostrils, throat and air passages thoroughly twice daily with the following solution. Dissolve one ounce of permanganate of potash in three pints of water, and, with a small atomizer, spray the head, eyes, nostrils, air passages, mouth and throat twice daily until the mucous discharge ceases and the bird recovers its appetite. Another remedy that has given good results is the tar, turpentine liniment made as follows: Neatsfoot oil, six ounces; oil of tar, two ounces; oil origanum, two ounces; turpentine, two ounces. Shake well together and, with a soft feather, apply to the eyes, nostrils, air tubes and throat. Keep the sick birds confined and give them the tonic solution in the drinking water. Disinfect with the one per cent. sulphuric acid solution all houses, runs and yards.

CANKER.—This is really the same as roup, or results

from roup conditions. The same treatment recommended for roup will apply to this disease.

PIP.—This is not a disease, but caused by the chick or fowl breathing constantly through the mouth, due to the stopping of the nostrils or air passages by colds, nasal catarrh, gapes, etc. The tip of the tongue becomes hard and white. This must not be removed, as it is part of the tongue. Cure the cause and the tongue will soon be normal.

ASTHENIA, GOING LIGHT.—This is considered by some writers to be due to improper feeding, lack of nutriment, etc., but the fact that only one or two birds may be the victims of this disease in a large flock certainly leads us to conclude otherwise. A fowl may show the symptoms of this disease and may apparently recover, but will be found dead on the roost or in some secluded place in a short time.

A fowl suffering from this disease will be found to be very much emaciated. Its comb will be colorless, gait staggering, eyes sunken, and a very "sick" general appearance will be noted. It has every symptom of tuberculosis, and may be diagnosed as such. Destroy the fowl and burn it and thus prevent spread of this infection. To treat such a fowl is a hopeless undertaking.

SCALY LEGS.—This is not a disease, but is caused by a parasite working in and under the scales of the leg and toes. It is contagious and spreads by the scale insect going from bird to bird on the roost poles. Soak the legs in warm soap suds to which add a tablespoonful of kerosene oil for every quart of strong suds. When the legs are dry, thoroughly saturate them with the tar, turpentine liniment. Repeat in six days and the scale

will disappear. Spray the roost poles with kerosene oil and crude carbolic acid, two parts oil to one part carbolic acid. This will effectually destroy any and all scale insects and mites.

DEPLUMING MITE.—This is a minute insect that lives on the base of the quills on fowls and, when not destroyed, will multiply until large clusters form on the quills, on the neck and rump feathers. This causes these feathers to die and break off. If the fowls are badly infected, dip them in some good sheep dip on a warm, sunny day. If only a few are infested, rub the tar, turpentine liniment on the affected parts. Make a second application in six to eight days.

FEATHER PULLING.—A vice caused by close confinement and improper feeding. Make the fowls work for all the feed they get by feeding in deep litter. Feed more meat and provide grit and charcoal. If a fowl becomes a confirmed culprit, roast it for dinner.

EGG EATING.—This is a very annoying vice. If hens have a good range, green feed, grit and oyster shell, with clean, darkened nests and a good supply of fresh water, they will seldom form this vexing habit. Occasionally we find a confirmed egg eater. Such birds make good eating and should follow the feather puller into the fathomless maw of the family.

WHITE DIARRHEA.—This is peculiar to little chicks and is usually the effect of wrong feeding and prolonged wet weather, damp quarters and sudden changes in temperature in brooders. Chicks that are kept warm and dry and fed as indicated in this book will seldom or never have this disease. It may be caused by feeding too much meat. Correct these conditions and give

the chicks boiled sweet milk and boiled rice. Doping with medicine will do more harm than good.

POISONING.—Fowls rarely eat any poisonous substances. They may eat common salt or salt meat or salt fish enough to poison them. Any of the arsenical preparations—Paris green, London purple, lead, copper, zinc or phosphorus—are fatal in their effect. Flaxseed boiled in sweet milk should be fed as quickly as possible after the fowls have eaten the poison. If they refuse to eat, hold the bird with mouth wide open and fill the crop by pouring the flaxseed and boiled milk down the throat.

Nightshade berries (stagger-weed) are a deadly poison to fowls and the foregoing remedy will effect a cure if used in time. The symptoms of this poison are very pronounced. The fowls will remain on the roosts all day and hang their heads down below their bodies, will be stupid, and stagger when trying to walk. Violent purging and a very pungent odor will be observed. Gather and burn all Nightshade before the berries form.

LIMBER NECK.—This is ptomaine poisoning and is the effect of eating decomposed, putrid animal matter. The most virulent form of this poisoning is where phosphorus paste is used for exterminating rats, mice and other rodents. The rodents crawl into secluded places and die and the fowls find the decomposed carcasses and an outbreak of limber neck or ptomaine poisoning follows. Isolate the sick birds and give them the boiled flaxseed and milk sweetened with sugar. Some may recover. Burn all dead birds and also search for and destroy by burning all dead animal matter and disinfect the houses and yards.

Many other diseases are named in various works on poultry, but prevention is far preferable to treatment, and nearly all poultry diseases are preventable. In the writer's experience of forty years with poultry, it has not been found necessary to treat fowls for any of the diseases enumerated excepting for nightshade and ptomaine poisoning and one outbreak of roup caused by housing a large flock in a house with a large surface of glass in the South side. This was removed and drilling stretched on large frames and put in place of the glass and the house thoroughly disinfected and at night, after the fowls were on the roosts, the house was closed and pine tar burned on a bed of live coals in an old kettle for three successive nights, and the fowls recovered with very little loss and bad effect.

The cause of ninety nine per cent. of all diseases of poultry can be traced directly to lice, mites, improper feeding, damp, filthy, badly-ventilated houses, and in-breeding.

CHAPTER IX.

FEEDING FOR MARKET EGGS.

This subject is treated in a separate chapter because many people want to feed for eggs for market as a means of increasing the profit from the fowls on the farm. Where one is engaged in breeding pure bred stock for eggs, for hatching purposes the mating should be done with care and judgment, but for eggs for market this feature need not be considered, and where one raises a limited number of chicks for laying purposes only, it will often be found cheaper and better to buy the eggs for this purpose from some reliable breeder or select the best yearling hens and yard them with a good cockbird or cockerel and hatch the eggs from this yard or pen. Twelve good hens will produce enough eggs to raise three hundred to five hundred chicks in a season. The advantages of this system must be apparent to everyone.

Feeding for market eggs must begin as soon as the chick comes out of the shell and the chicks should be hatched from eggs laid by a good laying strain of hens. The chicks should be hatched during March and April in order to have the pullets mature and laying before cold weather.

The small breeds can be depended on to begin to lay in about five months, the medium breeds in from six to seven months and the large breeds in seven to eight months. Feed for health and rapid growth.

As indicated in the chapter on feeds and feeding, corn should form a very small part of the ration for grow-

ing chicks and should not be fed generously at any time excepting in very cold weather. Wheat, soaked oats, buckwheat, wheat bran, shipstuff, meat meal and clover may be combined in such proportions as to produce excellent results. The best way to combine these feeds is to allow the hens to balance the ration according to their needs. Much is written in agricultural papers and poultry journals about balanced rations for the live stock on the farm and there is much good sense in these theories, but to say that a hen shall and must eat a certain amount of a certain kind of feed every day is too arbitrary. Some hens will eat more of one kind of feed and less of another than other hens in the same flock and the same individual hen will vary her desire for certain kinds of food from day to day. The great point in feeding for eggs is to feed the flock for perfect health, activity and contentment. If a hen is properly nourished she will be happy and contented. She will not be in good laying health if she craves for some element of food that is not supplied to her daily and in sufficient quantity to satisfy her appetite. Thus if we feed a mash composed of wheat bran, corn meal, shipstuff and meat meal in the morning and the hens do not eat with a relish we should feed them some other ration for a few days until they will again crave the mash. The same principle applies to the various grains.

Some writers argue that hens on free range will exercise too much and in this way eat more feed than hens confined in small enclosures and that hens fed in limited quarters may be given such rations as we want them to have. This sounds fine but to the man taking his meals regularly at the average hotel and boarding house it

sounds like torture, especially if his occupation is of a sedentary character. The farmer who works the live-long day in the open field, fresh air and sunshine can eat almost anything in the way of good, wholesome food that is well cooked. He does eat more but he also accomplishes more and has better health. The production of eggs is procreative and therefore depends very largely on good sound health, rich red blood, strong muscles, vigor. The hen that is lacking in any of these conditions is not in good laying condition and all of these physical conditions are dependant upon good appetite, digestion and assimilation and these in turn are dependant upon exercise in the open air and sunshine. No one knows the kind and character of the food that the hen picks up on the free range, neither can we estimate the amount.

The laying flock should have all the range possible and in addition have their appetite tempted with a variety of feeds. The morning and noon feeds should be composed of the more readily digested feed stuff and the evening feed should be good sound grain in variety so that every hen in the flock will go to roost with a full crop. No fixed rule will apply. Hopper feeding may be practiced with the small breeds during the spring, summer and fall months, when the flock is on free range with very gratifying results, providing a good variety of feed is kept before them (See Figs. 15 and 16). The yearling hens of the medium and large breeds are apt to get indolent and overfat with this system of feeding, therefore it is better to feed them from the hand and feed sparingly at the morning and noon meal with a full feed at the evening meal. This will induce them to take more exercise on the range in search of food and thus

promote vigor. This laying flock will give better results and the eggs will be better and keep much longer without deteriorating in quality if no males are allowed to run with them. This is an advantage in various ways. It saves feed, room, worry and annoyance. Cockbirds as a rule do not dust themselves and thus become a fruit-



FIG. 15.—Self-feeders. Figure 15 shows construction of a very satisfactory self-feeding device. This can be made any length, but we prefer it 4 feet long by 1 foot wide. Use three-quarter-inch lumber throughout. One piece 4 feet long by 12 inches wide for bottom; two pieces 20 inches long by twelve inches wide for ends. Cut one end of each to square mitre, as shown in figure, for roof to rest on; two pieces 4 feet 1½ inches long by 4 inches wide for sides of feed box; two pieces same length and 5 inches wide for top of sides; one piece 53½ inches long by 12 inches wide; one piece same length by 12¾ inches wide for roof or top; two pieces 12 inches long cut to square mitre for ends of top. Nail together, as shown in figure.

ful field for body lice to multiply and spread to the hens. It is a very common practice in the South to keep one male to every ten females. It will be seen that by disposing of these males the flock of laying hens may be increased ten per cent. with no increase for feed or room. We consider a good, safe ten per cent investment, a very desirable proposition.

The small breeds may be kept profitably as layers until they are three and even four years old. The medium breeds should be disposed of by the close of the second laying year and the large breeds at eighteen to twenty months old. The older hens of the large breeds are too much inclined to broodiness to be profitable as egg producers the second year.

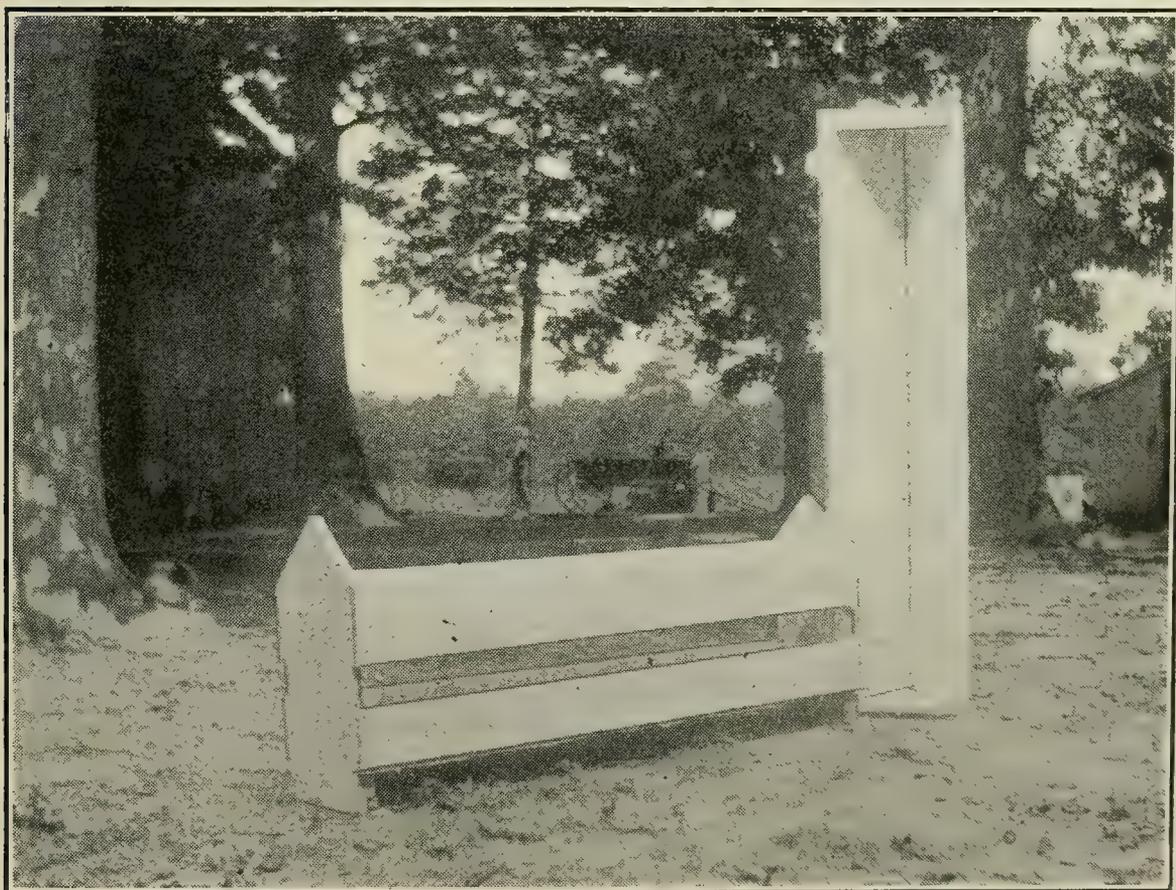


FIG. 16.—Showing self-feeding hopper open for cleaning and filling.

CHAPTER X.

THE BREEDING PEN.

The breeding pen system of producing eggs for hatching purposes has much to commend it to the farmer who is desirous of obtaining best results. By this system we mean the selection of the best specimens of the type of birds desired, either by selection from our own stock or by purchase. This breeding flock may consist of a few birds or many, according to our circumstances and needs. If we want but a few eggs a pen of four to six females will answer. If we want many eggs a large flock may be selected and mated to give excellent results for utility stock and many fine show birds have been raised in this way. It is always to be presumed that each breed is to be kept pure. The first consideration is to familiarize one's self with the breed or breeds that are mated. The standard requirements must be plainly understood, then select such individuals as will fairly represent the standard qualifications in both sexes. No one should undertake to sell eggs for hatching from a yard or pen of fowls until they fully understand the points of the breed in question. Very much dissatisfaction results from the sale of eggs every year by ignorance and carelessness on the part of so-called breeders or fanciers in not mating standard bred birds. Some buy a breeding pen of each of several different breeds and because they buy them for pure bred stock they do not inform themselves as to standard qualifications and many disqualified birds are thus allowed to produce eggs for hatching. This is not only careless

but fruitful of great injury to the buyer and to the seller, as well as to the entire fraternity. The stock from such eggs fails to satisfy the buyer and loss of confidence, time and money follows. Every bird used should be carefully examined by the help of the "American Standard of Perfection," and every disqualified bird thrown out.

Another fruitful source of trouble is in not keeping the different breeds separate during the entire time for which they are used for breeding purposes. Where two or more breeds are kept for breeding purposes they should be separated as soon as the sexes can be distinguished and be kept separate as long as their usefulness as breeders continues. Where the different breeds are allowed to run together during the fall and early winter months their usefulness as breeders is ruined so far as the pullets and hens are concerned.

Eggs will usually become fertile within four to six days after mating but the effect of such mating will continue many months and in the writer's opinion a hen that is cross bred or mated to a male of a different breed is never entirely free from that taint. Numerous instances have come under the personal observation of the writer where hens accidentally mated with males of a different breed early in the season, and were thrown out of the yards with the laying flock without males for ten months and were then carefully mated to a male of the same breed, the eggs and chicks marked and in each instance the chicks showed traces of the cross mating. In one instance a pullet from a White Leghorn hen mated with a Buff Plymouth Rock cockerel was kept away from all males for ten months and then mated to a White Leghorn cock,

and the eggs were hatched separately and chicks reared separately. Four pullets resulted from this clutch and every one standard in color and shape, yet every one of the four laid brown-shelled eggs. Another instance: A Brown Leghorn hen mated with a Buff Orpington cock and the next year mated to a Brown Leghorn of good color, produced chicks that were decidedly foxy in color and several of the pullets were nearly buff.

Pullets and hens intended for breeders should not be forced in growth or egg production but should be fed a growing ration all the time and allowed to lay their eggs in the natural season for hatching as nearly as possible. This will produce more fertile eggs and stronger germs.

The male birds should have extra care and feed during the breeding season. A large roomy cage or coop should be provided for each male, and a single perch placed in it and the male should be put into this cage every evening and confined there for several hours every morning and given extra feed. He should have a mash composed of equal parts of wheat bran, corn meal and crushed oats, a thimble full of meat meal, mixed dry, then moistened with sweet milk or water. Feed in a dish. Before turning out with the hens give a feed of wheat and corn, equal parts. This, with the feed he will take while with the hens, will insure vigor and fertile eggs. Breeding stock is selected many times for fancy or standard points without regard to vigor and health, and in poultry breeding vigor and perfect health are of vital importance. Very much of the loss sustained in hatching and rearing chicks is due primarily to lack of vigor and health in the parent stock.

SELLING EGGS FOR HATCHING.—As indicated in the beginning of this chapter, the stock should be carefully selected, then the flock should be well fed, have large, roomy houses and runs, the eggs should be gathered often and carefully selected and cared for. Eggs more than one week old should never be sold for hatching excepting by special agreement. The breeder should hatch some of these eggs throughout the season to be able to know exactly what they will do. Pack such eggs in the best manner possible, give full count and an extra one for every setting and guarantee full count, pure stock, safe delivery and nothing more. The honest breeder can, and should know that his eggs are fertile and all right in every way, but he cannot guarantee any certain results. So many conditions beyond his knowledge and control enter into the hatching and rearing of the chicks that it seems wise and good business that, if he delivers a specified number of good eggs to his customer at an agreed price that his responsibility should end with the delivery of the eggs in good condition, from stock that he knows to be standard bred.

CHAPTER XI.

MARKETING EGGS.

Eggs for hatching should be fresh laid, clean and uniform in size and color. They should be kept in a cool room of even temperature. Sixty to seventy degrees is

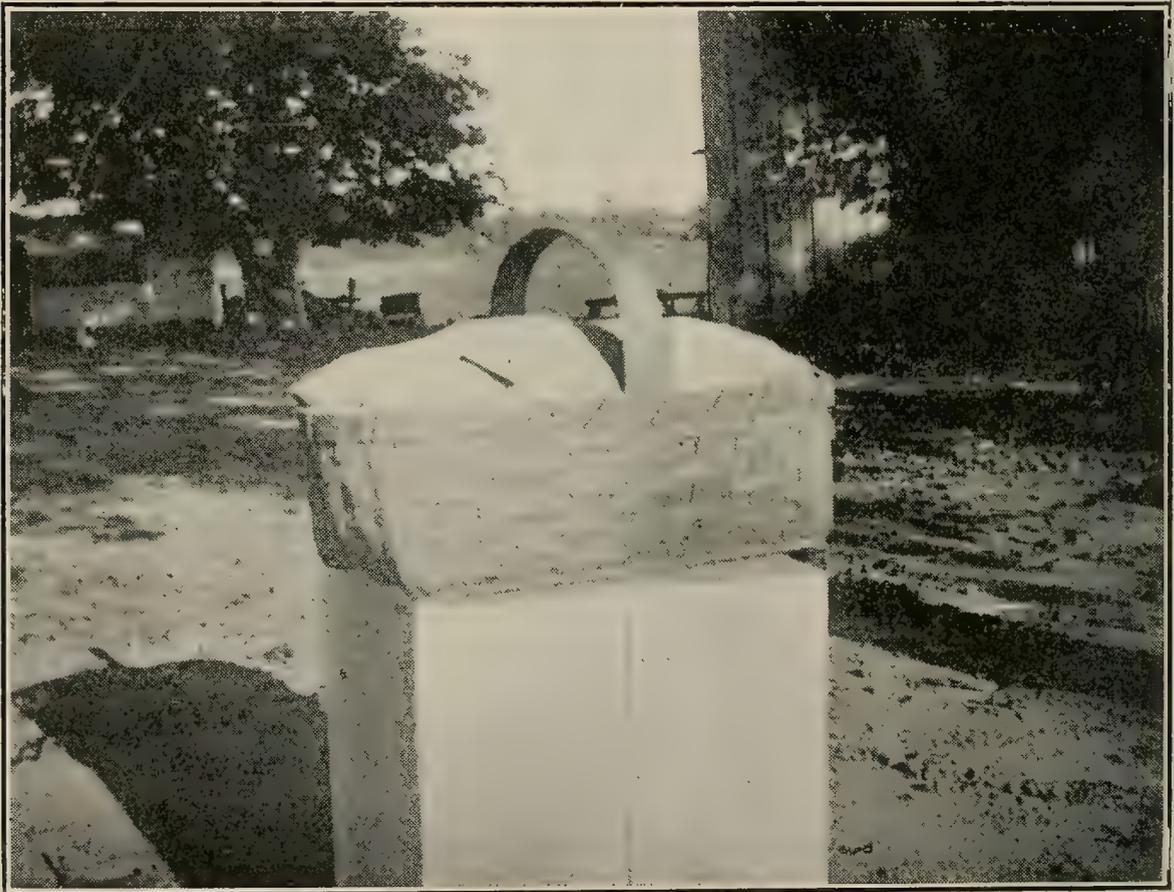


FIG. 17.—One hundred eggs for hatching.

best. The best packing material known to the writer is wood wool made from basswood. This should be dry. Good baskets with strong bottoms and handles should be

used. Baskets are handled more carefully by expressmen than boxes or cases. Wrap each egg in a small handful of the wood wool, put a layer of the wood wool in the bottom of the basket and after rolling the egg in the packing, place it into the basket, small end down. Continue this until the required number are packed into the basket. Put a layer of the packing material around the inside of the basket and over the top of the eggs and sew a piece of cotton drilling or burlap over the top tightly. This makes an excellent package that will carry the eggs safely thousands of miles and give them some air and keep them from getting chilled or jostled or broken. We have shipped thousands of such packages with entire satisfaction. When eggs are received they should be taken out and laid away to rest for one day before being put under hens or in incubator. This gives the germ time to settle and a better hatch will result. (Fig. 17.)

MARKET EGGS.—Eggs intended for market should be fresh laid, clean and uniform in color. Small eggs and extra large ones should be used in the family. It may be true that an egg is an egg, but a clean, fresh egg, guaranteed to be such, every one of them, will sell for more and more readily than a promiscuous lot of eggs, fresh and stale, clean and dirty, white and brown, all in the same basket. Clean, fresh eggs can always be sold at a premium and should be sold to the consumer direct if one can do so. If not, then contract with some reliable dealer to handle all your product and stay by him. He will thus be enabled to make a market for your eggs that will be mutually advantageous to all parties. To get a fancy price one must have fancy eggs and deliver them regularly

at stated times. Thus the consumer and the dealer will know what they are getting and when they can get them.



FIG. 18.—A breeding pen.

CHAPTER XII.

POULTRY ENEMIES.

The first and greatest, as well as the meanest enemy that our feathered stock has is the two-legged, nondescript generally known as a chicken thief. We have no words at our command to fully describe this particular form of depravity. In the South the colored race gets the blame when the hen roost is robbed, but every honest citizen knows that this is unjust and a sort of race prejudice. A chicken thief is a chicken thief, whether his skin is white or black and the one is no better than the other, only the one with the white skin is usually more artful than his dusky brother and makes a larger haul, and does it more gracefully. He usually comes to your place under the guise of friendship or as a prospective customer and looks your flock over and studies the arrangement of your houses and yards in order to enable him to get the best, with the least possible risk. The remedy is good houses, good locks, a good double barreled shot gun loaded with buck shot, and good nerve to use it with deadly aim. Anything that steals chickens should be loaded so heavily with buck shot that it would be impossible for it to carry anything more than the shot. Let it be known that you will shoot to kill and then do it.

Electric alarms can easily be installed in the houses and yards so that the night prowler will ring the bell and the poultryman can do the rest. The chicken thief is a burglar and the laws of every state will justify any citizen in shooting a burglar.

Hawks, crows, jackdaws and eagles can be destroyed easily and surely by feeding the chicks and growing stock strychnine or nux vomica. This may be given them in the mash two or three times per week for several weeks. Contrary to the general opinion of many people these poisons do not affect the chicks in the least, in fact are beneficial in destroying internal worms, but the flesh of the chick while eating the poison will kill any of the birds of prey, or dogs, cats, skunks, minks, weasles, rats, etc. Give half an ounce of strychnine or an ounce of nux vomica to every 100 chicks two to four weeks old two or three times per week if your flock is being destroyed by any of these enemies and you will soon be rid of these pests.

The house cat and the prowling dog destroy many chicks every season that are supposed to be the victims of minks, weasles, opossums, skunks, and rats.

The house, yards and premises generally should be kept clean and free from large weeds, rubbish, stone and lumber piles. The large gray rats may be driven away from buildings, where it is not advisable to use poison, by strewing powdered caustic potash in their burrows and runs under floors and walks. This will adhere to their feet and very soon will blister them and the rats will leave the premises speedily never to return. If we use the one-inch mesh netting on all houses, coops and runs it will keep these rodents out much better than the two-inch mesh.

CHAPTER XIII.

MARKET POULTRY.

The first on the list of table poultry is the young chicken. These are called by various names in different localities. If one is located near a good market or shipping point it may be very profitable to dispose of some of the chicks as squab broilers. These should be fed in limited quarters and made as plump as possible. They should be sold when they weigh one and a half to two pounds per pair. If one has a good market, large hotels, restaurants, clubhouses, etc., this may be made a very profitable branch of the business but the product must be sold direct to the consumer because they deteriorate very rapidly when handled by express and commission men. Good squab broilers often bring one dollar per pair at seven to eight weeks old.

In producing these chicks one must have quick growing, plump-bodied stock and cross-breeding will give excellent results if intelligently done. White Plymouth Rock hens mated to White Leghorn cocks produce cross-bred chicks that make rapid growth and a very plump, close-feathered carcass. White Leghorn hens mated to White Wyandotte cocks will also produce excellent chicks for this purpose. Do not attempt this squab broiler business until you have mastered the art of feeding and until you have a direct market in sight.

Broilers, weighing from one and a half to two pounds each are usually quite profitable. These too, should be plump and "meaty" and should go direct from the farm

to the consumer or to a quick market. If one is producing many chicks to be sold as broilers the crosses mentioned above will produce very satisfactory results, but where one sells the cockerels and cull pullets only, as broilers and retains the best for breeding and egg producing purposes, the cross-breeding is not advisable.

All chicks fed for table use should be fed to the limit with flesh and fat forming feeds. It is the plump, "meaty" chick that sells and we must produce it. Feed carefully the first four weeks as advised in the chapter on feeds and feeding, then increase the ration of corn and meat scrap to the limit of the chick's power to digest and assimilate without overfeeding. It is not generally known but brooder chicks can easily be trained or taught to eat a very heavy feed at night by the light of a good lamp. They will soon learn to eat as much at this night feed, say at 10 or 12 o'clock at night, as at any of the regular day feeds and they will gain very perceptibly on those not fed at night.

SOFT ROASTERS.—These are full grown, young, fat birds and should weigh, net, six to eight pounds. There is also a limited demand for very large soft roasters weighing ten to twelve pounds, but these should not be produced excepting for a special trade. This class of table poultry usually brings best prices during March and April. The sexes must be fed separately for best results.

CAPONS.—Where the large breeds are raised and one has plenty of room it is always profitable to caponize or castrate the extra cockerels. This is a very simple operation, easily learned by anyone and very little loss will result if the operation is performed at the right time. Caponizing tools can be bought at a nominal price and full

instructions accompany each set of tools. These birds become very quiet, have small heads and combs and grow to extreme weight. Brahmas, Cochins and Orpingtons are favorite breeds for caponizing with a growing preference for the Orpingtons.

Capons should be fed in clean, limited quarters until fully matured which will usually be at ten to twelve months old. Many of these weigh twelve to fifteen pounds and often sell at twenty cents per pound. Capons should always be shipped and sold dressed as they are too soft and tender to be roughly handled. All of the foregoing special table poultry brings much better prices in the large cities in the North and Northeast, beginning with Washington, D. C.

CHAPTER XIV.

GENERAL REVIEW.

In every well conducted school the pupils are required to review the work gone over. Let us review some of the main features of the work.

In the first place do not make the mistake too commonly made in selecting breeding stock. Study carefully your own taste, your location, the size of your farm, your market and what line of work you expect to specialize in. Do not imagine for a moment that you will make more money with eight or ten pens of different breeds. One good breed is far better than many. No breeder should attempt to keep more than two breeds.

If eggs for market is to be the main business do not select one of the large breeds. This book is written for truthful information, not to advertise any breed or appliances. The author has had forty years experience in poultry matters, and is entirely free and unhampered by prejudice, financial interests or friendship, to give unbiased advice, based on personal experience and observation with all the breeds mentioned in this book and some others, and nothing will be written that is not backed by experience. Therefore what is said in this connection must be understood as applying to actual experience. We have never been able to get a strain of any of the medium or large breeds that would produce as many eggs per hen per year as the small breeds. Some breeders advertise strains of the medium and large breeds as equal in egg production to the small breeds but we have never succeeded

in getting the results from these strains claimed for them by the advertisers, hence we repeat, if eggs are wanted for market select one of the small breeds.

There are two breeds not mentioned in the class of small fowls as enumerated in this book that are very satisfactory egg producers. These are the Blue Andalusians and the Hamburgs.

The Andalusian is larger than the Leghorn but very similar in disposition and general characteristics and in size is but a trifle larger than the average Leghorn.

In breeding these small breeds it is always well to be governed by the standard size and qualifications and not attempt, by selection and feeding to produce birds of large size. It is desirable to preserve the true size, shape and symmetry of all the breeds.

Where eggs and the production of meat are to be combined the medium breeds are unquestionably to be preferred. The Plymouth Rocks, Wyandottes and Rhode Island Reds are good layers and average about one-third larger than the small breeds.

As noted in the preceding chapter the Rocks and Wyandottes are perhaps the best fowls for cross-breeding with the small breeds for the production of plump, quick-growing broilers that we can select.

For heavy roasters nothing can equal the Brahmas and Orpingtons. The latter are better in quality and texture than the Brahma but do not get as heavy by several pounds.

With these facts in view one may select the breed for the purpose and not be misled.

It is a mistake to undertake to breed the small fowls in close quarters. They will not thrive and cannot be as

closely confined as the medium or large breeds. Therefore the man with limited range should select one of the medium breeds.

Where the market demands white shelled eggs the small breeds must be selected and for brown-shelled eggs the medium and large breeds must be chosen.

Housing and yarding of all the domestic fowls must be done with a view to the health and comfort of the flock. Dampness must be avoided. Fresh air and sunshine are the most potent factors for health.

A great variety of good, sound, sweet feed must be provided and the flock must be fed liberally but judiciously. Feed for contentment and health. The medium and large breeds can be overfed on carbonaceous foods, but the small birds on free range will seldom get too fat.

All must have a constant supply of fresh, clean water, grit, oyster shell, charcoal and green feed. Meat in some form must also be given regularly.

Do not feed musty, mouldy, heated grain or rotten vegetables or sloppy feeds.

Provide a good dusting place in a sunny exposure.

Keep the houses clean and free from strong odors, mites and disease germs by spraying or washing with hot lime wash. Have plenty of darkened nests and have them clean.

Do not allow dogs in your poultry houses and yards. Do not worry or excite your hens at any time or under any circumstances. It reduces the egg yield.

Never allow a broody hen to sit on a nest over night unless you intend to give her a clutch of eggs. Put her in a roomy yard with a male bird and feed her soaked oats

and wheat and she will lay in a few days. If you allow her to set a few days she will not lay an egg in less than twenty days.

Put setting hens in a separate house and in individual nests. Keep them free from lice and mites by dusting with lice powder and mix some of the lice powder in carbolized vaseline and rub into the short feathers on the heads of the sitting hens to kill the head lice before the chicks hatch.

Read Chapter V again, Feeds and Feeding, also Chapter VII, Feed and Care of Chicks.

Never sell a bad or dirty egg or an old tough lean fowl. Eat them yourself if they must be used by anybody.

Don't buy a cheap incubator unless you are looking for disappointment and trouble.

Shun the three hundred egg advertisers. Two hundred eggs per year per hen is plenty. Don't expect to make \$500.00 from twenty hens in one year. Cut these figures down about \$450.00. and then subtract \$20.00 You can make more than thirty dollars from the eggs of twenty hens if you hatch them but you will be making this money from the young stock, not from the hens.

If you advertise, make your advertisements short, plain and truthful. Do not advertise stock and eggs at "half price." That is too cheap to be good.

Do not go in partnership with anybody but your wife.

Remember that cleanliness is next to Godliness. Godliness is a rare but useful attribute.

A good doctor tells his patient how to live to avoid disease. Be a good doctor to your flock and keep them in good health.

If you want to live without working do not engage in poultry raising. Be a tramp.

Do not try to keep hens in your family garden. It will spoil the sweetest disposition.

If a hen persists in feather pulling, pull her feathers. It's the best remedy.

If she eats her eggs when she has plenty of other feed, eat her. It is the most satisfying disposition you can make of her.

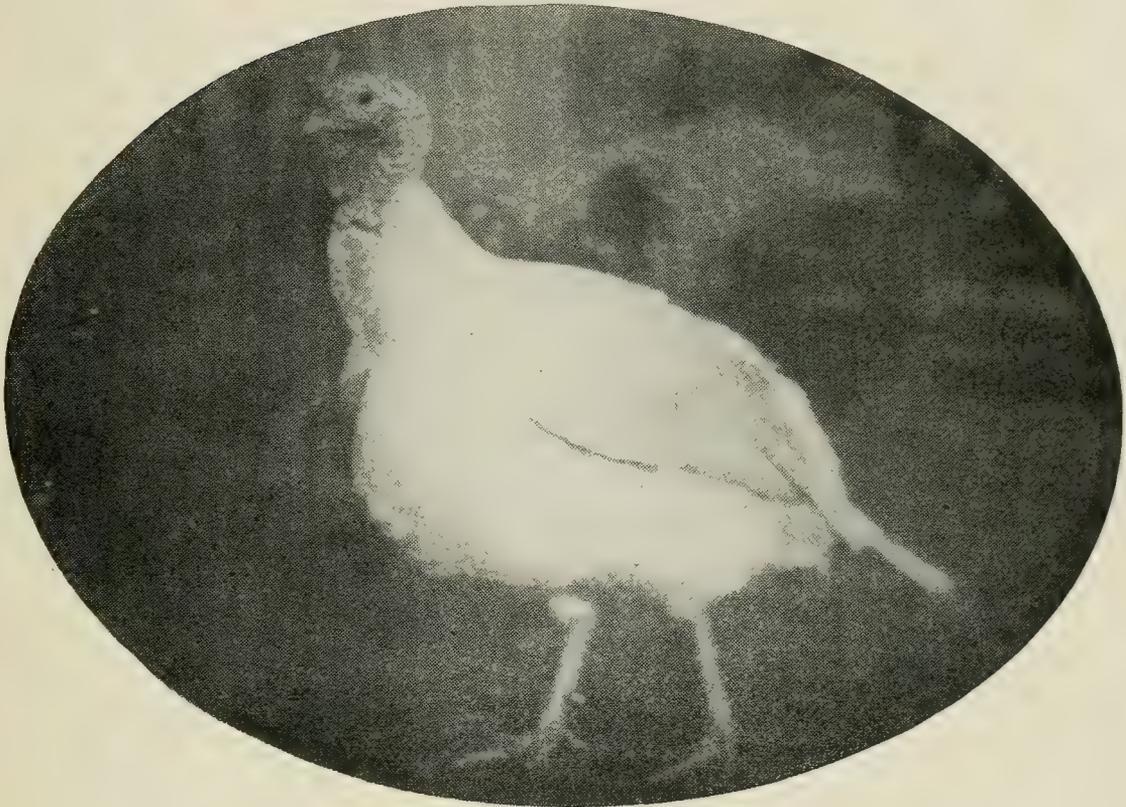
If your hens stand around in clusters and sleep in the daytime they have indigestion and need grit and a tonic. Give them clean, sharp grit and a handful of ginger in their morning mash for every twenty hens. A tablespoonful of red pepper will also put warmth and energy into their sluggish blood.

Do not compel them to eat snow and ice in the winter. They will lay fresh eggs if you take the chill off of their drinking water.

Save all the hen manure. Mix it with twice its bulk of dry loam and keep it in a dry place. Do not sell it for thirty cents per barrel. It is worth one dollar per barrel in your garden or potato patch.

Do not bury diseased hens. Dogs and skunks will dig them out and spread the disease. Burn them.

Roast a good fat hen occasionally and thus cultivate a taste for poultry.



CHAPTER XV.

TURKEYS.

The turkey is an American fowl. We have six distinct breeds recognized by the Standard, the Black, Bronze, Narragansett, Buff, Slate and White. The Bronze is the largest, Narragansett a close second with the other four breeds about equal in size. Single specimens of the Bronze have been fed to weigh over fifty pounds.

The objection to the Bronze and Black breeds is their inclination to roam. They must have a very large range to thrive and be healthy. The hens, as a rule, are very moderate layers. They are hardy and are really only one step removed from the native wild turkey of North America.

The White and Buff are very domestic and do not roam like the Black and Bronze and are more prolific. Hens

of these breeds frequently lay eighty to ninety eggs in a single season. They mature quickly and make a very plump carcass in six months. The Narragansett is similar to the Bronze in every respect excepting in color and the Slate is similar to the Buff and White.

Breeding and raising turkeys is quite profitable where one has sufficient range. It is almost impossible to grow them to maturity in confinement. Many people fail in this enterprise because they try to keep their breeding stock yarded and the young are weak in consequence of this confinement of the parent stock and soon pine away and die.

We must remember that the domesticated turkey is but a few steps or generations removed from the native or wild species and we must give them natural conditions if we want to succeed with them. For many years we tried to raise turkeys in large yards and house the young during rainy weather and at night, but always failed. Then we gave them the range of a large farm. Did not force them to early laying and simply gave them their freedom. Six hens and one tom of the Bronze variety were treated in this way and not a single egg was taken from the nests. They laid in bushes and clumps of briars and laid from twelve to seventeen eggs each. They hatched in May and early June and every egg but two produced poults and they were allowed to roam at will. No feed was given them until the mother hens brought them to the orchard near the house. Here we fed them wheat and corn bread soaked in sweet milk whenever they came up. Later we fed them whole wheat and cracked corn and by October 1st they came regularly for their feed of whole corn and wheat. The six hens raised to maturity eighty-

four turkeys and the following year the same six hens raised, by same method, sixty-seven. This was fifteen years ago and we have raised from twenty to fifty every year since in the same way, excepting two years since we came to Virginia when prowling dogs destroyed the nests or young. From this experience, and very much observation, we emphatically say that turkeys must have a large range, including some timber and water, and let them have nature's way.

Turkeys to be healthy must roost high in the open air. They must have a range sufficient in extent to afford them insects to feed their young the first month at least, and very much of their food during the entire period of their growth must come from the range. A flock of turkeys will keep a farm free from insects of all kinds, including tomato and tobacco worms and do very little damage to growing crops. During the past fifteen years we have not housed a turkey and have not lost but one by disease and none by rains or dew.

Roup, blackhead, liver and bowel trouble are all the direct result of housing and overfeeding with food stuff that does not agree with the nature of the turkey and it is folly to dope them with medicine in the hope of effecting a cure.

Mate strong, vigorous stock. Keep them out of doors. Keep them in moderate flesh during winter and early spring so they will not begin to lay before April, then give them freedom. Kill all the prowling dogs. Feed the young only when the hens bring them to the house, or yards and when the young are half grown feed liberally at evening and you will have less trouble, less worry and more turkeys.



CHAPTER XVI.

DUCKS.

We have ten varieties of ducks described in the Standard. The Pekin is the largest and most popular. Several breeds are very prolific layers of large, well-flavored eggs. The Indian Runner is small in size but lays fine large eggs and is considered the greatest egg-producer of any of the duck family.

The young are very hardy and grow very rapidly. They must have a good run on grass, have plenty of fresh water to drink and be fed on soft feed until nearly mature. During the breeding and laying season they must also be fed soft food if a full supply of fertile eggs are

wanted. Ducks lay their eggs very early in the morning and must be confined until all have laid or their eggs will be lost. Unlike other fowls the duck seldom makes a nest but drops her egg anywhere.

Young ducks are considered a great delicacy by some epicures and usually bring a fair price, but we have never been favorably impressed with duck raising as a business.

The young need very little brooding but should have a dry, clean floor to roost on and a good roof over them.

The germ in a duck egg is very strong and they hatch well in incubators. When the ducklings are hatched and thoroughly dry they should be removed to shallow boxes in a warm room. Have the floor of these boxes covered with clean, sharp sand. Give fresh water to drink, in shallow trays or dishes and feed may be given after the ducklings are twenty-four hours old. They should be fed the first four days on hard-boiled eggs, bran and oatmeal made into a soft mash with sweet milk. After they are four or five days old they should be given a run on grass in a small enclosure and fed a mash composed of three parts wheat bran; two parts corn meal and some meat meal. Do not give much meat at first but by the time the ducklings are three weeks old ten per cent. of their feed may be meat meal if they are intended for market. Moisten this mash with sweet milk or water and season slightly with salt.

Always have water before the ducklings to drink. They must have water when feeding as they will take a mouthful of mash and a sip of water, feed and water until their hunger is satisfied, if you have feed enough. At four weeks old the feed may be five parts bran, four parts corn meal and one part beef scrap or meat meal. Mix

this dry, then make into a mash with milk or water and feed liberally for four weeks. At eight to nine weeks old the ducks should weigh four to five pounds and should be sold at this age. If not sold before they are ten weeks old the adult feathers start and they cannot be sold for six or eight weeks. Ducks have a ravenous appetite when growing and must be fed liberally to make rapid growth. One hundred ducklings at four weeks old will consume twenty to twenty-four quarts of the dry mash mixture at a single feed and they should be fed four to five times per day. They are comparatively free from disease and vermin and where one has a good market and a suitable place they are quite profitable.

GEESE.—This book is written wholly from the practical experience of the author and I have never raised or owned a goose. I do not know a single item to say for or against this stately fowl only that they have never appealed to me in any way.

CHAPTER XVII.

FANCY FEATHERS.

The pages of this book are dedicated to plain, practical utility fowls, not because the so-called fancy fowls have no value, but because the great mass of poultry keepers are interested in utility stock and want stock that is ready sale in the market at all times.

Some of the fancy breeds like the Polish, Games, Game Bantams, Ornamental Bantams, Japanese Bantams, Polish Bantams, Silkies, Sultans and Frizzles are wonderful creations of the fancier. They show the possibilities of careful study in mating and development and some single specimens have sold for large sums of money, simply because of certain striking characteristics of feather marking difficult to produce.

Very few of the utility breeds have been brought to the standard requirements without the aid of the fancier, hence we owe much to that patient, painstaking class of scientific breeders for the perfection attained in the production of the utility breeds.

The difference between a fancier and a poultryman is very plainly seen at any of the poultry shows. The fancier looks at and admires the fine marking, lacing and correct shape and carriage of the various breeds, while the poultryman notes the size and vigor, the shape of the breast and body as an egg type and a few feathers makes no difference to him.

With the fancier it is clearly a case of fine feathers making a fine bird. With the utility breeder the fowls

must show business qualifications. Fancy fixes the value in the one case and the other is purely a commercial proposition.

There can be no more fascinating diversion than the breeding of some of these fancy fowls for pets, and many men have found health and pleasure in caring for a pen of some of these interesting little autocrats.

Some men cannot produce these fancy feathers to save their lives, and naturally turn to the egg producers and flesh growing types.

There is room enough in this big country of ours for all classes of fowls, and people admire and buy them, and there is no reason why every man should not have an undisputed right to indulge his taste to the limit of his time and means.

In conclusion, we have but one desire, one hope, and that is that all poultrymen and women, all fanciers, may unite in their every effort to produce better conditions for this great industry and improve every branch of this attractive and profitable occupation.

In the New South we especially need improvement in our flocks, our methods, our markets and our exhibitions. Let us strive for better stock, higher ideals, nobler aims. We have the climate, the soil, the markets, every natural advantage to assure success, and if we assert our faith in our calling by working for supremacy in the business we will soon find ourselves not only master of the markets but leaders in the show-room.

CHAPTER XVIII.

A FEW POINTS ON ECONOMICS.

PRESERVING EGGS.—Very often we have a large supply of eggs during April and May and the price is not satisfactory, or we may have only a few hens and want to keep some of these surplus eggs for use during the fall and winter months when the hens are moulting and not laying. Many thousand crates of eggs are kept in cold storage and in many instances are sold as fresh laid eggs. This is very common in the South. Farmers cannot, or do not, make use of cold storage and usually sell the eggs regardless of price. Cold storage eggs have a peculiar, stale, musty taste, very disagreeable to a person accustomed to first-class fresh eggs.

Every farmer's wife can preserve eggs and keep them in much better condition than in cold storage. For this purpose the eggs should be sterile, that is, the flock of hens should have no males with them. Such eggs will keep very much better than fertile eggs. They should have good hard shells, be perfectly clean and be gathered twice daily and put in the preserving liquid as fast as gathered. Stone jars holding four to six gallons are best for this purpose. They must be perfectly clean. As fast as the eggs are collected and cool place them in the stone jar, small end down, and cover them with a ten per cent. solution of water glass (silicate of soda). This can be bought at any drug store. Take one quart of the water-glass and nine quarts clean, cold water. Mix thoroughly by pouring from one vessel to another several times. Pour

over the eggs until they are all covered or submerged. When the jar is full cover with a plank lid and set away in a cool place. Good, sound, fresh, sterile eggs preserved in this way will keep perfectly for one year.

When wanted for use take them out and rinse in tepid water. Eggs kept in this way are just as good for every culinary purpose as new-laid eggs, excepting for boiling in the shell. The shells are liable to crack if they are dropped into boiling water. If you want to boil them put them into warm water and bring to the boiling point gradually.

Because such eggs are as good as new laid eggs it is no reason that they should be sold as such. They can be sold as preserved eggs at a good price and consumers will always buy them in preference to storage eggs.

FEATHERS.—Poultrymen who sell dressed poultry can save considerable money by getting a market for the feathers. The fowls must be dry picked and tail feathers, wing feathers and body feathers kept separate. After picking spread them out to dry in an airy loft and when thoroughly cured pack in clean burlap bags for shipment. Twenty to fifty cents per pound can be realized for first-class feathers.

HEN MANURE.—Very much fertility is lost and wasted on many farms in various ways and the manure from the fowls is not always cared for and used as judiciously as it deserves. Some people have an idea that hen manure is equal to Peruvian guano as a fertilizer. This is not the case but where a flock is fed for egg production and fed large quantities of bran and meat meal and bone the manure has a very much greater value than the manure from any of the farm animals. It is worth fully five

times as much per ton as cow or horse manure and four times as much as sheep manure. The manure must be kept dry and also be stored in some way to keep it from heating. This can be done by mixing with twice its bulk of dry loam. Land plaster (gypsum) or raw phosphate rock (floats) can also be mixed with it and this increases its value very much.

The dropping boards should be made with matched lumber and the loam, plaster or floats spread on the boards, then when the manure is collected it will be thoroughly mixed with the absorbent and it will keep in perfect condition until wanted if kept in barrels or boxes in a dry place. The average analysis of fresh hen manure from a flock fed for eggs and hence fed a full ration of wheat bran and meat meal, shows the following available or soluble elements of plant food.

Nitrogen 1.50 per cent.; phosphoric acid, 1 per cent.; potash, .70 per cent.

Mixed stable manure shows the following analysis: Nitrogen, .50 per cent.; phosphoric acid, .30 per cent.; potash, .60 per cent.

Hen manure contains much less water per ton than stable manure and is more readily available, hence its greater value for early maturing plants or for rapid growth.

It may be used as a base for mixing a very high grade fertilizer by using ground rock (floats) to mix with the hen manure and compost it to make the phosphatic element of the rock available. This rock contains about thirty per cent. phosphoric acid but must be composted with manure or vegetable matter to make it available. Thus if we compost one ton of fresh hen manure with

one ton of ground rock and then mix with this five hundred pounds of muriate of potash and five hundred pounds of dried blood we will have a complete fertilizer showing a very satisfactory analysis of plant food with no objectionable acid content. The analysis will be approximately nitrogen, 2 per cent.; phosphoric acid, 14 per cent.; potash, 6 per cent. This will cost here at Richmond, Va., as follows: One ton ground rock, \$12.00; 500 pounds muriate of potash \$13.00; 500 pounds dried blood, \$13.00. Total, \$37.00 for two and one-half tons of fertilizer or nearly \$15.00 per ton. This is less than one-half the cost of any fertilizer on the market showing a similar analysis.

Hen manure should always be used in this way, as a base for high grade chemicals but should not be mixed with anything except the ground rock until it is wanted for use.

Do not mix lime or wood ashes with hen manure at any time until wanted for immediate use.

Where hen manure is allowed to remain under the roost for any length of time it should be covered frequently with dry loam and land plaster to prevent the escape of the ammonia as this removes much of its value as a fertilizer and is also very injurious to the fowls.

CHAPTER XIX.

SELECTING LAYING HENS.

We have said very little, if indeed, anything, in regard to selecting laying hens. Some men claim to be able to select the best layers by sight or by some peculiar formation or type. Some use trap nests but this book is written for busy, business people and the trap nest is too much trouble and the selection of the laying hens by sight or shape is too uncertain. Experience will enable one to select good layers with reasonable certainty in hens as in cows, horses, sheep and swine. The cow that has a decided wedge shape, a large, broad muzzle, a bright eye, a soft, unctious skin, a long, slim tail, thin shins, big feet and a well developed udder is nearly always a good dairy animal. She must have perfect health.

So with the hen. She should show this same characteristic wedge shape, long in the back, perfect in form and feather, bright red comb and wattles, large bright eyes, good strong beak, a large crop, straight, strong legs, good feet and toes, straight, long breast bone and a feminine appearance throughout.

She must be active, alert and always busy. It is very easy to pick out the drones. The business hen is usually the first one off the roost, the first in the garden, the first at the feed trough and the first in the nest. She is usually very domestic in her general demeanor but does not want to be handled. She sings that merry song so cheerfully that she brings sunshine and happiness to her owner. She is the first to lay as a pullet and the last to stop at moult-

ing time. She moults quickly and very often will lay during this period.

Such hens are always conspicuous in a flock and can easily be selected for breeding purposes. This is undoubtedly the best method to pursue to get good layers. If we will select ten or twelve such hens and yard them in a good roomy yard, and select a good type of male birds of same general characteristics to make up our breeding pens we will soon have a strain of very superior layers with very little trouble. With a yard of twelve such hens it is an easy and simple matter to keep a daily record of the egg yield for six months beginning with January, and if they average ten eggs per day for this period they are good enough. This will be 1,810 eggs in 181 days or an average of 150 eggs for each hen for this period. Mate these hens the next year to a typical cockerel hatched from eggs laid by them and this laying trait will be intensified. The cock bird, if a good one, may be mated the next year to a pen of pullets from his flock and this line breeding will give excellent results if skillfully done. Great care is required in selecting birds for this purpose. Avoid every defect and select birds with perfect health and great vigor.

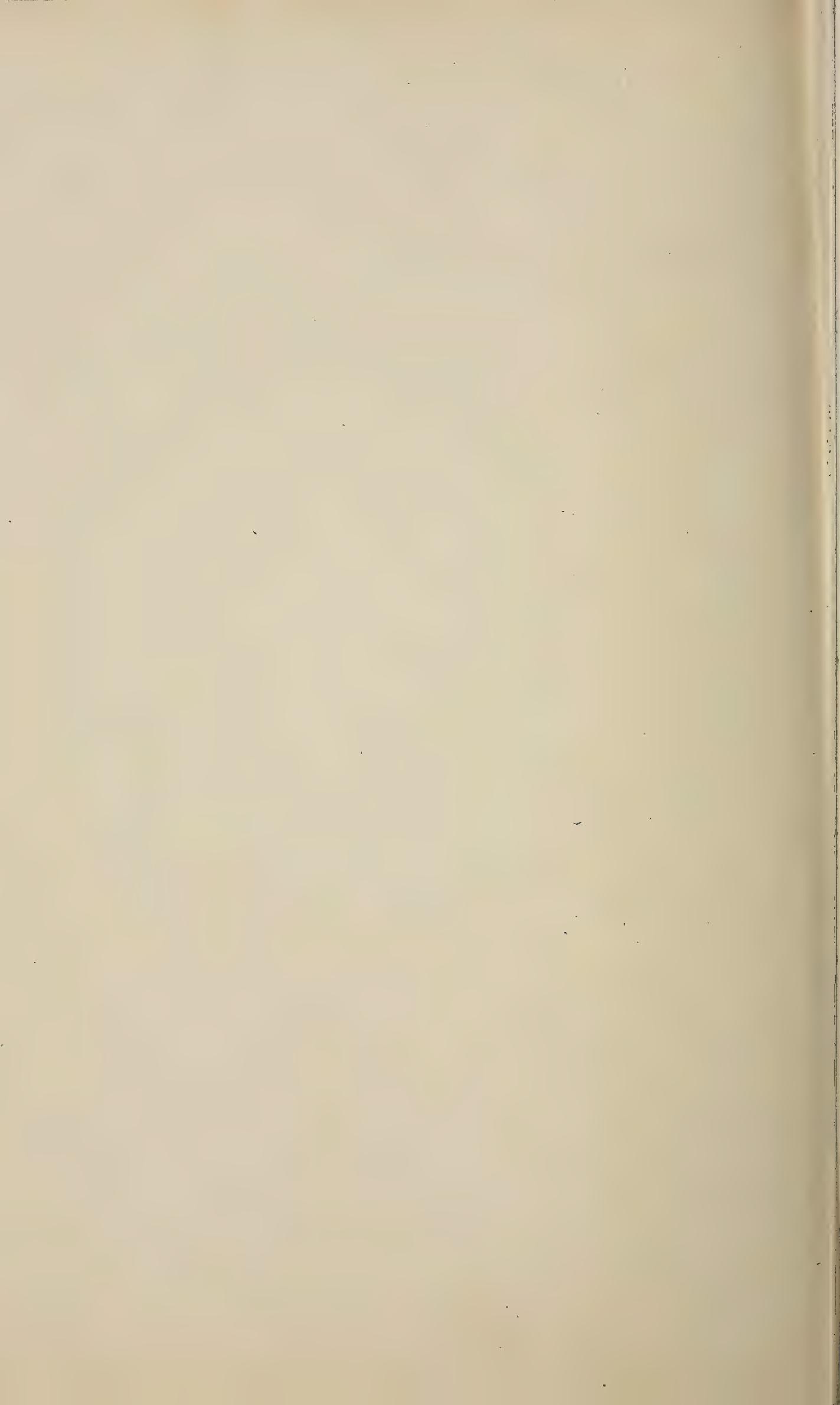
The master cockerel, if a good specimen is the best for this purpose. The survival of the strongest is nature's way of selecting males and we cannot devise a better way to determine vigor of body than by this natural way.

In and in-breeding and line breeding must be thoroughly studied and understood before one should attempt it, and for such information one must go into technicalities and heredity as well as genealogical lines of descent, and this is beyond the scope of this book. The various

breeds mentioned in this book are all good for the purpose for which they were made and there are many strains of each of these breeds, bred to standard requirements and one can always procure new blood that will be satisfactory and by judicious selection of such desirable strains it is not necessary to practice in-breeding to any great extent to maintain desirable traits in the farm flock.

The great aim and object for the poultryman to strive for is perfect health and vigor in every bird in his flock with the particular trait of character either for egg production, size and quality of the carcass or a blending of the two developed to the uttermost without sacrificing Standard qualifications and vigor.

FINALE.—I sincerely hope that the plain facts set forth in the pages of this little book may prove helpful to the people engaged in the business of commercial egg and poultry production. I have given my experience in as plain language, as short a space and as concise as possible. I do not say that this is the only way or the best method, but I say that the practice of the methods and principles laid down in this book have been found satisfactory to me.



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