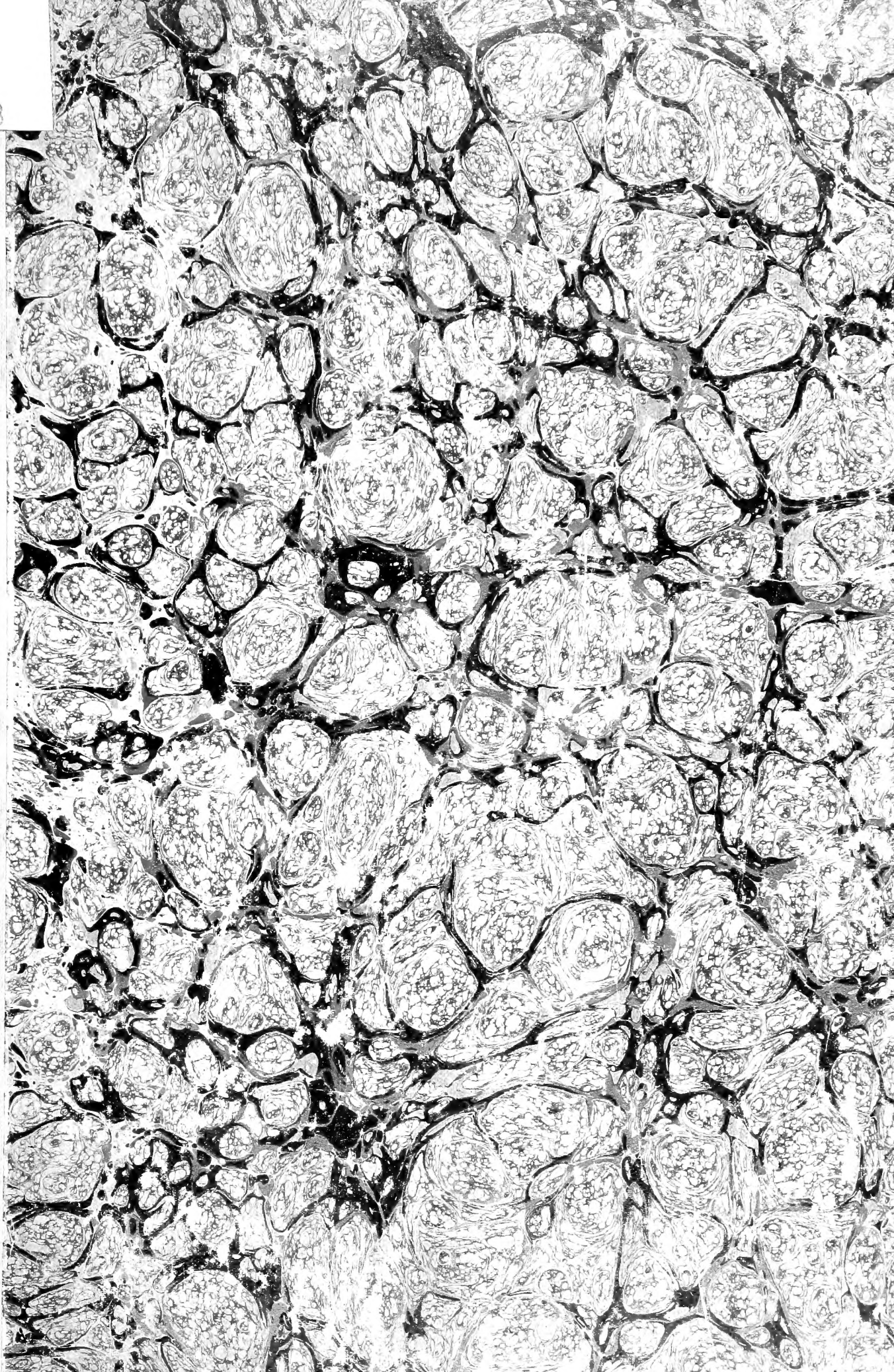

SUCCESS WITH POULTRY

SIXTH EDITION

A BOOK ON SUCCESSFUL AND PROFITABLE POULTRY RAISING CONTAINING VALUABLE INFORMATION FOR PERSONS WHO THINK OF ENGAGING IN ANY BRANCH OF THE POULTRY BUSINESS FOR PROFIT

PRICE ONE DOLLAR

EDITED BY J. W. MYERS

PUBLISHED BY

RELIABLE INCUBATOR & BROODER CO.

QUINCY, ILLINOIS

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V1

INTRODUCTORY

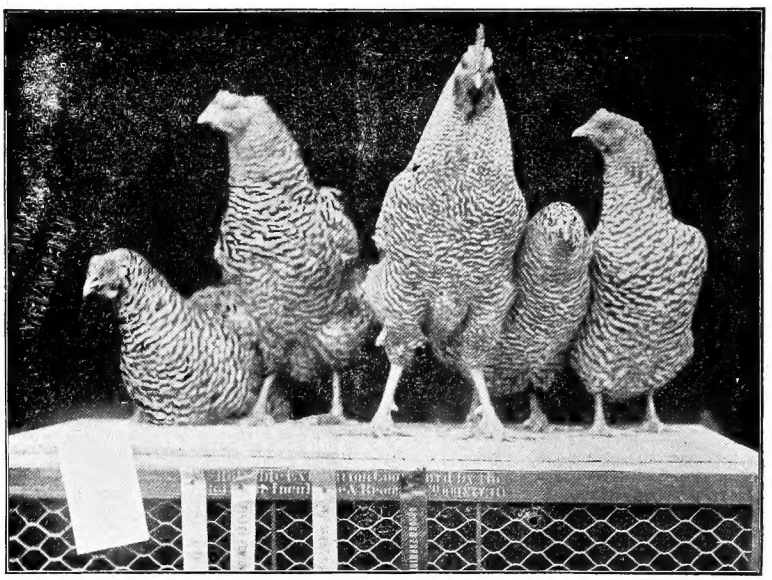
THIS book is to be compiled in dead earnest. Poultry keeping may be a fad with a limited few, but in a vast majority of cases it is a serious matter, a question of bread and butter, of a livelihood, and any book written or compiled on the subject of Success with Poultry should view the poultry business in this light. We shall not put into this book a single statement nor a bit of advice in which we have not full confidence. We do not wish to misrepresent in the least, or to deceive anybody. We do hope that this book may be the means of helping a large number of people who wish to better their condition in life and are in a position to handle poultry with both pleasure and profit. We shall put into this book therefore, only the best information and best advice at our command, doing so with a full understanding of our responsibility.

Success with Poultry depends upon much the same things that success does in any undertaking or business enterprise. To be successful in any line of work slothful, careless, extravagant habits must give way to thrifty, pains-taking methods. Thought must be put into your work.

Cause and effect must be studied; all the details must be looked after with intelligent care, and the hand that receives the income must constantly watch the hand that pays out. There is money—"good money," as the saying goes—to be made out of poultry, but this business, like any other, must be learned before great things can be accomplished. Like other human enterprises, poultry-raising pays better and better accordingly as you put more and more thought into the business. In the poultry business, above all others, ordinary common sense is the thing most useful.

It is not within the scope of this book to cover every case, but no matter where we go, certain things are true about poultry and poultry keeping, among the number being these: That poultry and eggs at all times of the year meet with a ready sale for cash; that as a rule the price for poultry and eggs does not fall below the cost of production, where intelligent methods are employed; that extra or gilt-edged prices can everywhere be obtained for gilt-edged stock, that is, for extra choice, uniform and neatly dressed fowls and strictly fresh eggs; that it costs practically no more when one is rightly equipped for the work to produce a gilt-edegd article than an inferior one; that by the proper use of artificial means the highest market price can be obtained at all seasons of the year; that by adopting up-to-date methods, hundreds of dozens of eggs can be produced during the seasons of the year when they will command the higher prices, and that hundreds, yes, thousands of chickens or ducklings can now be raised with success and profit on a comparatively small plat of ground. A surprisingly amount of poultry and eggs can be produced on an acre of ground, while a full-fledged farm can be conducted on a five acre piece, where knowledge and good sense go hand in hand.

Not all men are qualified to succeed to the same extent, but we claim it is fair to cite exceptional cases of success in the poultry business, where the methods employed and the man or woman who employs them is not a wonder-worker in any way, except that he or she has put heart and brains into the work. There are several branches of the poultry business that are separate and distinct from each other, although a number of successful men and women whom we know combine two or more branches of the business with success. What one man or woman has done, or is doing, others can do; hence, when we cite actual cases of success that have come under our personal observation, we feel that we are simply pointing out what others can do.



A Pen of Barred Plymouth Rocks as Bred by Reliable Poultry Farm.

It is no doubt true that where one person succeeds with poultry several fail. If this were not true there would be no excuse for publishing this book, the chief object of which is to describe success as it exists, and to explain fully how it was achieved. It is not the object of this book to induce thoughtless, heedless persons to rush pell-mell into poultry raising. All such persons will do well to give poultry raising a wide berth. Their habits will not win in this business. We do not mean to convey the idea that it takes a specially high order of intelligence to succeed with poultry, for it does not, but we are frank enough to warn the reckless, the shiftless and the indolent that they will make a flat failure with poultry.

THE SO-CALLED FANCY POULTRY BUSINESS.

Let us describe briefly the leading branches of the poultry business. We hear most about the fancy or standard-bred poultry business, and for good reasons, or no dout it is really the most important when we come to consider how insignificant the poultry industry was thirty to fifty years ago as

compared with what it has grown to be at the present day, the great change being due very largely to the work of fanciers, so-called, in breeding to a standard, that is, to different types and ideals, founded, as a rule, on the secure basis of combined utility and beauty. By "fancy" in poultry is meant, that which is pleasing to look at—the beautiful in form and feather. By "utility" is meant size, vigor, color or skin, egg production, etc., and the ability of a type to reproduce in its progeny those qualities that are especially desirable in market poultry. Persons who are not posted on the subject of standard-bred poultry can have no idea of what is meant when we say that there are over one hundred distinct varieties of standard poultry, ranging in weight all the way from a few ounces in the case of bantams, to Mammoth Bronze turkeys weighing, in exceptional cases, as high as forty-five to fifty pounds. The writer once saw and lifted a Mammoth Bronze turkey tom (gobbler) which weighed fifty-two pounds.

So far as egg yield is concerned, the average American hen, as set forth by the census of 1890, lays less than 100 eggs per year. On the other hand, as a result of the work done by the intelligent fancier or breeder, flocks of Leghorns running fifty to a pen, including 600 fowls in all, have been made to average 194 eggs in 365 days, while in other cases smaller flocks consisting of from eight to twenty-four hens have averaged, according to what were believed to be reliable reports, from 220 to 288 eggs per hen in 365 days. Many hen-men are disposed to dispute these last stated averages, but that is a common failing with mankind. That which a man tries hard to do but fails to accomplish, he is prone to deny when credited to others. A man whose hens lay only three or four clutches of eggs a year, and this means the average farmer, will be as quick to dispute the statement that 600 hens of any variety could possibly average 194 eggs per year as is the average man to dispute the statement that eight White Plymouth Rocks ever succeeded in laying an average of 288 eggs in 365 days. Possibly, just possibly no eight hen ever did this, but we have enough faith in mankind to recall a Biblical admonition to the effect that the man who hath said in his heart all men are liars is—mistaken. We leave this subject for the time being, simply referring the reader to a chapter in this book entitled "Feeding for Eggs," which gives an account of an actual egg contest conducted by a well-known and highly respected stock and farm paper, in which are given the results accomplished by six different pens of fowls, together with an interesting and valuable account by the respective owners of how these fowls were housed, fed and cared for. We also call the reader's attention to a table printed in this book entitled "Characteristics of Breeds." It will be of help to investigators of the poultry subject when they come to select the breed or variety they desire to handle. Suffice it to add that in numerous well authenticated cases individual hens have averaged from 200 to 230 eggs each per annum.

THE STANDARD OF PERFECTION.

The American Standard of Perfection, a book of some 250 pages, is often referred to as the national guide of poultrymen. This book is published under copyright by the American Poultry Association, a national organization devoted to the advancement of the poultry industry. In this book each class, breed and variety is set forth, and each and every variety is described with great care as to size, form and color, and every breeder is aiming to produce fowls from year to year that will come as near as possible to the standard requirements. Wonderful progress has been made by intelligent and persevering breeders, and the choicest specimens from year to year are placed on exhibition at the annual poultry shows by the breeders themselves, or are sold to other breeders for exhibition purposes. At these poultry shows (some 300 or more of which are held every winter in the leading cities of the country, in addition to hundreds of poultry departments that are run in connection with annual district, state or county fairs), so-called poultry judges, or men who are well versed in the standard requirements and who make a business of judging poultry either of what is called the score card, judge the fowls on exhibition and cash premiums or ribbons are given to the birds that come nearest to perfection, that is, to the standard requirements. Comparison judging, as it is called, is the popular method at the fall fairs, mainly from the fact that poultry at this season of the year is not in the pink of condition for exhibition purposes. The young stock is too young to be in full feather and the old stock is in the molt, that is shedding its old feathers and putting on the new plumage with which to go into the winter season. On the other hand, from November 1 to February 15, the season of the winter poultry exhibitions, both the young and old fowls are in fine feather and show up to best advantage. At these winter shows the score card is generally used. We present herewith a form of score card provided by the American Poultry Association:

A. P. A. STANDARD
SCORE CARD

Specimen Scored Dec. 22, 1906

For Reliable Poultry Farm

Variety Light Brahma *Sex* Cockerel

Entry —— *Ring No.* 723 *Weight* 10¼

SYMMETRY	Typical Shape	½	BREAST	Shape	½
WEIGHT				Color	
CONDITION			BODY and FLUFF	Shape	
COMB		¾		Color	
EYES			WINGS	Shape	
HEAD	Shape			Color	1
	Color		TAIL	Shape	½
WATTLES AND EARLOBES	Shape			Color	
	Color		LEGS and TOES	Shape	½
NECK	Shape			Color	½
	Color	¾	CREST & BEARD	Shape	
BACK	Shape			Color	
	Color	¾	Hardness of Feather		
			SCORE		94¼ 5¾

C. A. Emry, *Judge*

This is a duplicate of an actual card made out for a particular bird belonging to the Reliable Incubator & Brooder Company, which scored 94¼ points, that is, in the estimation

of Judge Emry, this specimen came within 5¾ points of perfection, which is represented by 100 points. The cut shows where the bird was defective, in his opinion, and to what extent. We thus give the average reader who is not posted on standard-bred poultry matters a general idea of how the score card is used, but we cannot go into detail within the scope of this book. Let us say, however, that these poultry exhibitions are of incalculable help in developing the poultry industry in all its branches, in that they create great interest and win an ever increasing number of new friends for fowls that are both useful and beautiful. Many people who have not given the subject careful and logical thought feel free to ridicule the beautiful in standard-bred poultry. They simply under-estimate the great value that beauty in fowls has been in atracting attention, creating interest and winning thereby new and lasting friends for poultry bred to a combined ideal—the acme of utility and beauty. Our poultry shows, together with the superior work now being done by poultry artists and the more recent use of photographic reproductions, showing choice specimens of different varieties axactly as they are in life, have done and are doing a great work in developing the poultry industry, and whoever depreciates any one of them simply either is not well posted or is not mentally qualified to deliver a sound opinion.

A CHIEF SECRET OF SUCCESS.

It will be readily understood by the intelligent reader that whoever among the breeders of standard poultry is able to produce specimens that come nearest to perfection, that is, to standard requirements, will be able to obtain for these best specimens high prices. The fact is that in England, where the standard-bred poultry business is older than in this country, and where the interest is even greater, poultry shows being held every week in the year, as high as $1,000 has been refused in a number of cases for extra choice and extra valuable specimens as breeders, while in this country as high as $100 is paid every season for extra choice specimens, and from $200 to as high as $300 has been refused from time to time for some particular bird with a proud record at a leading poultry show. These birds are valuable, not alone for their individual excellence and the record they have made, but also because they are the result, as a rule, of years of careful and systematic breeding and carry in their veins blood that is able to reproduce the excellent qualities or characteristics for which this individual bird is so highly prized.

Here, then, is one of the chief secrets of success in breeding standard poultry satisfactorily. In the beginning, so we are told by men who are posted in chicken lore, there existed only one kind of chicken, a black and red jungle fowl of uncertain origin. It is claimed that from this one kind or variety man has produced through selection and persistent matings, the one hundred or more distinct varieties of poultry now in existence. No doubt this is substantially true, for more than half the varieties of fowls now described in the American Standard of Perfection and bred in large numbers at the present time have been "created" within the lifetime of poultrymen now living, and even within the past twenty-five years a dozen or more of our popular varieties have come into existence. For example, twenty-five years ago there were no Buff Cochins, Silver Laced Wyandottes, White Wyandottes, White Plymouth Rocks, Buff Plymouth Rocks, Buff Wyandottes or Buff Leghorns in this country. The majority of these varieties did not exist in the world. New varieties are being created from time to time, some claim too numerously, others think not. Regardless of which is right, the constant aim may be said to be improvement either in utility or beauty, or both, and the goal sought at all times in the breeding of every variety is greater excellence, and the man or woman who is able to "mix the paints" and use "an eye for outline" to the best advantage is certain to win a golden reward, for the competition is keen and there is a widespread and constantly growing desire to "own the best." Frankly, more than average intelligence and enterprise are required in order to produce extra choice standard specimens. It has been said that "any fool can set a hen, but it takes brains to produce thoroughbred poultry." This remark is more true than elegant, but in all walks of life it is the same. The richer the reward the greater the effort required to obtain it.

Inasmuch as it has taken years to create the different varieties of standard-bred poultry, building them up to such

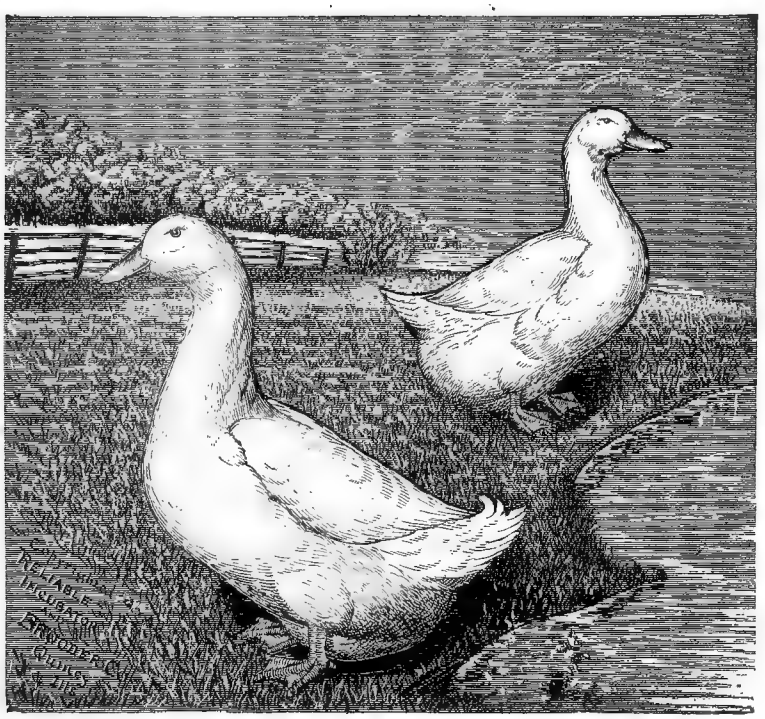
THE POULTRYMAN'S CHART.

The above Chart shows the sectional parts of a fowl: 1, Comb; 2, Face; 3, Wattles; 4, Earlobes; 5, Hackle; 6, Breast; 7, Back; 8, Saddle; 9, Saddle Feathers; 10, Sickles; 11, Tail Coverts; 12, Main Tail Feathers; 13, Wing-bow; 14, Wing Coverts, forming Wing Bar; 15, Secondaries, Wing Bay; 16, Primaries or Flight Feathers, Wing Butts; 17, Point of Breast Bone; 18, Thighs; 19, Hocks; 20, Shanks or Legs; 21, Spurs; 22, Toes or Claws.

an extent that they will reproduce the desirable qualities and charteristics, it follows that the one way to preserve and augment these qualities and characteristics is to buy into a strain and stick to that strain for better or for worse. A common mistake made by persons who go into the standard-bred poultry business is to buy a few hens or pullets here, a cockerel there, some eggs from still another place, crossing and mixing the blood of different strains, regardless of the loss of the breeding lines on which these different strains have been developed. It is equivalent to throwing just that much money away, provided your aim is to make progress in breeding to standard requirements. The better way to do, the only sensible way to do, is to buy into some established

strain, thus starting neck and neck with the breeder who created the strain. A beginner even in this case is at a disadvantage, but he stands a fair chance of success, and progress is possible to him, where he mixes the blood of two or more strains a set-back is almost certain to occur. There is a good deal to learn about poultry, especially the art of breeding to standard requirements with marked success.

Buy, therefore, with intelligence, not haphazardly, and it is the part of wisdom to decide on some breeder with an established reputation both as to the quality of his stock and his reliability as a man, then enlist his interest on your behalf, invite his advice until you are confident you know, of your own knowledge, what you should do. Do not be in a hurry to "go it alone." You will find sooner or later that men and women have grown old in the poultry business and still do not know it all. Be resolved, therefore, to be a good listener. Be patient, stick to it like grim death, and



A Pair of Imperial Pekin Ducks.

put into your work all the heart and all the brains at your command. Remember that some of the brightest men and women the Almighty has created in this generation are breeding standard poultry and doing their level best to show you a clean pair of heels. Remember that birds of your breeding, produced for exhibition purposes, must come into competition with those produced by men who have had years of experience, by men of bright intellect, men of unlimited capital, men who breed to win and because they love the beautiful and excellent in fowls, not alone because of the money value in them. There is a sportsman side to this branch of the business that is legitimate and fascinating. While there is not much danger of any leading branch of the poultry business being overdone for many years to come, we believe we are safe in saying that the only branch of it which cannot and never will be overdone is that of producing standard specimens. Perfection is no doubt unattainable, but it will be sought to the end, and the men and women who are able to produce fowls approaching nearest to perfection will be well rewarded.

POULTRY AND EGGS FOR MARKET.

Probably four out of every five persons who think seriously of embarking in the poultry business approach it from what may be called the practical or market side. Their first idea is to raise hundreds of thousands of chickens for the common market, and we regret to say that as a rule they do not look carefully enough into the subject before investing their capital, and as a direct result many failures are recorded. We know of no business wherein a man who is apt with figures and given to figuring can make untold wealth easier or quicker than in producing poultry for market—on paper. We remember that the first time we got the fever it took one side of a sixteen-foot board for us to figure out the profits we were to make from a broiler plant that was to have a capacity of 8,000 broilers per season. We were not daft—simply figuring.

There is money in poultry for market, we would almost say plenty of it, but it depends on the man. It was Napoleon who said: "Men are nothing; a man is everything." This is true in the poultry business as well as in war or statesmanship. But the men who achieved success are not extraordinary men. They are simply good American citizens who mean business and attend carefully to their own knitting. They are firm believers in the two old sayings, "What is worth doing at all is worth doing well," and, "If you would be well served, serve yourself."

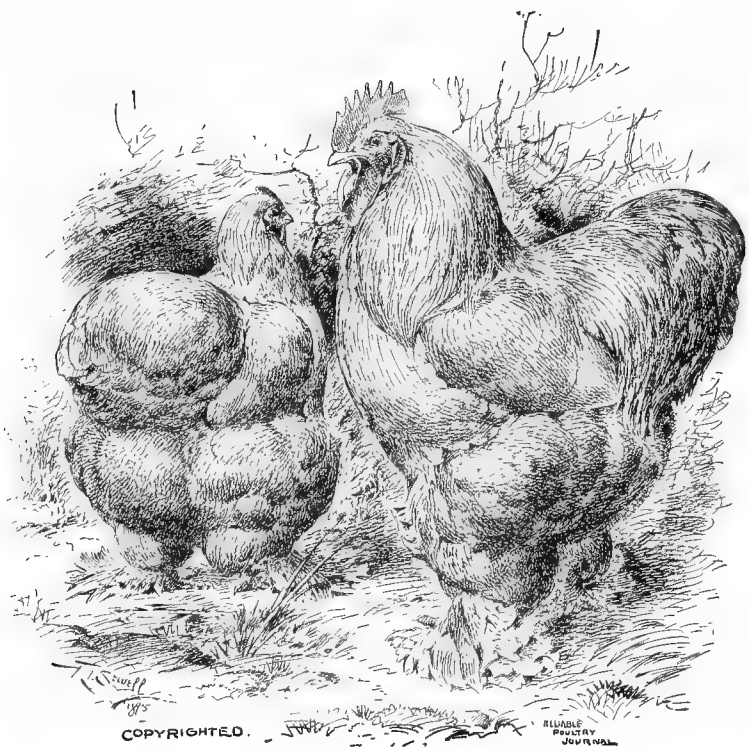
To all those whocontemplate raising poultry and eggs for market, let us say that a good market is of first importance. You should know what market you are to supply and what that market demands before you spend a dollar or take the first step toward going into the business. What you will want to do is to get into a position to furnish exactly what your market demands, what it prizes most highly and will pay a premium on. Desirable goods always sell the easiest, and you will want to join with your market men in catering to this invariable rule. A great secret of success is to send to market just what that market wants, delivering it there in the most attractive form possible, so as to attract favorable attention and command the highest prices. Not one poultryman in twenty gives particular attention to this important matter, but this simply means that the opportunity is all the greater for the twentieth one who has the good judgment to do so. As illustrating this point, we direct the readers' attention to the plan followed successfully by many poultrymen who take care in dressing and packing their poultry and putting up their eggs in attractive style, having eggs of each color separately packed. This receives a premium above market price. A premium of five cents per dozen on strictly fresh eggs is all profit, and a premium of three to five cents per pound on neatly dressed fowls that are uniform in shape, color and size, is also practically clear profit. Inasmuch as this clear profit amounts from 10 to 20 per cent of the gross receipts, here alone is margin enough to make a success of the business when rightly conducted. Permit us to emphasize the fact in the mind of the reader that these pointers can be made to be worth hundreds of dollars to him if he will but heed them.

BEWARE OF WORTHLESS ADVICE.

We want to inject a word of warning just here. Nearly every man you meet has been, is, wants to be a poultry

crank! He either has had, has now, or will have sometime in his life what is called the "chicken fever." The point is this: Everyone of these men believes he has a plan in his head out of which he can make big money in the poultry business. The milk of human kindness is so plentiful that each one of these men is willing to try his plan on some friend or neighbor. We want to advise the reader in all seriousness against being that "friend or neighbor." You really cannot afford it. In ninety-nine cases out of a hundred these well-meaning men do not know east from west in the poultry business. Their knowledge consists of 75 per cent of hope and enthusiasm and 25 per cent of what they have read, seen and heard here, there and everywhere. These men are dangerous advisers—look out for them.

A Montana woman came 1,300 miles to consult the writer about embarking in the business of producing eggs for market. We said to her, "Madam, write out a check for $25, inclose it in a letter of inquiry to Mr. ——— and ask him to kindly write out for you in black and white a full account of his fifteen years' experience in this line of work, stating



A Pair of Full-Feathered Buff Cochins.

in full the mistakes made by him, what they cost him, how he overcame every obstacle, what measure of success he has met with, etc. When he writes you all about it, advising you, as he will, just how in his opinion you should proceed, make up your mind once for all to follow his advice closely, disregarding anything and everything any one else tells you. Beware of the man who has a plan but who has never had actual experience. Above all things distrust your own pet schemes and ideas, based as they are on theory and lead-pencil work rather than on actual experience. Do this, stick to it wet or dry, hot or cold, and you should be able to succeed. Pay precious little attention to what interested friends tell you and steer clear of the worthless poultry paper. Fully 75 per cent of the stuff that is printed in various poultry papers and in the poultry departments of the average agricultural paper is clear guess work. It is not only valueless, but dangerous, for the man or woman who does not know any better, may accept and follow bad advice just as eagerly as pure gospel, but the outcome will be very different. Above all things, you want the best that money will buy in the shape of advice, and really valuable advice generally costs something. That which we get for nothing is too often worth no more than it costs.

PURE-BRED OR MONGREL STOCK.

No man is justified in handling mongrel poultry—not in this day and age of the world. It is the same with poultry as with horses, or cattle, or sheep, or hogs—the most money is to be made in producing thorough-bred or standard-bred stock. It takes no more house room or yard room, no more feed, no more time and labor to raise 100 or 1,000 pure blood fowls than it does to raise an equal number of mongrels, but the value of the product in one case ranges from twice to several times as much as in the other, according to your skill as a breeder, and the market you reach.

In this day of over-production (so-called), what is wanted in many lines of effort is quality, not quantity alone. We have too much quantity and not enough quality. There is a premium in every market on quality, and that premium is nine-tenths profit. When asked by the inexperienced "Which will pay the best, breeding thouorghbred poultry, or raising poultry for market?" we invariably answer, "Unite the two." If you are a farmer or villager and have mongrel stock, make up your minds to work into pure-bred stock as soon as you can, without unwise haste or expense. If you have no stock at all, decide upon some plan of securing pure-bred stock. It may be wise for you to get some mongrels to help make your start in the business, but by all means lay your plans with a view to handling nothing but pure-bred stock at the earliest date consistent with your capital and opportunities.

"SILVER WYANDOTTES VS. "DUNG-HILL SOUPERS."

"Armour & Co., are killing and dressing three thousand to six thousand head of chickens a day; it would pay you to see their place; you would get some interesting facts," wrote Mr. Hawk, of Kansas City, when we were considering the advisability of a trip west this winter. A few days later while turning over the pages of the Midland Poultry Journal (of Kansas City) we came upon an advertisement of Messrs. Armour & Co., urging farmers to get thoroughbred Wyandotte, Plymouth Rock or Indian Game males to improve the quality of their poultry. 'That certainly is unique.' we thought. 'There is a meaning to that, if we could only get at it. Business men are not as a rule, paying advertising bills without there being reasonable grounds for expecting returns in the shape of profits.'

That advertised advice was a puzzle, and the solution of the puzzle was one of the first things we asked, for when we stepped off the train at Kansas City, and found Mr. Hawk awaiting us. It is a simple story. Armour & Co. have added poultry dressing and shipping, to their beef, mutton and pork packing and shipping. One day last fall there came to the slaughter house, among a great many other coops of chickens, several coops containing "culls" from a

farm where are kept Wyandottes only. Instructions were given to have that lot kept together and by themselves, so that they might be compared with the common "dunghills" of which the bulk of the receipts consisted. When dressed and arranged for comparison, it was easy to see that the pure-bred Wyandottes were far superior in plumpness, fullness of breast, smooth fair skin, yellow legs—in fact, that it was a far better average lot of dressed poultry than the common stock. Mr. Armour's attention was called to the display, and he instructed the foreman in that department to pack five cases, of one hundred pounds each, ship one of them to each of five commission houses at different points in the east, and hand him a special report of the returns—also reporting prices returned on common chickens sent to the same places the same day. When the returns came in it was found that the five cases of Wyandottes were graded as "A No. 1," and the price was three cents a pound more than for the common chickens.

"What an object lesson!

"Armour & Co. are killing three thousand to six thousand head a day—six to ten tons. Calling it an average of eight tons, three cents more a pound makes a difference of $480 a day—$144,000 a year! Is it any wonder that they urge farmers to improve the quality of their stock?

If it is worth the while of Armour & Co. to pay advertising rates to get that advice before the farmers, how much more is it worth to the farmers to heed that advice, and improve the quality of their stock! The bulk of that additional $144,000 a year goes into the pockets of the farmers. It is only their commission, a small per cent for killing, dressing, packing and shipping, that Armour & Co. get. If Armour & Co. get but eight cents a pound for the common stuff, they can pay the farmers but six and a half or seven cents a pound for it; while they get eleven cents a pound for the "A No. 1" lot they can pay the farmers nine and a half or ten cents for it. It costs as much and takes as long to kill and pick a scrub as it does a pure bred—and the expense of handling, (dressing, packing and shipping) is the same. If Armour & Co. get three cents a pound more for the good stuff, they get their commission on a third more returns; but the farmer gets the full third more. It costs him no more to hatch and raise good stuff than it does to hatch and raise scrubs, and he will get three cents (probably thirty-three and a third per cent) more a pound for it.

"The point could be better understood if one could walk through the cold storage room, where there are about 300,000 pounds (a hundred and fifty tons!) of dressed poultry and game, the good stuff carefully wrapped in paper and packed in boxes ready for shipping. Each box has stenciled on it the kind and quality of the contents; as, for example, "forty broiler chicks, one and one-half pounds;" "thirty roaster chicks, three and one-half pounds;" twenty-five fowls, four pounds;" etc. In one corner was a carload of lean, skinny things piled up. "What are those?" we asked. "Those are soupers. Three or four cents a pound for those." said our guide. Now it costs as much to coop and send those lean "soupers" as it did to coop and ship the "A No. 1" Wyandottes—and it takes just as long to dress, pack and ship them. The farmer gets almost nothing for the "soupers" he sends in, and Armour & Co. get hardly enough for them to pay for handling. After seeing the great pile of "dunghill soupers" we could well understand why Armour & Co. advise farmers to improve their stock!"

So much for the advantages in thoroughbred stock when sold on the market. But the cream of the profits in the poultry business may be said to lie in selling standard-bred stock as standard-bred stock to the many persons who want it and who willingly pay from twice to twenty times as much for high-class poultry as can be obtained in any market at any season of the year for what is called common poultry.

It is truly remarkable what a widespread liking for fine poultry exists among mankind. It is confined to no one class. Merchants, professional men, bankers, and retired capitalists have this common fondness for poultry, as well as the farmer, the mechanic and the day laborer. Many thousands of people who do not "keep chickens" find themselves wishing each winter and spring that they had "just a few hens." Fresh eggs are "a joy forever."

Another remarkable thing is the great demand for standard-bred poultry. Persons who do not read poultry journals and have not looked into the subject can have no idea of this demand, or of the hundreds of thousands of dollars that exchange hands every year in payment for high-class, standard-bred poultry—the prices ranging from $1 to $100 per head. It is no longer a surprising thing for a single fowl to sell for $50—in fact, 94-point Barred Plymouth Rocks can be sold by contract at that figure. Today intelligently scored 90-point Barred Plymouth Rock male birds, ten months old, are worth $5 each in hundred lots, and the demand for such specimens far exceeds the supply. Every year many thousands of dollars are sent from the great west, the northwest, the south, and from the far away Pacific Slope to the New England and Atlantic states for standard-bred poultry. Twenty-five dollars for a trio of fowls (a male and two females) has come to be an ordinary price.

The great Mississippi Basin (the 500,000 square miles of territory drained by the Father of Waters and its tributaries) has now fairly wakened to the importance of poultry culture and in the years to come we are sure that many of the most noted and successful poultrymen of the world will be located between the Alleghanies and the Rockies, and the big sums of money that are now sent "down east" will be kept at home, and the chicken money from west of the Rockies will be stopped half way across the continent. The mid-continental states today have many capable breeders who are producing fowls second to none in the country and who are establishing reputations to that effect. In this section are now located numerous poultry farms and poultry plants that are doing very well indeed.

GETTING STARTED IN THE BUSINESS.

Getting started in the fancy or standard-bred poultry business is a comparatively easy matter. This is so mainly because so many people are interested in and fond of good poultry. To every person starting in this branch of the poultry business, his or her poultry yard should be the center of the universe. The next door neighbors will be the first customers. Friends and acquaintances will come to see the standard-bred flock; they will admire them and buy eggs. Be careful not to sell too many eggs while your flock is small, for you will find it profitable to raise as many chicks yourself as possible. Raise 150 or 200 the first year from an average pen if you can, and you should have from $100 to $300 out of your first year's work, the amount of profit depending on the breed you select and the quality of fowls you buy.

Your first house should cost you very little. It is seldom that a shed, or a part of a shed, or one corner of a barn can not be spared for a pen of fowls. Partition off a section ten feet square; put an ordinary window in the south or east side; line the inside walls with folded newspapers; whitewash thoroughly; put up roosts and nests; see that the floor

(a dirt floor preferred) is thoroughly dry, and the problem of a suitable home for the first flock is solved. The expense is small. We have known several persons to invest $50 in standard-bred poultry and make the first year from $200 to $450, nothing being deducted for feed or labor. On the farm the feed is not missed. Where all the feed has to be bought, one dollar will keep each fowl one year. As for the labor, less than two hours a day is required on an average to care for the fowls, old and young.

There are two especially good places in this world to raise poultry—in a barnyard and around a kitchen door. The first pen of birds can be kept, almost, on the scraps that come from the average kitchen. If the owner keeps a horse, or a horse and cow, the fowls will thrive around the barn and kitchen at small expense for food.

The first year a small advertisement inserted in a local newspaper, or in a near-by poultry paper will enable you to dispose of your surplus stock. You will want to keep your old birds for two more years' breeding, and also one or two pens of the best of the young stock, as you will wish to enlarge your business from year to year.

By following the simple and easy plan here briefly outlined, any person of intelligence and industry can get a start in poultry culture that can be developed into a business that will pay from $1,000 to $5,000 a year.

We maintain that the standard-bred poultry business is only getting fairly started, for the reason that more than ninety out of every one hundred flocks of poultry in this broad country are mongrel stock. This will not be so, just so sure as poultry keepers once discover the actual advantages in raising none but pure-bred fowls. In nine cases out of ten the farmer much prefers pure-bred fowls, and he will buy them if an opportunity offers itself and the prices are low enough. As an example of this, let some farmer or farmer's wife or son or daughter, living in any neighborhood, become interested in standard-bred fowls and send to some breeder for stock or eggs. As soon as a handsome flock is produced the neighbors show a keen interest and begin to buy. First, 50 cents a sitting is charged for eggs, then 75 cents, and finally $1 or more, as the demand increases. One dollar, and then $1.50, and finally $2 is charged for "roosters." That is the way it goes until some one breed of pure-bred chickens (Barred Plymouth Rocks, or Light Brahmas, or Brown Leghorns, for example) is found on a dozen or twenty farms in the one neighborhood. And the person who "keeps up" his stock by adding new blood each season, and who puts care and thought into his work, will be drawn on each year for "new blood" to help out his neighbors. In this way a regular and paying business is soon built up, a business that may be greatly extended by a person who has a business mind and is adapted to poultry raising.

IN BEHALF OF HIGH-CLASS, PURE-BRED FOWLS.

Today hundreds of men and women of widely different ages are breeding standard-bred poultry for profit. It is a pleasure always, and it should be profitable in every case, providing only that those who embark in the business start right and then display a proper amount of good sense and diligence.

By starting right we mean that, at the beginning, the dime of investment should not be held so close to the eye that the dollar of profit just beyond cannot be seen.

Let us illustrate: The writer himself remembers well of writing to a veteran breeder of Light Brahmas, for two pens of high-grade breeders. We did not ask him how cheap a pen we could get, but what two high-scoring pens of six birds each would cost. He replied, $100, providing we took the two pens. We did so. We have never regretted that purchase. We have the breeder and good common sense to thank for getting a right start.

But to continue the illustration. Those twelve birds cost us $100. That looked like an outlandish sum to pay for a dozen "chickens." Our acquaintances all thought so, and not a few of them said so. But we were conceited enough to think that we knew what we were about. This is how we reasoned: "One hundred dollars is a good deal to pay for twelve fowls, but these birds are among the finest that long years of careful breeding have been able to produce. By paying this sum I get the cream of all those years of study and work. I expect to raise the first year three hundred young birds from these two pens. Every one of these three hundred young chicks will have in its veins the royal blood of its parents, and on its plumage will be stamped indelibly the evidence of its proud pedigree. At the end of the first year I will have, not twelve birds, but three hundred and twelve, and instead of being ordinary stock, the whole number will be choice to extra choice—the legitimate result of long years of systematic breeding. It will cost me no more to raise the three hundred fine birds than it would to raise three hundred of the veriest scrubs, but what a difference in the results!"

We were not disappointed. We sold a few eggs from those old birds at $4 per thirteen and got as high as $10 each for some of the young cockerels. The first season's young stock paid for the old birds three times over and left us thirty fine breeders in addition to the first eleven—one hen had died. When we bought the old birds they were pullets and yearling cocks. The cocks we used three years as breeders and the pullets four years.

This gives the reader a glimpse into the profitableness of that first purchase of ours. We were fortunate enough to get started right, and as a result we are in the business today on a scale that was not dreamed of when we wrote our first inquiry for stock. One hundred dollars was a big sum to put into twelve birds, but when this amount was distributed over the large number of fine birds we raised from them, the $100 dwindled down to a few cents per head and we reaped a harvest.

We have made public this much of our private experience because we know that it contains a valuable lesson for the scores of others who stand today where we stood at the beginning. We wish to have them profit by our experience. As long as fully 90 per cent of the poultry in this country of the dung-hill, mongrel variety, there is no fear of overdoing the business of raising and introducing pure-bred fowls.

Finally, a man can be a man in the poultry business. The earth is beneath his feet, the open sky above his head. He can find a market anywhere for his produce, and need ask odds of no man. But by all means let him move forward cautiously. Let him "begin at the beginning" and not expect to accomplish wonders in a fortnight. If there were no drawbacks to the business of poultry-raising, if there were no obstacles to overcome, if there were no disappointments in store for you—if all were smooth sailing, with a fat purse for your compass, there would be no money in the business, none whatever, for in that case every thoughtless, reckless, shiftless Tom, Dick and Harry who tried it would succeed and there would be nothing left as a reward for earnest effort, careful methods, and perseverance.

Editor.

LEADING STANDARD BREEDS

Articles on the Best and Most Popular Varieties of Poultry in Existence, by Expert Breeders—These Articles Not Only Set Forth the Characteristic of Each, but also Give Valuable Inside Information on Mating for Best Results—Do Not "Trust to Luck"—Follow Good Advice

ARTICLES under this chapter are alone worth one hundred dollars of any person's money who is really interested in poultry for pleasure or profit, or both. We say this mainly to emphasize the high character of these special articles. After a person has about made up his mind to engage in the poultry business, the question naturally arises, "With what breed or variety shall I begin?" What better answer could we furnish than the following descriptive, illustrated articles by noted breeders each of whom makes a specialty of the variety he writes about? These breeders are noted, not alone for the fine fowls they produce, but also for their integrity as business men.

Permit us a few words of caution to the beginner: It is really better for you to start out with one variety, rather than with two or more. Learn thoroughly the one variety before you take up another. If your location is good, and you have the capital and enterprise, we see no real objection to the adoption of other varieties or breeds, but be sure that you are an expert with each variety you carry before taking up a new one.

Unlike Alexander the Great, you will not sit down and weep for more worlds to conquer—not if you go into the poultry business with a determination to surpass all others. You will find plenty of big, brainy, whole-souled men and women engaged in poultry culture. To succeed to a high degree in such company is no boy's job. One of the first things you will be impressed and delighted with, is the strong, helpful fraternal spirit existing among poultrymen.

You will find in the business many a good man and woman who will treat you more than fairly, and who will be to you a source of much encouragement.

BARRED PLYMOUTH ROCKS

A Clean-cut and Comprehensive Descriptive Article on America's Best Production in Poultry.

The Barred Plymouth Rock has been termed America's idol. There is no other variety, the product of American skill in breeding, that we can put on the markets of the world with so much pride, and none other is received from our shores by foreign fanciers with so much favor. They need no booming. They stand acknowledged without an equal as the best general-purpose fowl bred. They thrive anywhere, and are rapid growers, and make plump, juicy broilers at eight to twelve weeks old. As a market fowl they have no successful rivals among the pure breeds. They are a great favorite with farmers and market poultrymen, who breed this variety more extensively than all other pure breeds combined. As a fancier's fowl, the Plymouth Rock has reached a popularity in this country never before known. Utility and actual worth are the basis of this popularity, and make the Barred Plymouth Rock the bird of destiny, a breed come to stay.

There are many valuable breeds of poultry among our standard varieties. Some excel in beauty of plumage and graceful forms; others in massive size and majestic carriage, while still other breeds court popular favor by their records as egg producers. Nearly all breeds combine some of the good qualities in some degree. Bantams are handsome and good layers of eggs proportionate to the size of the breed. The smaller a bantam can be bred the better. They have hosts of admirers, and as pets and a breed upon which to exercise a true fancier's skill, they are valuable.

The ornamental breeds are small in size, and fanciers of such do not find their ideal fowls in a large variety—a Cochin, Langshan or Brahma—while fanciers of these massive birds can not see their ideal in a small fowl, be it gorgeous in feathers and as graceful in movement as a billowy cloud. We are speaking of fanciers in general. There doubtless are some who really love several breeds, both great and small, handsome and plain; but the majority find their hearts' idol in some particular variety although they may breed several varieties.

For a person who wants a business fowl, one that never deserts its post nor shirks a duty, I believe the Barred Plymouth Rock fills the bill nearer than any other breed. They are always ready for business, rain or shine. They are medium in size, and if decently fed are always in good, meaty condition to kill after eight weeks old. Their early maturity adapts them especially for broiler use.

The Plymouth Rocks are excellent "all the year around" layers, and will lay as many eggs as any breed that incubates and rears its young. They are the farmers' favorite. In the smaller breeds we may get better layers, but lose size. The larger birds give us no more, if as many eggs as the Plymouth Rocks, are later maturing and lack the sprightliness and elasticity of movement so admired in a medium large fowl.

The Barred Plymouth Rock is nearly always the largest class at our American shows, and strictly choice specimens command a higher price than any other American breed, which prove their sterling merits. New breeds come and go, but the great qualities of the Barred Plymouth Rock become more and more indelible. As a practical fowl, suited to the wants and conditions of those who desire eggs, meat and feathers combined in one breed, they acknowledge no competition.

MATING BARRED PLYMOUTH ROCKS A STUDY.

The mating of Barred Plymouth Rocks to produce exhibition specimens is a study indeed. Opinions are, that as

a rule the finest show cockerels are the result of the mating of a standard colored male with medium to medium dark females having deep barring even and straight across. The black bars in cockerels should be avoided, and in standard color the light bars should be clear and free from muddiness.

The best pullets come from prime colored hens and a male lighter color than a show bird.

Ancestral backing must be considered in mating Plymouth Rocks. The cockerel used for a pullet mating should be one whose dam was a prime high-scoring hen. Such a male will get far finer pullets than one equal in individual quality but bred from an ordinary hen. The same is true in a cockerel mating. Only males should be used as breeders that are first-class and sired by first-class cockerels, the finer the cockerel the better.

Chance birds are of little use as breeders, because they will not transmit their good points or reproduce themselves in their progeny. Some fine chicks, both cockerels and pullets, can be bred from what is called the "single mating"—standard or exhibition colored females and a standard colored male.

The blue tinge to the plumage should be always kept in mind, for this is one of the main attractions of the breed from a fancier's standpoint. To preserve even this, however, a regular barring of the feathers should not be sacrificed. A crescent bar is not what is wanted, but straight distinct lines running well to the skin; and if the feathers are rightly placed the "ringlets" or "zebra stripes" will be clearly defined throughout the whole body. These add to the beauty of a Plymouth Rock, and are much sought after by the breeders of America's favorite fowl. It has been stated that some breeders have been sacrificing regular paralell barring—which on feathers evenly placed show the ringlets—to get light surface color in females, which practice, if carried to extremes, is wholly wrong. All the features in color and plumage should, as far as possible, be preserved, and no one point be reected to bring out another. The aim should be a harmonious whole to comply yith the written rules of the American Standard. A perfect individual feather of the Barred Plymouth is worth the study of an artist, and shows the beautiful in nature to a high degree.

While the plumage of a Barred Plymouth Rock, taken as a whole, would not rank as gorgeous, they have an everyday prosperous, well-to-do, business-like dress and appearance, which, with their size, carriage and well-rounded form, make them a handsome fowl and adapted alike to the wants of the marketman and farmer, or poultry fancier, and in breeding fine exhibition specimens the fancier can find in the Barred Plymouth Rock a wide and boundless field in which to display his greatest skill and genius.

Cleanliness is one of the first essentials to success with poultry; not only must they have clean quarters, but the fowls must be kept free from vermin. Another essential is dry quarters, with perfect freedom from drafts during cold or wintry nights. Provide these, with enough range so that the fowls will be contented; furnish them with plenty of fresh, pure water; feed a good variety of sound, wholesome food, including green food in summer, cut vegetables in winter and cut green bone the year 'round—supply these and poultry will pay, and pay well.

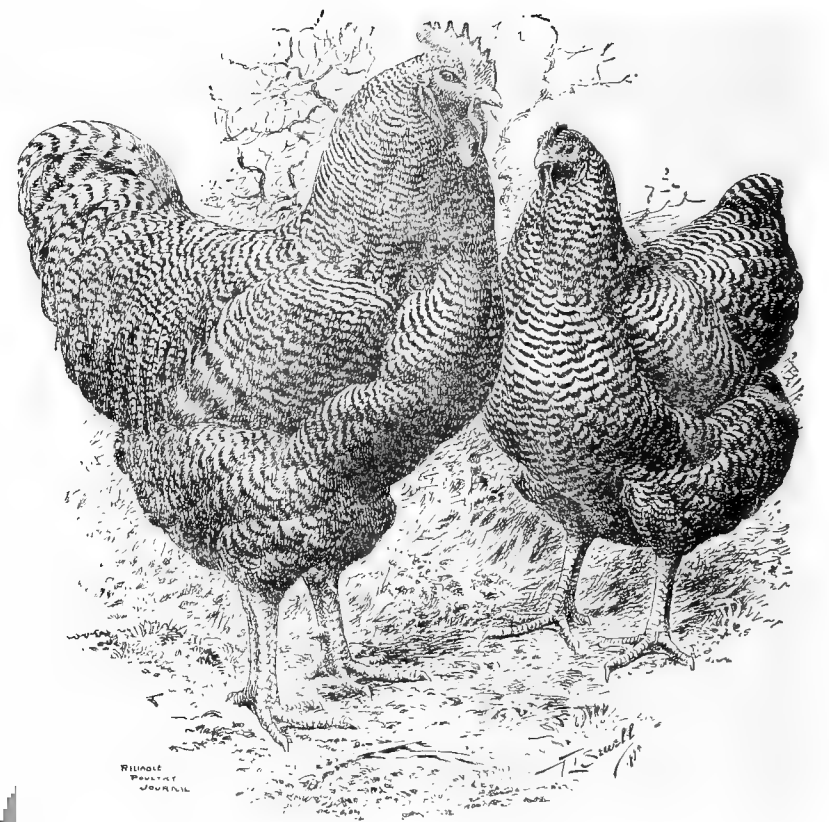
HOW TO BREED EXHIBITION BARRED ROCKS.

Detailed Instruction on Mating in Order to Produce Exhibtion Males and Females—The Double Mating System Advised.

BY MR. A. C. HAWKINS, JUDGE.

NO PROBLEM has been more difficult to solve by the American fanciers than that of breeding high-class exhibiton Barred Plymouth Rocks. The material that was used in producing this breed at the beginning was such that the different sexes have tended to follow in line from the first.

The Dominique male was mated with the Black Java female, and the produce from the union was the original



Standard-bred Barred Plymouth Rocks.

Barred Plymouth Rock. The pullets came dark in color, many of them black like the dam, while the males were light in color like the sire. The tendency is the same today in many flocks where the owners have tried to breed standard birds of both sexes from the same mating.

The leading breeders of this variety who have been most successful in producing high-scoring specimens have adopted the double mating system, that of making a special mating to produce exhibition males and another or different line to produce show females. It is of this method of special matings that I shall treat particularly, as I believe the most perfect specimens can be produced in this way. If the judges in different sections of the country did not differ so much in their ideal Barred Plymouth Rock, it would be much easier to understand what I mean by an exhibition specimen. I shall describe what I believe to be the ideal Barred Plymouth Rock.

Many of the judges have become so thoroughly carried

away with the under barring that they pay little attention to the beauty of the surface color. They begin to score from the skin and cut more severely for lack of under-color than for an inferior surface. The beauty of a fowl is what we see, and while I am a believer in distinct, even-barring under the surface, I do not want the bars so strong and heavy underneath that they destroy the beautiful blue on the surface, and it is a fact that most of the specimens that are very strong in under-color have a muddy black bar on the surface. It is also a fact that the very finest surface colored birds have not the strongest under-color. The two qualities do not breed together, naturally, or, in other words, those males that are most attractive in the breeding yard and exhibition pen may not have the same strength in the under-barring as other specimens that are less attractive.

Now, breeders, which will you have? What I want, and what any real fancier wants, is perfection in surface color and all the under-barring that nature will supply with it, and not what some judges I know require, namely, perfection in under-barring and as good surface as we can get with it.

LINE FOR MALE BREEDING.

To produce fine males select the very best exhibition male to head the pen. He must be a bird of standard weight, or a little over, with broad, full breast; low, evenly serrated comb; solid red lobes, bay eyes; broad, well curved back; nicely curved tail, carried rather low; and strong, rich yellow legs set well apart. In color he should be a rich, dark blue, even all over, and as closely barred as possible to retain distinctness, with wings and tail distinctly barred throughout. Get all the under-color possible with such a surface, but do not let the surface suffer for the sake of heavy under-color.

Mate with this male eight or ten females of the same line of blood, or, in other words, females whose sire and grand-sire were high-scoring exhibition males of the type and color I have described. Select females of standard size, with small, evenly serrated combs, bay eyes, blockly shape, broad backs, low, well-barred tails, and strong, yellow legs. In color these females should be several shades darker than exhibition color, the bars to be narrow, distinct and close together in all sections, with the under-color strong and distinct to the skin. With these strong colored females you can get all the under-color in the male product that it is possible to have wih a brilliant, high colored surface.

From such a mating as I have described, if bred in line, I can produce 95 per cent first-class breeding males with 25 per cent of sufficient merit for exhibition at the best shows.

LINE FOR FEMALE BREEDING.

In mating to produce high-class exhibition pullets select females of the best exhibition color, evenly and distinctly barred down to skin. Be particular that the neck is evenly and closely barred and not lighter in color than the back and body. Have the main tail feathers and tail coverts well barred across the feather. Females are liable to fail in these sections unless care is exercised in the selection of the breeders. Have them standard weight or a little over, with broad, full breasts, broad backs, gently inclining to the tail, which should not be carried too high. I prefer a slight cushion which gives the female a round, blockly appearance. The comb should be small and evently serrated, eyes bay, and legs a rich yellow. Such a bird should be fit to show in any company. If these females have been bred in line for several generations the offspring will be more even in form and color.

With these females place a male of medium light color and of even shade from head to tail. He should be of standard weight, have broad, deep, full breast; body not too short; back well curved to tail, which should be carried rather low. This male should have been bred in line from high-class exhibition females for several generations, so that his blood may have the same character as that of the females with which he is mated.

From such a mating can be produced 95 per cent of first-class breeding females and 20 to 30 per cent of high scoring show specimens. The males from this mating will be very nearly the color of the sire and are useful as breeding birds in mating for exhibition females. Save only those that are even in color for breeding purposes.

CARE OF THE BREEDING PEN.

While it is necessary to have the best blood and quality in the breeding pen to secure good results, there are many other conditions that are equally as important in the production of the winning show bird. The breeding fowls should have a large grass range during the breeding season, so that they may have perfect health and vigor and that the eggs laid will contain strong germs produced from nature's food. The exercise, insects and green food which nature supplies have much to do with the vigor and development of the coming chicks. Give them nature from the beginning until they are ready for the show room and breeding pen. Hatch and raise them and give the chicks the opportunity to roam for insects as soon as they have the strength and desire to do so. Give them an abundance of fresh air and room in their roosting quarters. Deprive them of nothing that will add to their thrift and comfort, and when the birds get into strong competition in the show room you will be well paid for your extra care. They will have the size, the color, the form, the style and vigor, all of which should be combined in the winning show bird.

WHITE PLYMOUTH ROCKS.

An Article Descriptive of the White Plymouth Rocks, a Variety That Many Claim Is "The Coming General Purpose Fowl"—It Certainly Has No Superior.

BY REV. JOHN HUGHES.

The White Plymouth Rock, said to be a descendant from sports of the Barred Plymouth Rock, must be of the same form and weight, pure white in plumage, and ought to be, and in my opinion is, possessed of all the excellencies of his justly popular ancestor.

The difference in standard requirements is in the color of plumage only. The Whites have the same yellow skin, beak and legs; the same bay eye and blockly build. They dress more neatly, showing no black pin-feathers when ready for the pot. Their meat is just as desirable for the table. They lay just as many eggs, mature as early, and breed to standard requirements more easily. There is no need of two matings, one for cockerels and one for pullets, with the inevitable lot of culls fit for the market only; no racking of brains with a lifetime's experience to attain "the blue tinge in color, which should always be kept in mind," with the feathers regularly barred with "straight, distinct lines, running well to the skin," that the "ringlets" or "zebra stripes" may be clearly defined throughout the whole body." "The mating of Barred Plymouth Rocks to produce exhibition specimens is a study indeed," and after all the thought and care bestowed on the subject the long sought for is not yet attained, for one of our judges says: "There is

something wrong with the mating of Barred Plymouth Rocks or there would be more of them to be had when purchasers are willing to pay any price to get them that the breeder cares to name.'' Nor are the authorities agreed as to whether there shall be two matings or one. And then when you have a specimen that will score righteously ninety-three to ninety-four points you have attained the limit of perfection. We indeed see cockerels advertised as scoring ninety-six points; but are there any such scores certified to by Theo. Hewes, B. N. Emery, F. W. Hitchcock, F. H. Shellabarger, or any of our leading judges? The same care and skill will produce White Plymouth Rock cockerels at ninety-five and ninety-six honest points, and very few specimens at less than ninety points.

Right here I make the claim that intelligent breeders of the White variety can produce a much larger per cent of stndard birds than many of the more popular varieties and, of course, with much less waste in culls. There is in the handicap of solid color varieties, when in competition with the parti-colored, a confession of this point.

I would not be understood as inveighing against the Barred Rock. ''I love not Caeser less, but Rome more.'' I have bred them and can sympathize with the enthusiasm of the fancier who has produced a really fine specimen. It is indeed an attainment, and well may his pulse quicken at his anticipated triumph in the show room. But why should the amateur fool away his time and get badly left in the cold, when he can with a reasonable outlay of time, care and expense, with due exercise of brain, be successful and have more dollars in his pocket?

If the Barred Plymouth Rock is the farmers' fowl par excellence, so is the White as well, for the one has not one good quality not possessed by the other, and in some points the White excel. The Whites are just as good rangers and hustle equally well for a living, and when neglected will not run into a smutty unsightly plumage, nor if crossed throw a lot of black posterity. (But they do run, if neglected, to an unsightly yellow plumage, which is as undesirable as the smutty appearance in the Barred variety.)

BREEDING THE WHITE PLYMOUTH ROCKS

In breeding the White Plymouth Rocks use the best specimens only—those which show best in all required points. Remember that in breeding for pure white feathers only, you are in danger of losing the bay eye and yellow skin and legs; or in breeding for the deep yellow in required sections you are indanger of running to creamy colored feathers, and the despised ''brassy color'' on the surface. There seems to be a connection between the deep yllow in skin and th straw color on back and wings. My experience is that is neither feed nor sunshine that produces that unsightly surface color, for I have known specimens to maintain the purest white in surface for years and be fed constantly on corn and continually exposed to the sun. Corn produces fat, and fat fowls molt yellowish feathers, but they come white with age. The brassy color will not fade out for me. Weed it out by breeding from cockerels that show none of it.

It should also be remembered that good care has very much to do in producing fine fowls. Do not over-feed, for this is the cause of one-half of the diseases, with lice perhaps the cause of the other half. An active, stirring bird is a healthy one, and should not be over fat. They should have feed enough to be in good flesh, otherwise they will deteriorate. The farmers say they like a hog crossed with the corncrib; and the finest stock in the world will become scrubs when exposed to all weather and half starved. Especially should young stock be kept thrifty and growing—and in no other way can fine birds be produced. And the purchaser should bear in mind if he starts with fine fowls or with eggs, that they are stock that have been used to high living and neglect will bring a penalty for which he only will be to blame. Many purchasers of eggs have been disappointed because the young White Plymouth Rock chicks were not hatched pure white, and they have thought they were imposed upon by that mottled group of yellow-white, blue and brown chicks. The writer has been roundly abused

Standard-bred White Plymouth Rocks.

for that same group. But that is the way they all come, and the darkest chick will likely make the whitest fowl. The dark color is only a reminiscense of color in the Barred progenitors—and a little patient waiting will prove that all fanciers are not rascals, and that perhaps you have been a little hasty in your judgment.

I would urge that breeders of this variety direct their efforts to attain the highest excellence in it, so that our favorites, which we are so confident are second to none as an all-purpose fowl, shall come to the front and occupy the place they justly deserve.

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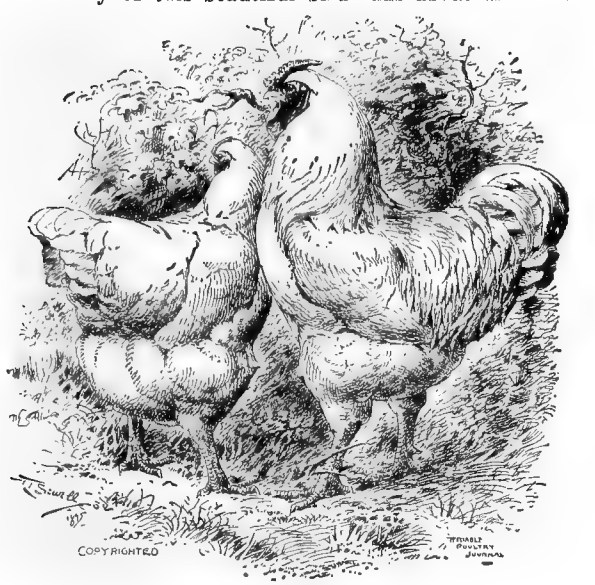
WHITE WYANDOTTES.

Rivals of the White Plymouth Rocks—They Grow in Popularity Very Rapidly—The Best Breeds for Broilers.

BY MR. A. G. DUSTON.

There is nothing I enjoy better than an opportunity to tell of the true merits of the White Wyandottes.

The story of this beautiful bird runs about as follows:



Standard-bred White Wyandottes.

We have first, a good sized egg of brown color, or richly tinted, and an egg that is hatchable, one well fertilized, being almost sure to hatch under any conditions, the shell being thin and easily broken. As chicks they are easily raised, and under artificial methods they will stand forcing better than any of the five other breeds that I have handled. Although active, they have a quiet disposition, so they stand confinement well, thus insuring steady growth where a Mediterranean would "fly all to pieces." As pullets they are quick maturing, being a month earlier than any of the American classes, laying, with any decent care, when five to six months old. The males make splendid roasters with their bright yellow legs and plump breasts and are ready to kill at almost any time after four weeks. I know what I say is true, for I have sold hundreds that weighed only thirteen ounces alive and they were round as butter-balls. For broilers the White Wyandottes stands out unexcelled, making two pounds in eight weeks, and no dark pin-feathers to contend with.

The pullets commence to lay early, and are very regular. Having low rose combs they are never troubled by frost and all winter will keep up the egg production, discounting any breed I ever had. I can show by my files that other persons have discarded the Leghorn on account of the laying qualities of the White Wyandotte, after running them side by side. When spring comes you do not have to scour the neighborhood for "sitting hens." While they become broody, all that have ever run them will testify to the ease with which they can be broken up. As mothers they are fine, having smooth legs and not being so heavy as to crush the life out of a chick should they happen to step on it.

As for beauty, who will deny it? Yesterday on one of my outlying farms I was looking over the young stock. In one flock was about two hundred birds, pullets and cockerels, and where could one find anything prettier. They were white as snow, with bright red combs and quick, wide-awake motions.

As a practical fowl I know them to be unsurpassed, for I made the test with my mind predisposed in favor of the Barred Plymouth Rock, with a "little pot" invested in Light Brahmas, a bird I most sincerely admire today, with my eye full of the lordly Langshans, and delighted with the delicate color and soft plumage of the Buff Cochins, so you can judge it took a good practical bird to make me drop all for the White Wyandottes.

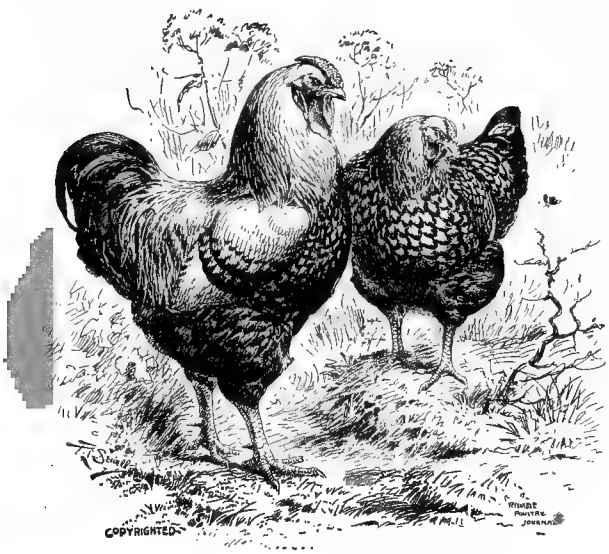
As regards breeding, in a general way one might say, strive always as far as possible to make your birds so that any defect may be remedied by a strong point in the male overcoming the weak one in female, and vice versa. This sounds well, but does not always work, first, because the especially good point that we have worked so long and hard to attain is forgotten in the strife to better some other section. A good flock of White Wyandottes well mated is a gold mine, but like a gold mine it must be worked. If a man tries to raise chickens but spends all his time sitting around, I would not give fifteen cents apiece for the chicks he does raise, even if they were hatched from the best eggs ever laid. It takes work and lots of it to succeed with chickens, and while there is a good living in it and much keen enjoyment, if you have not the capacity to work hard, let it alone, and when you decide to enter these fraternal ranks do not fail to try White Wyandottes, for they stand out pre-eminently the bird of today, whose popularity is fostered by its combined practical and beauty points. As a good show specimen there is nothing handsomer in fowls today, and as a good market bird there is nothing better.

SILVER LACED WYANDOTTES.

A Breed Which Grows in Popularity—A Rival of the Barred Rocks as a General Purpose Fowl—They Make First-Class Broilers—Good Layers and Good Mothers.

BY MR. HENRY STEINMESCH, BREEDER.

The Silver Laced Wyandotte is a combination of beauty and utility, and in this respect is excelled by no other breed.



Standard-bred Silver Laced Wyandottes.

They are hardy, and whether in the sunny south or the frigid north, the Green Mountain hills of Vermont, or the

sandy soil of the Pacific coast, they grow and thrive, and sing and lay, bringing pleasure and profit wherever they are.

The Silver Wyandotte is of medium size, the Standard calling for the following weights: Cock, eight and one-half pounds; hen, six and one-half pounds; cockerel, seven and one-half pounds; pullet, five and one-half pounds. One of the largest buyers and shippers of poultry in the St. Louis market says these weights are the most desirable for adult fowls, and that poultry of that weight would always be assured of top prices in any market in this country. As spring chickens they are equally desirable. The chicks grow rapidly and feather out quickly, giving them a plump appearance. At eight to ten weeks they will weigh one and one-fourth to one and three-fourths pounds; that is they will dress at these weights, making the very best of broilers. Their meat is tender and juicy, and in this respect they surpass their only rivals, the Barred Rocks, for public favor.

As layers of eggs they are in the front ranks. Their low rose comb and medium sized wattles enable them to stand the severe winter better than most breeds, and at the season of the year when eggs are bringing the highest prices they will lay more eggs than any other breed under the same conditions. They will get broody once or twice a year, but lose very little time that way. They are naturally quiet and gentle, but appear just a little more so when sitting. They make no fuss, break no eggs, desert no nests, but just go on attending strictly to business, and afterward rear their young in a sort of "That's-what-I'm-here-for" way.

MATING SILVER WYANDOTTES.

The most interesting study in the poultry world is the mating of birds to produce certain results, and in no breed is this so much of a study as in the case of the Silver Wyandotte. When they were first brought forth for public favor we were satisfied with a Hamburg comb and narrow centers, but later on the call was for a distinct Wyandotte comb and for more open lacing. To produce such birds has required the experience and patience of the best breeders in this country, and it is extremely gratifying to know that at next winter's show we shall see better Silver Wyandottes than have ever before been shown in this country.

In mating for open lacing it is of the utmost importance that the male bird be strong in that respect. The open lacing should show the white center, shaped something like an almond, but not quite so pointed. The black lacing should encircle the white entirely—the stronger the black, the better, as it will hold color, not fade in the "wash" (molt). He should not only be open laced in the breast, but should also show this same characteristic in his back and in his thighs clear up to the fluff, and the wing bars should be clear and distinct. The under-color of the bird should be slate or dark slate, as this as the color that will hold. Birds with white or cotton under-color generally go to pieces after the first molt, no matter how evently and clearly laced as cockerels or pullets.

In selecting breeders it is desirable to have them with feathers free of mossy or frosty edging. This is a fault hard to control and care should be used not to mate such birds. We can never breed good Silver Wyandottes where this fault is predominant in both sexes.

It is very desirable to have birds with a clear, silver white hackle and saddle, properly laced, but such birds, with all other sections good, are rare, and we are disposed to be lenient where these sections are simply a little cloudy or smoky, but most severely condemn the bronze or copper color, or a streak of red or rust here or there. The tail must be solid black in the male, and as much so as possible in the female.

I would also advise that close attention be paid to the comb and eyes. The former should be of medium size, well serrated, and shaped closely to the head, coming to a spike point behind. A good Wyandtte comb is peculiar to itself and adds materially to the beauty of the breed. The eyes should be a bright bay. Pale blue or pearl eyes are quite common in this breed, but they can be bred out with good care, and we hope to see less of them in the future.

In conclusion, I should like to strongly recommend the use of only such breeders as are full standard weight. I do not mean birds so large that they are unshapely, but a male weighing seven to seven and one-half pounds, of square and blocky build, with a good broad breast and a broad back, with legs set well apart. The female should be trimly built, weighing five and one-half to six pounds. She should be full breasted and her back should be broad, with a slight cushion. Avoid, so far as possible, the narrow breasted, narrow backed, pinched tail, long legged birds. Such stock will breed nothing but disappointment. On the other hand, use birds such as are called for by the American Standard. Get the best, start in right, and your anticipations will come pretty near being realized, in my opinion, just a little more so with Silver Wyandottes than with any other breed.

HENRY STEINMESCH.

LIGHT BRAHMAS.

A Grand Breed—Kind, Gentle, Productive, Profitable—Their Proper Shape, Color, Markings—Also How to Mate Them for Best Results.

BY MR. H. S. BABCOCK, JUDGE.

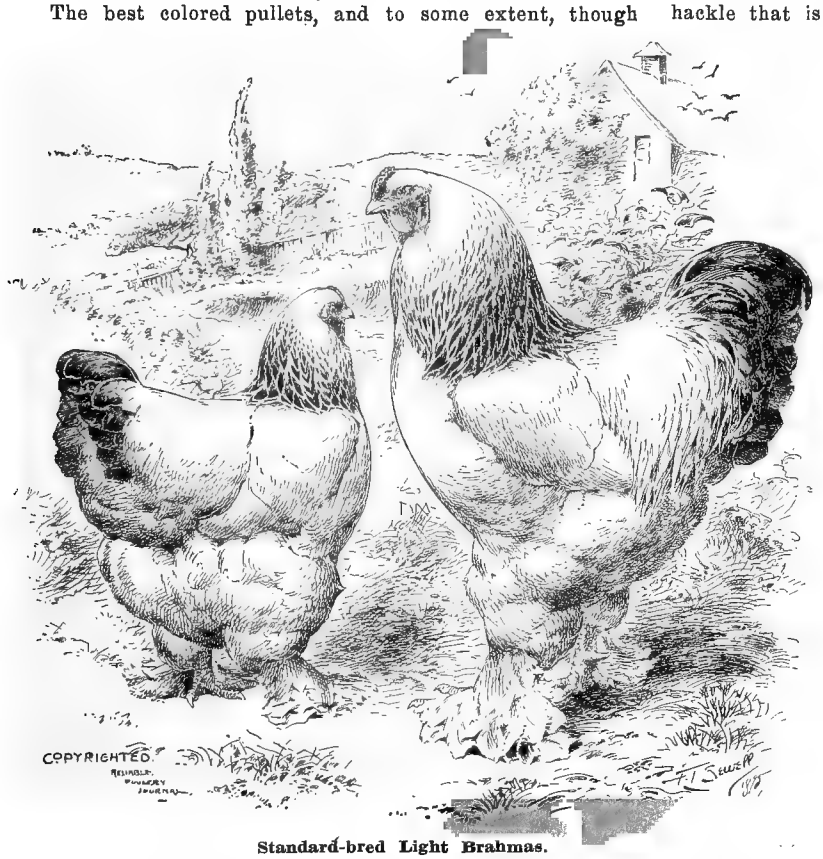
(Note—Where the Light Brahma is well known, we need say little in its behalf. The standard weight of the hen of this noble breed is nine and one-half pounds, while that of the cock is twelve pounds. Think of it! They weigh like turkeys. They are splendid table fowls, lay extra well in the winter time, do not suffer from severe cold, and for home use are unexcelled. We have handled no breed of poultry with a greater degree of satisfaction than the Light Brahmas. Out of one hundred Light Brahma chicks that come from choice stock, from eighty to ninety of them will make good birds. Herein lies one chief source of the profit in breeding Light Brahmas. Of this breed it may be said with reasonable assurance that "like produces like." One objection to the Light Brahmas, as compared with some of the smaller breeds, is their feathered legs, but owing to the marked vigor of the chicks this objection is not a serious one. There is a gentleness about the properly treated Light Brahma that wins the human heart. They respond to kind treatment with evident affection. Like many another breed they learn to know their friends and to trust them. They will learn to respond to a name like a dog. We had some years ago, an especially responsive yearling hen named Rachel. She would come promptly when called by name, leaving the flock at the far end of the yard. We ornamented her with a blue ribbon and a silver bell tied 'round her neck, and seldom failed to parade her intelligence before visitors.)

The typical Light Brahma, from the American point of view, is a large fowl, with moderately abundant plumage, the feathers lying much closer than in the Cochin. In fact, along the back of the Light Brahma it is desirable that the feathers should lie so smoothly as to suggest a back cut out

of white marble. The hock should be clean cut, showing clearly in profile with no suggestion of vulture hock, and the shank should be well feathered, and I like to see both outer and middle toes feathered to the nails.

The colors in this variety are milk-white and jet black, that is, the colors we desire to obtain are such, but we often fail in getting just what we want, for the white may, and, if skin and legs are a rich yellow, must have more or less tendency to yellow, and the black is either too abundant or too scarce and is sometimes smoky, almost brown. But when we get just what we wish in colors, and get them in the proper proportions and rightly distributed, we have a most beautiful combinaion, and on a large, well-shaped bird a combination displayed so as to provoke admiration from almost every person.

The best colored pullets, and to some extent, though



Standard-bred Light Brahmas.

less so than with the pullets, the best colored cockerels, will show black in the web of the feathers of the back. These are the pullets and cockerels, however, that as hens and cocks, do the winning, and are the ones that the winners are bred from. To get them ready to show in the chicken classes these dark feathers should be plucked out six or eight weeks before the exhibition, so as to give time for new ones to grow. They will almost always come of the desired color: But if one does not care to do this, all he has to do is to let them alone, and when they molt they will be replaced by nice white feathers. The chickens that are white in the back are almost alawys faded in wings and tail and deficient in hackle when they are fowls, but these black-backed birds have the desired strongly colored wings, tails and hackles.

In mating for color it is indispensable that at least one of the sexes should have dark undercolor. In on other way can one hope to keep up the color in the flights, tails and hackles. If both sexes have dark undercolor good black will be obtained with a decided chance of having too much of it in the chickens, yet, if both sexes are young birds when mated, I believe in dark undercolor on both sides. But young birds on both sides do not make the ideal mating for me. I like to have hens eighteen months to thirty months old, which, as pullets, had too much black in the back, but as hens have clear, white backs, with white undercolor, but good, black flights and tails and well penciled hackles. For such hens select a big-boned cockerel, having a well formed tail, with almost solid black flights, brilliant black in tail and the hackles striped well up toward his head. From this mating will come such chickens as will delight a Light Brahma fancier's heart.

If one must use pullets and he has a two-year-old cock, it will be best to put them together. If these pullets have dark undercolor, intensely black flights and tail, and a hackle that is heavily penciled, the cock can be white in undercolor and have a narrow stripe in the hackle, but where he is black it is desirable tnat the black should be brilliant in color. This is a good mating, but not quite equal to the previous one.

The secret of mating Light Brahmas is to secure dark undersolor in one sex.

Penciled coverts add much to the beauty of a Light Brahma's tail, and in all matings it is well to select breeders havng ths feature well developed, but such coverts should not be selected at the expense of the hackles and the desired black in flights and tails.

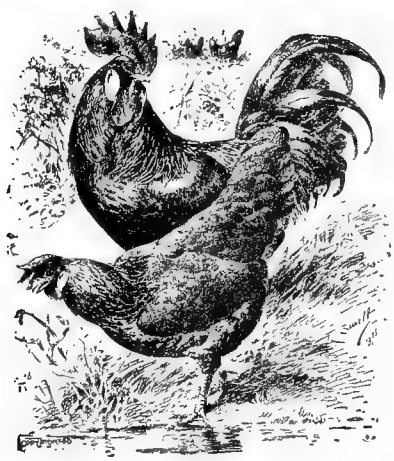
In mating for shape, I like to have the birds, especially the hens, rather short in leg and with a true Brahma back. I do not like to see much tendency to cushion in the back, though a bird fine in other respects should not be rejected because of this tendency. No better description of the male's back has ever been given tnan the following: The back should curve so that the outlines of a Brahma egg, big end at the base of the hackle, would just fit in it. This gives a graceful curve to the neck and that fine upward sweep to the saddle that makes a true Brahma back for a male bird. The male to head the breeding pen should have just such a back, and if he is mated to very short-legged hens he may have a moderately long shank, but should not reach the old-fashioned Shanghai type. It is always to be remembered that you cannot get style on a bird unless you have some daylight beneath him. While we do not wish to breed our Brahmas to the old Shanghai type, with tne remarkably long legs and neck, neither do we wish to transform them into creepers. What we want is just enough shank to give us style and not a particle more. To secure this in our matings we select the short-legged type of females and trust ot the male to add just enough in shank to preserve the true and graceful American type.

The tail has been spoken of as well-formed. By this is meant that the two sides meeting at the top spread out laterally so as to form something like the sides of a capital A, or a capital V inverted. Occasionally a Brahma will be found with a pointed tail, a suggestion of the desired shape in the Game, but the well-spread tail is what is wanted in

the Brahma for exhibtion or breeding, and the pointed tail is what is to be avoided.

And finally a word about combs. Select the very best and finest combs possible to be found in the females, and in the male a similar, but somewhat larger comb. My ideal of a true Brahma comb is to have the middle section somewhat higher than those on the sides, with seven well-defined serrations or points, the sides each with five points, and the whole comb arched on top to correspond with the curvature of the crown of the head, the whole also fitting firmly and closely to the head, the whole also fitting firmly and closely to the head, so that it will not shake or show any tendency to lop. It must, therefore, have a broad base. A encycy to lop. It must, therefore, have a broad base. A good comb adds the finishing touch to a beautiful bird, and is a point that every fancier will cultivate.

And when one has secured a Light Brahma with a nearly perfect comb, well-penciled hackles and coverts, black flights and tails, of typical shape and size, he has a most valuable fowl and one that will bring a long price. Such a fowl while none the less useful because of its beauty, is, because of its beauty, one to command admiration and coax gold out of the pockets of observers, and to produce such a triumph of the breeder's art, is well worth the careful study of the stock and the necessary consideration of mating.



Standard-bred Single Comb Brown Leghorns.

THE LEGHORNS, BROWN AND WHITE.

The Egg Machine of Poultrydom—An Article on Mating Single Comb Brown Leghorns—Also White Leghorns —The Rose Comb Variety.

Note.—The Leghorns (of which there are five desirable varieties, the Single Comb Brown, the Single Comb White, the Rose Comb Brown, the Rose Comb White, and the Single Comb Buff) all are well known as the great egg-producers of poultrydom. Where eggs alone in large numbers are wanted, the Leghorns are the most desirable fowl. We are a great admirer of the Leghorns. They are a neat, thrifty handsome and profitable fowl and will never cease to be popular. The Rose Comb White and Brown Leghorns are identical with the Single Comb varieties, except that they have the rose comb, or the Wyandotte comb, in place of the tall, frost-inviter of the latter. We have bred all five varieties. The Rose Comb we took up on account of the steady demand for them in northern latitudes, arising from the superior laying qualities of all Leghorns, and the fact that the Rose Comb varieties are less liable to frost-bite. A hen with a frozen or badly bitten comb will cease laying. We found that the Rose Comb varieties lay equally as well as do their Single Comb cousins. Where Leghorns are wanted in northern latitudes, we recommend the Rose Combs, either White or Brown.

Standard-bred Single Comb White Leghorns.

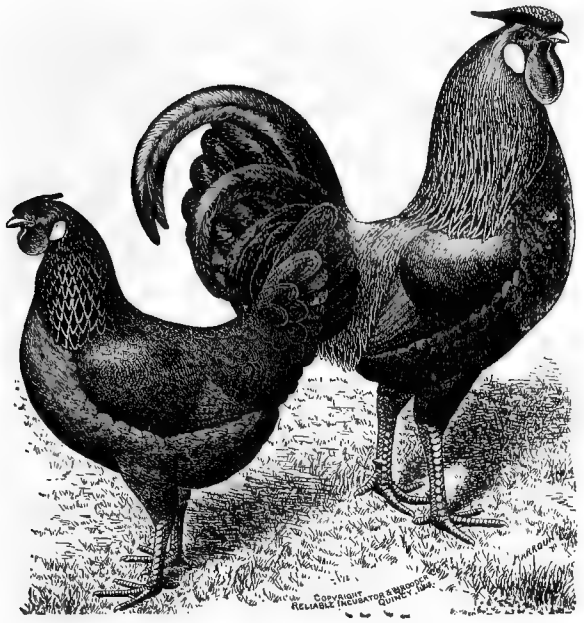
MATING SINGLE COMB BROWN LEGHORNS.

BY MR. F. H. SHELLABARGER, JUDGE.

In mating this variety to produce chicks of the standard requirements, first the breeder must consider the quality of stock he is breeding from. The male should have as many desirable features as it is possible to get, beginning with size. He should be of good style, with well arched neck, a straight five point comb, medium size and free from twists in front; with smooth, white ear-lobes of medium size; wattles well developed and free from folds; breast full and round and carried well forward; back medium, though not long and having a gentle sweep from center to tail; wings should be rather large, having quite large flights, well folded; tail should be well spread, carried well up; sickles and coverts well developed, showing lustrous green; legs should be of good length and toes straight. Fully fifty per cent of the Brown Leghorns all over the country are too short-legged, which spoils symmetry. In most cases they are under size and inclined to run too much to the bantam in that respect. So, in selecting a male, see to it that he is well up in size, and has good length of legs. Color can be summed up in a few words: Neck feathers should have a distinct black stripe edged with brilliant red, and this edging of red should circle the lower two-thirds of the feathers, so that the black stripe does not show out on the end of the feathers. You then have a well laced hackle. Saddle should be the same as to color and lacings. The under color in all sections should be dark slate, free from white. Color of legs and toes yellow. Be careful to guard against any tendency to flesh color, as in some cases the finest colored ear-lobes are to be found on birds with pale shanks. Use only such as have yellow shanks, free from feathers or down.

In selecting mates, get females that are of good style and size, with combs medium, and those that lap the entire length of comb, and when viewed from in front, such as do not fall across the head, but such as lap and form a true arch in front, free from twists. This, you say, is hard to get, yet, nevertheless, they come that way when bred right.

If over one-half of the females in the pen have well serrated combs and they are perfectly upright, so much the better for breeding cockerels with straight combs. Consider ear-lobes and wattles the same as on the male; then examine the color of neck or hackle, and get a black stripe with



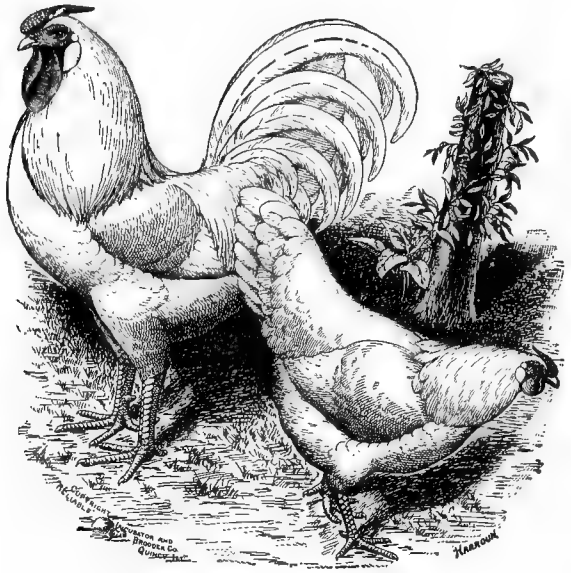
Standard-bred Rose Comb Brown Leghorns.

an orange yellow edging around each feather and as little penciling in the black stripe as possible. Wings in females are very frequently found with a brick color on bows. This is objectionable, yet is very hard to breed out. We are of the opinion that where continual breeding is resorted to for a few years with females that show none of this red on wings the result will be cockerels with large dark bar and scarcely any red on wing bowls, thus making it tit for tat—what is gained in the color of the female is lost in the color of the male. So, if the females show a small amount of red on wings, all the better for the cockerels from such a mating. Be careful to select such as show backs well penciled with dark brown, and such as are penciled closer up to the web of each feather, not open with dark stripe along each side of the shaft, causing the back to look too dark. Select females with good length of legs, fairly long in body, with good, upright carriage, and the results should be fine chicks.

MATING WHITE LEGHORNS.

(Prize Essay in Fanciers' Gazette, London, England.)

Here, perhaps, the amateur may obtain better results in the way of both sexes from one breeding pen than it is possible to do in the Browns, though I very much doubt whether it be possible for him to do as well as if he mated separately. Pay attention to all the general Leghorn characteristics, as described in my notes on Browns; and further, see that your cock bird is free from straw color on his back and saddle feathers, and that both he and his mates have a good depth of color in their legs, as there has in many strains come a tendency to paleness in leg, brought about probably by the efforts to keep the plumage as pure in color as possible; for while I do not agree with some who assert that a canary tint is correct in a White Leghorn—and I do much prefer a pure white color—I must admit that it is preferable to have a faint tinge of yellow color in the plumage combined with a lovely yellow leg, rather than the pale, washy legs one sometimes sees exhibited. In the breeding of Whites, those who can find trees and other natural shade, or failing this, who provide artificial shade, will be wise to avail themselves of it, and

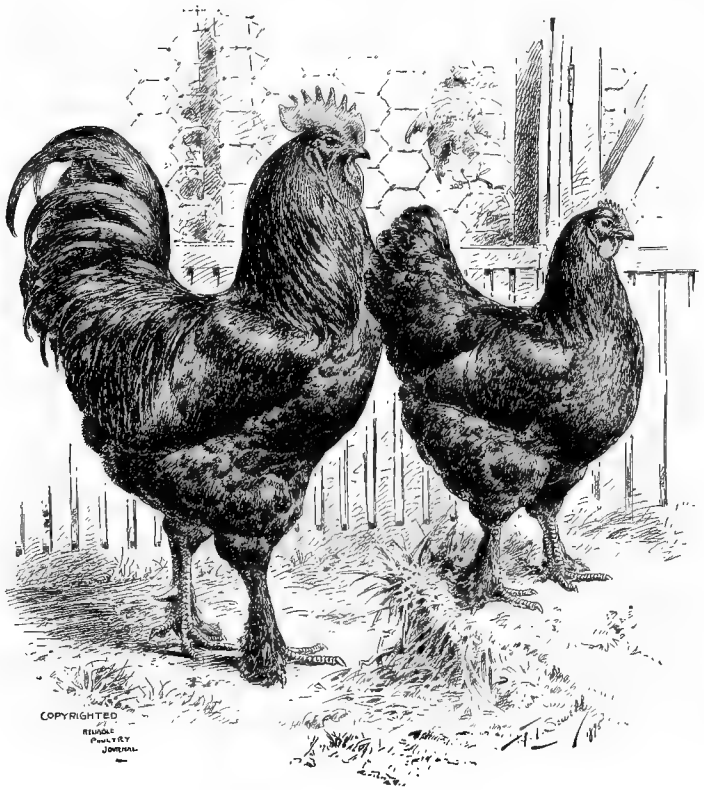


Standard-bred Rose Comb White Leghorns.

can not fail, especially in a strong season, when we get "first a shower and then a shine," to reap great benefits therefrom; for it is such a season as above described, rather than a tropical summer, that strains an otherwise white bird's plumage.

BLACK LANGSHANS.

The Black Langshans, owing to their beauty of form and feather are often called the lordly Langshans. They are esteemed very highly by many people. The surface color of the plumage of both the male and female is a glossy, metallic black, showing a green sheen. The under-color is black or dark slate. The standard weights of the Langshans are as follows: Cock, ten pounds; hen, seven pounds. Langshans are fair to good layers, especially in winter time. They are superior to the Cochins as layers and about as good, or a little better, than the Brahmas in this respect. They are smaller and somewhat more active than Brahmas, which accounts no doubt for their being somewhat better layers. Tre flesh of the Langshans is moderately fine in texture, juicy and palatable, but they are not so popular as they should be as table fowls, owing to two afcts; namely, their skin is white, and it is almost impossible to put them upon the market as dressed fowl in an attractive condition, owing to the black pin feathers. Where people have a preference for black fowls, large in size, docile, fair to good layers, strikingly handsome, the lordly Langshan will fill the bill and render a good account of itself. In breeding Langshans to standard requirements, their besetting sin is white or gray in the plumage and purple barring which comes in the glossy black surface plumage in place of the even, green sheen which should exist in the surface plumage of the upper half of the body on both male and female. Any white or gray whatever in fowls that are meant to be solid black is an eye-sore and a serious defect. Furthermore, all black fowls are made particularly handsome by the rich, metallic green sheen, and this is not an easy characteristic to establish in o strain. Beginners with



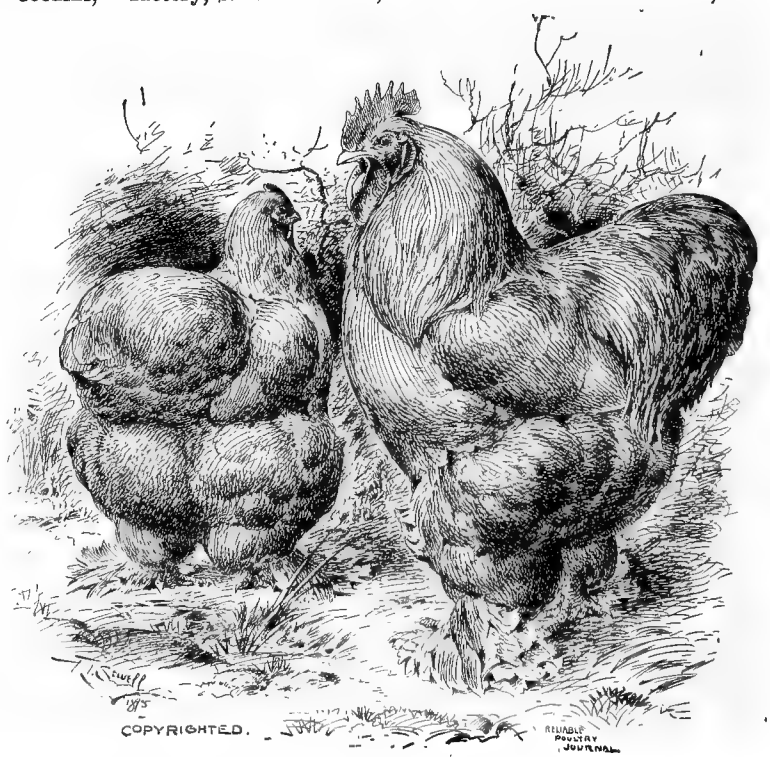
Standard-bred Black Langshans.

poultry are prone to make the mistake of believing that solid colored varieties, Black Langshans, Buff Cochins, White Wyandottes, and so on, are much easier to breed than the parti-colored varieties like Barred Plymouth Rocks, Partridge Cochins and Silver Laced Wyandottes. This is no doubt partly correct, but ninety-nine out of a hundred breeders of solid colored fowls will dispute this belief in toto and insist that it is substantially as hard to breed solid colored fowls close to standard requirements as it is the parti-colored fowls. This is an extreme view for them to take, but the fact remains that the breeders of solid colored fowls are less than two points ahead of the breeders of parti-colored fowls, which is evidenced by the fact that a handicap of only one to one and a half points is placed on solid colored fowls at the poultry exhibitions when they are to compete with parti-colored fowls for special prizes. Another way for arriving at the comparative difficulty of breeding solid colored and parti-colored fowls to standard requirements is to be found in the fact that the best scores given to parti-colored fowls by our best judges range from 93 to 94 points, while the best scores given by the same judges to the best solid colored fowls produced during the past three or four seasons have ranged from 94 to 96 points. This shows the matter up pretty clearly. The fact is that black feathers will creep into the plumage of white birds, and a creamy shade is very often evident in the white plumage. In Buff breeds both black and white cause trouble, and haste in breeding out one of these defects is apt to result in the creation of the other. Keeping the white out of the plumage of a Black Langshan is no child's play. It is plain enough that the breeder of solid colored fowls who wishes to reach the very top has his mountain to climb and need not sit down early in the contest to weep for more worlds to conquer.

BUFF COCHINS.

In the Buff Cochin we have a beautiful and fairly popular fowl. When well bred they are considered to be the most artistically beautiful fowl in existence. Bred to standard requirements their plumage is of a soft, uniform, golden buff, the feathers standing out well from the body, and, being loose and fluffy, they give the bird a round and graceful form that is not duplicated in any other breed of standard fowls. It is no doubt true that the best Cochins have been bred to such an extreme in length and fluffiness of feather that they are not well suited for practical purposes, in fact, the beautiful has transgressed more or less on the useful, although to what extent we are unable to say. It is not part of the object of this book to go into a lengthy discussionn of questions of this kind, but breeders who propose to go into the poultry business for practical purposes can find in the list of standard fowls varieties that excel the Cochins as table fowl, as layers and as broilers. This is likewise true of the Light Brahmas and Black Langshans.

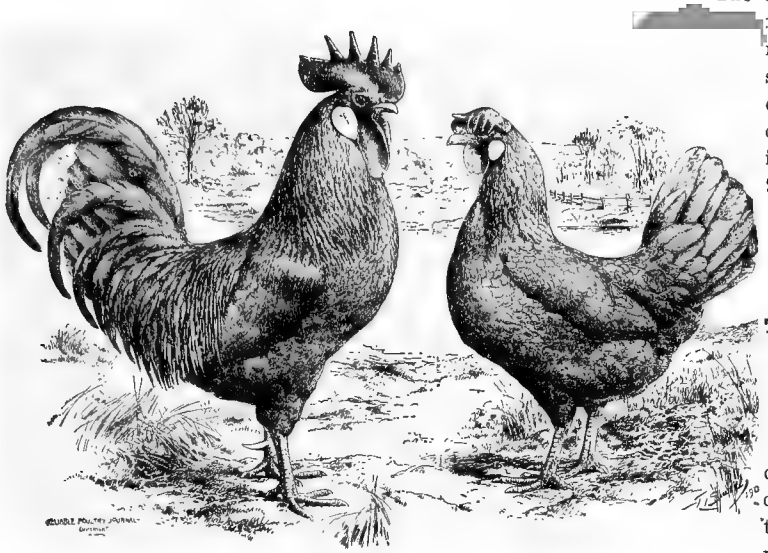
On the other hand, where a moderate sized flock of beautiful fowls is wanted for the city lawn or village lot, nothing more beautiful, more docile or more satisfactory, taken all in all, can be found than the Cochins, the



Standard-bred Buff Cochins.

Brahmas or Langshans. It should be remembered, however, that these Asiatics are more sluggish, are poorer layers, and therefore less productive than the medium sized and small varieties belonging to the American and Mediterranean

classes. It is not our object in writing for this book to serve the interests of any one breed or variety. What we are aiming to do is to state facts for the information of the readers. Said a well-known Ohio judge and breeder to us: "The Cochins are a nuisance. Those of us who breed them have to import stock from England to perpetuate the breed—they are such poor layers." This is an extreme view, but there is an excuse for it.



Standard-bred Buff Leghorns.

In the January, 1898, number of the Reliable Poultry Journal was printed a color plate of a pair of Buff Cochins, copied from a painting by Franklane L. Sewell, the noted poultry artist, who had for models two of the best Buff Cochins from the yards of Messrs. Sharp Brothers, breeders of prize-winning Buff Cochins. They are said to be a pair of the best colored buff birds that have ever been bred. This reproduction served to create new friends not only for Buff Cochins, but for buff fowls in general. Mr. Sewell, writing on the subject in that number of the Journal says this in conclusion:

"The art of producing the buff plumage of fowls has not, in the race of Cochins especially, received its reward of success at small cost, or without many years of constant care and thoughtful breeding and selection. Those who of late years here in America have undertaken the breeding of the newer buff varieties have realzed some of the dffcultes that must have worred the earler breeders of the Buff Cochn. However, with all these difficulties with which the handlers of Buff Cochins have met, I imagine that the soft tones of color are more favorably bred in the loose, fluffy plumage of the Cochin than will be obtained in some of the races for which the clear buff feathering is now so studiously sought. We have referred to the varying lights and changeable reflections which influence the apparent color or plumage on a fowl. This is charmingly so in the case of the full-feathered and deep-fluffed Buff Cochin. The slightest movement and change of pose in the bird, presents to the sensitive eye such a fascinating picture that it can not be satisfied with a passing glance. These alluring, mellow lights that seem to play about the soft plumage of these buff beauties are to the eye restful contrasts to the kaleidoscopic brilliancies that dazzle the sight as one attempts to follow their changes over the surface of the nervously moving, fiery hackled Leghorn.'

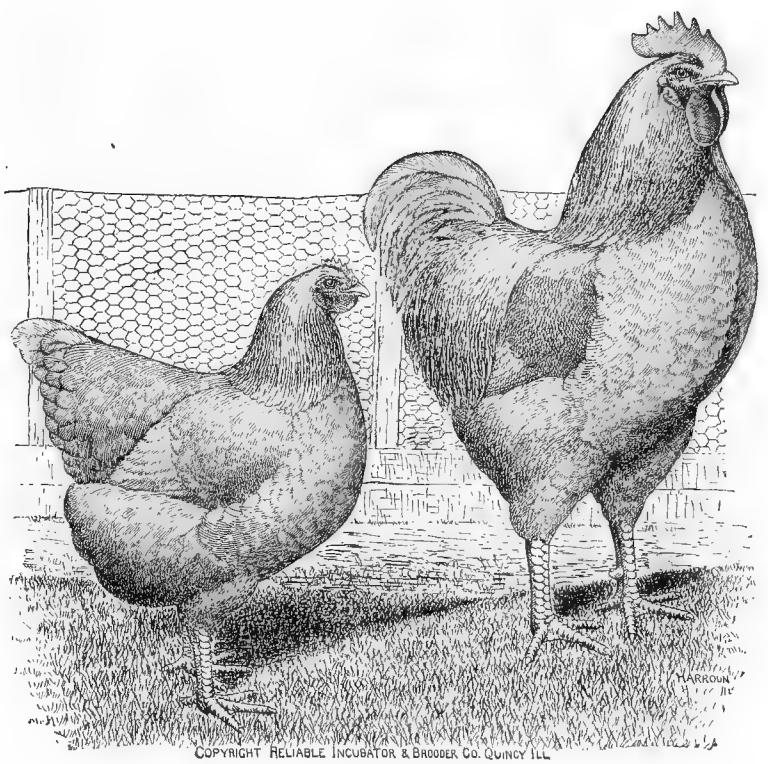
The full feathered Buff Cochin, while being a wonderful extreme in its amount and quality of feather, displays the nicest harmony of blended color which poultry fanciers possess.

The Cochin breed includes four varieties, the Buff, Partridge, White and Black. The Buff variety is the most popular, the Partridge coming in second. The standard weights of Cochins are as follows: Cock, eleven pounds; hen, eight and one-half pounds; cockerel, nine pounds, pullet, seven pounds, excepting in Black Cochins, where the cock should weigh ten and a half pounds.

NEW BUFF VARIETIsS OF STANDARD BREEDS.

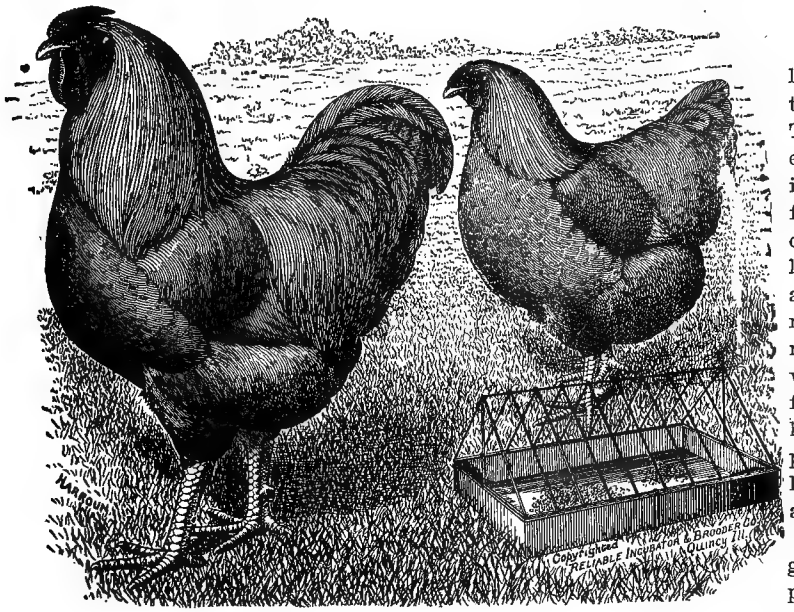
They Comprise the Buff Plymouth Rocks, the Buff Wyandottes and Buff Leghorns—Rapid Growth in Popularity.

During the past few years there has been a craze for buff plumaged birds, and many of the oldest and most level-headed fanciers have caught the fever and have been quietly experimenting with one of the varieties of buff fowls. The breeders of Buff Cochins have undoubtedly made great progress in getting the beautiful shade of buff so fixed that a large per cent of the birds will come true, but the fanciers of Buff Cochins have also bred their birds with a view to forming a ball of feathers, until the practical farmer who looks to the egg basket for groceries, refuses to buy them. The presence of feathers on the legs has limited their demand and doubtless led to the introduc-



Standard-bred Buff Plymouth Rocks.

tion of other buff breeds free from feathers on the legs, but which possess at the same time all the advantages of a buff fowl. These new breeds are Buff Plymouth Rocks, Buff Wyandottes and Buff Leghorns, the first two being general purpose fowls.



Standard-bred Buff Wyandottes.

A close inspection of the cuts of Buff Rocks, Buff Leghorns and Buff Wyandottes presented herewith will disclose that in the matter of shape they are like the other varieties of the same breeds. This is as it should be—form is the first thing to be considered; the dress is another matter.

Breeders of these new varieties of Rocks, Leghorns and Wyandottes have succeeded in producing some fowls of a wonderful shade of buff, and each year the color culls are fewer than the preceding. When these varieties were originated a few years ago many of them came too red or too pale in shade, but almost any color can be fixed by patient breeding from year to year and now some breeders have strains that will reproduce their color in large proportion. Some years ago the poultry judge, Mr. Theo. Hewes, in answering an inquiry about Buff Wyandottes, with which he had been experimenting, said to the questioner that it would be well for amateurs to let such breeds remain in the hands of old fanciers until the color is more firmly established, and the time has now arrived when the color is established, so that any young breeder, with such an application of intelligence as is needed in handling the older breeds, may breed these new-comers true to color.

The putting on of a buff dress should in no degree injure the good qualities of any breed, either in weight, shape, or egg-producing qualities; in fact, as we have said, it improves the appearance of the dressed fowls.

All Leghorns lay well and the Buff variety is not behind the others. It lays an egg equaling (in many strains) the size of that laid by the White Leghorn, and many flocks of Buffs have an advantage in size of body.

As general purpose fowls the Buff Rocks and Wyandottes possess the qualifications of the other varieties of these breeds, with the additional advantage of a color of plumage which assists in securing the yellow skin desired by the public. The fact that the pin feathers are of a color similar to that of the skin, adds to their value as market fowls, as these pin feathers are barely noticed, even when the fowls have not been very carefully plucked. The Buff breeds are favorites, and they have proven such valuable fowls from the utility point of view that the public says they must stay, and the public knows.

BLACK MINORCAS.

Black Minorcas have come to be quite popular in America, though not nearly so popular as the Single Comb Brown and White Leghorns. The Minorcas seem to rival the Leghorns as layers, but they have hardly succeeded. They are in fact great layers, and as such are valuable fowls. They have two important advantages over the Leghorns, viz: They are considerably larger and heavier and lay a larger egg. There are no standard weights for Leghorns, but they range in size from four and one-half pounds for male birds, and four to five pounds for females, while the standard weights for Minorcas is as follows: Cock, eight pounds; hen, six and one-half pounds; cockerel, six and one-half pounds; pullet, five and one-half pounds. The Miorcas lay a handsome, large, pure white egg and lay a good many of them.

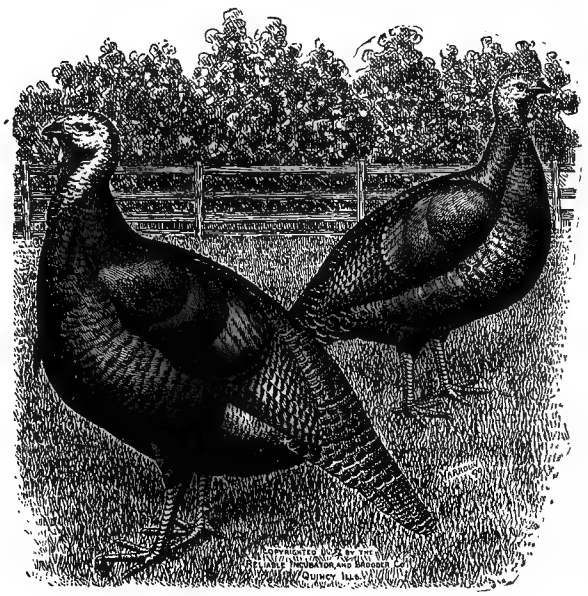
In color of plumage they should be a rich, glossy black throughout, showing an absence of purple barring, and having the same rich green sheen that is so desirable in Black Langshans. This sheen is not required by the Standard to the same extent as it is in Langshans, but it should be. Any white or gray in Black Minorcas is as serious a defect as in Black Langshans and should disqualify specimens for breeding purposes, except in cases where an off-colored feather is the result of an accident, like a bruised pinfeather or the bird being out of condition when molting. It is dangerous to compromise at all with white in the plumage of black fowls, for too often breeders are too lenient in this respect, the result being a cropping out of white or partially white feathers in their strain, to its ruination.

Standard-bred Black Minorcas.

The Minorcas include as a breed the Blacks, Whites and Rose Comb Blacks. The Whites are the same as the Blacks, excepting that their plumage is pure white throughout, and their legs are of a flesh color instead of slate color. The Rose Comb Blacks are the same as the Single Comb Blacks, except comb. For views of a Rose Comb see illustrations of Rose Comb White and Brown Leghorns in these pages.

MAMMOTH BRONZE TURKEYS.

Bronze turkeys are by far the most popular variety of turkeys bred in this country. There are six standard varieties of turkeys, viz: the Bronze, White, Buff, Slate, Black and Narragansett. Next to the Bronze the White Holland is most popular. The standard weights of Bronze turkeys



Standard-bred Mammoth Bronze Turkeys.

are as follows: Adult cock, thirty-five pounds; yearling cock, thirty-two pounds; cockerel, twenty-four pounds; hen, twenty pounds; pullet, fifteen pounds. The Bronze turkey is perhaps the most beautiful bird in poultrydom. Their plumage is irridescent in color, having all the tints of the rainbow and about a dozen more. We understand that they were bred from the wild turkey. The wild turkey is a handsome bird, but not to be compared with the standard-bred Mammoth Bronze.

In Bronze turkeys the size of the wild turkey has been much improved on, in fact, Bronze turkeys have been bred so large as to make them unsaleable on the market. In other words, it is not desirable to breed them too large. The benefit of breeding them to extra size is that they are of quicker growth, and hence will sell on the market when younger, more tender and less costly to produce. Ninety per cent of the turkeys sold on the common market are Bronze, or part Bronze. The smaller they are, as a rule, the less pure-bred Bronze there is about them. Where a flock of fine, large turkeys is seen, it may be taken for granted that there is more or less Bronze blood in their veins.

It is useless to attempt to raise turkeys on a small lot. They must have range. Some breeders turn their flocks into a wooded place and let them grow in nature's way—the way of the wild turkeys which live in the woods.

They must have large range and they will forage their own living, set, hatch and raise their young, but it is advisable to watch them, gather their eggs and set them, where you can keep watch over them so varmints will not kill the young. You must not confine old turkeys in small houses, they will not thrive or do well.

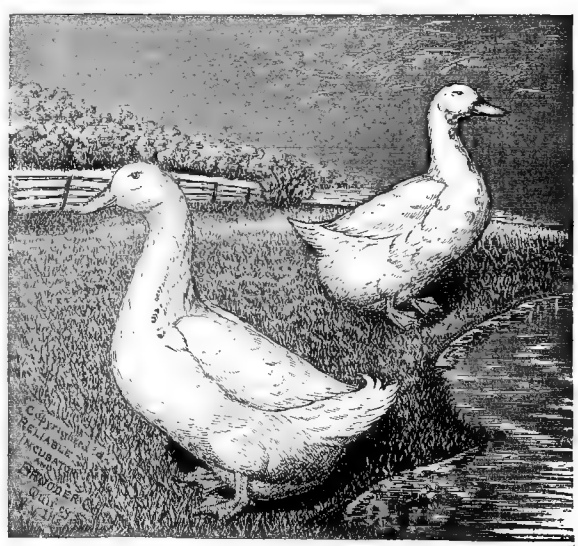
IMPERIAL PEKIN DUCKS.

Unquestionably the Business Duck of the Age—Handsome, Thrifty, Easy to Raise, Productive, Profitable—Thouands Hatched and Reared by Artificial Means.

BY MR. JAMES RANKIN, BREEDER.

The Pekin ducks are first-class layers, producing from 100 to 120 eggs each year. It is a very fascinating work to raise ducks, they mature so quickly, the mortality is so small, and the grower, if he works his cards right, has complete control over them from beginning to end. Our mortality is about one per cent, and that principally by accident. A duckling will weigh more at nine weeks old than a chicken at twenty weeks. We grow all our poultry artificially, getting out from 4,000 to 5,000 ducklings and from 2,000 to 3,000 chicks yearly. We ship our ducklings to both Boston and New York, sometimes to both the same day. The maximum price for ducklings the past season was forty cents per pound, the minimum thirteen cents, and as these ducklings dress on the average nine pounds per pair at nine weeks old, and can be put upon the market at a cost of less than five centsperpound, it can be easily seen what profits attend the business.

We obtain for our birds, both in New York and Boston, from four to five cents per pound more than thehighest market rates. Our dealers in both places will gladly corroborate this statement. We mention this in particular in order to disprove a wide-spread but erroneous opinion which prevails over the country that artifiicially grown birds are inferior in every respect to those grown in a natural way. Our ducklings are the largest of their age that enter the Boston and New York markets, and not only that, but they have won the first premiums the past year all over the country for their size and beauty, while not only the birds themselves, but their parents and grandparents, together with a long line of ancestors have been hatched and grown artificially.



Standard-bred Imperial Pekin Ducks.

We find no trouble in getting rid of our surplus eggs in market at remunerative prices. We find ducks during the summer months much more profitable than chicks. The feathers are worth fifty cents per pound at wholesale, making quite an item of profit.

Hard grain is not so good for Pekins as soft food. We keep our laying ducks (of which we keep some eleven hundred) on equal parts of boiled turnips, wheat bran and corn meal, with a little ground beef scraps thrown in. This is all mixed thoroughly together while the turnips are hot, and constitutes our entire feed during the winter and spring.

I would like here to give a few hints in regard to hatching, raising and handling young ducks. Contrary to the general acceptation of the thing, it is not necessary for ducks, either young or old, to have access either to a pond or a brook, as simply giving them all the water they need to drink is sufficient. Indeed they thrive better and grow quicker when confined in yards with just enough water to drink. Shade is one of the essentials to duck growing in warm weather, also plenty of green food and vegetables. Ducks are gross feeders, but are not particular as to quality. We have some 2,500 out now, confined in yards, with wire netting two feet high. The first lot go when nine weeks old. Some of them will dress over ten pounds per pair. It is necessary to have water dishes so constructed that they can drink without wetting themselves. Ducklings should be fed about the same as chicks for the first few days, giving them milk if it can be had, by mixing their food with it. Care should be taken the first few days to keep the young ducklings warm and dry. For the first week they will suffer more from cold and wet than chicks, after that time they will endure more of either than chicks. Corn meal exclusively is too much concentrated, and will soon cripple them in the legs and feet; it should be mixed with bran, boiled potatoes, etc. About the same temperature and moisture are required in hatching as with chicks. Ducklings usually pip about forty-eight hours before they are ready to come out. It is a pleasing and comical sight to see three or four hundred ducklings when first out.

They will fatten much easier and better with simply water to drink. For green food we like green corn the best. We begin to market ducklings at nine weeks old, picking them clean, all but the head and tips of the wings. They are bled by cutting across the roof of the mouth juts below the eyes (to stun them with a billet of wood before this operation would be merciful). Ducklings are not drawn for the New York market. Our ducklings last year, dressed, for market, averaged at ten weeks old, nine and one-half pounds per pair.

It is well known by this time that the poultry business is as much a trade as any other department in life, and a man in order to succeed must possess, at least, two traits to qualify him for the business—intelligence and energy. His buildings must be neat and commodious, constructed with a view of reducing the labor to a minimum, also of securing good drainage. Above all, start in with good incubators and good brooding apparatus. Secure first-class stock to start with. Debilitated, degenerate stock will never produce healthy young birds that come into the world with enfeebled constitutions and in no conditon to live, and waste time trying to raise them.

With the demand for dressed poultry, as far as we are concerned, always in excess of the supply, with the returns far greater than from any other farm product, we think that every farm should have its poultry department.

JAMES RANKIN.

BREEDING TOULOUSE GEESE.

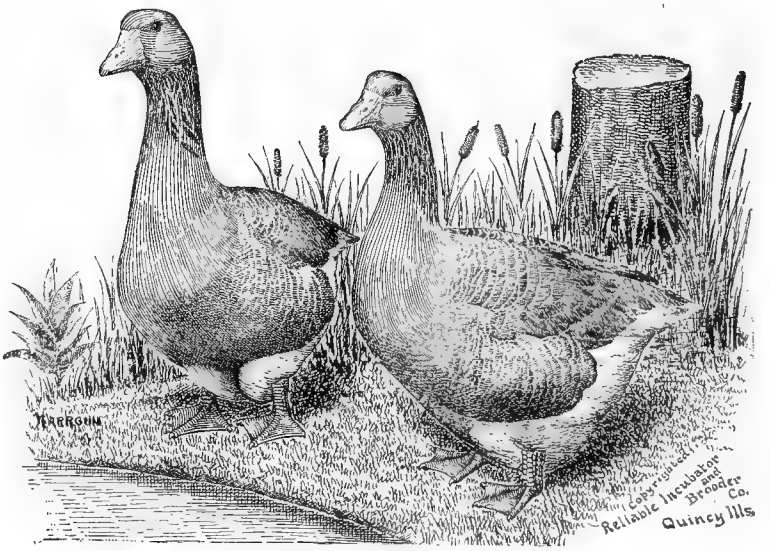
How to Manage Geese With Success and Profit—Why the Toulouse are Best—Care of the Breeders —Must Have Range.

BY CHARLES F. NEWMAN, BREEDER.

The Toulouse goose is in my estimation the most profitable goose to raise. I have made many trials with others, but I now prefer the Toulouse. It grows the largest, matures the quickest, is not so much of a rambler and flyer as other kinds and as it does not take so readily to water as other varieties, it grows more rapidly and accumulates flesh faster. They are not so noisy, and you need not be afraid to let your horse stand in the yard for fear the flock might rise and fly away and scare the horse and wagon into flying too.

The Breeders.

I allow two geese to one gander, though generally they will pair off and you will notice that a gander will stay with his actual mate nearly all the time. The gander is the protector of the goose, especially in breeding time will he defend her and her nest—fearless and vicious. It is not an easy matter to distinguish the sex. When six or seven months old, or at maturity, you can usually, by observation, tell the ganders from the geese. The male, in most cases, grows some larger than the female. The goose is deeper in the body, a trifle slimmer in neck and smaller in head.



Standard-bred Toulouse Geese.

The call of the gander is loud, long and shrill, while that of the goose is merely an answer to it. Separate a flock by driving part on each side of a fence or building and you can distinguish most of the ganders by their calls. Never look for a curled feather in the tail or any outside marks such as I have seen in some cuts, for there are none. Early in the spring it is easier to tell them, for instance, by tasting, but it must be understood and done with care.

Geese grow to a great age. The females are profitable up to ten or twelve years of age and the males up to six or seven years. It is not profitable to raise geese in confinement. They must have a pasture where from early spring they will live almost exclusively on green rye, clover or grass, needing little grain and thriving well. Do not feed too much corn in winter, as it is apt to get them too fat

for breeders. Oats and barley are better. The way I feed is this: I take some boxes about eight inches deep and put in the oats or whatever grain I want them to have. These I place in the pasture, away from other fowls, and invite them to help themselves. One need not be so careful in feeding them as in feeding ducks and other poultry. You can not spoil their appetites, and by putting the boxes of grain in the runs they get a good run and a light feed, and are in no danger of overfeeding. I should not advise you to feed corn in this way. Give them corn only in the hardest weather, when it is storming or there is so much snow they can not go foraging. Toulouse geese need only enough water to drink, none to swim in.

When in proper condition young geese will lay from eighteen to twenty-four eggs the first season, and old geese will lay from thirty to thirty-six and even forty eggs in a rels in out-of-the-way places and cover them with rubbish, rels in out-of-tht-way places and cover them with rubbish, having straw or litter of some kind inside of them. Some of the geese will begin laying in February, and they will find the places provided for them. We gather the eggs every day, but avoid disturbing a goose when she is on the nest, and we always arrange the nest as nearly as possible the same as we found it. Always leave a nest egg—any kind will do. A goose will cover her egg with the nest material, and in winter instinct teaches her to bury it deep.

Young geese seldom get broody the first year. We seldom let a goose sit, but break them up as soon as they become broody. We put an extra gander in a yard by himself away from the other geese. Into this yard goes the broody goose or geese. Her nest is destroyed, or if it is in a barrel or box it is moved to a new position. In four or five days turn the goose out, and in most cases she has forgotten she wanted to sit and goes to work again. In this way we keep the geese busy laying eggs, and a large common hen attends to the hatching for her.

We set our geese eggs in crews. On the fifth or sixth day we test the eggs, and discard all infertile ones. The same rule follows the hatching of geese eggs as hens' eggs, except the geese eggs needs a little more moisture on account of large thick shells. It takes thirty days to hatch them.

Feeding the Goslings.

The first two or three days keep them in a warm place and give them a little soaked bread and water. When the weather is nice turn them out in a small enclosure which can be changed every day or so. Use boards six feet long and twelve inches wide. After a week let them go—and then their foster mother's trouble begins, for the little goslings do not care a snap for her calling. They are off hustling for every spear of grass, and she has to go after them. Her business is to keep them warm at night and warm them in the day time if they get chilled.

The first four or five weeks give them nothing but stale bread occasionally, but always leave them at liberty to get all the grass or clover they want. Do not soak the bread, as they do not like it so well. After five weeks give them a mash of two-thirds bran and one-third corn-meal. If you wish to fatten them, after six weeks feed one-half bran and one-half cracked corn, but do not let it be sloppy. Never allow goslings to go to water to swim until fully feathered, and then only let those go that you wish to keep for breeders. Any of them will do as well if they never go swimming. During this period you must keep the old geese away, as they will fight the hen and molest the young.

It will sometimes happen that you will hatch and raise a gosling with a broken wing. It is no serious fault at all; only a malformation in the egg. If it is a nice, large, promising bird do not kill it nor be apprehensive that it will breed broken-winged birds, for it will not. If the looks of it be unpleasant to you take a sharp knife and sever the crooked part at the joint. Bandage it and it will soon heal and you will never note the difference afterward. You will generally find such to be the largest birds.

Goslings, when nine and ten weeks old, weigh from twelve to fifteen pounds. That is the best time to market them, as they will bring more money then than in the fall and winter and you have no trouble fattening them. The first green geese in the New York and Boston markets this year brought from eighteen to twenty-five cents a pound, and now, when nine months old and not weighing much more, they bring from fourteen to eighteen cents. Will you not agree with me that they are profitable to raise? I do not generally paint things in the brightest colors, and I do not advocate everybody going into goose culture. You can not raise geese as you do chickens and ducks—on an acre lot. They must have a pasture. It is a wrong belief that geese or their droppings will kill grass or destroy a pasture. I will explain this as follows: If you have a large flock of geese and a small pasture they will clean it up, that is, they will eat the grass as fast as it sprouts and give it no chance to grow, just as a cow on a city lot will soon have only bare ground and you will have to tie her out in the road. If you could do the same with geese you would find the grass coming again and growing as before.

To provide a good pasture for geese for the late fall, winter and early spring, plow a piece of ground in September and sow it to rye. It will make good picking for them in the winter and provide them with a good living in the early spring before the grass comes in the pasture.

Geese are as profitable as either ducks or chickens, but you can not raise them in such quantities. But you can raise quite a flock in a season and make it pay. Have no fear of glutting the market. Green geese always find a ready sale, and there is a good demand in the fall and winter. Their feathers are an item worth considering, but do not pluck your geese twice a year and expect them to be good breeders. A goose so treated will not lay as early, nor as many, nor as fertile eggs as one that is left alone to go through the changes naturally. Always send your fowls to market properly dressed. Never send them alive. The difference in the price of the carcass and the feathers will pay you three-fold for the extra work.

Diseases of Geese.

Geese are easier to raise than any other fowl. There is no mortality among the young stock from disease. Lameness is the only ailment with which I have had to contend. It is caused by too close confinement, unwholesome food, too warm housing, and close quarters in the fall. Let your geese stay out under a shed with some litter under them in the hardest winter weather, and they will be more vigorous than those closely housed.

To treat lameness, proceed as follows: If you notice one that is rather bad, put it by itself in a dry place and give light food (stale bread) and water. If it shows signs of fever and diarrhoea, give a tablespoonful of caster oil by holding its beak open and working it down its throat. Repeat the second day if it is no better.

Do not mistake the common crown goose for the Toulouse. The following is a short description of the Toulouse:

Head, large and short, especially in the gander; color, dark-gray; beak, reddish-flesh, not pink; eyes, dark brown,

or hazel; neck on gander, long and carried erect—by long I do not mean extremely long; neck of goose, medium in length; plumage, dark gray, shading a trifle lighter toward the beak; back slightly curved, long and broad, color dark gray; breast, full and deep, plumage light gray, not white; body round and deep, in old birds in good condition it almost touches the ground; plumage down to the keel is light gray; the lower and fluffy parts are pure white.

The tail ought to be short, in color black and white, the ends of the feathers being white. Wings, strong and large, with smoothly folded, dark gray primaries, brown secondaries and dark gray coverts. Thighs, short and stout, covered by light gray plumage, distinctly laced. Shanks and web of feet, dark orange color, nor pink. White feathers in wings, or any other part of body other than above mentioned, shows impure breeding.

The weight differs in various seasons. In winter they should be kept in good condition. The old geese should average about twenty pounds, the young about eighteen pounds. I have some weighing from twenty-six to twenty-eight pounds.

There is still much to be said about this variety of geese, and a wide field open for discussion. Who has not heard of "Hanover Ganze Biuste," Hanover smoked geese breasts, which sell in Europe in the finest delicatessan stores at eighty cents and one dollar a pound? And have you ever heard of goose livers selling at two dollars to three dollars per dozen? That is for the livers only. You can sell lots of them every day in New York and other large cities—if you only have them.

CHARLES F. NEWMAN.

CHARACTERISTICS OF BREEDS

Table Showing the Merits of the Different Breeds of Fowls, Ducks, Geese and Turkeys

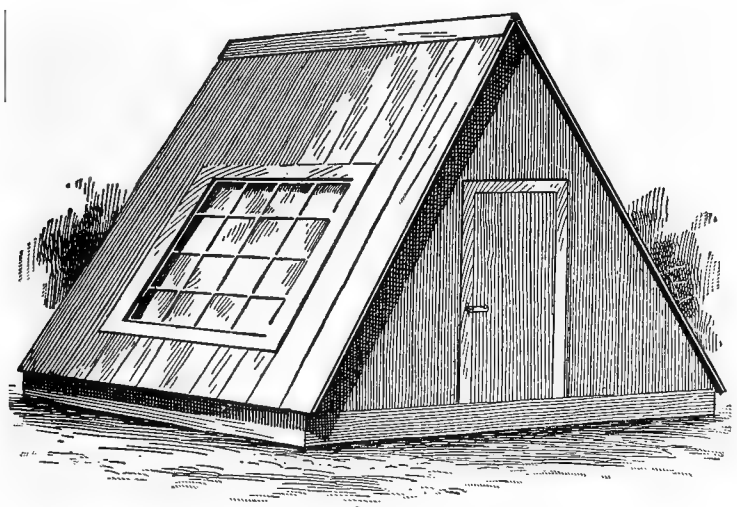
BREEDS	Live weight of cock in pounds	Live weight of hen in pounds	Age at maturity in months	Cost of raising to maturity	Annual cost of keeping	Average egg yield per year	Average number of eggs to pound	Constitution	As foragers	Can they stand confinement?	As sitters	As mothers	Grain and Flavor of Flesh
Light Brahmas	12	9½	12	$0.75	$0 90	150	7	Hardy	Fair	Yes	Heavy	Clumsy	Fair
Buff Cochins	11	8½	12	.75	.90	140	8	Average	Poor	Yes	Fair	Fair	Poor
Partridge Cochins	11	8½	12	.75	.90	120	8½	Average	Poor	Yes	Heavy	Clumsy	Fair
Black Langshans	10	7	12	.75	.90	150	8	Hardy	Fair	Yes	Fair	Fair	Good
Barred Plymouth Rocks	9½	7½	10	.75	.90	175	8½	Hardy	Good	Yes	Fine	Good	Good
White Plymouth Rocks	9½	7½	10	.75	.90	175	8½	Hardy	Good	Yes	Fine	Good	Good
Buff Plymouth Rocks	9½	7½	10	.75	.90	175	8½	Hardy	Godd	Yes	Fine	Good	Good
Silver Laced Wyandottes	8½	6½	10	.70	.80	175	9	Average	Good	Yes	Fine	Good	Good
White Wyandottes	8½	6½	10	.70	.80	175	9	Average	Good	Yes	Fine	Good	Good
Buff Wyandottes	8½	6½	10	.70	.80	175	9	Average	Good	Yes	Fine	Good	Good
Cornish Indian Games	9	6½	10	.75	.90	130	9	Tender	Fair	Yes	Fair	Fair	Fine
Hamburgs	4	3	7	.40	.75	180	12	Tender	Good	Yes	Non	Poor	Best
Houdans	7½	5	10	.70	.90	170	9	Average	Good	Yes	Fair	Poor	Good
Dorkings	6½	5½	9	.65	.75	120	9	Tender	Good	No	Good	Good	Good
Dominiques	5½	4½	7	60	.75	170	10	Hardy	Good	No	Good	Good	Good
Games S. B. R	7½	5	8	.70	.80	170	10	Hardy	Good	No	Fine	Best	Good
White Leghorns	5	4	7	.40	.75	200	10	Hardy	Fine	Yes	Non	Poor	Poor
Brown Leghorns	5	4	7	.40	.75	200	10	Hardy	Fine	Yes	Non	Poor	Poor
Buff Leghorns	5	4	7	.40	.75	200	10	Hardy	Fine	Yes	Non	Poor	Poor
Black Spanish	7	6	9	.70	.80	170	7½	Average	Good	Yes	Non	Bad	Poor
Polish	5½	3½	7	.50	.75	170	11	Tender	Good	No	Non	Poor	Poor
Black Minorcas	8	6½	9	.70	.80	180	9	Hardy	Good	Yes	Non	Poor	Fair
Common	4½	3½	9	.50	.75	150	11	Average	Good	Yes	Good	Good	Fair
Ducks, Pekin	7½	6	9	1.00	1.00	120	8	Hardy	Fair	Yes	Good	Good	Good
Ducks, Rouen	7½	6	12	1.10	1.00	100	6	Hardy	Fair	Yes	Poor	Good	Good
Ducks, Common	4	3½	6	.75	1.00	90	9	Hardy	Good	Yes	Good	Good	Fair
Geese, Toulouse	22	18	36	2.00	1 50	30	3½	Hardy	Fair	No	Fair	Fair	Fine
Geese, Embden	18	15	30	1.75	1.50	20	3½	Tender	Fair	No	Fair	Fair	Fine
Geese, Common	10	7	12	1.25	1 50	20	4	Hardy	Fine	No	Good	Good	Fine
Turkeys, Bronze	28	18	24	2.00	1.20	50	6	Tender	Fine	No	Fair	Fair	Fine
Turkeys, Common	12	10	12	1.20	1 00	50	7	Tender	Fine	No	Fair	Fair	Fine

PRACTICAL POULTRY HOUSES

The Ideal Low-Cost New England House—A Double House Costing Fifty Dollars—A Low Cost House for the Farmer—Latest Improved Scratching Shed, Double or Continuous Houses—An All 'Round Complete Poultry House, as Designed by an Expert Fancier.

WE PRESENT in this chapter not a large and confusing variety of low-cost poultry houses, but such houses as are calculated to meet the needs of a large majority of the readers of this book. The several houses are materially different in design, and may be enlarged or modified to meet varying conditions. Tney are practical, and no money need be wasted in their construction.

At this point we wish to caution the readers against extravagance in building a poultry house. Do not spend a dollar, not a dime, when it can be properly avoided. That is one secret of success in the poultry business. Have your poultry house built so as to keep out all drafts, but, bear in mind that nature has provided fowls with a warm coat of feathers, and that if gradually hardened they will stand a surprising amount of cold weather. Even a Leghorn cock or cockerel will stand a night or two of twelve degerees below zero (out temperature) in houses constructed as we advise in this chapter, without injury to his tail and slender comb, providing he has been hardened to it. We write from experience.



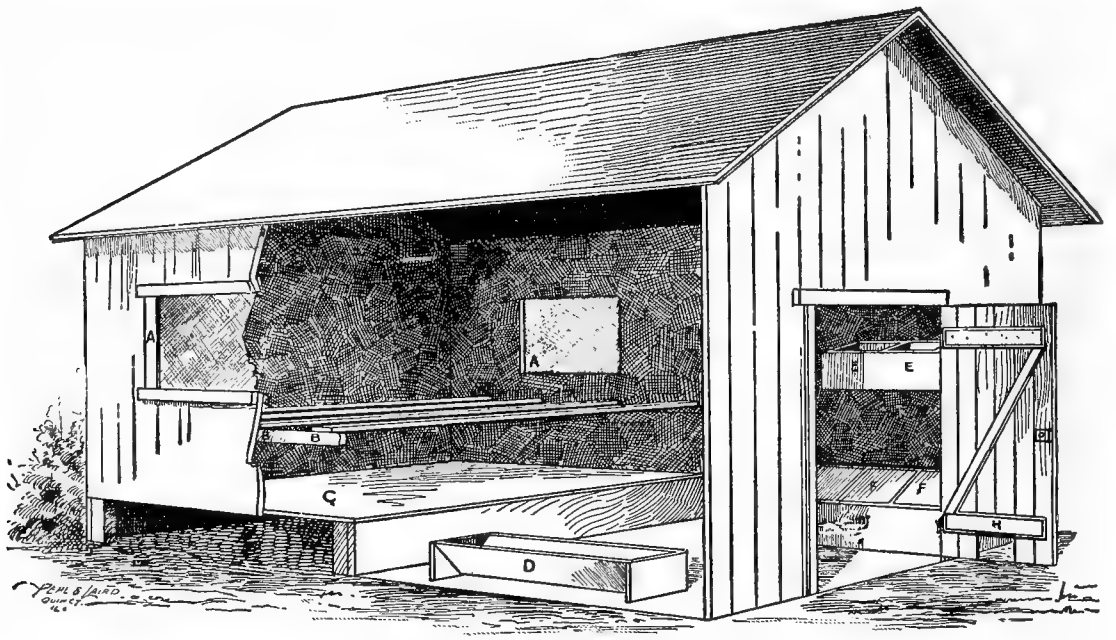
Ideal New England Poultry House.

Do not use artificial heat for adult fowls except in the case of Leghorns or Minorcas in northern latitudes during very cold weather. They do not need it. It is far better for them not to have it. Build your houses snug against the wind, put some glass where direct sunlight will flood the dirt floor, leave the chicken exit open day and night; except in rare instances let them go in and out of the house when they please, and they will in this way become toughened until the severe cold will not injure their general health. Feed them regularly on sound, wholesome, nourishing food; keep them at work as many hours of the day as possible—but we are getting ahead of our story.

With the exception of the Leghorns and other similar varieties, poultry will withstand the winters of our northern climate right well, and will be free from disease if they are provided with quarters where they can seek shelter from wind and rain in the day time and be protected from drafts at night. It is the unhealthy fowl, the fowl that has been abused either by neglect or by too much kindness, that cannot withstand winter weather. Proper food well digested makes thick, warm blood—but this is subject matter for another chapter.

We regard the low-priced and simple house shown in the lilustration on this page as one of the best, cost considered, that can be designed for use on large poultry farms where ample range is afforded, or for a pen of fowls in any small enclosure. Such a house (without a board floor) can be readily moved from place to place. If we had a ten-acre orchard and forty such houses we could "house" 400 laying stock in them (giving each pen the run of a quarter of an acre), and give them such care, with a minimum of labor, that they would thrive superbly and pay big returns on the outlay.

For a floor a few inches of fresh, dry loam is good enough for us. Have the dirt floor of the house fully six inches above the surface of the ground outside the house. For roosts use ordinary trestles about fifteen to eighteen inches in height. Once a month or so take them out of doors, pour a moderate quantity of coal oil over them and set fire to them. It will be good-bye lice to those caught napping on the roosts. Locate a window 3x3 feet in the roof, south front. Be sure to run the front and back end boards up and down. Have nest boxes quite dark; this will prevent egg-eating in most cases. For the roof use foot-wide boards with grooves half an inch wide, running parallel with each edge. The water that seeps under the battens will then follow these grooves and flow off the roof. This roof being steep, will turn the water first rate. Line your poultry house with tar paper, then stripping it with lath so that it will hold fast. By using tar paper it has a tendency to keep out mites as tar is a good preventive of mites. Paint your poultry house as soon as it is completed, using the best oil you can afford to buy. Such a house, 8x8 feet, will do nicely for eight Asiatics (Brahmas, Cochins and Langshans), ten American fowls (Rocks and Wyandottes), or fifteen of the small breeds (Leghorns, etc.).

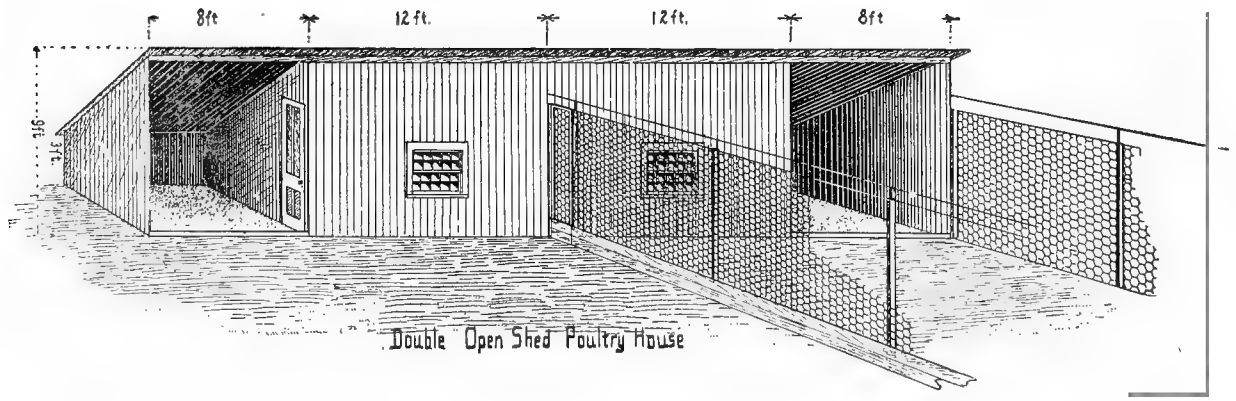


Low-Cost Practical Farmers' Poultry House.

The dimensions are 10x15 feet, giving a capacity of thirty to thirty-five fowls. A A, represents the windows; B B, the roosts, built on a level; C the droppings board; D, the feed trough; E E, the nests; F F, the feed and grit bins; H, the exit for fowls. The house should face south or east. Have droppings board fifteen to eighteen inches high, and leave opening on the outside for fowls to pass under for shelter and dust bath, as shown in illustration.

LOW-COST, PRACTICAL FARMER'S POULTRY HOUSE.

The house shown above on this page, taken with this brief description, explains itself. The reader will at once see how the parts of the house are made, and this house has some good features. There is nothing complicated about it, and it is such a house that the average farmer would find suited to his needs. We much prefer darkened nests to these open ones, and all roosts for a poultry house should be made movable, so that they can be taken out for treatment with coal oil or some good lice killer. The droppings board should be at least eighteen inches above the ground, so as to leave room enough for the fowls to move about underneath it and enjoy the dusting places. Instead of locating a window in both sides of the house it would be better to locate one long window or two short windows in the south front of the house, presenting a solid wall to the north and west winds. A board floor is not needed in a poultry house, though it makes it easier to clean, and where dampness prevails in the house a good tight floor with an open space underneath will overcome the dampness. Dampness in the poultry house must be fought and overcome at any cost.



Can be Built Complete for $50 to $75 and will Accomodate 20 to 40 Fowls.

DOUBLE OPEN SHED POULTRY HOUSE.

A Mr. H. W. Sinnock, living a neighbor of ours, wished to put up a suitable, low-priced house several years ago, and as a result of what the writer has seen the country over, the plan here illustrated and described was recommended to him. At a cost of about $65 Mr. Sinnock now owns a number one good house with yards attached, all complete, built on the plan illustrated.

It is wise to locate a poultry house on high ground, for dryness is essential to the health of fowls. If it is necessary to scrape up a mound or ridge in order to keep surface water from draining toward the house where it will soak into it, do so, for it may be the price of your success with poultry. If the ground is flat it will answer to build the house well up from the ground, then fill in six to twelve inches of cinders or gravel (not earth), and cover this with six inches of fresh earth, which should be renewed twice a year, spring and fall. Changing this earth and keeping it reasonably free from filth and bad odors

will prevent cholera and add much to the comfort and healthfulness of the flock. The cinders or gravel will insure a dry floor even on low ground where the surface drainage is in toward the house. Do not bank earth up against the outside walls. Doing so will, in two or three years' time, cause the boards to rot off.

Size of the House.

The double house shown in the illustration is forty feet long, twelve feet wide, three feet high in rear and nine in front. The closed part is divided by a board and wire partition into two pens 12x12 feet, with a door in same next to the front wall. There is no hallway, all of the room being accessible to the fowls. The partition is of boards two feet up from the earth floor (the same as the divisin fence), and prevents the male birds from fighting through. The upper part of the partition can be made of lath or wire netting. The netting costs a trifle more, but looks better and is not a harbor for lice. If lath are used, plane them. Lice are not "at home" on a smooth surface.

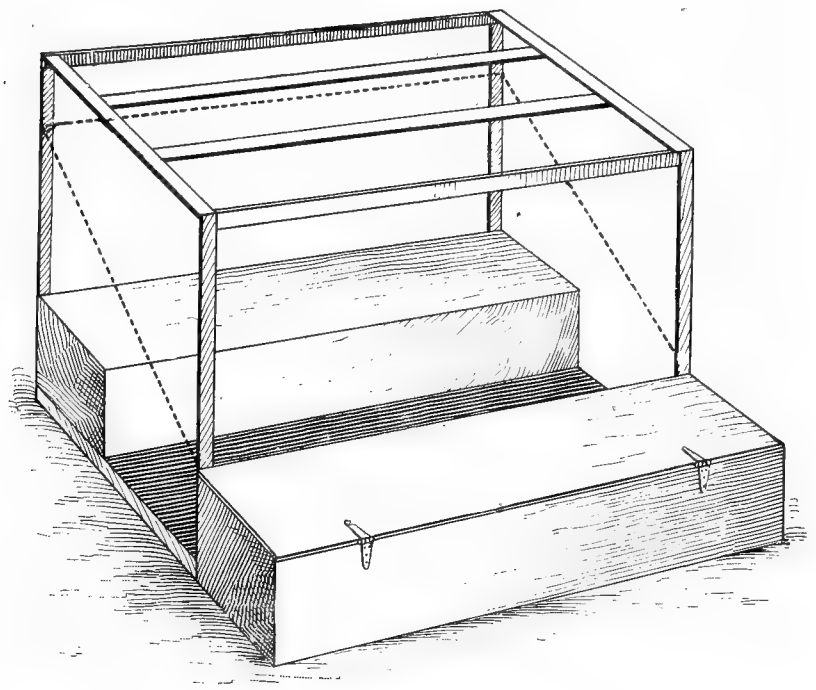
Each closed pen has an 8x12 foot open scratching shed attached—a place sheltered from the prevailing winter winds, where, on sunshiny days the fowls can scratch and bask and dust themselves and make eggs. These sheds are open to the south, and it is the practice down east, where this style of house is popular among practical poultrymen, to provide a storm door made of oiled canvass, tacked to a light frame, which is used to close the opening of the shed. This storm door is usually hinged at the top and when not in use, is swung up against the ceiling of the open shed out of the way and safe against injury. Canvas or heavy muslin that is oiled with good paint oil is impervious to wind and water, but admits enough light to the interior of the scratching shed so the fowls can see to attend to business.

This storm dor is recommended. By its use the fowls may be admitted to the shed during the day time of all ordinary winter weather, thus giving them more floor space and a place to keep busy. It will be plenty light for them, even on cloudy days.

The Materials Needed.

The sills of a poultry house like this may be of 4x4 or 4x6 pieces. If of the latter dimensions the house can be moved if desired, but the 4x4 pieces are heavy enough. These sills may be set on a rock foundation (which is best), or on two-foot cedar, oak or hickory posts. If posts are used, dig the holes twelve to eighteen inches deep, depending on how high above the surface of the ground the floor of the house is to be; place a flat rock in bottom of hole (two bricks will do if you have nothing better), and on this stand the post. A large flat rock will prevent the house from settling. If it is convenient for you to dip these posts in asbestos paint or tar, to stave off decay, so much the better.

For the frame work and rafters use 2x4 stuff. In cold climates the walls should be double, with a four-inch air space between. Ship-lap or tongued and grooved lumber, should be used for the outside wall. It is cheaper to buy for this purpose, a good grade of lumber, free from knots. For the inner wall as cheap stuff as No. 4 siding will answer, surfaced on one side, so it will take kindly to white-wash. Put the outside boards on up and down, the inside boards crosswise, which will greatly strengthen the house and render cross braces of any kind unnecessary. After the frame work is complete put on the outside wall, and make as snug a job of this as you are able, taking pains to shut out as much draft and air as possible. Now before you put on the inner wall cover the inside of the outside wall with tar paper or tarred felt. The latter is stronger and more lasting. Fit this in closely around the 2x4 pieces, with a view to shutting out every bit of draft. use lath to hold this paper or felt in place; nail or tack heads are not large enough. In damp weather the paper will fall away from them. After a good job has been made of this important task, put on the inside wall. If thin but close fitting ceiling can be used, so much the warmer and better.



Combination Roost, Drop Board, Box to Catch Droppings and Nests.

As for the roof, use shingles, buying a medium to good grade of them. Use cheap sheeting first, cover this snugly with the paper or felt, then put on the shingles. This will give you a tight, warm and lasting roof. A ceiling will not be necessary, unless the expense of making the house still warmer is not dreaded; in that case put on the same ceiling as is used for the side walls.

Moderate Sized Windows.

The windows should not be large. For 12x12 apartment two half windows put in side by side, instead of one above the other, will answer. They can be put in so as to slide to either side or be changed at the top so as to swing outward and form an awning to keep out summer rain. But these windows should be snugly built, should close against wide enough jambs to keep out the cold and be hooked tight in the winter time. They should also be located down near the floor, the bottom sill within two feet of the floor—so that the sunlight in winter will fall on the floor, not against the rear wall or sill. Windows that are too large draw too much sun warmth during the day time and let in too much cold at night, resulting in extremes of temperature that are more hurtful than a lower mean

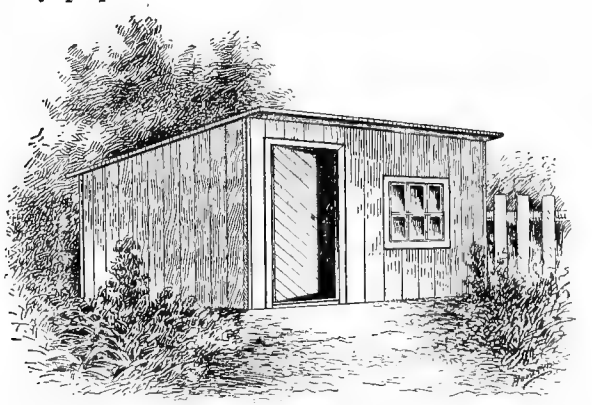
temperature. In the far north it is a good plan to double-glaze the windows, leaving a quarter or half-inch space between the glass. The man who makes the sash for you can do this work.

The Yard Fences.

The yard fences shown in the illustration are six feet high, with a strand of fine wire four inches above the top of wire netting. 9 four-foot fence is sufficient for Brahmas, Cochins, Langshans or Indian Games. For the Plymouth Rocks, Wyandottes and Houdans, provide a six-foot fence; for Leghorns, Minorcas, Hamburg, etc., one higher still, up to, well, say one hundred feet. These flighty fowls will remain inside a six or eight-foot fence, provided they want to. It is largely a matter of their being contented. If changed about from yard to yard, they will fly over a barn in their efforts to get back home.

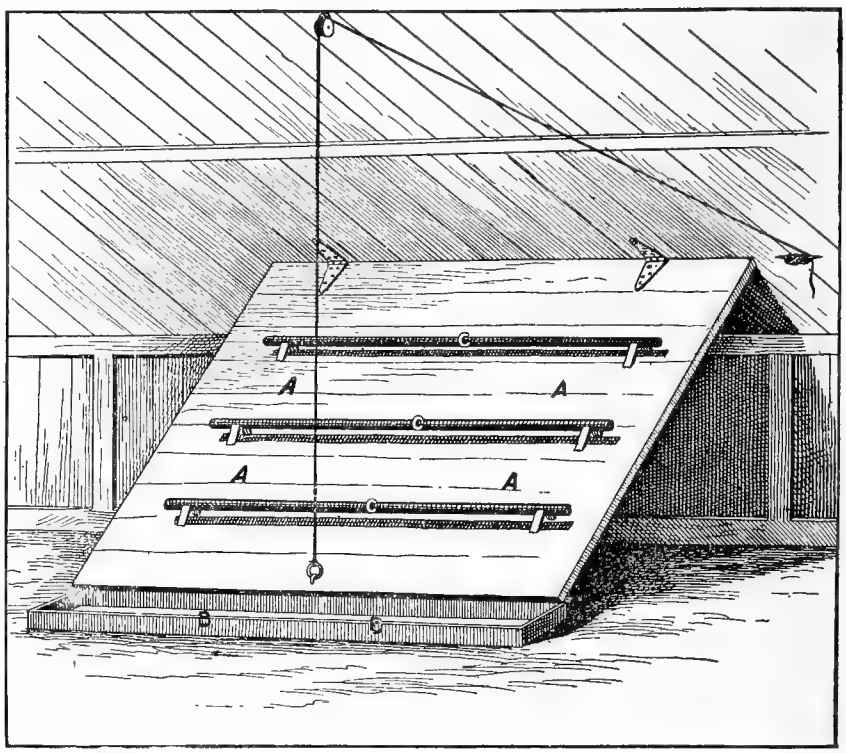
In building the fence do not provide a top rail for the fowls to alight upon. Let the upper paling that holds the netting in position be six inches below the top of the netting. Use posts that are long enough to extend twelve inches above the paling; weave a stout wire through the upper mesh of netting and stretch tight and fasten to posts to hold netting upright and in place. Then, if found necessary, stretch a thin, thread-like wire between the posts some four inches above the netting. If they do not see the thin wire it will throw them backward into the yard when they try to alight on top of the netting, or fly the fence, aiming to just clear the netting.

If a single house, instead of a double one, with scratching shed, is desired, use only one-half of the house shown in the illustration. Gates should be conveniently placed in the fences to save steps. One next to the house is very handy, where two yards are used. If the housese are continuous, gates between the runs are a necessity and a labor-saver. If they have spring hinges all the better. Sometimes larger yards are connected with these small runs, in which case it will be an advantage to place gates between the large and small yards, as they will enable one better to change the fowls from pen to pen when necessary to do so for any purpose.



This illustration shows a good, but cheap poultry house, 12x16 feet, one that can be built very reasonable. The height of the house in the back is 5 feet; the height in front, 7 feet, making a pitch of 2 feet, in the 12 foot drain. The following is the bill of lumber that is necessary to build this house.

Flooring			
3 pieces 16' x 4"x⅞"	Stays to nail to	142 feet	Front
2 " 6' x 4"x⅞"		19 "	
1 " 3' x 4"x⅞"	Door casing	5½ "	
1 sash 12"x14"—4 light sash			
Flooring		100 feet	Back
3 pieces 16' x 4"x⅞"	Stays to nail to	16 "	
Flooring		180 feet	
6 pieces 12' x 4"x⅞"			Ends
2 " 7' x 4"x⅞"	Stays to nail to	32 "	
2 " 5' x 4"x⅞"			
19 pieces 13' x10"x⅞"	Barnsiding	225 feet	Top
3 " 16' x 4"x⅞"	Stays to nail to	16 "	
18 " 13' x 3"x⅞"	Battens	60 "	



A Roost and Droppings Board That Can Be Used to Good Advantage in Any House.

We herewith give you a little description of the above roosts. This roost is 5x5 feet in size; see A, A, A, A. This is hinged to the ceiling, and during the day (in the winter time especially) is drawn up by means of a rope and pulley, out of the way, thus giving the fowls the use of all the floor space in the house. The droppings board B, B, is loose on the ground and can be set back against the wall, out of the way, after the droppings have been removed. C, C, C, represent the roosts which are made of 2x2 inch pieces (2x4's ripped in two), the two upper corners being rounded off with a plane or other tool. Sifting the droppings board each day with road dust keeps in check all odors and causes the droppings to find their way readily into the box at the bottom. We like this scheme very much. In the winter time, when the fowls are confined, they need all the floor space they are likely to get. Besides this arrangement is cheap and handy. Make the box B, B only a trifle wider than the blade of an ordinary shovel, and two moves or even one will clean it out.

The above roosts are adapted for any size or kind of a house and can be lifted up out of the way during the day and give the entire house room for the poultry to roam or scratch and is cheap and is a good design.

MODEL BROODING HOUSES

Several Styles of Practical Brood Houses Designed to Suit Poultry Plants of all Sizes—Information on the Handling of Chicks in These Houses.

WE STATE with emphasis that the broiler or market poultry business is not a delusion and a snare, as many seem inclined to believe; it is really a field of profitable and safe investment. The fact that men who are wholly unsuited to the poultry business in any of its branches have rushed pell-mell into the "broiler business" and made total failures, is not proof that there is no money in broilers. We know that there is good money to be made in this branch of poultry raising; this fact has been clearly demonstrated on hundreds of successful chicken and duck farms. We firmly believe that the broiler business is destined to be one of the most profitable in the list. There is something still to be learned (there always will be), but the demand exists, the appliances are at hand, and active brains are at work solving the problem of success.

A sample of why some people fail to succeed in the broiler business came to our personal notice this fall. A Hungarian from Chicago visited Quincy to buy one hundred Barred Plymouth Rock laying hens. He wanted us to agree to furnish him the hundred hens, and to contract that by the tenth day after they reached their Chicago quarters fifty of them would be laying. We told him that it would be impossible for us to fulfill such a contract. This man, five months before he came to Quincy, had no thought of going into the poultry business. At this time, however, he had $2,500 invested, and was rapidly getting afraid of his own shadow. The fact that he thought that any one could furnish him with one hundred hens in the midst of the molting season, fifty of which would lay within ten days after being shipped 260 miles away, and being placed in strange quarters, in strange hands, showed how very little he knew about the disposition and habits of poultry.

Another man wrote us in August, saying that he proposed to engage in the broiler business on a large scale; that he had ample capital and was confident of success. Then he asked if it would not be a good scheme to buy a few thousand fresh eggs at August prices and save them until the following January and February for hatching purposes.

In view of such cases as the above, and the well-known fact that in ordinary mercantile pursuits a large per cent of those who embark fail to succeed, it is not at all surprising that a good many of those who go hastily into the broiler business meet with failure. If a person has not a natural liking for poultry, if he is not pains-taking, economical and persistent, he will not succeed in this business, not to a satisfactory extent. In this day and generation, when competition is so great, a man to succeed in almost any business must stick to it closely, employ the best appliance sand watch every point.

We advise those who think of going into the broiler business, who have had little or no experience with poultry, to go slow; to buy one or two incubators or brooders and learn how to use them with good results before buying a dozen. Spend a year in experimenting, if need be. This is straight, honest advice. There is no great hurry. You can depend upon it that the demand for broilers will be as great next year as it is now. America will never consume less poultry and eggs than she is now consuming. We are sure of this. Our people, in proportion to population, do not today consume one-half as much of these foods as do the European nations. Our population is rapidly increasing, our cities are growing at a surprising rate—more and more poultry and eggs will be demanded as the years go by.

We insert here an extract from a report of our trip east, made during the summer of 1898, touching on the broiler business: "Mr. Thomas Allen, one of the proprietors of a large poultry farm, began as a boy years ago to buy common poultry and eggs for market, going from farm house to farm house. He kept branching out until now he buys and ships to the Philadelphia and New York markets $150,000 to $175,000 worth of poultry and eggs each year. He stated that probably his business in this line will reach $185,000 this year. He buys practically all of this amount within a radius of twelve miles of Glassboro, so it may be seen that this is quite a poultry raising section. He has men with wagons who make regular trips out through the country.

On July 6, which is late in the season, Mr. Allen was paying ten cents per pound for young ducks and twenty-one and twenty-two cents per pound for spring chickens—the larger the better. "The duck market," said he, "is being overstocked this year here in the east. The price for ducks is now lower than I have ever known it to be, while the demand for choice spring chickens at good prices has been away beyond the supply. There is good money in spring chickens at the present prices."

"Capons pay well," continued Mr. Allen. "They bring twenty cents a pound from Thanksgiving to April 1, then range down to fifteen cents. I bought five hundred from one man this spring. The largest pair I have bought this season weighed twenty-eight pounds, and I paid the owner twenty cents per pound for them. Capons should be marketed when from seven to twelve months old.

"I do all I can to encourage farmers and farmers' wives to raise better stock each year, to improve its size and appearance when dressed by using standard-bred males with their flocks. They have done this until I am now able to buy much choicer dressed poultry and to get top prices for it. I buy it all dressed and aim at the top of the market. As a matter of fact poultry is the best paying crop raised in this section. There is no doubt that it pays better than any oher crop marketed. Many people have found this out and others will.

"One year I bought five hundred and seven tons of dressed poultry, all within a radius of twelve miles of Glassboro. Farmers' wives raised the most of it. Now and then you will nnd a farmer who turns in and helps, but the women in this section raise most of the poultry.

"I like Wyandottes best for early fries, for broiling, but

for five and eight-pound roasters, the Cochins are the best and tenderest. The introduction of Asiatics has increased the weight of market poultry in this section from two to three pounds per head. I constantly advise farmers to buy big, vigorous, thorough-bred males to put with their common hens, and they are doing it. Those who do this and take pains soon find their poultry to be the best paying crop they raise."

If you know very little about handling poultry, begin on a small scale. Build a brooding house that will hold 500 chicks (or even 200), but build it so that it can be added to from year to year. Any properly constructed brooding house can be built part at a time. Think twice, think several times, before you take a step forward. Feel your way. This is the great secret of success. Advice is cheap. Experience costs dearly, but is generally worth the price. Save on experience by accepting good advice given in this book.

The next few years will witness the development in the west, northwest and south of dozens of large broiler farms and scores of small ones. The best and most successful of these will be combination farms. They will combine thoroughbred poultry with market poultry, and will give close attention to egg production and the raising of broilers, roasters and capons. By this combination a substantial, lasting and profitable business can be built up.

An inviting feature of the poultry business is the fact that a man or woman can begin at the bottom, with a small amount of capital, and by proper effort work up a big and paying business. There is apparently no limit to this business. No one has ever yet reached a limit. There are farms with capacities ranging from 10,000 to 20,000 chickens and ducklings per year, but these men do not pretend that they have reached the limit of profitable investment.

SINGLE ROW RELIABLE BROODING HOUSE.

On the next page are presented drawings of the Single Row Reliable Brooding House, a house that embodies the best ideas to date for a single row house. This house can be built in any length, the usual width being twelve to sixteen feet, sixteen feet preferred. This gives room for a four-foot aisle along the rear wall of the house, for brooders, two and a half feet in width and for inside yards or runs nine and a half feet in length. These inside runs can be built on the plan of the Hammonton brooding house shown herewith, that is, yards to be increased in size to accommodate the chicks as they grow larger, or the number of chicks can be reduced. The latter is perhaps the easier plan, for then the brooders are all of the same length, but either plan can be used as desired.

If a long brooding house is built a double heater with pipes extending both ways should be used, for this places the heater mid-way of the house, thus bringing the source of heat nearer to the pens located in the ends of the house farthest from the heater. Where a short house is built, say one of fifty feet or less in length, a heater with pipes extending from one side only will do very well. If a house one hundred feet long is built, by all means locate the heater in the middle of the house.

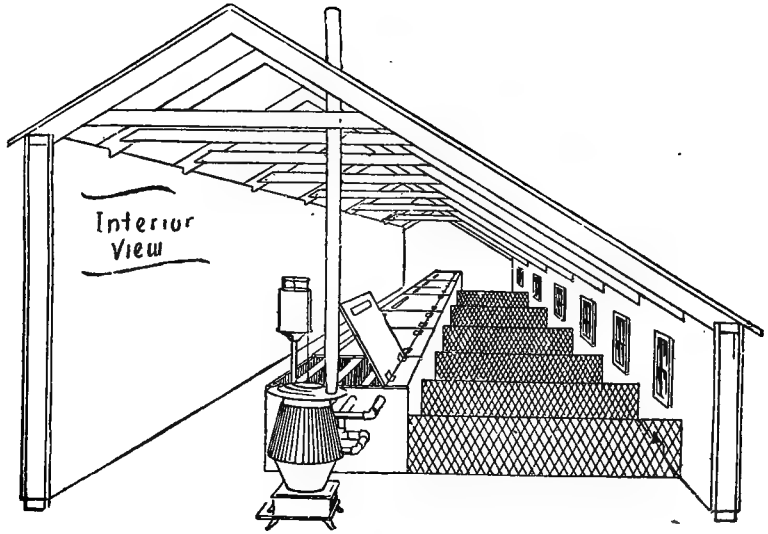
A pit should be dug fifteen to eighteen inches deep for the location of the heater. Make this pit large enough so that the heater can be taken care of conveniently, and the coal pit or bin should be located back of the heater and within easy reach of it. The Reliable Incubator and Brooder Company furnishes these heaters separate, or with complete piping outfit, as desired. If you are located in a large city where first-class plumbing can be had at a reasonable price, it may be as well for you to buy piping near at home and save freight charges, though the freight charges on material of this class are not excessive. We think, as a rule, it is better to buy a heater and piping complete, with full directions in the shape of blue prints for setting up, building the brooders and operating same. The Reliable Company furnishes blue prints and full instructions for building and operating both the single row and double row Reliable brooding houses. Where their plans are followed, they assume the responsibility of proper fittings, etc., which as a rule, more than offsets the freight charges, for they know what they are about in this particular line, while the ordinary plumber may be at fault.

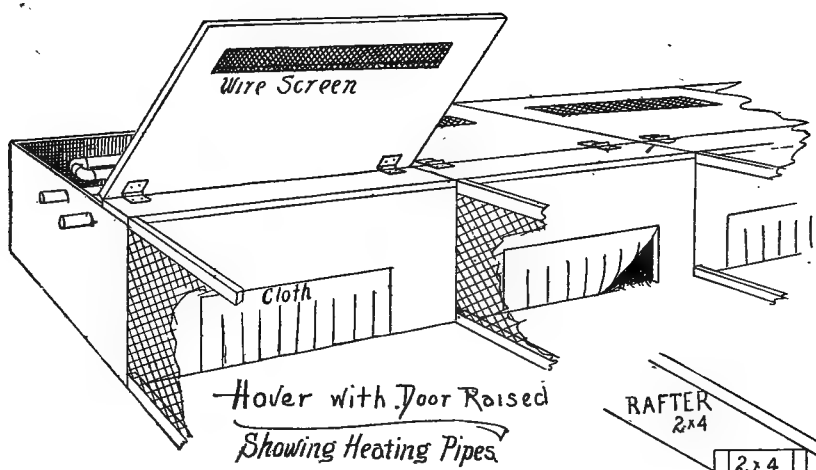
Any good carpenter might, by studying the plans shown on page 38 and consulting the following bill of material, build this single row brood house without making a mistake. It is really a simple affair, but should be well built and snugly built to preserve the heat and keep out the cold. Brood houses like the two illustrated herewith are extensively used by the successful duck and broiler raisers of the east:

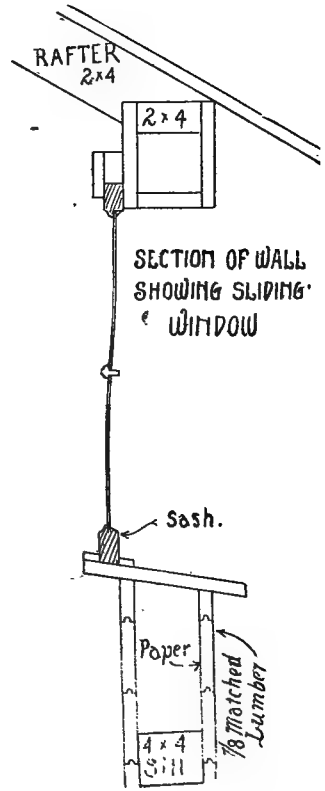
Bill of Material for Single Row Reliable Brood House—No. 4.

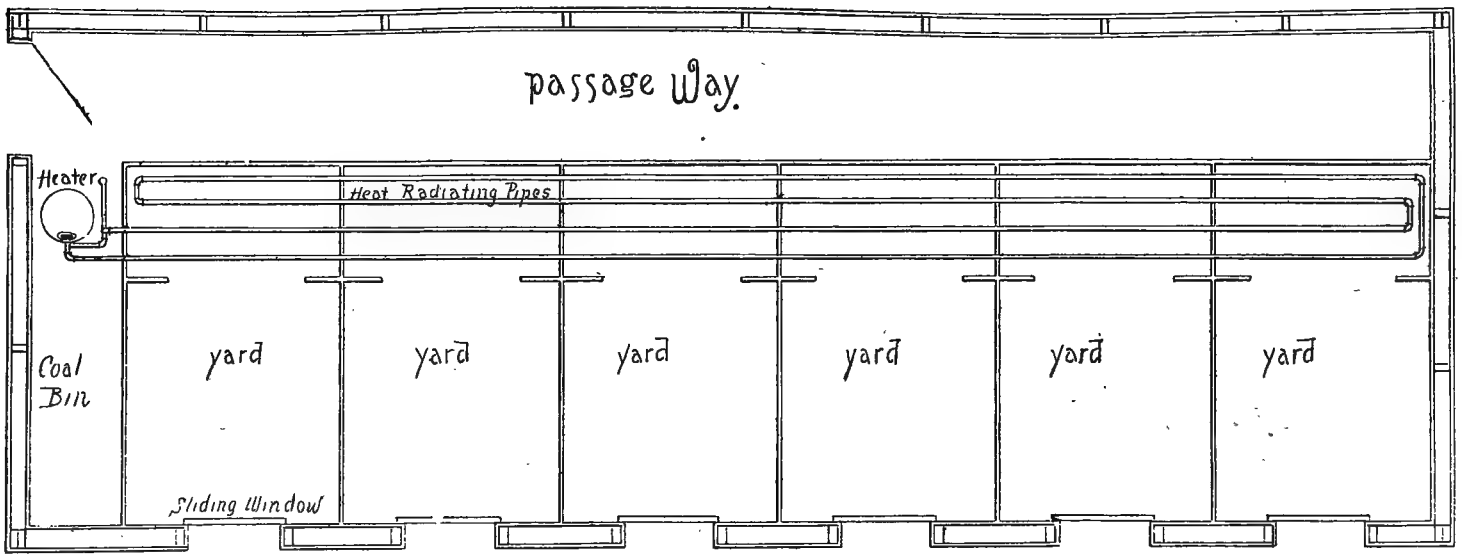
4	4x4	16 foot sills.
2	4x4	12 foot sills.
9	2x4	7-10 long side.
14	2x4	3-10 short sides.
17	2x4	12 foot rafters.
17	2x4	5 foot rafters.
5	2x4	7 foot end studs.
15	1x4	8 foot collar beams.
6	2x4	6 foot partition for wire.
5	2x4	16 foot plates.

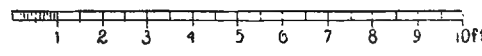
Sixteen posts set in ground, 560 feet 8 feet wide matched, 618 feet 12 feet wide matched, 100 feet 12 inch stock for casing, 650 feet sheeting, 5,250 shingles, six windows, sash 2 feet 6 inches wide, 32 inches high, 84 feet stock for pens, 212 feet 12 inch stock for brooder, 32 feet six inches dressed fence for ridge boards, 7 pair 4 inch strap hinges, 6 pair spring hinges for chicken doors, 25 pounds 20 spikes, 50 pounds 8 common nails, 24 pounds 4 penny nails, 10 pounds 8 finish nails, 1 gross No. 7¼ screws for doors on brooder, 2 pounds wrought nails, 36 lineal feet wire netting 2 feet wide, 1,350 feet paper.











Floor Plan Single Row "RELIABLE" Brood House

DESIGNED BY

Reliable Incubator & Brooder Company Quincy Ill

DOUBLE ROW RELIABLE BROODING HOUSE.

This double row Reliable brooding house, as illustrated and described on page 40, is, we believe an entirely original production of the Reliable Company. It combines a number of features found in no other style of brooding house and has several advantages that make it extra valuable. The row of gable windows fronting south permits the sunlight to fall into the north or rear row of pens during the winter time when the sun swings low in the heavens, while in the summer time, when the sun is high, the four-inch casings to these windows cut off every bit of sunlight from the interior. It is in the winter time that sunlight is so essential to the health and comfort of the chicks, and at this season of the year both rows of pens are taken care of in this respect.

By locating the brooders half way in the aisle and half way in the pens, with hinged lid doors opening from the aisle, the chicks can be put into the brooders and the brooders cleaned out without going into the pens. A house built after this style, that is 100 feet long, is equivalent to a single row house 200 feet long, but is much more compact, is easier to keep warm and of a uniform temperature. A house of this style that is 100 feet long should have two stoves, one to heat the piping system on each side of the aisle, and these stoves, when located midway of the building, will keep the general temperature moderately warm, in fact, drums can be put on the stoves if desired, or common stove pipe can be conducted the length of the house, one going in one direction, the other in the other direction, thus utilizing practically every bit of heat that comes from the fuel. Two stoves with drums or stove pipes as suggested operated in a house of this style, that is warmly built, will keep the temperature up to 60 to 70 degrees in ordinary weather, and this will give an ideal place for brooder chicks.

The youngest chicks should always be placed in the pens next to the stoves, or nearest to the source of heat, and this will also place them in the warmest part of the building. The south and north walls of this building are to be only three feet or three and a half feet high under the eaves, are to be double, with a four-finch air space between, the outer wall to be lined on the inside with building paper or tarred felt.

The house foundations measure 100x20 feet, inside measurement. This allows a passageway four feet in width, and leave space for forty pens 5x8 feet, twenty on each side of the aisle. Allowing one hundred chicks to the pen until they are three weeks old; seventy-five to the pen when they are between the ages of three and six weks, and fifty to a pen after six weeks, or an average of seventy-five to a pen, this house is calculated to accommodate 3,000 chicks.

The foundations consist of 4x6 pieces, resting on the tops of 4x4 red cedar posts that are two feet long and sunk into the ground a distance of twenty-two inches on an average—the ground being nearly level. At no point do the 4x6 pieces rest on the soil. The floor of the house is covered with three to four inches of sand and fine, screened creek gravel, and it is this dry gravel and not the surface soil that comes in contact with the sills.

Pieces 2x6 are used to support the large roof, the uprights all being of 2x4 stuff. It is hardly necessary to go into such details as these, as any carpenter and builder should know what sort of lumber is required for such a building, so far, at least, as its strength is concerned. The sides of our house are made of No. 2 tongued and grooved lumber, planed on one side.

Both roofs should be shingled, the sheeting to be put on first, close together, building paper or tarred felt to be put on over this and then the shingles put on with four inches exposed to the weather, which will insure a warm roof. Of course the building can also be sealed overhead if desired, leaving a four or six-inch air space, which will make it extra warm. It pays to build a brooding house so as to have it plenty warm. It will save more than enough fuel to pay a handsome interest on the extra investment and will save in labor and in loss of chicks as long as the house is used.

The windows (forty of them) are all of the same size, 20x40. The house faces to the south. All the windows are hung from the top and are made to open outward, so that if left open during a rain storm the rain will not beat in.

The rear section of this house is four feet wider than the forward section, the four-foot passageway being entirely under the rear roof. The supports of the roof of the rear section extend down to the ground and form part of the partition dividing the pasageway and the front tier of pens.

The rear wall or back of the house is only three feet high, the extreme height of the rear section being eleven feet. This gives the big roof a good pitch. The front section is forty-two inches high at the eaves and seven feet six inches high where it joins the rear section. This roof is a little too flat for the good of the shingles.

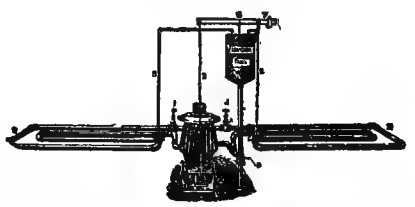
Board and wire partitions are used, two twelve-inch boards being placed at the bottom and two-inch wire mesh above. Doors open from the hallway into each pen. The attendants and visitors are required to step over a twelve-inch board in going in and out of the pens. Every door is supplied with a spring so that it does not fail to close after the large percentage of visitors, who, as the saying goes, "must have been raised in a barn," as they seldom close a door behind them.

In our opinion, here is the best style of brooder house for raising broilers that has been designed thus far. If a man can not raise chicks successfully in a brooder house of this kind, the chances are about ninety-nine to one that he is not qualified to raise them anywhere in any way. The bill of lumber for this house is presented herewith, and any good carpenter can build it.

Bill for Material for Reliable Double Row Brooding House —No. 3.

15	4x4	16 sills.
6	4x4	12 sills.
3	4x4	14 sills.
18	2x4	10 center studding.
15	2x4	12 side sills.
30	2x4	16 studs and plates.

Two thousand one hundred feet 12-inch stock for brooder and casing, 2,600 feet wide matched, 2,400 feet sheeting, 20,000 shingles, 48 windows 12x14, 4 lights, 48 pairs 2-inch butts, 3 gross ¾ No. 6 screws, 150 pounds 8 common nails, 50 pounds 20 spikes, 10 pounds 8 finish nails, 4 pairs 4-inch strap hinges, 32 pairs spring hinges, 3,700 feet paper, 240 lineal feet wire netting 2 feet wide, 200 lineal feet wire netting 6 feet wide.



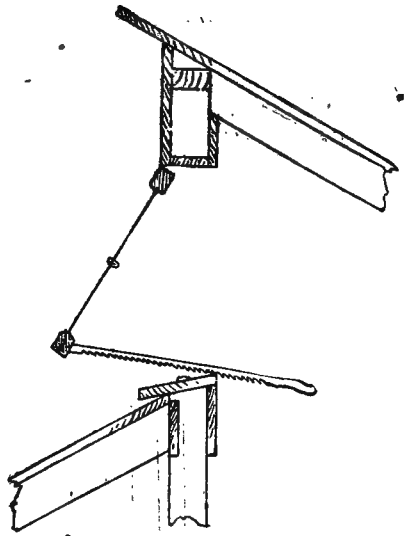
This illustration shows Heater in center, so it can be used in the House shown above of which less fuel will be used and give more heat as the longest distance of pipe from heater is only 50 feet. Where heater is at end of 100-foot house the pipe distance is 100 feet.

Double Row Reliable Brooding House

DESIGNED BY

Reliable Incubator & Brooder Co.

Quincy, Ill.

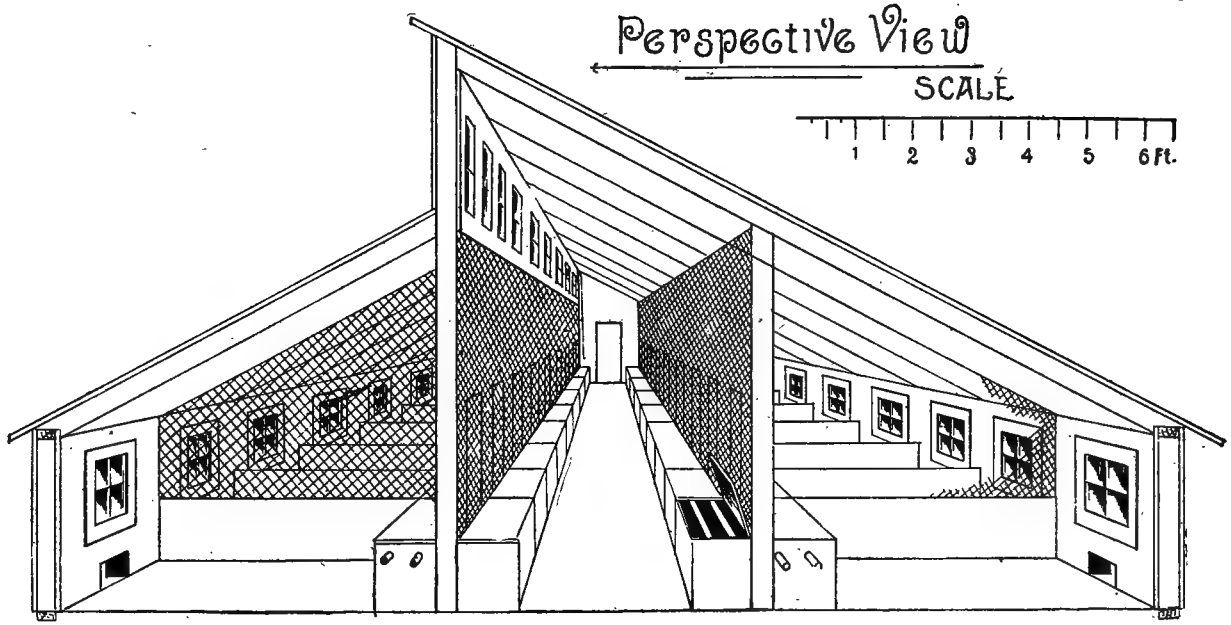


WINDOW AT GABLE TO SWING

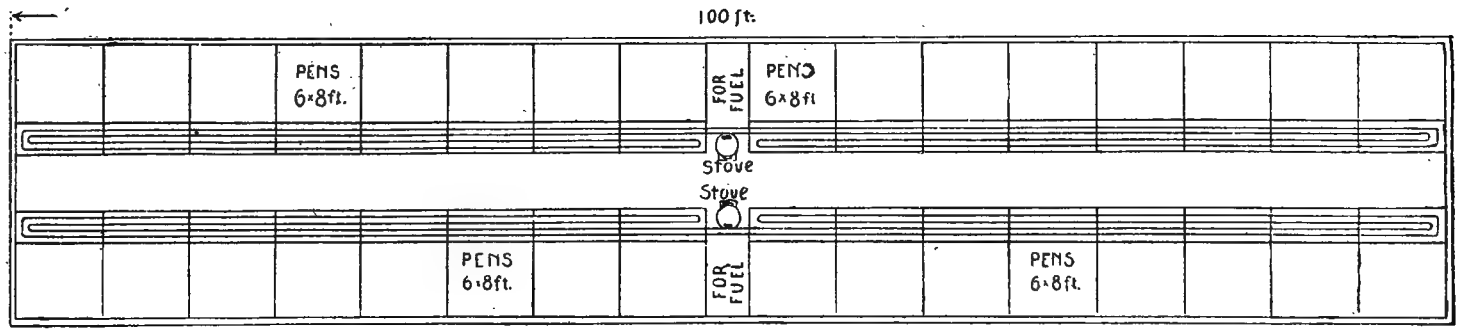
Perspective View

SCALE

1 2 3 4 5 6 Ft.



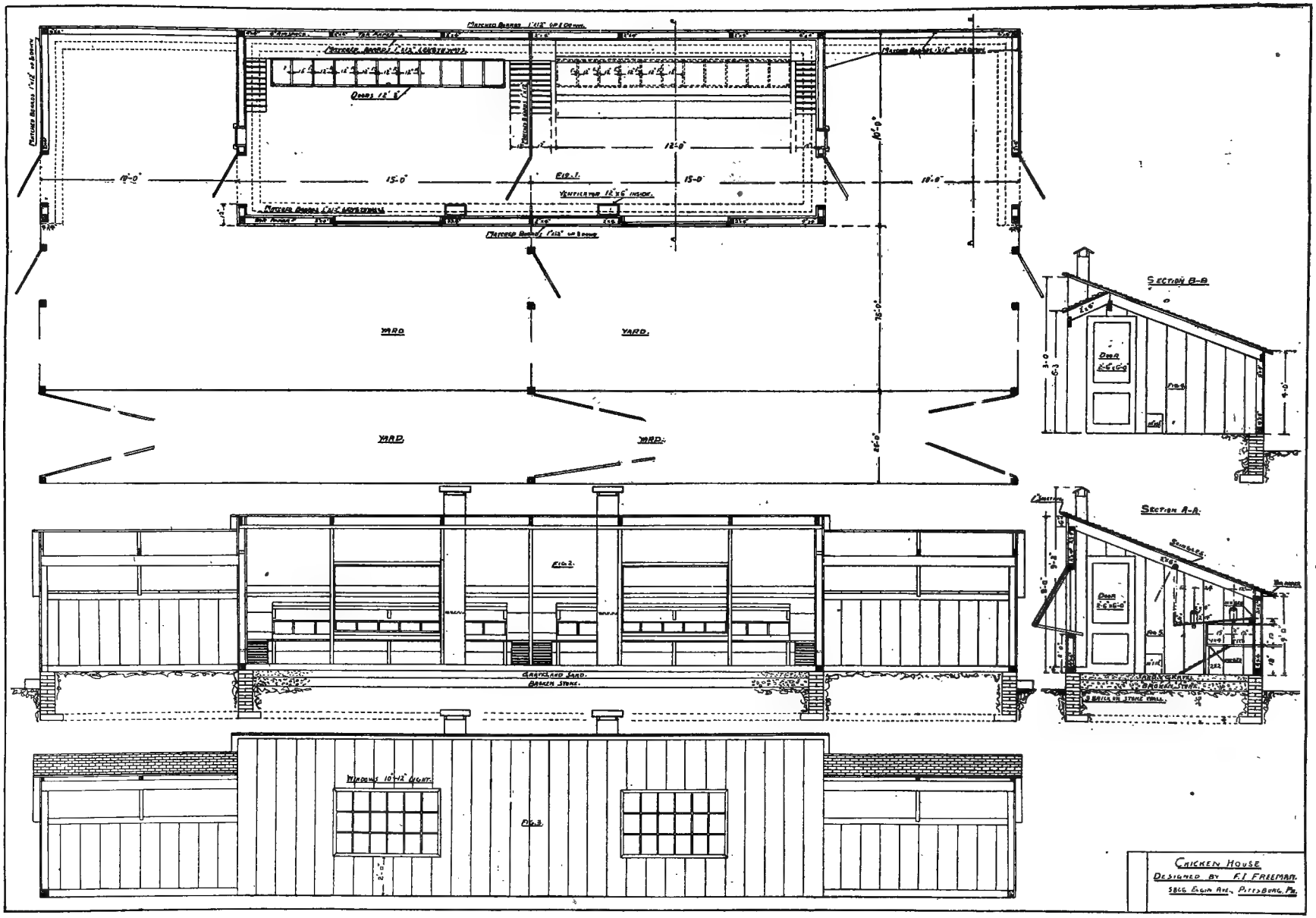
Bill of Lumber		
15	4×4	16ft Sills
6	4×4	12 "
3	4×4	14 "
18	2×4	10 - Center Stud.
15	2×4	12 - Side "
30	2×4	16 - Plates & "
12	2×4	14 - "
36	2×4	16 - Rafters
36	2×4	9 " "



FLOOR PLAN

SCALE

5 10 15 20ft

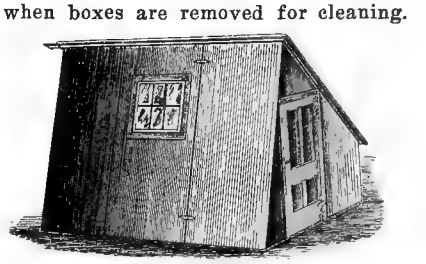


Poultry House Designed by F. I. Freeman, Pittsburg, Pa.

DESCRIPTION OF HOUSE.

Designed by F. I. Freeman, Pittsburg, Pa., for "Success with Poultry."

Figure 1 is a ground plan of the building which has a total length of 50 feet and a width of 10 feet. The enclosed houses are 10 by 15 feet. The scratching sheds each 10 by 10 feet. The building is 8 feet high in front, which faces the south, and 4 feet high at back or north side. There is a solid wall foundation under the building except front of scratching sheds. This foundation may be built of stone, brick, or concrete whichever is preferred. They must be deep enough to be below frost. The top of foundations should be at least 10 inches above the ground. My idea is then to make the floor of the entire house and sheds by filling in first 6 inches of broken stone then cover this with 4 inches of gravel and sand, thus bringing the floor of building 10 inches above the ground on the outside. This will give good drainage and make a warm, dry floor. The walls of the entire building are made of 1 by 12 barn boards, matched and planed on one side. Outside to be painted. The boards on outside to be put on up and down as shown in figure 3; those on the inside to run lengthwise. By putting the boards on in this way the building will be well braced and strong. All walls of the enclosed house are double with a 4 inch air space between walls. The inside of outer walls are all lined with tar paper. The walls of the scratching sheds are single. The roof of entire building is first sheeted with rough hemlock boards, then covered with tar paper, then shingled with pine shingles laid 4 inches to the weather. The sills are 4x4 inches. Rafters 2x6 inches; balance of frame timber 2x4 inches. There is one window and one ventilator in each of the enclosed houses. Each window has 12 lights of 10x12 glass. The windows are hung on hinges at top and swing out at bottom, therefore when open rain and snow cannot well blow in. The windows are only 2 feet above the floor. The sash, when windows are closed, come against a flat surface (see figure 5), making it an easy matter to equip same with window strips, so that there will be no draft around windows when they are shut. The ventilators are 6 by 12 inches inside and extend down to within 4 inches of the floor; the bottom is open but is provided with a slide to regulate the draft. The roof of the enclosed houses slope one way (as shown in figure 5) while the roof of the scratching sheds slope both ways (as shown in figure 4). The object of this is to prevent the snow or rain to some extent from blowing into the sheds. There is also a curtain door in front of the openings that can be let down when necessary to keep out storms. There are two yards or runs for this building, each yard is 25 feet wide and 100 feet long. Twenty-five feet of the lower end is fenced off from main yard and is intended to be plowed and planted with something for green food. The birds to be allowed to run in this part of the yards part of each day to get the green fod. It is my intention to plant fruit trees in these yards not only for shade for the birds but for profit. These trees are to be set in rows so as not to interfere with plowing of yards when necessary. Gates are arranged so that caretaker can pass from yard to yard without going through buildings and doors arranged so caretaker can go from pen to pen and through buildings without going outside of buildings. The arrangement of dropping board, roosts and nest boxes are shown in figure 5, also figure 2. The dropping board is 3 feet high in front, is hinged to wall at back and can be drawn up to roof out of the way in the day time. The supports for roosts are let into the dropping board but not fastened to same so that they can be taken out and cleaned. The roosts and supports for same are made of 2x4 lumber, the roosts rounded some at top. The nest boxes are 12 inches high, 12 inches wide and 15 inches deep. The openings to nest boxes faces back side of building. There is a passage-way for hens 12 inches wide and 12 inches high between the front of nest boxes and back of building; this makes nest boxes dark and secluded, as I understand they should ze. The front of boxes are closed up at bottom for a distance of 3 inches. The back is entirely closed by doors to each box which can be opened to take out the eggs. There is a ladder that runs from floor of house to each end of passage-way, so that hens can easily walk up to same. The nest boxes are made in separate pieces, that is the top of boxes is in one piece, the bottom in one piece, and the center in one piece, so that all pieces can be easily taken out separately and cleaned. The bottom of the nest boxes is 18 inches high from the floor so that birds can go under it, therefore the floor space in house is not lessened. The legs that support bottom of the nest boxes are hinged to bottom so will fold up when boxes are taken down for cleaning. The top and bottom of nest boxes are held in position against the back wall of house with pins which can be taken out when boxes are removed for cleaning.



Portable Poultry House.

The illustration shows a portable poultry house, which can be taken down and removed at any time by unhooking and hooking it together. We show herewith an illustration of a cheap portable poultry house.

In putting this house together, make each end in one piece; the top should be made in three pieces; the back lower side in one piece and the front in three pieces, so that it can be hinged each way over the window in front, so as to save the glass from breaking in the window. Clasp it in the corner with hooks and eyes, clasp the top upon it with hooks and eyes. Nail the strip along the edge underneath the top so that when the roof is set upon the house, it will hold itself. Then, use your hooks and eyes for keeping it together.

This house has a floor space of 12,500 square inches. The dimensions are 8x10 feet on the floor; height in front, 7 feet; height in back, 3 feet. The front has an 18 inch pitch. It has one window and one door. It should be built so that when the window faces the south, the door will be in the east end, and when folding together, the window is shielded so that there is no danger of breakage. It should be painted with two coats of red mineral paint, and it is just the thing for the village or city poultryman. The following is the bill of lumber for this poultry house.

Portable Poultry House, 8x10 Feet.

Flooring						
3 pieces	10' x 4	"x⅞"	Stays to nail to	75	feet	Front
2 "	3' x 2½"	x⅞"	Window casing	10	"	
1 sash	12"x14	"—4 light		1½	"	
Flooring						
2 piece2	10' x 4	"x⅞"	Stays to nail to	38	feet	Back
				7	"	
Flooring				100	feet	
4 pieces	8' x 4	"x⅞"				
2 "	7' x 4	"x⅞"	Stays to nail to			Ends
3 "	3' x 4	"x⅞"				
2 "	2' x 4	"x⅞"				
12 "	8' x10	"x⅞"	Barnsiding	80	feet	
3 "	10' x 4	"x⅞"	Stays to nail to	10	"	Top
11 "	8' x 3	"x⅜"	Bttens	22	"	

COMBINED RELIABLE ROOST AND NEST BOX.

No. 1—Size 12x42, lid to drop box hinged on No. 2.

No. 2.—Size 12x42, back to drop box hinged on No. 1.

No. 3.—Size 10x42, front to drop box notched in both ends to set on No. 4.

No. 4.—Size 12x12, on one end and 6 inches high, 46 inches long, total length consists of end to drop box cut down to six inches, making the side lower.

No. 5.—Same as No. 4, only have opposite ends.

No. 7.—12x40 bottom of roost box to go inside ends 4 and 5.

No. 8.—Bracket to fasten on back of No. 2 to hold door of drop box up.

No. 9.—2½x42, screw on over edge of No. 6 and fasten on top ends 4 and 5.

Nos. 10, 11, 12, 13.—Four pieces, 4v36 uprights for afstening on side of Nos. 4 and 5 at bottom and 14 and 15 at top, two on each side.

Two pieces 6x36, notched in 1x4 for top roost Nos. 16 and 17 to set in.

Nos. 16, 17.—Two pieces 4x48, top roost to go in notches 15 and 15.

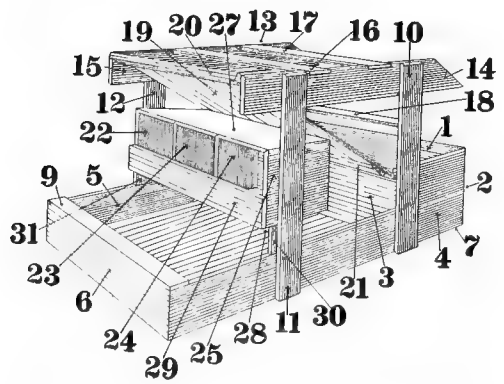
No. 18.—One piece 4x40 middle roost or step to fasten between 10 and 13 (midway).

No. 19.—Drop boards, 42x39, notched on four corners, notching being 1x4 with hook on upper corner to hook to Nos. 14 and 15.

No. 20—3x40 piece to hold board together to be underneath drop board, upper part.

No. 21.—Piece 3x18 to hold drop piece together, to be underneath below.

Nos. 22, 23, 24, 25—Two ends and two center partitions, 11x15 each, to divide spaces in Nest Box.



No. 26.—11x42.—Back to Nest Box.

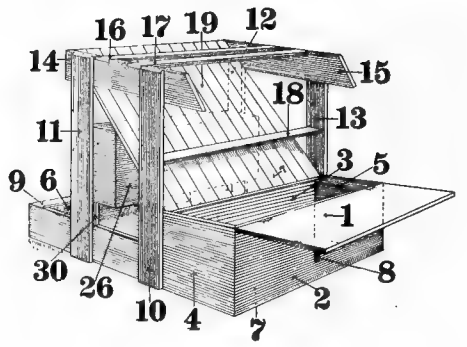
No. 27.—15¾x42, bottom of Nest Box.

No. 28.—15¾x42, bottom of Nest Box.

No. 29—3x42, front on lower edge of Nest Box.

Nos. 30 and 31—Two small pieces to fasten to 11 and 12 to hold up Nest Box.

Nos. 30 and 31 are not necessary unless you desire to have your Nest Box raised high enough that your chickens can scratch underneath. Nest Box will set down upon Nos. 4 and 5 between 11 and 12 if Nos. 30 and 31 are not used. These two small brackets we do not send with the roost. The size of the brackets should be 1 inch thick, 3 inches high and 7 inches long. The lower end of No. 19 of the drop board should set in the drop box on the upper edge of No. 3 so that it will give a gradual slope down and all litter will naturally go into the box. The top of the drop box and the inner side of the box is arranged so that it leaves space enough when the top of the box is closed down for an easy ascent to this box.



See reproduction, that will give you information and teach you how to put this together. They can be put together with screws and taken apart at any time.

Combined Roost and Nest Boxes, which are used exclusively on the Reliable Poultry Farm at Quincy, Ill., and which are exceptionally high class roosts, having advantages over a great many other roosts in cleanliness, etc., and these illustrations show both front and rear views.

The nest boxes, which are removable, as will be noticed, are arranged in the rear and underneath the dropping boards, which keep them perfectly clean. The dropping boards are arranged to carry all droppings to the hinged box in front, which can be easily cleaned. This box should be kept closed, as there is enough space back of the lid for the droppings to pass by.

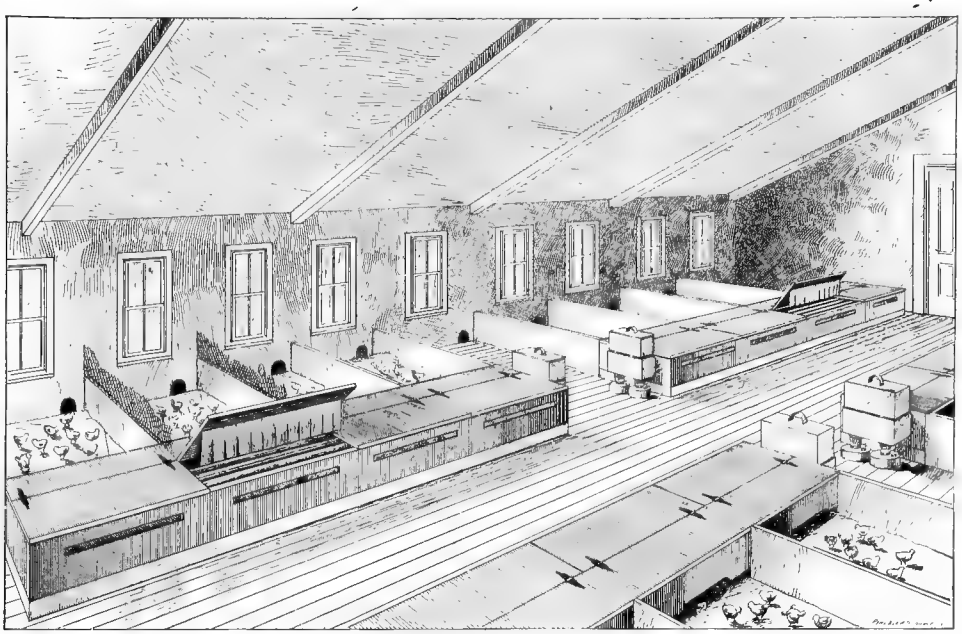
should be kept closed, as there is enough space back of the lid for the droppings to pass by.

You will notice the roosts have a piece located on top, half way between the roost and dropping box, thus making an easy ascent for the fowls. This roost has been admired by a great many breeders. We herewith show you these roosts, marked with figures, so that these rosts can be made by anyone with but very little trouble.

Interior View of Double-Row Brooder House Showing Four Sectional Brooders in Position.

This house is designed especially for the double sectional hot water circulating system brooder and is heated entirely by lamps. This kind of a house equipped with these brooders are economical, as you can run either brooder independent by themselves and is meant principally for smaller breeders where only a 30 foot house is needed. In this style of a house, four, or more of these brooders can be used to an excellent advantage.

In the interior view of the house shown here, the wire partitions, or room to the pens are omitted, so that a better view can be obtained. The rear end of these partitions should rest on top of the brooder just far enough back of the hinges to where the door to the hover (one of which is shown partly raised) to be opened from the aisle, in order that the attendants can clean out underneath the hover each day, without having to enter each pen. The pens can be entered from the main aisle through the doors placed in the end partitions.



Interior View of Double-Row Brooder House, Showing Four Sectional Brooders in Position.

Before the chickens are placed in these brooders, put four to six inches of dry sand on the floor of the room, extending it under the brooder (as no bottom) thus, bringing the tiny chickens up from four to six inches nearer the warm pipes, than they would if they stood on the floor of the house. A dirt floor is all that is needed for such a house (but must be dry.) Two lamps are furnished with each complete brooder. The water boilers and reservoirs above should be made of copper. The pipes are the regular steam fitting pipes, which insure durability.

A space should be left between the back wall and the rear curtain, so that if your chickens get to crowding and crowding each other out into the cooler air at one place, only to creep back into the warmer air under the hover at another place.

We consider a house equipped with these brooders to be an exceedingly good and durable house, where the tiny chickens can be raised up from maturity with very little ease and without danger of being chilled, which naturally makes a profitable investment.

THE INCUBATOR CELLAR AND THE NEXT BEST PLACE

THE sole idea in building an incubator cellar is to control the atmosphere surrounding the machine so that there will be no external influences at work to affect the temperature of the egg chamber. To secure best results an incubator must be placed where there is little change of temperature from day to day. The incubator is an inanimate thing. It has no control over itself and so cannot be compared to the hen that hatches chicks in a manger when the thermometer is hovering around zero. The colder the weather, the closer the hen sits to keep the eggs warm, and if the weather becomes extremely hot she stands up and cools them off. The incubator cannot of itself guard against extremes of heat and cold, and so it becomes necessary that the operator should do so. Why not turn the lamp higher or lower to counteract external influences? Because that would not be following closely the teaching of nature. To raise or lower the temperature of the egg chamber takes time. Did you ever notice after having turned the eggs and replaced them in the machine how long it took to bring the thermometer up to 103 degrees, the point at which it formerly stood? Yes, and very likely you turned the flame of the lamp higher or placed a weight on the regulator to get the thermometer up to the proper notch, and then you had to open the door of the incubator to cool it off, it ran so high. When a hen returns to the nest her temperature is no higher than when she left it. The eggs which have "cooled off" resume their original heat gradually, and observation of these things teaches us that the temperature must be fixed and remain fixed, and that the eggs are all right in a chamber regulated to 103 degrees even if the thermometer does not register the wished for figure immediately upon replacing the eggs in the machine, also that not only must the operator avoid interferring with the temperature in this way, but he must guard against interference by atmospheric changes. That is why poultrymen build incubator cellars. The fact that a hen hatches chicks in a changeable atmosphere is no proof that she would not have done better under improved conditions. In fact we know the best hatches are made at a season when the temperature varies but little. Where are atmospheric changes least liable to be felt? Under the ground. Then that is where the incubator cellar should be built, yet not so far beneath the surface as to interfere with the purity of the air, free from excessive moisture or dryness, are the requirements of an incubator cellar. The lamps give off an amount of foul air that envelopes the machines, ventilation therefore must be perfect.

The majority of incubator cellars are built in great part below the surface of the ground, often in the side of a hill.

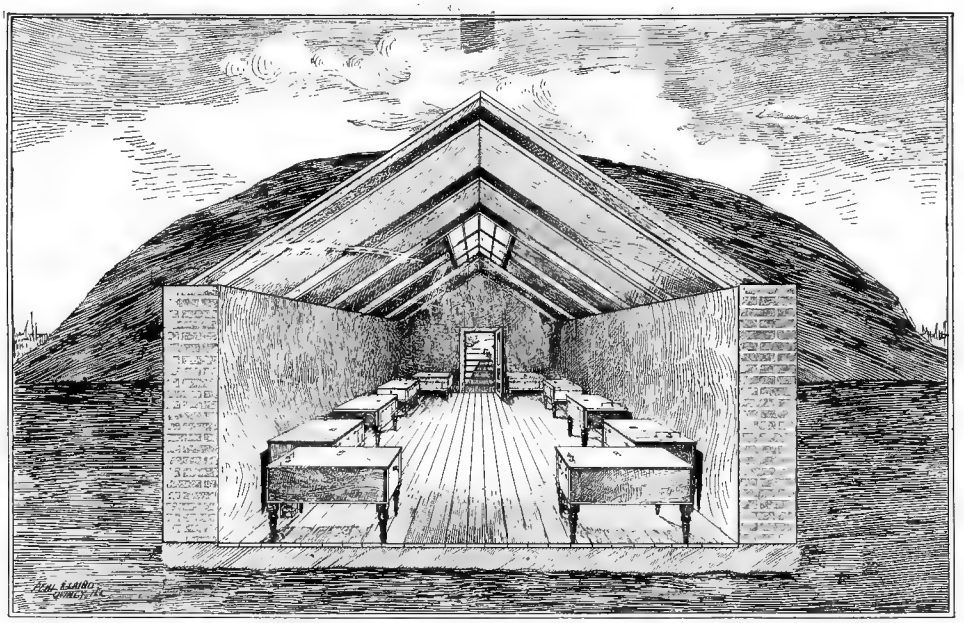
How to Build an Incubator Cellar.

It costs only a small amount of money to construct a first-class incubator house, or half-cellar, such as is commonly used on extensive poultry farms in the eastern states. On this page we show a sectional view of an incubator cellar. The exact plans for building such a cellar are at the discretion of the person chiefly interested, but in the way of general directions, we submit the following:

Choose a well-drained location, free from seep-water, and excavate to a depth of two or three feet. Two feet is ample. For the walls brick or stone can be used. If these are not available, hardwood or even pine plank will answer first-rate, except that they will not be as lasting. Where the ground is dry, plank will last for years. Build the side walls up to the height of four or six feet, as desired, having these walls half way below and half way above the surface of the ground. Build the end walls up to a peak to fit closely under the roof.

Persons who use only one or two incubators may not desire to go to the expense of building an incubator cellar, in such cases they must choose the next best location. Sometimes this will be found in the cellar beneath the residence; at other times a spare room in the residence, and during warm weather an outhouse may be utilized.

In using a house cellar the chief considerations are freedom from excessive moisture, and a plentiful supply of pure air. Even a hen set in a damp cellar will not do well. If the cellar is properly ventilated, that is if the air is continually being changed without too great variation in temperature there will always be sufficient moisture in the air. The fact that a thermometer in the cellar remains at or near the desired point is not proof that conditions are right. Foul air may be regulated at the same temperature as pure air, but chicks fail to hatch when the machine is surrounded by it. The incubator is not intended to purify the air, it is simply arranged so as to allow air to circulate through the egg



Style of Incubator Cellar Used on Large Plants.

The roof will need to be well built. Use for the roof 2x6 pieces, and if thought necessary, brace it with two uprights, one placed at each end of the fairly good-sized skylight, which is placed in the center of the roof. Cheap sheeting will answer for covering the roof. On this place six inches of loose straw; on the straw throw from six to ten inches of earth—that excavated—and pack it down well. Use double windows for the skylight, leaving four to six inches between them, and protect the top one with a wire screen. It is no doubt best to have a double, or vestibule door, as there will be less loss of heat when entering and coming out, but this precaution is not necessary. The floor can be of the natural earth, or cement, as desired.

An incubator cellar built as above will preserve a remarkably uniform temperature, regardles of outside atmospheric changes, and in such places hot air and hot water incubators are on a par—both naturally being at their very best. On the large eastern farms the incubator house or cellar is considered of first importance in the matter of successful incubation, and where persons in the west, northwest or south taink of embarking in the business on a large scale, we advise the use of a regular incubator cellar similar to the one here described.

chamber, and is of course dependent upon the air immediately surrounding it. Therefore keep the air fresh.

If the incubator is placed in a spare room in the residence, it is not wise to have one end of it near a cold outside wall or window and the other end towards a fire. The pasage of air through the room will not affect the hatch unless the incubator comes within the direct draft, its effect would then be to keep one side of the incubator cooler than the other, and to cause a variation in the lamp flame.

There is little difficulty in avoiding these things. They do not call for a high degree of intelligence, simply the exercise of comon sense. An incubator is an easy machine to manage; it calls for no great effort of the brain to run it, in fact a good incubator will run itself if it be once adjusted and the supply of oil kept up.

An incubator like an egg is often misunderstood. They will both stand more abuse than some persons imagine. We have known an incubator that was operated by means of furnishing a regular supply of hot water and drawing off the cold. It was in a kitchen and during the period of incubation the housemaid used it for a shelf, sometimes as a table upon which to wash the plates, etc., and even then a fair hatch was secured. The hatch would have been better, but

it was discovered that to save time, the housemaid, when she required eggs in a hurry took them from the incubator and put in others later on. As incubation progressed and the eggs became unfit for table use, enquiry was instituted which elicited this fact. Needless to say, this incubator was strongly built. We wish to remind our readers that this was one of those stray cases that sometimes happen on similar lines to that of the hen that brings off her brood in zero weather, but it is not advisable to follow such an example, nor to put the incubator to a use for which it is not intended.

Do not experiment. The manufacturers of incubators what treatment is best suited to their machine. Read carewhat tratment is best suited to their machine. Read carefully the book of directions that is sent out with each machine and then follow its instructions. If it says put in moisture—put it in. If it tells you no moisture is needed—leave it out. These things are regulated by the ventilation, and as we have said the manufacturer knows what his machine requires.

General Directions.

A cellar is a capital place in which to run an incubator, plain style, without top brooder. A brooder containing chicks has no business in a cellar, cave, or other sunless apartment. Growing chicks, like growing plants, must have pure air and plenty of sunlight. If your machine is an incubator and brooder combined in one, or if you have an incubator and separate brooder, and wish to operate them in the same apartment, use a south, southeast or southwest room, placing the brooder where direct sunlight will reach the chicks part of the day—the more the better

Before putting the eggs in for the first hatch run the machine thirty-six to forty-eight hours until it becomes uniformly and thoroughly heated; then readjust the regulator; make sure it is in proper working order, and put in the eggs. Don't be nervous during the hatch. Take things coolly. Be watchful. Use your headpiece—that is what counts most in this life in any field of effort. To be sure, thinking is a good deal like work, but we need it in our business if we are to succeed well. Don't be easily discouraged; what scores of others are doing you can do. If you have a good incubator located in a suitable place, that is in working order and is properly run, you should be able to get satisfactory results. Don't give up.

Know as near as you can just what your eggs are. Get them from stock that has plenty of range, plenty of exercise. Reject the small pullet eggs, the large, double-yolked eggs, those with rough or thin or mottled shells. After the third day turn the eggs twice a day. Take your time to it. Cooling them will not hurt them until they begin to pip. Chilling the eggs then, or chilling the newly hatched wet chick is very risky; do not do it. When the eggs begin to pip, see that a liberal amount of fresh air is supplied through the bottom ventilators, but do not open the egg chamber until the hatch is about completed. Even then handle the chicks rapidly (if the atmos here of the room is cold) and close up the machine on the remaining eggs as quickly as posible. Treat these little chicks about as you would a newly born babe and the proper thing will be done. They simply must not be chilled at this tender age or congestion will result and bowel trouble end their lives.

Do not sprinkle the eggs. This lowers the temperature too suddenly and is therefore hurtful. If the machine, through some cause, runs up too high, dampen a towel or cloth in warm water and spread it out over the eggs in the tray, leaving the tray in the egg chamber, but not closing the egg-chamber door. Should the heat run up to as high as 112 degrees, you may still save the hatch by the above plan, providing the excessive heat was not applied too long. At two weeks old the chick embryo will stand more of such abuse than when only one week old, and after the two weeks, handling, jarring, etc., do much less damage than during the first days of the hatch when the chick embryo is first taking form. Be governed accordingly.

As a rule, incubators that are run in cellars where there is no furnace or stove, require very little moisture until the dry summer months come. Most cellars, caves and basements are moist, providing there is no fire in them. Top ventilation we do not believe in, and if we had an incubator with top ventilation we would keep the top vents closed all the time. If you have such a machine, and are not having success with it, try a hatch with the top vents closed.

EGYPTIAN INCUBATORIES

Semi-official Report of the United States Consul at Cairo, Egypt, Setting Forth Interesting and Surprising Facts Regarding the State of Artificial Incubation and Brooding Practiced at This Present Day in the Country of the Nile.

IT is quite generally known that the hatching and rearing of chickens by artificial means was first practiced in Egypt. "The art of artificial hatching hen's egg has been known from the remotest ages. Though in Egypt tradition attributes the invention to the ancient priests of the Temple of Isis, it is imposible to determine at what period or to what nation the construction of the first eccaleobion should be credited."

The fact now develops that artificial incubating and brooding is still extensively practiced in Egypt. We wrote to the United States Consul at Cairo, Egypt, asking for information on the subject of Artificial Incubation in that country to date. In due time we received, through the Foreign, or Consular Department, at Washington, a lengthy and carefully prepared report, accompanied by three drawings, outlining the ground plan of a present-day Egyptian Incubatory and two sectional views of same, showing the interior construction and arrangement. This semi-official report and the drawings are presented herewith, under copyright, all rights being reserved:

EGYPTIAN INCUBATORIES.

(Report of the U. S. Consul at Cairo.)

The artificial hatching of eggs has been so long practiced in Egypt that the hens have completely abandoned that part of their work to man. It is a regular industry

and the professors form a very close corporation, handing down their secrets from father to son. For three months in the year their time is completely absorbed by constant attention at the incubatories.

Although very successful in the work, they never attempt the hatching except during the months of February, March and April. The minimum temperature in Egypt is reached on the 20th of January; after this it steadily rises, and by Easter the hot weather may be expected. This makes the process difficult and the ovens are therefore closed for the year.

The population of Egypt is very dense, about 100 per square mile. This agglomeration fosters the use of large incubators, turning out each one from 300,000 to 600,000 chicks each season. In some villages there are from three to five of these establishments. They are generally near to some important market place, and each one apparently in the center of a district of about 50,000 population. That is, each one is the center of a circle having a radius of five miles. It is this density of the population that has allowed this system of artificial hatching to become so very successful. At the same time it must be remembered that there is no other, as the native hen never sits on her eggs.

Another important point is that the hatchers do not attempt to rear the young broods. Forty-eight hours after the chicks emerge from the shell they are scattered over the country; overcrowding is thus prevented. This distribution is effected in a very simple manner. As the incubatory is near a market place, word is sent there that on such a day there will be so many young chicks. This news is quickly disseminated among the villages, and on the appointed day the women arrive with their cages and purchase the young chicks, which are generally sold by the hundred for about $1.50 per hundred. There are also a number of brokers or dealers who take the young chicks to the more distant villages. For this they have cages made from the palm branch. They are divided into two stories, each of which is divided by a partition, so that the smaller division only contains about 250 chicks, thus preventing overcrowding. Two such cages will transport each 1,000 young birds, so that a man with a donkey easily manages 2,000 of them, and by nightfall has probably sold the entire lot at a distance of five or six miles from the establishment.

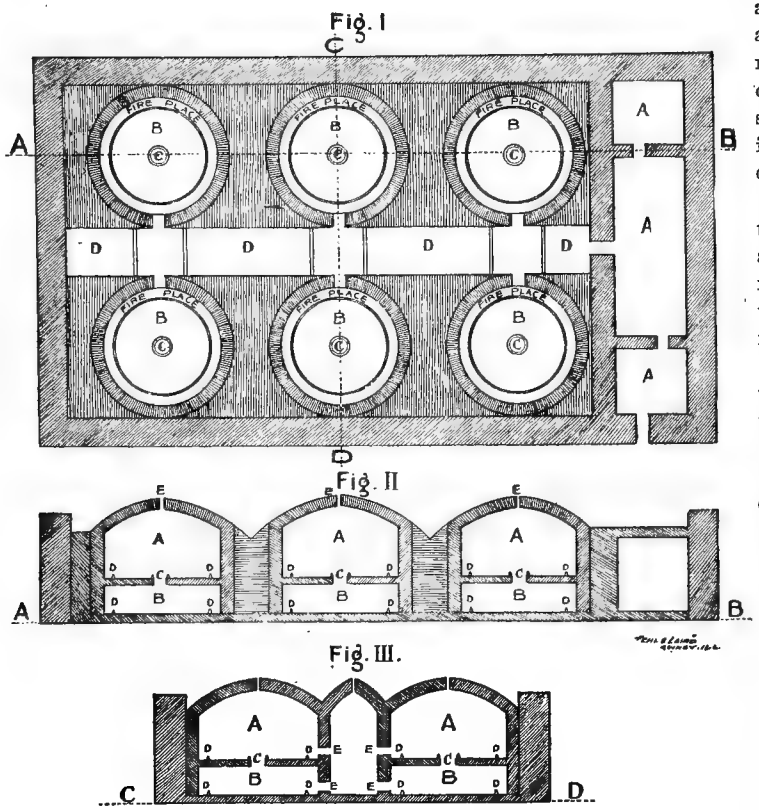
Once in the villages the chicks become the property of the women, who take great care of them during the first week. For two or three days they are kept in cages in lots of twenty or thirty and fed on broken grain, slightly moistened. At night the cages are taken into the houses and sometimes covered with a bit of cloth. After these first few days the young birds are strong enough to forage for a living; they are then allowed to roam freely and at night are kept in a sort of oven placed in a corner of the courtyard. This oven is made of unburnt clay and in shape is like the letter U laid on one side. The top is slightly perforated. The entrance is closed by a heavy stone to keep off foxes and other vermin.

When the young chicks are fairly feathered they are plucked perfectly clean and greased. This adds greatly to their ehalth, but detracts much from their beauty. It strikes astranger as something extremely novel to see hundreds of perfectly naked chickens basking in the sun or running about.

It is difficult to get any exact figures as to the number of these incubatories, but judging from those personally known to me, and their distances apart, I should estimate the number at 150 with an average population of 300,000 per season. This estimate must be well within the mark, as the popualtion of Egypt is nearly seven millions, and fowls form a very large part of the Egyptian diet, so that 45,000,000 eatable fowls would be a short supply.

The ordinary form of the incubatories is an oblong 100 feet in length by 60 feet in width, the height varying from 12 to 15 feet. Fig. No. 1, though not drawn exactly to scale, shows the general arrangements. The outer chamber A is divided into three rooms, the middle one masking the entrance to the ovens and thus excluding the outer air. The door leading from A into the central hall is very small. B represents the ovens of the upper tier. C is the man-hole; the attendant stands in this and manipulates the eggs. D D are spaces in the central half for the reception of the young chicks. These spaces are marked off by ridges of dried mud about nine inches in height. E is the door giving excess to the interior of the oven. Around the wall and parallel to it runs a raised ridge six inches in height; between this and the wall the fires are lighted. In the top of the dome is a small aperture about two inches square for the exit of smoke and regulating the heat.

The outer wall, four feet thick, is generally built of sun-dried bricks, the mortar simply mud. The space con-



PLANS OF EGYPTIAN INCUBATORY.
(As furnished by the United States Consul at Cairo, Egypt.

KEY TO ILLUSTRATIONS.

Fig. I.—Ground plan. A. A. A. rooms masking entrance to incubatory. B. B. B. ovens where eggs are hatched. D. D. hallway. C. C. manholes admitting attendants to upper tier.

Fig. 11.—Sectional view lengthwise. A. A. A. upper chambers to ovens. B. B. B. lower chambers. C. C. C. man-holes. D D. fire spaces.

Fig. III.—Sectional view crosswise—same lettering as for Fig. 11.

tained within the walls is divided as shown in Fig. No. 1. The circular ovens are built up and the space between them and the wall filled in with bricks and mortar, the same as the outer wall. Each set of ovens, the upper and the lower, is perfectly independent and is covered by a dome having a very small aperature in the crown.

Fig. No. 2 represents the elevation on the line A B of Fig. 1. The height of the lower oven is four feet, that of the upper one nine. The interior diameter between the ridges d d is fifteen feet.

Fig. No. 3 represents the elevation on the line C B of Fig. 1, and shows the disposition of the central wall and the doors of the ovens. For this particular incubatory the attendants consist of two men and a boy.

In the month of January, about the 10th, fires are lighted in all the ovens and on the floor of the central hall. The entire building is thoroughly warmed to a temperature of 110 degrees Fahrenheit. This heat is continued for three weeks, when the temperature is allowed to fall to 100 degrees Fahrenheit.

The fires are at first composed of gelleh or dried cow dung, but when the eggs are placed in the oven coarse broken straw, mostly the joints, and sheep or goat dung is used, The fuel is placed in the trough between the hall and the ridge, and is lighted at one or more places, according to the degrees of heat required. This is the only means of regulating the heat. Thermometers are not used. The attendants endeavor to keep the heat a trifle greater than that of their own skin.

While the oven is being warmed, notice is sent out to the villages that the establishment will purchase eggs on such a date. The country people arrive with large crates containing from one to two thousand. These are purchased outright by the establishment at the rate of $4.00 per 1,000.

The floor of the oven is covered with a coarse mat made of palm leaves; on this a little bran is sprinkled to prevent the eggs from rolling. The attendant changes the positon of the eggs twice a day, taking those from near the man-hole and placing them in the outer edge of the circle and vice versa. At the end of six days the eggs are held up one by one towards a strong light. If they appear clear and of a uniform color, it is evident that they have not succeeded; but if they show an opaque substance within or the appearance of different shades, the chickens are already formed. The bad eggs are removed and the others are continued in their places for four days; at the expiration of this time they are again examined and then put back into their places, the same continual shifting from the inner to the outer part of the circle being observed. The doors of the ovens are kept hermetically closed by a small plank well caulked. This is removed in the forenoon and afternoon and once during the night to see that the heat is kept at the proper point.

After the eggs have been fifteen days in the ovens they are daily examined, and so delicate is the touch of the attendant that he can at once distinguish if the eggs be alive by the fact that it should be slightly warmer than his own skin.

At the expiration of twenty-one days the chicks commence to emerge from the shells, the attendants constantly aiding them. They are placed in the spaces d d Fig. 1 and left to dry for nearly forty-eight hours, but they are not fed. The sale then commences and in a few hours they are spirited away. The temperature in the central hall is maintained at 98 F., and that of the ovens slightly more.

BEST BREEDS FOR BROILERS

Valuable Points in Broiler Raising by a Man Who Achieved Success in This Line—The Merits of the Light Brahmas, Leghorn-Bantams, Wyandotte-Brahmas, Barred and White Rocks and White Wyandottes Set Forth.

BY ARTHUR G. DUSTON.

AT THE request of the editor I am going to present to the readers some hints on broiler-raising as exemplified by me on my farm. I have thought best to divide these into two papers—one on varieties and their comparative values, the other on forcing for growth. I believe that many lose courage in raising broilers by not obtaining the right stock at the start.

First, many try Brahmas. They might do far worse. Let us take the Brahma from the egg and follow it. Mr. Felch says Brahmas are superior for this purpose. Yet, in an argument with an incubator manufacturer his first and best-proved claim is, that they do not hatch as well artificially as eggs from the American or Mediterranean classes. Does it pay to put eggs in machines that will make the chicks cost, on coming into the brooder house, 25 to 50 per cent more than others?

Once in the brooder, Brahmas prove very strong as little chicks, but look out for leg-weaknesses, their heavy bodies proving too much for small legs.

Again, any one watching chicks raised artificially knows that they will attain their height earlier than those raised with hens. So a Brahma chick has that against it as a broiler, for long legs with feathers on them hurt a broiler in the market. But, properly taken care of, Light Brahmas will prove fairly satisfactory as broilers. As roasters, which subject cannot be even touched on in this article, they are choice.

While the Brahma is under consideration it seems well to take up two of the more popular crosses made with them, viz: Leghorn on Brahma and Wyandotte on Brahma.

Leghorn on Brahma have some very good points, which are: Yellow skin and legs, fairly plump bodies, and they also feather early, but a large proportion of the early cockerels will be so near full blood Leghorn that they would easily be taken for them by a casual observer, and to force them, giving a liberal quantity of meat or ground bone, together with the heat, will develop extremely large combs, which gives the appearance in a dressed bird of its being old—a

point against us. Furthermore, the nervous temperament of this cross (taken from the Leghorn) keeps them from making flesh, where other varieties would take on fat.

I have run this cross where at fifteen weeks I could not force at least twenty-five per cent of them to weigh more than from one and one-half to one and three-quarters pounds.

The Wyandotte-Brahma cross is almost ideal, being hardy, low-combed and not getting "stagy" at an early age, as with the Leghorn cross; but, my dear reader, do you know there is something to the feathered leg that is not inviting to the buyer? To see a neat, yellow breasted broiler with a mess of feathers on the legs and feet will detract from their appearance more than one would think unless he has had the very fastidious market of Boston to cater to. The carcass of this cross is plump and yellow, only a small proportion coming so dark as to have black pin feathers enough to injure the looks.

To leave the Asiatics, we will touch on the Barred and White Plymouth Rocks. The rich yellow legs and bodies of these justly popular fowls, the quick growth, with not enough comb to hurt, gives us a broiler hard to beat—one of the worst faults being dark pin-feathers in the Barred, which are always somewhat objectionable in a broiler, for the reason that they are put on the market at an age when it is impossible to get them all out.

I can not go through all the breeds, but will only take up those I have honestly tried. This brings me to the last, the White Wyandottes. To be frank, I will state that I once thought of discarding this breed as not fitted for my business purposes, but after "summering and wintering" them, I now feel that I would drop all other breeds before I would the reliable White Wyandottes.

Let us note their faults. The first is that in some birds, more especially those bred for extreme whiteness, you will find they are not yellow-meated. At the same time I have seen the whitest plumage birds have rich, yellow skin, beak and legs. In buying stock look for yellow beak, and as yellow a leg as you could naturally expect at the time of year you are buying; that is, make allowance for a bird hived up in a yard, with sand to dust in, as it will surely bleach the legs to a flesh color.

Another trouble you may have with the Wyandotte, as perhaps you would have with no other breed, is, when confining a large number in a small pen, they easily take up feather pulling. I think this is due to the peculiar way in which they feather. Some will grow to weigh one and one-half pounds before they have any but neck and wing feathers. Then the pin feathers start all at once, making the habit easily formed by the "chicken act" of striking one another, or picking off any soft food that may adhere to the feathers. But plenty of green food will obviate that to a great extent, especially should that food be freshly cut clover. Of course it can not be obtained in winter, but well-cured clover rowen can. With care after this warning, you need have no trouble in this direction.

Regarding white skin, I will tell you in my next paper how to overcome that by the use of the right kind of food, making it yellow enough to suit any one. Now that we have seen the faults of the White Wyandottes in their worst light, let me extol their virtues as broilers, for they have many.

The eggs being reasonably thin-shelled hatch as well as any you can get.

They mature as laying pullets a full month earlier than Plymouth Rocks, thus giving you eggs for early hatching.

Their clean, yellow legs, low combs, white pin feathers, and quick growing qualities, render them the best broilers I can put out.

I sold hundreds to dress eight ounces (one-half pound) this year and they were as round as a "butter ball"; this being one of their most important merits, that when properly fed they are at all times ready for market.

Again, they will stand all the forcing any chick can. If you try to raise Rocks and Wyandottes in the same pen, the experiment will prove to you this fact: Your Rocks will go "off their legs," while the deep-breasted, plump-bodied, smooth-skinned, active little Wyandottes will take their medicine five times a day and stand as straight as matches. Remember, it is generally the bird that can stand the greatest amount of food that makes the quickest grown broiler, and must be the bird you should adopt, as every additional day means additional cost from labor, coal and feed.

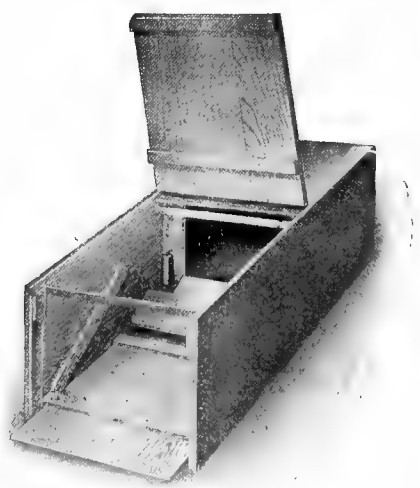
I have written this article from the market point of view, that is, the sales-counter, as that is where our returns for broilers come from.

Now, for one moment let us look at the matter as epicures. Take any one of the varieties mentioned above, and the Wyandotte, besides having the extra flesh on breast, as I stated before, caused by the great depth of breast-bone, is as juicy and delicious as any, and, in the opinion of "our folks," more so, a dish luscious enough for a king.

This is just my experience briefly set before your readers. If I have written anything that will in any way aid my brother poultrymen, I am satisfied.

One word in closing. Do not be in a hurry to cross your stock, as no one can make me believe again that there is anything gained by crossing, for there is no place that a thoroughbred of some variety will not fill the bill, and once you start to cross where can you stop? The labor and skill of years come to naught when you destroy the integrity of a breed or strain by crossing.

We herewith show illustrations of a few articles that are needed on an up-to-date poultry farm. Some of these articles especially needed where thoroughbred poultry, or high class stock is raised. We give some illustrations as to how and why they are used.



Pedigree Nest Boxes.

How many farmers or poultry raisers is there that knows whether or not they have any drones in their flocks? And when you take into consideration that there are two, three, or four, possibly more, hens in your flock that are not prolific

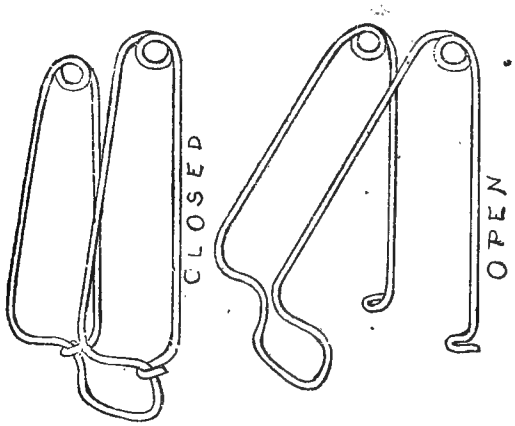
layers, or do not even lay at all and you are feeding and taking care of these drones the same as you are the fowls that are paying you.

The above Pedigree Nest Box will readily tell you which are, and which are not, the drones; which birds are bringing you the revenue and which are eating up your revenue. This nest and laying box shows the top of the front part left up so as to show an interior view and the entrance to the left. A chicken passing in the front of this possibly springs the trap and closes the door, leaving just enough light in the front so that she can see. It takes but a short time for your hens to get accustomed to these nests, and if you take a little of your spare time, using these nest boxes, keeping watch of your hens for a few days, you will readily find there are some drones in your flock, that should be disposed of even at a sacrifice, although this is not necessary with the prices of poultry of today.

This nest box is so arranged that it will lock automatically so that the hen cannot get out, or, if you desire to use this nest box so that only one hen can get into the box at one time, the lock can be very easily detached. The hen when she is through laying, naturally comes to the light and steps on the outer platform, opening up itself and will naturally stay open until another hen steps on the back trap and closes it, leaving only one hen in the box.

Again, if you have a number of excellent high class birds that you desire to save the eggs from for breeding purposes, this box can be used so as to ascertain which hen lays the eggs. The back end of this is hinged, also, so that it can be raised and the hen released.

Breeders of thoroughbred poultry should use this box.



Fly Arresters.

This name is meant to indicate a small contrivance, which passes over the back of the bird, entering underneath the wings, in order that your birds may not fly. It is used principally by breeders of thoroughbred poultry who wish to keep their birds confined and do not desire to build an exceedingly high fence. This is a new article and has not been on the market very long, but, it is a device, which is fast coming into use. Again, it is often used in cities, or town lots where the poultry must be confined. Owing to the trouble we have had heretofore with fowls flying over fences, especially in the smaller birds, and it being undesirable to cut their wings, spoiling their appearance and making them unsalable as thoroughbred stock.

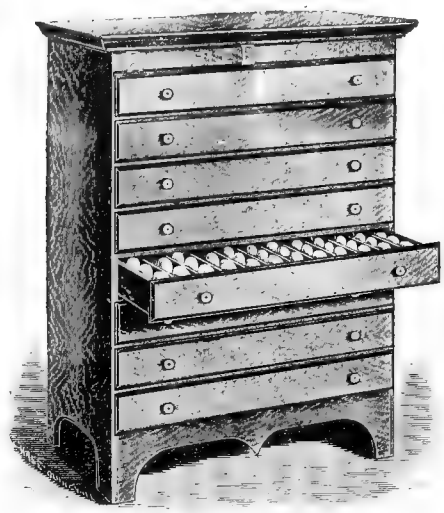
To us, experience and experimenting with these Fly Arresters have taught us that it works to perfection. It does not hurt the fowls, or injure the plumage, and they soon become accustomed to it and go around singing and scratching, contented as those without it.

It will keep your fowls inside of a three-foot fence.

It will save your eggs being mixed.

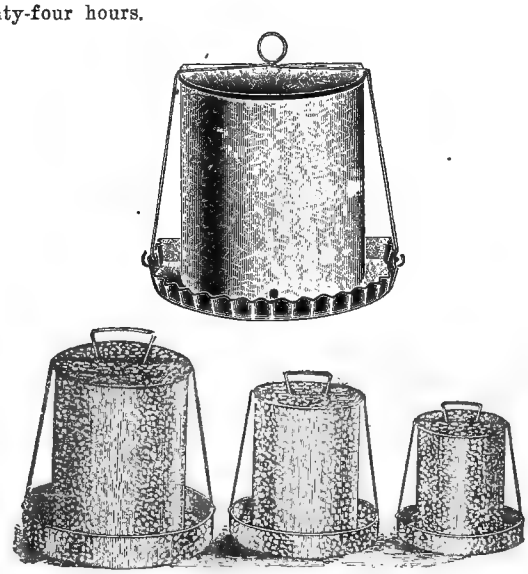
It will keep the fowls out of your neighbors' yards.

You will never have to cut their wings to prevent their flight.



Egg Cabinets.

This is an article that should be on every farm that is saving eggs for hatching purposes. Each egg cabinet contains a patent turning tray so the eggs can be turned very easily. And, in saving eggs for incubation, they must be turned. The object of turning the eggs is simply to remove the germ into different positions, day by day, thus, not allowing it to adhere, or stick to the shell. You oftimes see an egg clouded with blood, and by turning this egg, you will find it always stays in the same position. The cause of this is, allowing the egg to lie too long in one position. Eggs or invubation should be turned more than once every twenty-four hours. Eggs can be saved longer and have better results in hatching, by turning them. Hence, this cabinet is put upon the market to make is easy for taking care and turning the eggs. They again could be turned by placing your pasteboard over the top of each layer of fillers, arranging it so you can tip your egg case over, one-quarter every twenty-four hours.

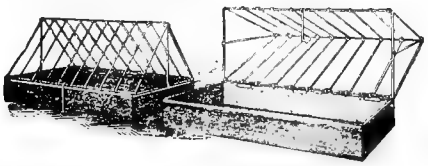


Drinking Fountains.

There is one point that all poultrymen should pay strict attention to, that is, to keep their fowls supplied with good

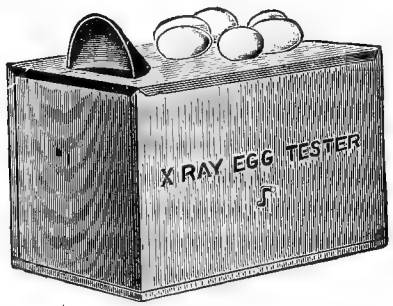
fresh water at all times and keep the vessels, or the drinking fountains, thoroughly cleansed.

The drinking fountain shown here, is very easily cleansed, being able to detach it from the pen, so that it can be washed out without any trouble. A fountain of this kind is superior to the stoneware fountain, in this respect: the stone water fountain naturally becomes filthy and it is almost impossible to cleanse it out inside, but, it cannot be said of this drinking fountain.



Feed Troughs.

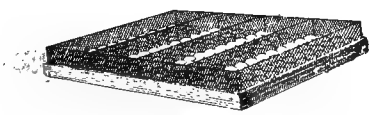
The feed trough shown here is a sample of an exceptionally high class feed trough that can be used in feeding poultry, not allowing them to get into their food with their feet; only placing their head through between the wires and not dirtying up the balance of their food.



Egg Testers.

The X-Ray egg tester shown is an exceptionally good article, not only for the poultry breeders, but for the commission houses. As eggs should be thoroughly tested and can be tested with this tester in considerable less time and expense than by candling them in a dark room.

Hucksters, who go out through the country to get eggs, should carry one of these testers with them, for they will find it will pay them ten fold for they will receive nothing but good fresh eggs.

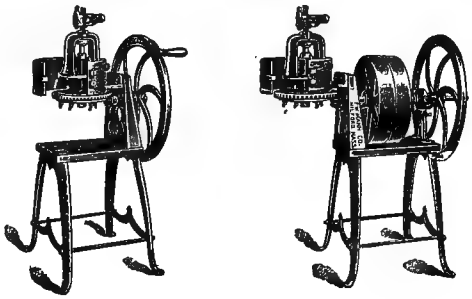


Pedigree Egg Tray.

This tray is so arranged that you can put one, two, or more strains, or breeds, of eggs without having them get mixed up after being hatched. This is principally used by thoroughbred poultry raisers. This marker is used in marking the webs of the feet of the small chickens so that they can be turned together, keeping a record of the marks, so that when they are grown, they can be distinguished from one another.

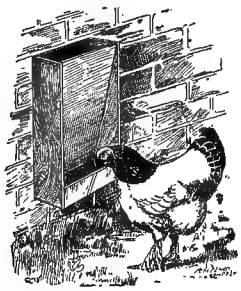
Green Bone Cutters.

It is very excellent and cheaper to you to be the owner of a Green Bone Cutter, cutting your own bones, as you get your bones from the butcher at a very reasonable price, which is better egg food than any of the deoderized blood, dried beef scraps, dried bone meal, etc., as in this green bone, the nourishment is therein that tends to make poultry lay. Whereas the dry blood that has gone through an oven and baked takes the albumen out, leaving it in a state that is not near so nourishing and beneficial as though you used the green bone.



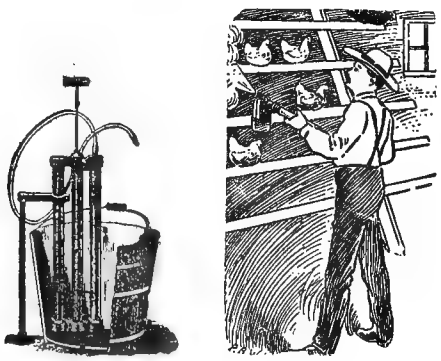
Green foods are also essential and plenty of lime for the laying fowls; grit should be kept before them as before mentioned.

It is not necessary that you should purchase some of every kind of particular poultry food and egg laying food put upon the market, you can just as easily get such foods yourself as mentioned herewith as to purchase such ingredients and pay double prices for them.



Grit, or Shell Boxes.

The above illustration shows a triple compartment grit, or shell box, where you can use either oyster shell, grit, or other food that you desire. One of these boxes should be in every pen, filled with grit and shell, so that your laying hens can have it at all times. The grit, providing teeth to grind food for the chickens; the shell, providing the lime for the shell of the eggs. It keeps your chickens healthy and in good condition; no one should be without them.



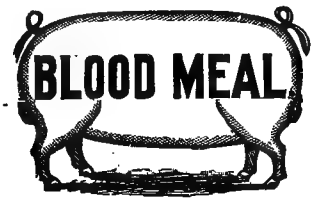
The above illustration shows the Whitewashing of Poultry Houses. It is better to use the "Preventative than the Cure" and we advise that all poultry houses be whitewashed at least three to four times each year. First, slack your lime; strain it off so that there are no lumps in it; mix it up thin enough so that it will work easily, and with a common bucket full of such whitewash use about ten drops of crude carbolic acid. Spraying your house, it places the

whitewash in all crevices, which cannot be done with a brush, although it is advisable that when after spraying your house to run across it with a brush smoothing it up, so it will make it look clean and not striped. As in spraying, the whitewash will run, and in this way will get in all crevices and kill all mites in the house. Another word about mites. Always paint your roosts with coal oil, or with some regular lice killer about every three months. Use a little lice powder in the nest, or use the carbolized nest eggs.

Over your floor, also, use some disinfectant. The disinfectant such as you would need would be a bucket of water with about 15 to 20 drops of crude carbolic acid, keeping the mites out of your house at all times, using "The Preventative than the Cure."

If you have one of the Rotary Lice Machines upon your place and there are new fowls coming into your place, run them through this machine, thoroughly dusting them with the lice powder in this method, thus killing the lice before turning them loose upon your place.

All this may seem considerable trouble, yet it is not a drop in the bucket as to when your chickens become thoroughly infested with mites, and you must destroy them in order to protect your fowls.

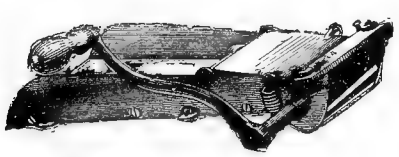


How to Prepare Blood Meal to Feed Your Poultry.

If you have a slaugther house or any place you can get blood directly from, you can prepare it in the following manner, which gives you all the ingredients and which will keep without spoiling, and by far superior to such blood that you purchase that has been baked in an oven.

If you have a large kettle, or a food cooker, fill the tank with water, getting it boiling hot. Take a flour sack, taking a milk can, a bucket, or anything you can carry the blood in. Drop the sack in the water, leaving it open and pouring the blood in it. Then tie it up, and by boiling it several hours, it will become crumbly. Blood prepared in this manner contains all the albumen that is necessary for high class egg food for your poultry.

In shipping poultry, it is advisable to use the "knock-down" coop, so that it will not be broken up in returning. The above illustration shows the "knock-down" coop and we herewith show another illustration of a wire shipping coop set up in "knock-down" shape, showing the advantage of using such coops.

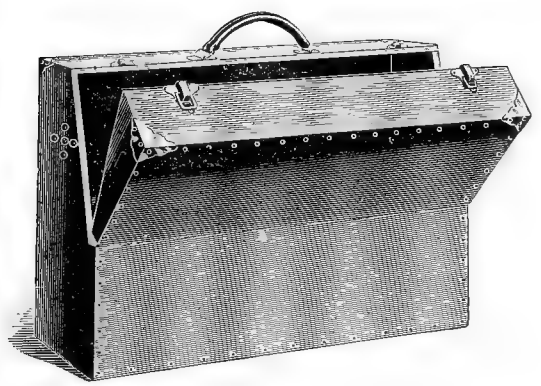


Clover Cutters.

This is a good little machine to have upon the place, as any farmer generally has a little clover upon the place, and by using a clover cutter cutting the clover up about one-half inch, it gives the poultry good fresh green food at all seasons of the year. Another green food for poultry, is putting away cabbage with the roots, burying them, or hanging them in the cellar, as you need them in winter. Hang them up in the poultry house by the roots with the heads downward, so that your poultry may exercise a little by jumping up; leave it just above the ground so that they must jump to pick it. It will be surprising how soon a pen of eight hens and one cockerel will devour a head of cabbage.

Small potatoes are an excellent food for your fowls, it is very fattening. A great many people dispose of the small potatoes feeding them to the hogs, etc., where, if they had a good cooker, after washing these potatoes, boil them, then mash them up, using a little bran, or middlings in stiffening it up, and in feeding it to your chickens, especially ducks, you will find it exceedingly fattening for them and a very cheap food.

We mention these above facts, as they are simply every-day facts that can be had and accomplished by every poultryman, or farmer, without any great cost whatever, and which are very essential, when it comes to the profitable raising of poultry.



CARRYING CASE, BETTER KNOWN AS PIT GAME CARRYING CASE.

A case of which the sides are made of cloth, arranged so that a bird can stand erect; tail feathers will not be crumpled and bird not injured. Exceptionally good for carrying birds from one place to another, without endangering the feathers, when arranging them for exhibition purposes. A broken feather in a wing of a bird cuts a point in half, which goes a long ways in making your birds score too low to win a prize; the same with the sickle feathers. This case prevents this. It gives them sufficient air, they are well ventilated. No one knows what you are carrying. They are used principally by fanciers of pit games, carrying birds to and from the pits.

UNITED STATES GOVERNMENT

Now Taking an Interest in the Poultry Industry and Rendering Valuable Service—Issues Practical Instructions on the Construction of Poultry Houses, Feed Dishes, the Selection of Breeds, Breeding, Feeding, the Use of Green Food, Grit, Meat Food, Etc.

Also the Feeding of Young Chicks, the Use of Incubators and Brooders, Treatment of Diseases, Dressing, Shipping, Etc.

THE IMPORTANCE of the poultry industry will be at once appreciated by the casual observer and respected by him when it is known that the government considers it worthy of its close attention and experiments, the results of which are embodied in pamphlets and distributed to those interested, through the Department of Agriculture.

In the introduction to the latest bulletin on "Fowls; Care and Feeding," Mr. Wilson, the author, writes of the wide distribution of poultry over the United States, the importance of eggs and fowls as food, the excellent home market, and the remunerative prices received for them when judgment is exercised in the management of the business. He further says:

"Although fowls require as wholesome food as any class of live stock, they can be fed perhaps more than any other kind of animals on unmerchantable seeds and grains that would otherwise be wholly or partially lost. These seeds often contain various weed seeds, broken and undeveloped kernels, and thus furnish a variety of food which is always advantageous in profitable stock feeding. There is less danger of injury to poultry from these refuse seeds than is the case with any other kind of animals. As a rule, noxious weed seeds can be fed to fowls without fear of disseminating the seeds through the manure, which is not generally true when the weed seeds are fed to other classes of live stock, particularly in any considerable quantity."

The bulletin then goes on to describe and illustrate the practical construction of poultry houses, with interior arrangements as follows:

Selection of Site for Buildings.

"In caring for the various classes of live stock, the question of labor is always an important item, and the class that requires the closest attention to petty details, as a rule, requires the greatest amount of labor. As poultry keeping is wholly a business of details, the economy of labor in performing the necessary work is of great importance. Buildings not conveniently located and arranged become expensive on account of unnecessary labor.

"As it is necessary to visit poultry houses several times each day in the year, convenience is of more importance than in case of almost any other farm building. The operations must be performed frequently, so that any little inconvenience in the arrangements of the buildings will cause not only extra expense in the care, but in many cases a greater or less neglect of operations that ought to be performed carefully each day. It is generally best to locate the poultry house at some distance from other farm buildings, especially if grain is kept in the latter. Convenience of access and freedom from vermin are two desirable points to be secured, and they depend largely upon the location. Everything considered, it is the safest to have the house quite isolated.

"A dry, porous soil is always to be preferred as a site for buildings and yards. Cleanliness and freedom from moisture must be secured if the greatest success is to be obtained. Without doubt, filth and moisture are the causes, either directly or indirectly, of the majority of poultry diseases. Poultry can be successfully kept on heavy soils, but an open, porous soil can be kept comparatively clean with much less labor than a clay soil. When fowls are confined in buildings and yards, that part of the yard nearest the buildings will become more or less filthy from the droppings and continual tramping to which it is subjected. A heavy or clayey soil not only retains all the manure on the surface, but by retarding percolation at times of frequent showers aids materially in giving the whole surface a complete coating of filth. If a knoll or ridge can be selected where natural drainage is perfect, the ideal condition will be nearly approached. When natural favorable conditions as to drainage do not exist, thorough under-drainage will go a long way toward making the necessary amends to insure success.

Construction of Houses.

"In general, it may be said that the house should provide warm, dry, well-lighted and well-ventilated quarters for the fowls.

"In order to meet these requirements it will be necessary to provide a good roof, with side walls more or less impervious to moisture and cold, suitable arrangements for lighting and ventilating, and some means for excluding the moisture from beneath. Where permanent buildings are to be erected some provision should be made against rats and mice; and for this reason, if for no other, the structure should be placed on cement walls with foundation below the frost line. Cheap, efficient walls may be made of small field stone in the following manner: Dig trenches for the walls below the frost line; drive two rows of stakes in the trenches, one row at each side of the trench, and board inside of the stakes. The boards simply hold the stones and cement in place until the cement hardens. Rough and uneven boards will answer every purpose except for the top ones, which should have the upper edge straight and be placed level to determine the top of the wall. Place two or three layers of stone in the bottom of the trench, put on cement mixed rather thin, and pound down; repeat this operation until the desired height is obtained. The top of the wall can be smoothed off with a trowel or ditching spade and left until the cement becomes hard, when it will be ready for the building. The boards at the side may be removed, if desirable, at any time after the cement becomes hard.

"For the colder latitudes a house with hollow or double side walls is to be preferred on many accounts, although a solid wall may prove quite satisfactory, particularly if the building is in the hands of a skilled poultryman. Imperfect buildings and appliances, when under the management of skilled and experienced men, are not the hindrances that they would be to the amateur. Buildings with hollow side

walls are warmer in winter and cooler in summer, with less frost in severe weather, and less resulting moisture when the temperature moderates sufficiently to melt the frost from the walls and roof of the house.

"A cheap, efficient house for latitudes south of New York may be made of two thicknesses of rough inch lumber for the side and end walls. This siding should be put on vertically, with a good quality of tarred building paper between. It is usually best to nail on the inner layer of boards first; then put on the outside of this layer the building paper in such a manner that the whole surface is covered. Where the edges of the paper meet, a liberal lap should be given, the object being to prevent as far as possible drafts of air in severe weather. Nail the second thickness of boards on the building paper so as to break joints in the two boardings. In selecting lumber for siding, it is best to choose boards of a uniform width, to facilitate the breaking of joints.

"In constructing a roof for a house in the colder latitudes, one of two courses must be pursued, either to ceil the inside with some material to exclude drafts or to place the roof boards close together and cover thoroughly with tarred paper before shingling. The ordinary shingle roof is too open for windy weather when the mercury is at or below the zero mark. The fowls will endure severe weather without suffering from frosted combs or wattles if there are no drafts of air. Hens will lay well during the winter months if the houses are warm enough so that the single comb varieties do not suffer from frost bite. Whenever the combs or wattles are frozen the loss in decreased egg production, can not be other than serious.

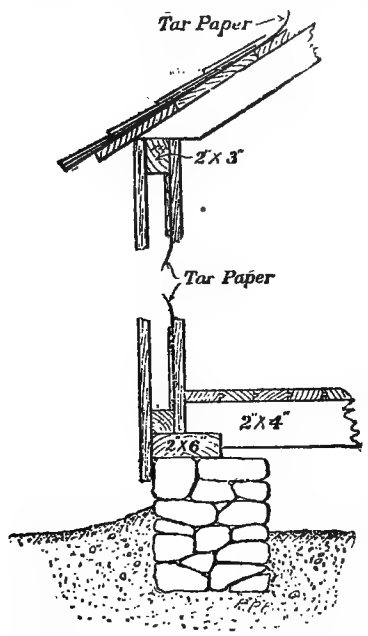


Fig. 1.—Method of Building Poultry House with Hollow Side Walls.

"Fig. 1 represents a cheap and efficient method of building a poultry house with a hollow side wall. The sill may be a 2x6 or 2x8 scantling, laid flat on the wall or foundation; a 2x2 strip is nailed at the outer edge to give the size of the space between the boards which constitute the side walls. A 2x3 scantling set edgewise forms the plate, and to this the boards of the side walls are nailed. These boards may be of rough lumber if economy in building is desired. If so, the inner boarding should be nailed on first and covered with tarred building paper on the side that will come within the hollow wall when the building is completed. This building paper is to be held in place with laths or strips of thin boards. If only small nails or tacks are used, the paper will tear around the nail heads when damp and will not stay in place.

"The cracks between the boards of the outside boarding may be covered with inexpensive battens if they are nailed at frequent intervals with small nails. Ordinary building lath will answer this purpose admirably, and will last many years, although they are not so durable as heavier and more expensive strips. The tarred paper on the inside boarding and the battens on the outside make two walls, each impervious to wind, with an air space between them.

"In preparing plans for a building, one of the first questions to be decided upon is the size and form of the house. If the buildings are made with the corners right angles, there is no form so economical as the square building. This form will inclose more square feet of floor space for a given amount of lumber than any other, but for some reasons a square building is not so well adapted for fowls as one that is much longer than wide. It is essential to have the different pen in the house so arranged that each one will receive as much sunlight as possible, and to secure this, some sacrifice in economy of building must be made.

"The writer prefers a building one story high, not less than ten nor more than fourteen feet wide, and as long as circumstances require. In most cases a building from thirty to sixty feet long meets the requirements. If this does not give room enough, it is better to construct other buildings than to extend one building for more than sixty feet. It must be remembered that each pen in the building should have a separate yard or run, and that a pen should not be made to accommodate more than fifty fowls, or, better, thirty to forty.

"The building should extend nearly east and west, in order that as much sunshine as possible may be admitted through windows on the south side. The windows should not be large, nor more than one to every eight or ten feet in length for a house twelve feet wide, and about seventeen inches from the floor, or at such height that as much sunshine as possible will be thrown on the floor. The size and form of the windows will determine quite largely their location. In all poultry houses in a cold latitude the windows should be placed in such a positon that they will give the most sunshine on the floor during the severe winter months. One of the common mistakes is in putting in too many windows. While a building that admits plenty of sunlight in the winter time is very desirable, a cold one is equally undesirable, and windows are a source of radiation at night unless shutters or curtains are provided. Sliding windows are preferred on many accounts. They can be partially opened for ventilation on warm days. The base or rail on which the window slides should be made of several pieces fastened an inch or so apart, through which openings the dirt which is sure to accumulate in poultry houses may drop and insure free movement of the window.

Ventilation.

"Some means of ventilating the building should be provided. A ventilator that can be opened and closed at the will of the attendant will give good results if given proper attention, and without attention no ventilator will give the best results. All ventilators that are in continuous operation either give too much ventilation during cold and windy weather, or not enough during still, warm days. As a rule they give too much ventilation at night to too little during the warm parts of the day. Ventilators are not needed in severe cold weather, but during the first warm days of early spring, and whenever the temperature rises above freezing during the winter months some ventilation should be provided. Houses with single walls will become quite frosty on the inside during severe weather, which will cause considerable dampness whenever the temperature rises sufficiently to thaw out all the frost on the side walls and roof. At this time a ventilator is most needed. A ventilator in the highest part of the roof that can be closed

tightly by means of cords or chains answers the purpose admirably and may be constructed with little expense. The ease and convenience of operation are important points, and should not be neglected when the building is being constructed. It is a simple matter for the attendant to open or close a ventilator as he passes through the house if the appliances for operating it are within easy reach. Fig. 2 represents an efficient and easily operated ventilator.

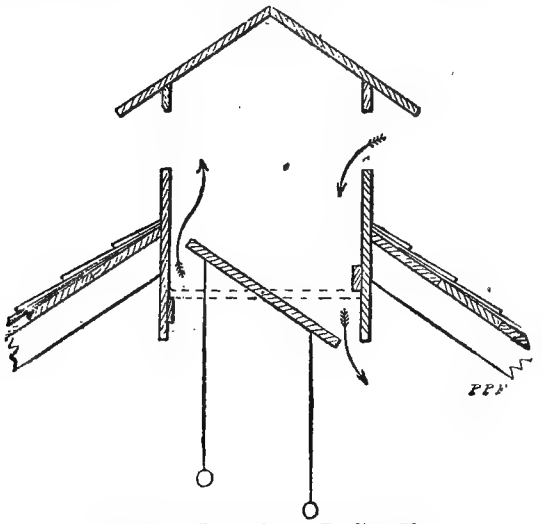


Fig. 2.—Ventilator for a Poultry House.

Perches.

"Perches should not be more than two and a half feet from the floor, and should all be of the same height. Many fowls prefer to perch as far above the ground as possible, in order, without doubt, to be more secure from their natural enemies; but when fowls are protected artificially from skunks, minks, foxes, etc., a low perch is just as safe and a great deal better for the heavy-bodied fowls. It must be borne in mind that the distance given at which perches should be placed from the floor applies to all breeds of fowls. It is true that some of the Mediterranean fowls would not in any way be injured in flying to and from the perches, but some of the heavy breeds would find it almost impossible to reach high perches and would sustain positive injuries in alighting on the floor from any considerable elevation. Convenient walks or ladders can be constructed which will enable the large fowls to approach the perches without great effort, but there are always times when even the most clumsy fowls will attempt to fly from the perch to the floor and come down with a heavy thud, which is often injurious. And furthermore, ladders or stairs for the easy ascent of fowls are more or less of a nuisance in the poultry house. The ideal interior arrangement of the house is to have everything that is needed in as simple a form as possible and not to complicate the arrangement by any unnecessary apparatus. The fewer and simpler the interior arrangements the easier the house can be kept clean, and the greater the floor space available for the fowls.

"There is no reason why all perches should not be placed near the floor. Movable perches are to be preferred. A 2x3 scantling set edgewise, with the upper corners rounded, answers every purpose and makes a satisfactory perch. The perches should be firm and not tip or rock. The form of the scantling makes it easy to secure them firmly and still have them removable.

"Underneath the perches should always be placed a smooth platform to catch the droppings. This is necessary for two reasons: The droppings are valuable for fertilizing purposes and ought not to be mixed with the litter on the floor; then, too, if the droppings are kept separate and in a convenient place to remove, it is much easier to keep the house clean than when they are allowed to become more or less scattered by the tramping and scratching of fowls. The distance of the platform from the perch will be governed somewhat by the means employed for removing the droppings. If a broad iron shovel with a tolerably straight handle is used, the space between the platform and the perches need not be more than six inches. The droppings should be removed every day.

Nests.

"In constructing nest boxes, three points should be kept constantly in mind: (1) The box should be of such a nature that it can be readily cleaned and thoroughly disinfected; if it is removable, so that it can be taken out of doors, so much the better; (2) it should be placed in the dark, or where there is only just sufficient light for the fowl to distinguish the nest and the nest egg; (3) there should be plenty of room on two or three sides of the nest. It is well known fact that some hens in seeking a nest will always drive off other hens, no matter how many vacant nests may be available. If the nest is so arranged that it can be approached only from one side, when one hen is driving another from the nest there is likely to be more or less of a combat, the result of which is often a broken egg. This, perhaps, more than any other one thing, leads to the vice of egg eating. To the writer's knowledge, the habit of egg eating is not contracted where the nests are arranged in the dark and open on two or three sides. Nests for Leghorns or Hamburgs may be made of six-inch fence boards nailed together so as to form boxes 8x10 inches and six inches deep. Where perches are arranged with the platform underneath to catch the droppings, as previously described, the nests may be placed on the floor underneath this platform, the opening in front closed with a door which either lets down from the top or lifts from the bottom. Where nests are placed side by side it is necessary to have the partitions between them of sufficient height so that it will be impossible for a hen to draw eggs from one nest to another.

Drinking Fountains.

"One of the difficult problems for the poultryman to solve is how to easily provide pure, fresh water for his fowls. Many patent fountains which are on the market are automatic and keep before the fowls a certain quantity of water. Under certain conditions these fountains serve an admirable purpose. Under more adverse conditions many of them fail to give satisfaction, because it is impossible to keep them clean. If fowls were fed only whole grain and the weather were always cool it would be a comparatively easy matter to provide satisfactory automatic drinking fountains, but as soft food forms a considerable portion of the diet for laying hens and fattening fowls these fountains are necessarily more or less fouled and in warm weather soon become unfit for use as

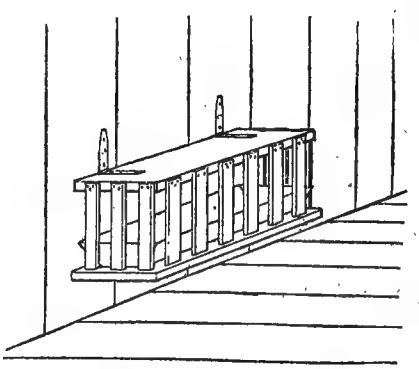


Fig 3.—Drinking Fountain.

drinking fountains on account of the tainted water and disagreeable odor.

"A simple, wholesome arrangement may be made as follows: Place an ordinary milk pan on a block or shallow box, the top of which shall be four or five inches from the floor. The water or milk to be drunk by the fowls is to be placed in this pan. Over the panisplaced a board cover supported on pieces of lath about eight inches long, nailed to the cover so that they are about two inches apart, the lower ends resting upon the box which forms the support of the pan. In order to drink from the pan it will be necessary for the fowls to insert their heads between the strips of lath. The cover over the pan an the strips of lath at the sides prevent the fowls from fouling the water in any manner, except in the act of drinking. When such pans are used it is very easy to cleanse and scald them with hot water as occasion demands. This arrangement may be carried a little further by placing a pan, or what would be still better, a long, narrow dish, something like a tin bread tray, on a low shelf a few inches from the floor, and hinging the cover to one side of the poultry house so that it can be tipped up in front for the removal of the dish or for filling it with water. (See Fig. 3.) Whatever device is used it must be easily cleaned and of free access to the fowls at all times.

Dust Boxes.

"It is necessary to provide dust boxes for the fowls during the winter months, if they are to be kept free from lice. If the soil in the yard is naturally dry and porous, abundant opportunities will be had for dust baths during the warm summer months, but during the late fall, winter and early spring, some artificial provision must be made. A comparatively small box will answer the purpose if the attendant is willing to give a little attention to it each day. These boxes should be placed so that they will receive some sunshine on each bright day, and be kept well filled with loose, fine earth. Road dust procured during the hot, dry months of July and August from much-traveled roads has no superior for this purpose. Probably there is no way in which the poultryman can better combat the body louse than by providing dust boxes for his fowls.

Yards or Parks.

"Where fowls are kept in confinement it will be found best to provide outdoor runs or yards for them during the summer months. Give them free access to these yards whenever the weather will permit. The most economical form, everything considered, for a poultry yard is one much longer than wide. Two rods wide by eight rods long is sufficient for fifty fowls. Whenever a poultry plant of considerable size is to be established it will be found most economical to arrange the yards side by side, with one end at the poultry house. The fences which enclose these yards may be made of poultry netting or pickets, and should be at least seven feet high. In either case it is best to have a board at the bottom, for sometimes it will be desirable to give quite young chickens the run of these yards. If the poultry yards are constructed as described there is sufficient room for a row of fruit trees down the center of the yard and still leave ample room for horse cultivation on either side, either with one or two horses.

"These yards are to be kept thoroughly cultivated. If thought best, grain may be sown before cultivation to furnish part of the green food for the fowls. Of all fruit trees, probably there are none that are more suitable for the poultry yard than the plums. The droppings of the fowls will manure the trees, and the fowls as insect destroyers perform a great office in protecting plums from curculio. After the trees are once well established a crop of plums should be secured nearly every year. These, too, will require no extra cultivation. The plum trees perform a valuable service in providing shade for the fowls. Where trees are not available, sunflowers may be used for this purpose with a considerable degree of satisfaction. However, some protection must be given the plants until they are well established, and even then many plants will be destroyed unless the fowls have an abundance of green food all the time.

"Hamburgs and Leghorns, if they are frequently moved from one pen to another, will sometimes give the owner considerable trouble in flying over fences, even though they are seven feet high. If it is possible to place the fowls, when they are quite young, in the yard where they are too remain, much less trouble will be experienced. It has often been noticed that hens would remain peacefully in the yard where they had been reared, but if moved to another yard would give the owner more or less trouble by flying over the inclosure.

Selection of Breeds and Breeding.

"A mistake is oftentimes made in selecting fowls of a breed that is not suited for the purposes for which they are to be kept. If egg-production is the all-important point, it is a most serious mistake to select a breed of fowls that is not noted for this product. If, on the other hand, meat is the chief object, an expensive mistake will be made if any but the heavy-bodied fowls are chosen. The small, active, nervous, egg-producing breeds can not compete with the larger phlegmatic Asiatics for meat production. Then, too, if fowls are kept for both eggs and meat production, some breed of the middle class should be chosen. These, while they do not attain the great size of the Asiatics, are sufficiently large to be reared profitably to supply the table with meat, and at the same time have the tendency for egg-production developed sufficiently to produce a goodly number of eggs during the year. The Wyandottes and Plymouth Rocks are good illustrations of this class of fowls. While individuals of these breeds have made excellent records in egg-production, the records of large numbers do not compare favorably with the egg-production of the Mediterranean fowls. All of the so-called Mediterranean fowls have a great tendency toward egg-production and require only the proper food and care to produce eggs in abundance.

"A serious mistake is also made in selecting fowls for breeding purposes and in selecting eggs for hatching. On many farms the custom is to select eggs for hatching during the spring months, when nearly all of the fowls are laying. No matter how poor a layer a hen may be, the chances are that most of her eggs will be produced during the spring and early summer months. A hen that has laid many eggs during the winter months is quite likely to produce fewer eggs during the spring and early summer months than one that commenced to lay on the approach of warm weather. Springtime is nature's season for egg-production. All fowls that produce any considerable number of eggs during the year are likely to be laying at this time. It is, therefore, plain that whenever eggs are selected in the springtime from a flock of mixed hens, composed of some god layers and some poor ones, a larger per cent of eggs will be obtained from the poor layers than at almost any other season of the year. A serious mistake is therefore made in breeding largely from the unprofitable fowls. Whenever it is possible, fowls that are known for the great number of eggs they have produced during the year should be selected for the breeding pen. While it will be almost impossible, and certainly impractical, in the majority of cases, to keep

individual records of egg-production, yet a selection may be made that will enable the breeder to improve his flock greatly.

"The two things necessary to produce large quantities of eggs with the Mediterranean fowls are: (1) Proper food and care, and (2) a strong constitution, which will enable the fowls to digest and assimilate a large amount of food; in other words, fowls so strong physically that they will stand forcing fo regg-production. In this relation, we may look at the fowl as a machine. If that machine is so strong that it can run at its full capacity all the time, much greater profit will be derived than if it can be run at its full capacity only a part of the time.

"There is, perhaps, no time in the history of the fowl that will indicate its vigor so well as the molting period. Fowls that molt in a very short time and hardly stop laying during this period, as a rule, have strong, vigorous constitutions, and if properly fed give a large yearly record. On the other hand, those that are a long time molting have not the vigor and strength to digest and assimilate food enough to produce the requisite number of eggs. If it is necessary to select fowls at some time during the year other than the molting period some indication of their egg-producing power is shown in their general conformation. In selecting a hen for egg-production, her form will give some indication of value. A long, deep-bodied fowl is chosen rather than one with a short body whose under-line is not unlike a half circle. A strong, hearty, vigorous fowl usually has a long body, a deep chest, with a long and straight under-line. Other things being equal, the larger bodied fowls of the egg breeds are to be preferred. It is a rule that fowls bred for egg-production are larger bodied than those bred for fancy points. Whenever vigor and constitution form an important part in the selection of fowls for breeding the size of the fowls is invariably increased.

Feeding.

"It will be observed that our domestic fowls that receive the least care and attention, or, in other words, whose conditions approach more nearly the natural conditions, lay most of their eggs in the springtime. It is our duty, then, as feeders, to note the conditions surrounding these fowls at that time. The weather is warm, they have an abundance of green food, more or less grain, many insects, and plenty of exercise and fresh air. Then, if we are to feed for egg-production, we will endeavor to make it springtime all the year round; not only to provide a warm place for our fowls and give them a proper proportion of green food, grain and meat, but also to provide pure air and plenty of exercise.

"Farmers who keep only a small flock of hens, chiefly to provide eggs for the family, frequently make a mistake in feeding too much corn. It has been clearly proven by experiment that corn should not form a very large proportion of the grain ration for laying hens; it is too fattening, especially for hens kept in close confinement. Until the past few years corn has been considered the universal poultry food of America. This, no doubt, has been largely brought about by its cheapness and wide distribution. The recent low prices of wheat have led farmers to feed more of this grain than formerly, and with a consequent improvement in the poultry ration.

"When comfortable quarters are provided for the fowls, the nutritive ratio of the food should be about 1:4; that is, one part of protein or muscle-producing compounds to four parts of carbohydrates or heat and fat-producing compounds. Wheat is to be preferred to corn. Oats make an excellent food, and perhaps come nearer the ideal than most any other single grain, particularly if the hull can be removed.

"Buckwheat, like wheat, has too wide a nutritive ratio if fed alone, and produces a white flesh and light-colored yolk if fed in very large quantities. In forcing fowls for egg-production, as in forcing animals for large yields of milk, it is found best to make up a ration of many kinds of grain. This invariably gives better results than one or two kinds of grain, although the nutritive ratio of the ration may be about the same. It has been found by experiment that the fowls not only relish their ration more when composed of many kinds of grain, but that a somewhat larger percentage of the whole ration is digested than when it is composed of fewer ingredients. It has been clearly proven by experiment that food consumed by the fowls influences the flavor of the eggs; that in extreme cases not only is the flavor of the food imparted to the egg, but also the odor. This is itself a sufficient reason for always supplying wholesome food for the fowls and seeing to it that none but wholesome food is consumed.

"It is conceded by a majority of poultrymen that ground or soft food should form a part of the daily ration. As the digestive organs contain the least amount of food in the morning, it is desirable to feed the soft food at this time, for the reason that it will be digested and assimilated quicker than the whole grain. A mixture of equal parts, by weight, of corn and oats ground, added to an equal weight of wheat bran and fine middlings makes a good morning food if mixed with milk and water, thoroughly wet without being sloppy. If the mixture is inclined to be sticky the proportion of bran should be increased. A little linseed meal will improve the mixture, particularly for hens during the molting period, or for chickens when they are growing feathers. If prepared meat scraps or animal meal is to be fed it should be mixed with this soft food in the proportion of about one pound to twenty-five hens. It will be necessary to feed this food in troughs to avoid soiling before it is consumed.

"The grain ration should consist largely of whole wheat, some oats, and perhaps a little cracked corn. This should be scattered in the litter, which should always cover the floor of the poultry house. It is necessary to have the floor of the poultry house covered with a litter of some kind to insure cleanliness. Straw chaff, buckwheat hulls, cut cornstalks all make excellent litters. The object of scattering the grain in this litter is to give the fowls exercise. All breeds of fowls that are noted for egg-production are active, nervous, and like to be continually at work. How to keep them busy is a problem not easily solved. Feeding the grain as described will go a long way toward providing exercise. If the fowls are fed three times a day they should not be fed all they will eat at noon. Make them find every kernel. At night, just before going on the perches, they should have all they will eat up clean. At no time should mature fowls be fed more than they can eat. Keep them active, always on the lookout for another kernel of grain.

Green Food.

"While perhaps not strictly necessary for their existence, some kind of green food is necessary for the greatest production of eggs. Where fowls are kept in pens and yards throughout the year, it is always best to supply some green food. The question how to supply the best food most cheaply is one that each individual must solve largely for himself. In a general way, however, it may be said that during the winter and early spring months, mangel-wurzels, if properly kept, may be fed to good advantage. The fowls relish them, and they are easily prepared. As it is not difficult to grow ten to twenty tons of these roots per acre, their cost is not

excessive. In feeding these beets to flocks of hens, a very good practice is simply to split the root lengthwise with a large knife. The fowls will then be able to pick out all of the crisp, fresh food rrom the exposed surface. These large pieces have the advantage over smaller pieces in this respect: The smaller pieces, when fed from troughs or dishes, will be thrown into the litter and soiled more or less before being consumed by the fowls, and, in fact, many pieces will become so dirty that they will not, nor should they, be eaten. Large pieces can not be thrown about, and they remain clean and fresh until wholly consumed.

"Clover, during the early spring, is perhaps one of the cheapest and best foods. It is readily eaten when cut fine in a fodder cutter, and furnishes a considerable amount of nitrogen. If clover is frequently mowed, fresh food of this kind may be obtained nearly all summer, particularly if the season is a wet one. Should the supply of clover be limited, or the season be unusually dry, green food may be cheaply and easily grown in the form of Dwarf Essex rape. This should be sown in drills and given cultivation as corn and potatoes. When the rape is from eight inches to a foot in height, it may be cut and fed. It furnishes a fresh, crisp food that is readily eaten. If cut a few inches from the ground, a second, and sometimes a third crop will be produced from one seeding. Alfalfa will also furnish an abundance of green food. It must, however, be cut frequently, each cutting being made before the stalk becomes hard and woody.

"A good quality of clover hay cut fine and steamed makes an excellent food for laying hens if mixed with the soft food.

"Cabbages can be grown cheaply in many localities, and make excellent green food so long as they can be kept fresh and crisp. Kale and beet leaves are equally as good and are readily eaten. Sweet apples are also suitable, and, in fact, almost any crisp, fresh, green food can be fed with profit. The green food, in many instances, may be cut fine and fed with the soft food, but, as a rule, it is better to feed separately during the middle of the day in such quantities that the fowls have about all they can eat at one time.

Grit.

"It is necessary that fowls have access to some kind of grit if grain food is fed in any considerable quantities. During the summer months, when they have free access to the yards or runs, it will not be necessary to provide grit, providing the soil is at all gravelly. If on the other hand, the soil is fine sand or clay, it will be necessary not only to provide grit during the winter months, but throughout the whole year.

"Small pieces of crushed stone, flint, or crockery ware will answer the purpose admirably. There are many poultry supply houses which keep constantly on hand crushed granite in various sizes, suitable for nearly all kinds of domestic fowls.

"Crushed oyster shells, to a large extent, will supply the necessary material for grinding their food, and at the same time furnish lime for the egg shells. Chemical analysis and experiments, together with the reports from many practical poultrymen, show conclusively that the ordinary grain and the green food supplied to laying hens do not contain enough lime for the formation of the egg shells. It will require several times as much lime as is ordinarily fed if good, strong egg shells are to be produced. Crushed oyster shells will supply this necessary lime if kept constantly before the fowls, trusting to them to eat the amount needed to supply lime rather than mix the shells with food. The judgment of the fowls can be relied upon in this respect.

Meat Food.

"Where fowls are kept in confinement it will be necessary to supply some meat food. Finely cut fresh bone from the meat market is one of the best, if not the best, kind of meat food for laying hens and young chickens. Unfortunately, it is not practicable for many poultrymen to depend wholly on this product, for the reason that it is often inconvenient or impossible to obtain, and when once secured it can not be kept in warm weather without becoming tainted. Tainted bones should be rejected as unfit for food. Skim milk may be substituted wholly or in part for meat food without a decrease in egg production, provided the proper grain ration is given.

Feeding Small Chickens.

"Chickens do not require food for the first twelve to thirty-six hours after hatching. One of the best foods that can be fed the first few days is stale bread soaked in milk. This should be crumbled fine and placed where the chickens have free access to it, and where they can not step on it. One of the difficult problems for the amateur poultryman is to devise some means for feeding little chickens so that they can consume all the food without soiling it.

"A simple and efficient feeding trough may be made by tacking a piece of tin about three and a half inches wide along the edge of a half-inch board so that the tin projects about an inch and a half on either side of the board, bending the tin so as to form a shallow trough, and fastening the board to blocks which raise it from one to two inches from the floor. (See Fig. 4.)

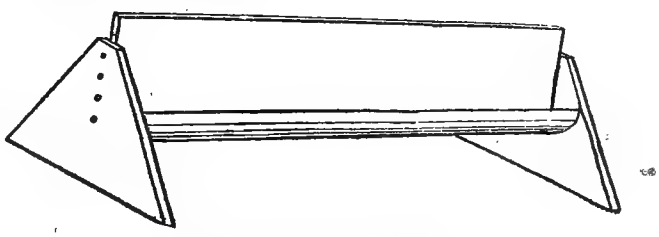


Fig. 4.—Feeding Trough.

"The trough may be from one to three feet long. It is within easy reach of the chickens and so narrow that they can not stand upon the edges. Food placed in such feeding troughs can be kept clean until wholly consumed.

"Granulated oats (with the hulls removed) make an excellent food for young chickens. There is, perhaps, no better grain food for young chickens than oats prepared in this manner. It may be fed to good advantage after the second or third day in connection with the bread sopped in milk. A good practice is to keep it before them all the time.

"The chickens should have free access to some kind of grit after the first day. Coarse sand makes an excellent grit for very young chickens. As they get a little older some coarser material must be provided. Milk is an excellent food for these young fowls, but requires skill in feeding.

"One of the great difficulties in rearing fowls is to carry young chickens through the first two weeks without bowel disorders. Too low temperature in the brooder, improper food and injudicious feeding, even if the right kinds of food are given, each plays an important part in producing these disorders. After the first ten days milk will be given more freely, perhaps, than during the earlier stages of the chick's existence. As a chick becomes a little older, more uncooked food may be fed. A mixture of fine middlings, wheat bran a little corn meal, and a little linseed mixed with milk

makes a valuable food. Hard-boiled eggs may be fed from the beginning, but, like milk, requires more skill than the feeding of bread sopped in milk. On farms where screenings from the various grains become really a by-product, these form a cheap and efficient food for the little chickens. Wheat screenings, especially, form one of the best foods, particularly if they contain a considerable portion of good kernels that have been cracked in threshing. Then, too, the screenings contain a number of weed seeds that have some feeding value and are relished by the fowls. They not only provide sustenance, but give variety, and this, in a measure, improves the general health.

"Drinking fountains require close attention. Small chickens drink frequently and oftentimes with their beaks loaded with food, which is left, to a greater or less extent, in the water supply. As it is necessary to keep these fountains in a tolerably warm atmosphere, they soon become tainted and emit a disagreeable odor. This must not be, for all food and drink consumed by fowls should be wholesome. Cleanliness is essential to success in poultry keeping. The drinking fountains must be kept clean. If automatic fountains are used, great care must be exercised in keeping them clean and free from bad odors. Nothing less than frequent scalding with steam or hot water will answer the purpose. A cheap, efficient drinking fountain may be made of a tin can with a small hole in one end, near the side of the can, under which is soldered a crescent-shaped piece of tin, forming a lip or small receptacle for water. If the can is filled with water and then placed on its side, a small quantity of water will run out of the opening and remain in this crescent-shaped lip. As the chicks drink this water a quantity of air will pass into the opening and a little more water will flow out. This kind of fountain will keep before the chickens a small quantity of water at all times accessible. By exercising care and keeping the fountain thoroughly clean, satisfactory results are easily obtained from this arrangement.

Brooders.

"If one resorts to artificial incubation it will be necessary to provide a brooder of some kind. It may be simple and quite inexpensive, or complex and costly. It is not necessary to expend very much money in the construction of an efficient brooder. It is necessary, however, to see that the brooder is capable of doing certain things. Some of these requisites are summed up in the following: It must be warm. The little chickens require a temperature of from 90 to 100 degrees the first few days, and at all times they should find it so warm in the brooder that they are not inclined to huddle together to keep warm. If the brooder is automatic, then the temperature may be kept quite even throughout the whole floor space. If, on the other hand, the brooder is heated from one side or from the top, and is not automatic, it will be best to construct it so that certain parts of the machine will be very warm, in fact, a little warmer than is necessary for the chickens, and some other parts somewhat too cool. It does not take them long to learn just where the most comfortable position is. They may be trusted entirely to select the proper temperature if the brooder is of sufficient size so that it is never crowded. A brooder constructed on this plan will require less attention than almost any other. It may undergo a considerable variation in temperature without overheating or chilling the chickens.

"The brooder should be easily cleaned and so constructed that all of the floor space can readily be seen. Inconvenient corners are objectionable in brooders, in fact, any corner is objectionable, but if brooders are constructed cheaply it is almost necessary to make more or less corners. If constructed of wood, circular ones are somewhat more expensive than square or rectangular ones. The floor must not only be kept clean, but dry.

"Top or side heat is to be preferred to bottom heat, but there must be sufficient bottom heat to keep the floor dry.

"As chickens get a few days old, plenty of exercise must be provided. On objection to many of the brooders in the market is that the chickens are kept too closely confined and not allowed sufficient exercise. It will be a matter of surprise to many to learn how much exercise these little fellows require. With the young chickens, as with the athlete, strength is acquired by exercise, and above all other conditions of growth, strength is the one thing necessary in the

Incubators.

"The modern improvement in incubators has made the rearing of fowls solely for egg-production quite out of the question unless these machines are used. No experienced poultryman at the present time will undertake to rear fowls in large numbers for the production of eggs and depend on the hens that lay the eggs for incubation. The Mediterranean fowls can not be depended upon for natural incubation. Artificial incubation must be resorted to if these fowls are to be reared in considerable numbers.

"There are many kinds of excellent incubators on the market. As with many kinds of farm machinery, it is impossible to say that one particular kind is better than all others. Then, too, an incubator that would give very satisfactory results with one individual might prove to be quite inferior in the hands of another person. What is best for one is not necessarily best for another. It is advisable, before investing extensively in any make of incubator, to thoroughly understand the machine. If good results are obtained, then additional machines of the same kind should be purchased. Failures are recorded simply because the individual fails to thoroughly understand the machine he is trying to operate, or in other words, fails to learn how to operate that particular machine to the best advantage. A successful poultryman must necessarily pay close attention to petty details. Not only is this necessary in caring for little chickens and mature fowls, but also in the care and management of incubators and brooders. The whole business is one of details. Excellent results are obtained by the use of many machines now on the market when the operator of these various machines is thoroughly interested. Poultrymen have, for a term of years, hatched in incubators over 80 per cent of all eggs put in the machine. It must not be inferred that this is an easy thing to do. A record of this kind is attained only by close observation and good judgment, not only in running the machine, but also in the breeding and care of the fowls to produce fertile eggs.

Disease and Lice.

"Disease and lice are the great obstacles to be overcome in poultry raising. The house may be kept free from lice by a liberal use of kerosene emulsion, and by whitewashing. Whitewash serves a double purpose, that of ridding the house of lice and making the interior much lighter. A small window, with the interior of the house whitewashed, will make the building as light as a much larger window without the whitewash. If the poultry houses are kept free from lice, the fowls can usually be depended upon to keep themselves free by a liberal use of the dust bath. If, however, body lice are found, they may be successfully treated by dusting insect powder under the feathers in the evening and allowing the fowls to remain undisturbed on the perches after the treatment.

Gapes.

"Gapes in chickens frequently destroy large numbers, and are caused by trematode worms in the windpipe. The number of worms is sometimes so great as to completely choke the fowl. A feather moistened with turpentine or kerosene oil and inserted into the windpipe and turned until the worms are removed is a practice quite largely recommended. Others recommend removing the worms with a fine wire or horsehair, doubled so as to form a loop; this is to be inserted into the windpipe and turned until the worms are detached, and then withdrawn, bringing the worms with it. Another remedy practiced by some poultrymen is to cause the chickens to breathe air in a confined space into which fine slacked lime is occasionally dusted.

"Preventive measures are far more satisfactory than the treatment of infected fowls. The pens and yards should be kept clean ad dry and the chickens in as thrifty condition as possible by supplying proper food and exercise. While these conditions may not insure absolute freedom from the disease in every instance, yet to moisture and filth can be attributed nearly all cases of gapes, particularly if the yards or pens were previously occupied by infected birds. Yards that have been allowed to become damp, filthy and infected with gape worms may be improved by draining and thorough cultivation. Heavy applications of lime just before cultivating, or saturation of the soil with a strong salt solution (provided no crop is to be grown) are recommended by experienced poultrymen.

"**Chicken Cholera**—This is an exceedingly fatal contagious disease, which is widely distributed over this country, and causes enormous annual losses, especially in the central and southern sections.

"The first symptom of the disease is, in the majority of cases, a yellow coloration of that part of the excrement which is usually white, quickly followed by violent diarrhea and rise of temperature. Other common accompanying symptoms are drooping of the wings, stupor, lessened appetite, and excessive thirst. Since the disease is due to a specific germ, it can only be introduced into a flock by direct importation of this germ, generally by fowls from infected premises. As soon as the symptoms of the disease are observed, the fowls should be separated as much as possible and given restricted quarters, where they may be observed and where disinfectants can be freely used. As soon as the peculiar diarrhoea is noticed in any of the fowls, the birds of that lot should be changed to a fresh ground and the sick ones killed. The infected excrement should be carefully scraped up and burned, and the inclosure in which it has been, thoroughly disinfected with a one-half per cent solution of sulphuric acid or a one per cent solution of carbolic acid, which may be applied with an ordinary watering pot. Dead birds should be burned or deeply buried at a distance from the grounds frequented by the fowls. The germs of the disease are taken into the system only by the mouth, and for this reason the watering troughs and feeding places must be kept thoroughly free from them by frequent disinfection with one of the solutions mentioned. Treatment of sick birds is not to be recommended under any circumstances. The malady runs its course, as a rule, in one, two, or three days, and it can only be checked with great difficulty.

"**Roup** is one of the most dreaded of diseases. It is sometimes spoken of as the winter disease. The symptoms are hoarse breathing, swelled eyes, discharge at the nostrils, and sometimes a fetid breath. Treatment is not generally satisfactory. The affected birds should be removed, the houses cleansed and disinfected. Damp, foul air and cold drafts in the poultry houses should be carefully avoided whenever fowls are subject to roup. A decrease in the proportion of corn and an increase in the proportion of meat food in the daily ration is held by some to be highly beneficial in warding off this disease.

"In general, the treatment of common diseases of fowls is not so satisfactory as preventive measures. Nowhere more than in the poultry business does that old adage apply, "An ounce of prevention is worth a pound of cure."

Dressing and Shipping.

"A considerable proportion of the dressed poultry consigned to commission houses in large cities brings to the producer a much smaller profit than it would had the same poultry been dressed and packed for shipment with greater skill. It is of prime importance that the poultry-products be placed on the market in a condition that will make them appear as inviting as possible. Proper feeding for two or three weeks before the fowls are slaughtered will improve their color materially. In most of the American markets fat fowls with a yellow skin bring the highest price. This condition may be secured most cheaply by feeding a grain ration composed largely of corn for two or three weeks before the fowls are slaughtered. Of the more common grain foods there is none that excels corn for this purpose.

"The commission men and shippers, who study in detail dressing and packing, state that uniformly fine quality will soon acquire a reputation among buyers. The shipper should always be careful to have the product look as neat as possible. In some of the large cities ordinances prohibit the sale of dressed poultry with food in their crops. In a few instances the sale of live poultry in coops which contain food is also prohibited. In all cases it is best to withhold food from twelve to twenty-four hours before killing, but the fowls should have plenty of water during this time, that they may be able to digest and assimilate food already consumed. All fowls should be killed by cutting through the roof of the mouth and allowing them to bleed to death. In all operations of dressing avoid cutting or bruising the skin or breaking bones. Care is required in the case of the heavy fowls in picking and handling to prevent bruising the skin. In packing fowls use neat, clean, and as light packages as will carry safely. Boxes or barrels holding about two hundred pounds meet these requirements best; boxes are better for turkeys and geese and barrels for chickens. Barrels may be used, however, for dry shipment as well as for hot weather shipment when the fowls are to be packed in ice.

"In shipping live poultry the coop should be high enough to allow the fowls to stand upright without bending their legs. When large coops are used there should be partitions, so that if the coops are tipped all of the fowls are not thrown to one side. They should have plenty of room in the coop. If possible put only one kind in a coop or in the division of a coop."

THE CARE OF ADULT FOWLS

Allow Nature to Assert Itself—Do Not Pamper Your Fowls—Definite Instructions on Feeding for Winter Laying—Special Winter Care of Adult Fowls—Best Egg Rations—Feeding For Eggs.

PROVIDE a few essentials in the care of adult fowls and there should be little trouble in handling large numbers successfully. Poultry is naturally vigorous and hardy, but their constitutions can be ruined by imagined kindness. It is not, for example, true kindness to subject adult fowls to artificial heat. They do not need it. As a rule they will suffer from it. To subject fowls to artificial heat (which renders them tender) and then to turn them out into even moderate weather is almost sure to bring on colds, throat trouble and roup. It is the fowl that becomes gradually hardened to cold that is able to withstand it and pass through the winter in good health.

Have your houses closely built, so that no drafts can strike the fowls at night; keep the houses free from bad odors; protect the fowls from lice, mites or other vermin; keep them at work as much as possible; feed sparingly of proper foods, and you need not dread disease in your flocks. These things are essential; provide them and you will meet with smooth sailing.

Poultry houses should be cleaned often enough to keep down the bad odors. In summer time (especially during damp weather) clean out three or four times a week, according to your accommodations and the number of fowls kept. In winter time twice or even once a week will do, if your houses are properly constructed and your fowls are not overcrowded. Overcrowded fowls require far more attention than those not crowded.

Use fresh loam or earth under the roosts rather than boards, as earth is a great absorbent of bad odors—a great purifier in fact—while wood (especially pine) soon becomes foul. Clean out the droppings frequently and change the earth under the roosts once every two or three weeks. Slacked lime is an excellent disinfectant. Use, as a lime sifter, an ordinary tin can with nail holes punched in the bottom. Box up the earth under the roosts in such a way that the night droppings will not get scratched out into the litter placed in the pens.

In winter time, by all means, feed all grain in litter of some kind, and do not spare the litter. Use straw, chaff, leaves, weeds, corn fodder—anything will do if you have enough of it. Make your fowls work by keeping them hungry through the day. Send them to bed with full crops at night (especially in the winter time), but be sparing enough of food of all kinds in the daytime to keep them on the move, to keep them hunting and scratching for more. Have them so that they will eat up clean all that you give them.

We should like to italicize every word of the foregoing paragraph, it is so important. If you overlook or forget everything else in this book, remember the advice given above.

Every fall we thoroughly clean our poultry houses, removing all the litter and also at least three inches of the soil. We then put in three or four inches of fresh, sweet earth, obtained from fields or garden. This is put in the houses during dry weather, and under the constant scratching of the fowls becomes fine dust. Road dust contains too much horse manure to suit us, and we doubt if it is healthful for fowls, especially if it gets wet or becomes damp. We are certain that we do not like to inhale it ourselves; hence we advise dry, fresh, clean soil in place of road dust. During an hour or two after feeding time a person can hardly see twenty feet ahead of him in our houses, so full is the air of dust. It invariably makes us feel good to see this, for it shows activity among the fowls and is a sure indication of health.

Fowls that do not scratch, and scratch with energy, need looking after. They may be sickly. They are either "out of condition" or are being over-fed. It is an easy matter to over-feed the larger breeds of fowls, especially the Asiatics. But do not under-feed. Avoid the two extremes. The more active birds can stand more food than the big, lazy breeds, for the latter pile on the fat with ease. They stand the cold better and are more contented in confinement—two things that are conducive to fat.

Dust is a paralyzer of lice. Lice cannot live in a cloud of dust. With plenty of fine dust handy, the fowls will themselves save you the trouble and annoyance of fighting vermin. In the fall, when we put in fresh earth and fresh litter, we carefully whitewash the inside of the house, putting an ounce of carbolic acid in every gallon of the wash. Fill all the cracks and crevices. Be liberal with the wash; it is cheap, and lice are the source of sixty per cent of the losses in poultry.

In feeding poultry the first thing to decide is, What am I feeding for?

If you have thoroughbred stock only, and are intending to furnish eggs for hatching purposes alone, then you do not want to force winter laying, for the demand for your eggs will be much better, and at higher prices during the spring months—during March, April and May. In this case it may become necessary to shift your fowls from pen to pen during January and February to prevent their beginning to lay too early.

If you wish to conduct an egg farm, as some farms are called, it will be to your advantage to force laying during November, December, January, February and March, when the market price is high for eggs as food, and to do this, you must do two things: Hatch out each spring a large number of early pullets, and then feed them for eggs the coming fall and winter. An egg farm pays well. The price of eggs seldom, if ever, falls below the cost of production, while in the fall, winter and early spring from 100 to 200 per cent can be made on every egg laid. It requires thought, system in feeding, and extra care to secure a large number of eggs during this time, and that is why there is money to be made in this branch of the business.

A market always exists everywhere for fresh eggs. No one need go a-begging with a basket or case of fresh laid eggs, especially in winter time. Every human habitation contains a customer. On an egg farm, rightly conducted,

$100 worth of feed can be readily converted into $300 worth of eggs in a month's time. Hotels and restaurants in cities are ever ready to buy, or to contract for eggs that are guaranteed to be fresh. In any city a person can work up a private trade at so much a dozen the year around. In Quincy, a western city of 40,000 people, well-to-do citizens willingly pay twenty cents a dozen twelve months in the year for eggs guaranteed by responsible poultrymen to be fresh laid. Down east they as willingly contract to pay thirty cents the year round.

FEEDING FOR WINTER LAYING.

Herewith is presented the plan of feeding followed on one of the leading egg farms of the country.

We can make a fowl pay us a net profit of $2.50 to $3.00 a year, and so can anybody who goes to work right. The whole secret lies in that oft-repeated rule: "Hatch the chicks in April, keep them growing so the pullets will lay by October, and then keep them laying."

There's no magic about it, no "sleight of hand," but that plain, sinmple rule lived up to, and everything made to bend to it or revolve around it. It doesn't do to let the hatching go till May or June because other work needs to be done. If other work runs up against the hatching season or chicken work, so much the worse for the other work, for chickens on our farm have the right of way.

An important item in our creed is that the old stock must be sold off each summer and pullets raised to take its place. By doing this the price received for the old stock swells the total receipts, as the pullets cost nothing to raise —the cockerels hatched with them sell for enough to pay for the food of both themselves and the pullets.

Four mornings in the week we feed a mash made up of about one-third cooked vegetables mashed fine, or cut clover cooked by being brought to a boiling heat in water, an equal amount of hot water added, a teaspoonful of salt to a bucketful; then cayenne pepper one day, then powdered charcoal one day, and into this is stirred mixed meal until the mash is as stiff as a strong arm can make it.

This mixed-meal with us consists of one part each cornmeal, fine middlings, bran, ground oats, and animal meal or green bone, a scoop or dipper of each being dipped in turn into a bag and poured from the bag into the meal barrel from which it is dipped into the mash. We consider the thorough mixing of these meals a considerable factor in making a good mash.

When we have cut fresh bone in abundance we omit the animal meal from the mixture, ordinarily we have only about half-rations of cut bone to go round, so use regularly half the amount of the mash to make up the deficiency.

The foundation of the mash is the cooked vegetables, which may be refuse potatoes, beets, carrots, turnips, onions, (anything in the vegetable line), and into the pot goes the table waste, etc., and the potato, squash and apple parings from the kitchen. The potatoes, or beets, etc., are washed before putting on to cook, and the mess when boiled is sweet and savory.

This mash, our readers will notice, contains a great variety of food elements, and this variety is quite an important factor. A fowl needs a variety of food to supply her various physical needs, and give her a surplus out of which to make eggs, and this "variety" of foods we believe we best can attain in the manner described above. An additional advantage is that a tonic or stimulant can be added if desired; we sometimes use a teaspoonful of tincture of iron for the poultry food, and sometimes add a handful of linseed meal or cottonseed meal; but the latter are somewhat fattening (as well as stimulating), and those who feed their fowls well for eggs must beware of too fattening foods.

This morning mash is fed in troughs large enough so that all of the fifteen fowls in a pen can get about it at one time, another important factor, because if the trough is small some of the birds have to stand back and wait for second table, and when there chance does come there's nothin left for them. With a trough four feet long by six inches wide, there is plenty of room, and if a biddy is driven away from one place she runs around and goes to eating at another, and thus all get a share.

Our fowls have exercise grounds in summer in yards 125x12 feet, which gives them a grass run (with growing grass always in the growing season), and they will take ample exercise in pleasant weather. To keep them out of doors the noon feed of whole barley (or buckwheat) and night feed (before sunset) of wheat is scattered upon the graveled space immediately in front of the houses. Each family of fifteen has a pen within the house twelve feet square, or 144 square feet of floor space, which gives about ten square feet per fowl. The floor is of earth, covered about six inches deep with screened gravel. On the gravel the grain is scattered in stormy weather in spring, summer and early fall, when we want the birds to stay indoors. When cold weather approaches, exercise must be stimulated, and we cover the pen floors four to six inches deep with chopped meadow hay, or chopped straw, into which the grain is scattered, and the biddies have to dig it out. Some poultrymen use dry leaves for pen litter; chaff from a threshing mill would be most excellent (nothing could be better), and we have found one or two cases where common cornstalks were used. With us straw and meadow hay are most easily obtained and we use these. What the scratching material is, is of far less importance than that the scratching material be there.

Whole wheat is the best grain food for fowls, whole barley is the next best, and buckwheat next. Corn comes last, and should be used only at night and in small quantities, when eggs are sought for. We make barley or buckwheat the noon feed for five days a week, and wheat the night feed five or six days in the week. We do not make the mash on Sunday, because we want to reduce the work to its lowest limit on that day, doing no more than the regular feedings and waterings, and collecting the eggs.

Monday we feed oats (or barley), wheat, corn.
Tuesday we feed mash, barley (or buckwheat), wheat.
Wednesday we feed mash, cut bone, wheat.
Thursday we feed oats, barley, wheat (or corn).
Friday we feed mash, barley, wheat.
Saturday we feed mash, cut bone, wheat.
Sunday we feed mash, barley (or buckwheat), wheat.

Two feeds of cut bone each week, one or two of whole oats, and one or two of whole corn (according to the season), give variety to our ration, and to that is added whole cabbages hung in the pens in cold weather to tempt picking them to get green food; or turnips, or beets, or carrots are split in halves and placed in pens to be picked to pieces and eaten.

Ground oyster shells and mica crystal grit are always accessible, and fresh water, replenished three times a day (warm in winter), and the water pans are carefully rinsed every day.

One variation from this program we propose making this winter, and that is a slightly lighter feed of mash in the morning, making it a breakfast rather than a full meal, and

about mid forenoon (and the last feed mid afternoon), to induce even more scratching exercise. To search and scratch for seeds, grains, insects, etc., is the fowl's normal method of feeding, and the nearer we approximate to nature's way the better; hence the greatest possible amount of exercise should be compelled.

FEEDING FOR EGGS.

Results Achieved in the Noted "National Stockman and Farmer" Egg Contest—Surprising Egg Yield Obtained—How It Was Done.

On January 31, the National Stockman and Farmer, of Pittsburg, Pa., closed its annual egg contest, which contest was opened February 1. Two hundred and twenty-four pens of fowls were entered by subscribers in this contest, 143 of which continued throughout the year. Weekly reports were required from each contestant, and the value of the eggs laid was determined according to the current price of eggs in the Pittsburg market, this value being computed on the number of eggs as reported from week to week. The six highest winners and the number and value of eggs were reported in the Stockman and Farmer, as follows:

First—Pen 112, W. S. Stevens, Ohio, eight White Plymouth Rock pullets, an average of 289 eggs each, or a value of $5.02 per hen.

Second—Pen 189, William G. Dodson, Ohio, eight crossbred pullets, an average of 283 eggs, or a value of $4.82 per hen.

Third—Pen 115, J. G. Redkey, Ohio, eight White Plymouth Rock pullets, an average of 280 eggs each or a value of $4.00 per hen.

Fourth—Pen 88, Z. N. Allen, Pennsylvania, twenty-four Single Comb Brown Leghorns, an average of 277 eggs each, or a value of $4.89.

Fifth—Pen 75, L. E. Bradbury, Ohio, eight Single Comb Brown Leghorn pullets, an average of 270 eggs each, or a value of $4.64 per hen.

Sixth—Pen 154, Z. N. Allen, Pennsylvania, twelve Barred Plymouth Rocks, an average of 262 eggs each, or a value of $4.24 per hen.

HOW THEY DID IT.

In the Reliable Poultry Journal were printed communications from four of the five above named winners, giving their methods of housing, caring for and feeding the fowls entered in the contest. This is considered the cream of practical matter, and these communications are reproduced here for the guidance of persons who wish to largely increase the egg yield of fowls.

AN AVERAGE OF 289 EGGS PER HEN.

Ohio, April 15.

Editor Reliable Poultry Journal.

You asked how I managed and cared for my eight White Plymouth Rock hens during the recent egg contest as conducted by the National Stockman. I will be pleased to tell you. This pen consisted of eight White Plymouth Rock hens and one rooster. These eight hens laid 2,312 eggs in 365 days, or an average of 289 per hen for the year. Estimated by the Pittsburg, Pa., market, week by week, each hen laid during the year $5.02 worth of eggs. They were kept in a house 12x20 feet long, divided into two parts, each 10x12, one part being used for a scratching shed and the other part containing the nests and roosts. The building is seven feet high and is a frame, weather-boarded with pine siding and ceiled with matched pine flooring, which makes the house very warm. You will notice this pen had plenty of room. The floor consists of mother earth, and is covered about four inches deep in the fall, with road dust and sand. The building runs east and west, facing the south.

In the south of the building are two windows, which extend from the floor to the height of the building, thus admitting plenty of sunshine and light, so necessary to the comfort and happiness of the fowls. The perches are about three feet from the floor, and under them is the droppings board. A house of this kind in which fowls are housed during the winter months, with the right kind of food and proper care will insure the poultryman eggs all winter.

My hens were not out during last December and January and they were healthy, happy and contented as if they were roaming the fields during the happy summer months. They were all aglee with song and contentment and shelled out eggs every day even during the coldest days of last winter.

They have free access to oyster shells and grit. I give them twice a week fresh granulated bone. Their food consists of a warm breakfast, equal parts of bran, white middlings and chopped corn and oats, and into this, I put for them, fine beef meal. At noon I feed wheat, which is thrown into the scratching shed. This gives them exercise in obtaining their noon meal. In the evening they are fed whole corn. During the time from the first of April until the first of November, I feed the same, with this change: In the morning their mash is mixed with cold water, and in the evening wheat takes the place of corn.

Cleanliness is a very important matter in regard to the maintenance of the health of your fowls. I clean the house twice a week during the winter, and in the summer every other day. I have been breeding Plymouth Rocks now for five years, and have not as yet had any disease, and I attribute it to cleanliness and proper care. I am in the poultry business to stay.

Wishing the readers of the R. P. J. a prosperous year and a bright and happy future, also the editor a long and prosperous life, crowned by still greater success, I am,

Yours respectfully, W. S. STEVENS.

WINNER OF THE SECOND PRIZE.

Mr. William G. Dodson, who won the second prize, writes as follows:

Ohio, March 26.

Editor Reliable Poultry Journal.

Yours of March 19 at hand. My pen of eight pullets that I had in the National Stockman and Farmer contest laid an average of 283 eggs each in one year. The pullets were from a Rose Comb Brown Leghorn cock crossed on White Leghorn hens. The house I kept them in was built of lap-siding and lined with Neponset paper and roofed with the same. Not a pin crack was left for drafts to get in. I have a good-sized yard fenced in with wire netting.

Each morning these pullets had a hot feed of chop, mixed with the water that the fresh bones and beef scraps were boiled in. After that some wheat and oats were thrown in the straw for them to scratch for. At noon they had ground bone and meat scraps and stale bread. At night they had in summer wheat and barley, and in winter corn and buckwheat.

At all times they had before them fresh water, and each day fresh milk. Twice a week I gave them some buttermilk. They also had at all times a good supply of broken dishes, seashells and limestone, broken in small pieces, and

once a week they had a small quantity of ground ginger and black antimony.

The house was cleaned once a week and the floor sprinkled with air-slacked lime, and the inside of the house dosed with coal oil.

The dust box was four feet square and filled with sifted coal ashes and road dust mixed. Not one of them was sick or "off its feed" one hour in the whole year, and they are still laying and look as fresh as any of my chicks. They are from my best layers singled out for several years. I breed from none but the best. I have been experimenting for some time on crossing different chicks. I could just as well have entered a pen of full-bloods as cross-breeds, but so many laughed at cross-breeds I thought I would give them a trial.

I do not think any of you can do just as good without extra effort, for those pullets have been petted like children. They never knew in the whole year what it was to want for anything. No males were kept with them. Do not send to me for eggs or birds, as I have none to sell at present, nor this summer. Now, Mr. Editor, I have given you the facts in the case and you must pass judgment. Thanking you for the interest you have taken in the result of the contest, I remain, yours truly, WILLIAM G. DODSON,

AN INTERESTING COMMUNICATION.

Mr. J. G. Redkey, of Ohio, won the third prize with eight White Plymouth Rock pullets that averaged 280 eggs each for the year. He wrote as follows:

Ohio, March 22.

Editor Reliable Poultry Journal.

Yours of the 19th at hand, and in reply to your request for a short article descriptive of my methods of feeding, housing and quality of stock in the late Stockman and Farmer contest, I have this to say: The varieties I breed are thoroughbred White and Barred Plymouth Rocks, of the Bowman and Boyer strains of White Rocks, and Farmer and Newel strains of Barred Rocks. My pens are composed of some choice birds.

I feed warm food in the morning, composed of cooked meat two parts and twenty parts of cracked wheat, with whole wheat and oats at noon scattered in litter. I feed oats, wheat and corn at night, with clover heads, cabbage, beets or turnips for green food, and cut bone, oyster shells and crushed limestone for grit.

My houses are built 14x20 feet, with a hall, 4 feet wide in front and four, six-light windows in front. There is a partition in the center, making two pens of 10x10 feet to each house. These houses are double boarded, with tarred paper between, and are roofed with Marietta roofing, double seamed. Each house is five feet high in the rear and eight feet in front. Each house has an earth floor filled in with from six to eight inches of pounded clay, with four inches of coal cinders on top, which makes a floor perfectly dry.

My houses are frost-proof, having withstood a temperature of twenty-one degrees below zero. This, I think, is one of the great secrets of winter egg-production, as my twelve years' experience as a breeder of fancy poultry have taught me that you cannot expect to get eggs in winter with all the feeding and care you may be able to give unless you have comfortable houses for them.

There is also a great difference in the laying qualities of birds of the same breed, some strains laying almost double the number of eggs of others of the same breed. I have been mating some of my pens with that object in view, viz: eggs, and I have been in a measure successful, as my record in the late contest shows. I have been giving this my attention for the past eight years, and by careful selection have increased the average per hen from 212 eggs nine years ago to 280. In my pens of White Plymouth Rocks and in the Barred Rocks I have brought them up from 205 to 264 in the same length of time. My yards are each thirty feet wide by 200 feet long, with one house for each two yards. Each pen contains fifteen hens and one cock, except the pens that were in the contest, which contained nine hens and one cock, and ten hens and one cock respectively.

I have never allowed my hens to raise chicks, as I hatch and raise all my fowls by artificial heat, and when I have a hen that becomes broody I remove her to a yard prepared for that purpose, containing no nests or secluded corners, and in a few days she can be returned to the pen again, and she will soon be laying again, as though she had never offered to sit. It is my belief that fowls hatched in incubators and raised in brooders, year after year, will lose, to some extent, the habit of incubation, as my Rocks are now much less inclined to become broody than they were a few years ago, and I firmly believe that were it possible to introduce no other blood in the yearly matings, except from those that were artificially hatched and raised, the results would be much more marked. I may be wrong, but I have in one of my pens a Barred hen hatched in May, 1893, that laid 297 eggs to March 1, 1895, and has never offered to sit. This is an exception, but only goes to prove what I believe is possible. J. G. REDKEY.

(Note—Mr. Redkey is confirmed in his opinion by the report of the United States Consul in Egypt, who states that the native hen of that country (where artificial incubation has been followed for centuries), has abandoned the work of hatching.)

NO EXCELLENCE WITHOUT LABOR.

Mr. Z. N. Allen, who came off fifth and sixth best in the contest, and an average of 262 eggs apiece from a pen of 24 Single Comb Brown Leghorns, favors us with the following valuable information:

Pennsylvania, March 25.

Sixteen years ago this spring I began an egg contest of my own. The preceding summer I had built a good hen house, so I determined to ascertain which of my breeds were the best egg producers. I penned six of each kind, Brown Leghorns, Silver Hamburgs, Polish and Plymouth Rocks. This gave me some experience in feeding and confinement (which lasted four months) and this experience has stood me well in hand ever since. Pens Nos. 88 and 154 in the Stockman egg contest were pullets from good laying stock. Those in No. 88 were hatched the first week in May, began laying about the middle of November. Those in Pen No. 154 were hatched the first of April, and began laying the last of November. They were well fed and cared for from chicks until the contest ended. Their houses were made as warm as could be done without artificial heat. Their apartments were kept clean and dry and were supplied with grit, ground bone and oyster shells. They had to scratch in the winter in litter, and in summer in sand. One side of their yards was spaded two feet wide. Then wheat was scattered and the sand was shoveled up against the side of the yard. To get the wheat they had to scratch it back until it was about level. This was repeated once a day during the summer unless it was too wet. When cold weather came they had to go into winter quarters and earn their living by scratching litter. They breakfasted on hot mash in winter and not very cold in summer. A short time after breakfast they went to scratching for life, some singing as they worked. For dinner they had green bone, meat and

clover every alternate day, with very little exception. The noisiest time in the hen house was from daylight until noon. I thought sometimes they were trying to see which could make the most noise.

I believe they had a more jolly time than I did. Along in the afternoon they turned their scratching into pecking cabbage. This sobered them down somewhat and gave them an appetite for supper, at least they got in a hurry and tried to see which would get the first bite. Some of them were so devoid of etiquette that they even flew up and lit on the side of the feed bucket. They appeared to relish very much boiled wheat and oats and some coarse bran, even if it was quite hot. After supper they got lazy.

Once a week the medicine man came around with his jar of cayenne pepper and made it a little hot for them in the mash. I believe the pullets in 88 and 154 laid eggs because they liked to do it. To cut it short, a notion came into the heads of these pullets in late summer or early fall that nothing but a new dress of a more gaudy kind would suit them. So one day they huddled together and threatened to strike. I took the hint and began to boil rye and oats together and mix bran with them. Said I to the biddies: "This shall be your breakfast. As for scratching you will be too lazy, so in its place I will give you all the meat and green bone you need, but you must sup on hard tack and all the sweet milk you can drink." So they supped on corn and milk. They made a quick job of it with slight falling off of eggs. Pen 88 made a record of 6,645 eggs. Pen 154, 3,139 eggs. Thoroughbred stock, good, wholesome feed and plenty of it, good warm houses and good care will make a success of poultry. Respectfully,

Z. N. ALLEN.

A HEN CATECHISM

Answers to Everyday Questions That are Asked of Poultry Paper Editors, Poultry Lecturers and Poultry Raisers.

(Answers by Mrs. Ida E. Tilson, of the Minnesota Farmers' Institute Corps.)

1. How many hens can be kept in a yard 75x100 feet, and a house 12x20 feet, latter 8 feet high? Ans. Good authorities recommend, per confined fowl, 100 square feet of yard room, and 8 square feet of house room.

2. We have a good, high hen house, built as a lean-to on our barn. Would it be well to finish off the loft for our hens to lay in? Ans. I have seen lofts furnished with nest boxes, etc., but no such room was very accessible or easy to clean, and cleanliness is the first condition of poultry success. I should judge it would be a cold place in winter and hot in summer; therefore not attractive to hens nor good for eggs. The main room below, however, would be much more comfortable with a small enclosed loft above it.

3. When hen houses are built double walled, with an air space between, do you find the latter a harbor for insects? Ans. Insects could hardly penetrate the building paper which lines each side of air space in my house built thus. Early, strict, constant cleanliness, by means of a broom, whitewash, fumigation, sprayer, etc., prevents any great accumulation of insects anywhere.

4. Can a force pump be used for cleaning the hen house and for other purposes, too? Ans. Those who keep force-pumps as window cleaners, fire extinguishers, etc., naturally do not wish kerosene and whitewash used. Many emulsions sprayed on fruit trees are similar to the insecticides for hen houses. Some years ago I used the same pump for the last two purposes.

5. Should the perch for chickens be round or flat? Ans. A broad, flat perch prevents the breast bone from crooking while it is young and tender. Fat adults and large breeds prefer the same, but smaller kinds seem to like a round perch.

6. Do you favor putting nest boxes on the ground? Ans. Yes, for Asiatics. Egg eating prevails almost exclusively among smaller breeds, like Leghorns, Minorcas, etc. A nest box eighteen inches from the ground can not be peered into as they walk about; and they are able to fly up when they need to lay.

7. In raising 200 or 300 chicks, would you advise the use of an incubator? Ans. I would rather raise that number by hens; but if your fowls are wild, and you do not understand feeding them to cause early sitting, and you like machinery, and have safe, suitable places for incubator and brooder, you may prefer the latter.

8. Which is the best incubator and the best brooder, and where are they made? Ans. No one could answer that who had not tried all. There are many well-tested machines. I have successfully used an excellent hot-water one, the "Reliable" incubator of Quincy, Ill.

9. Is it advisable to try artificial incubation by placing eggs in manure beds? Ans. A man lately selling directions for such a scheme has been widely condemned by the poultry press. That method, said to have been anciently and extensively practiced in Egypt, is not practicable for our colder, changeable climate.

10. What is the best material to set a hen on? Ans. One year I tried several hens on widely different materials—hay, sawdust, earth, etc., but with eggs of the same age, kind, etc. Each hatched just nine chicks. The character of the eggs is most important. A hot, dry country and season require, however, more moisture about nests than under ordinary circumstances.

11. What is the trouble with hens when they will not sit their time out, or wish to change nests? Ans. Probably lice, mites or bed bugs annoy them. Possibly they are "new" hens, and want a larger sphere.

12. Does a sitter merely turn her eggs over, or does she also move them from outside in, and vice versa? Ans. She is not perfectly regular about either operation, but both turns her eggs over and moves them back and forth. The latter is proved by watching a sitting composed of different colored eggs. The incubators, therefore, which have their racks taken out and inverted as a whole, thereby also changing the relative locations of eggs, are scientific, but require a warmer situation for such cooling operations, than do machines with an inside device to turn each egg in its place.

13. Is a cellar a good place to put little chicks? Ans. Not unless exceptionally light, dry and warm. I knew one attempt where sore eyes and many deaths resulted.

14. Do small chicks thrive as well on a floor as on the bare ground? Ans. In a damp climate, sitting on the ground gives chills and rheumatism. A dry climate would not furnish that objection, but rats and skunks easily work into a floorless coop. I use a little dried sand and chaff to remedy the hardness of boards, on the bottom both of coops and brooder.

15. Is cracked corn good for little chicks? Ans. Yes, for broilers. To future layers I would give cracked wheat and rolled oats instead.

16. How are corn and oats for laying hens? Ans. Corn favors richness but not number of eggs. It is very heating and fattening, therefore is suitable to feed winter nights. Oats are fine as an occasional winter ration, but their indigestibile, clogging hulls make them most suitable for summer, when constipation does not prevail.

17. I have been told not to cut up raw vegetables in winter, because a hen's mouth is large, and she can swallow chunks which stay and freeze in her crop. Ans. There is no danger if vegetables are chopped reasonably fine. An English veterinarian, who has examined scores of diseased crops, never found a case like above.

18. Why not put cayenne pepper in their food to make hens lay? Ans. Pepper, like everything else which is a stimulant and not a food, needs to be cautiously used.

19. Is there danger of feeding too much ground bone? Ans. There have been reports of untimely molting caused thus, but few poulterers are able to buy or prepare enough for harm. I feed one ounce per fowl every third day.

20. Are ground clam shells as good as bone, if you can get the mas cheap? Ans. Shells contain more carbonate of lime and answer for layers, but are not nearly so valuable for growing chicks as is ground bone containing phosphate of lime, like their own frames.

21. If I give ducks fresh water they set to work at once making it muddy as fast as they can. Do they need pure water the same as chickens? Ans. I supply fresh water twice daily for both ducks and hens, and all thrive well.

22. What is the best breed for an inexperienced person? Ans. Probably some general-purpose breed, like Wyandottes and Plymouth Rocks.

23. In full blood Plymouth Rocks, are the male and female of the same shade? Ans. The "American Standard of Perfection" still requires the same color of plumage in both, but there is considerable discussion on the matter, because the pullets naturally run darker than the cockerels, and thus two breeding pens are often necessary in rearing show birds.

24. What is the origin of the Plymouth Rock? Ans. It is a cross of Dominique and Black Java, with probably other slight mixtures. The breed is said to have been first exhibited in 1867 by its originator, D. A. Upham, of Wilsonville, Conn. Some strains by similar crosses may have been produced independently of his work.

25. How would a cross between Brown Leghorns and Plymouth Rocks do for laying? Ans. The cross would, probably, make a better layer than the Plymouth Rock and a poorer one than the Leghorn.

26. What is good for scurfy legs? Ans. Clean the legs with soap and water; then anoint with sweet oil or hen's oil containing a little sulphur.

27. Why did my little turkeys die when I greased them for lice with kerosene, as told to do in a book? Ans. I, myself, never advise kerosene; it is to severe. Scaly legs dipped in it often become lame. Fowls are made crazy by application on the head, etc.

28. What do you give fowls with gapes? Ans. Purer drinking water and cleaner yards, because gapes are usually caused by a little red worm found in water and dew. Air-slacked lime sprinkled over yards will purify them. If the fowl swallows a piece or two of raw salt pork, size of corn kernels, that may dislodge worms.

29. What is a cure for cholera? Ans. Joseph Wallace says there is no specific for genuine cholera. I would advise killing bad cases at once. Give the others a little lime or alum in their drinking water. If they mend, feed on bread and milk and table scraps at first. Give the poultry quarters, the well and the water dishes a better cleaning than ever before.

30. What causes spots of blood in eggs, and how may we prevent them? Ans. Generally the hens are too fat; hence, egg organs are crowded and there is a rupture of some tiny blood vessels while the egg forms and passes.

FEEDING YOUNG CHICKENS

Poultry Men and Women of Experience Give Their Methods—Valuable Advice to be Remembered—Common Errors to be Avoided—"A Stitch in Time."

(Not all successful poultrymen feed alike. Various methods of feeding young chickens may be adopted, yet all may have beneficial results; circumstances and environments differ, and may demand different treatment and rations; dangers of ill health that beset chickens in one state may be comparatively unknown in another; and the successful poultryman is he whose observation instructs him upon particular necessities of this location.—Editor.)

Millet a Favorite Food—No Cornmeal Mush—Give Fresh Water and Let Them Hustle.

Feeding the chicks is one of the greatest problems the poultry fancier has to meet. When chicks are hatched with a hen I give them no food for thirty-six to forty-eight hours. In the incubator, when the hatch is very large and they are crowding each other at the window, I take them out as soon as they are apparently strong and place them in a brooder, giving them nothing for the first twenty-four hours but coarse river sand and fine Mica Crystal grit. The next twenty-four hours I give them water and dry food in the shape of millet seed, pin head oats, fine cracked corn and stale dry bread crumbs. My experience has been, however, that the little ones do better on millet seed alone for the first week or ten days then on any combination I have ever given them, but they do fairly well on any of the above rations.

I think more chicks are killed by the old-fashioned method of mixing up cornmeal and giving them all they can eat, than from any other cause. This brings on fermentation in the crop, followed by bowel trouble, and when this appears there is very little to be done for the affected chicks, and they usually drop off within a few days.

I never feed my chickens, from the time they are hatched up to laying time the next year, any mashes whatever, and I question very much whether mashes are ever beneficial.

After the chicks are old enough to leave the brooder they are continued on one of the above (or all of them are given at various times), and in the summer I keep the troughs (under shelter and arranged so that chickens cannot get into them), well supplied with oats, cracked corn, wheat, millet and grit. Let me again call the fancier's attention to millet. This one article alone, which can be cheaply purchased, is the most valuable of all our foods for the little chicks, and I might say for the older ones also. It makes the best scratching food that I know of and chickens are so fond of it that they will work in their scratching pens from morning till night to hunt out the little grains.

The drinking vesels should be at all times kept clean and filled with fresh water, the oftener the better. I have solved the question on my own place for the older chickens by a system of springs, as I call them. I have a system of water pipes running through the yards and outside runs, and by making a little leakage in one of these joints, cutting out a little hole as the pipe is laid underneath the ground, and fixing a basin to hold the water, I have cool, fresh water at all times. I cover this little spring with a box or shade of some sort, then surround the spring with something or other so as to allow the chickens to reach in and drink, but not get into the water.

By carefully looking after these details one should be able to raise from ninety to ninety-five per cent of all the chickens that are hatched and that live to be three days old. There will be a small percentage of each hatch that are strong enough to get out of the shell but have not enough vitality to survive the first three days. Where I use hens for mothers I never allow the hen to run with the litle ones, but keep her confined, allowing the chicks to roam where they please after the dew is off. In this way each little one learns independence, and many times I find them far away from the mother hustling for themselves, while if the mother were allowed to go out with them they would depend on her to forage for them. Should a rain storm come up, each will hustle back to its mother, while if the mother were out with the brood confusion would result.

E. A. KEGLEY, Iowa.
Ex-president of the American Poultry Asociation.

A Variety of Food—Overfeeding Disastrous—Confine the Old Hens—No More Greased Heads.

I have no fixed rule for feeding young chicks, but experience (the best of teachers) has given me better results than any set of methods I have ever tried. My chicks are not fed until about twenty-four hours old, when they are given oatmeal, dry. This is their only ration until they are one week old, when some millet seed is fed. Oatmeal and millet are fed alternately until the chicks are about three weeks old, when I feed a little wheat, also cane seed. About this time the oatmeal is gradually dropped and millet, wheat and cane seed form their principal ration. Occasionally they get a feed of bread crumbs or cornbread. When they are one month to six weeks old I feed cracked corn or any grain they seem to like. Up to this time they are fed five times a day and are fed sparingly. I want them to eat everything up clean—in fact, they do better if kept just a little hungry to induce exercise. Especially is this true of chicks half grown. In my opinion the greatest bane to poultry raisers is overfeeding. At no time do I feed soft iood to chicks.

When hens are used for brooding there are confined until the chicks are a month to six weeks old, and after that even during damp or cold weather. When the hens are permitted to range they neglect to hover the chicks properly, but if closely confined the chicks will thrive during zero weather if they can slip under the mother hen for warmth when necessary. When chicks are this old, if the weather is fine the hen and her brood are turned out and sometimes they are fed both morning and evening. If they are taught to range a quarter of a mile from home so much the better.

I had an experience last year that is worth relating. In April I noticed lice on some of my chicks and greased one hundred and thirty. In two weeks from that time there were less than twenty of them alive. I had greased chicks many times before, but never with results like this. Their

eyes would swell and close, and in a short time they died. John Skinner, of Nebraska, met with a like misfortune later in the sanson. Comparing notes we learned that each had applied the grease during damp, chilly weather, and we concluded that grease is all right as a lice destroyer if the weather is warm and dry, but all wrong if the season is wet. In both cases lard was used. My method of aplication was to dip my finger into the lard and aply the grease to the head and vent. This year I am dusting my sitters thoroughly three times during incubation and hope to take the chicks off free from lice. P. H. GOSSARD, Iowa.

Give Them a Good Start—No Hard and Fast Rule for Feeding—Follow Nature, and Do Not Forget the Grit and Green Food.

For the successful raising of chicks it is most essential that they have the right kind of a start. My experience has been that if they have proper attention the first week or ten days from the shell, we may hope they will develop into the finest stock, either for market or the breeding yards. We must look well to the flocks from which we select our eggs, if we would have vigorous chicks, those that come from the shell sturdy and full of life. I shall assume we have such chicks, for anybody by proper care can have them, and a puny chick, exhausted by its effort to free itself from its prison shell, does not seem to me to be worth feeding or bothering with. When the hatch is over I remove the hen with her brood to the brood coop, or place the chicks in the brooder, and as some of them will be a day old or more, they will be looking around for something to eat.

The feeding of chicks! What a question this involves, and as many succeed by quite different methods, I am sure there can be no hard and fast rule to go by. I have no rules, as so much depends on the season and other conditions. I breed for eggs and to develop the chicks into the most useful breeding stocck, rather than for broilers and therefore strive more for stamina and a well-made frame-work of bone and muscle, rather than a forced amout of flesh at the earliest age. I can hardly more than suggest my method. In its very simplicity I believe lies much of my success. Keep close to nature. Warmth and cleanliness the chicks must have. For the first food I find nothing better than cornbread (johnny cake), just such as you use on the family table, crumbled fine (it should be quite dry) and the old fashioned pin-head oatmeal. This is vastly superior to the various prepared oats on the market of late years. It is understood both are fed dry. My chicks seem to relish it from the start. From the first I keep water convenient to them in shallow pans and milk is splendid after the second week.

For the first few days the food is sprinkled on an inch or two of cut hay or chaff, allowing the chicks to pick at it and eat as much as they require. As there is no mush or soft food about this it will not sour in hot weather and is always wholesome. If the season is early and the chicks are confined indoors throw a shovelful of earth and fine gravel, or chick grit before the coop or brooder. If the chicks are outside they will usually find enough grit if the ground contains gravel. After the first week I feed four or five times a day. If they are not on a green range, green food in some form must be supplied (any vegetables they will eat are good). Early in the season once a day I give the chicks a feed of Pioneer Clover Meal, bran and cornmeal, one-third each by measure, scalded and fed warm. If rightly prepared this mash will crumble readily. Boiled potatoes are relished by the chicks and make a fine change occasionally throughout the season. Do not pare them or mash them, break them open and the chicks will see to it that none is wasted.

After the first week or ten days, make the chicks work for all their food except the mash. While the season is so early that they are partly confined indors throw wheat, cracked corn and buckwheat into three or four inches of cut straw or any litter not too coarse. The chicks will find it all and nothing will keep these early chicks in such fine condition as exercise. When the season advances if they have a free range this method is not so essential. I raise my chicks almost entirely on dry grains and think this much beter than to use soft food freely; they certainly thrive on it. I seldom loose one save from accident.

Of course animal food in some form must be supplied. Chopped raw beef is fine and a little of it will supply quite a colony till they get to be a month or more old, when fresh cut bone can be substituted. Feed this alone, not in the mash. If fresh meat in some form cannot be obtained, any of the good prepared animal meals may be used to advantage. When the chicks are on a free range with natural green foods I would omit the clover from the mash, which now needh to be fed only on alternate days, but throughout the summer if any large number is kept it is an advantage to continue the animal food, as but few ranges will supply enough in the form of worms, insects, etc., to meet the demands of large growing flocks. I trust there may be some helpful suggestion in these lines. I could give no rules, nor do I believe chicks could be raised by rule and develop all the good there is in them. Stpdy young chicks, Watch out for their needs. If you are a true poultryman on poultry woman you will learn of them lessons in nature's ways that will lead to success.

G. M. DIVEN, New York.

The Crop as an Indicator—Animal Food and Charcoal—Oats are Satisfactory—Overfeeding a Danger.

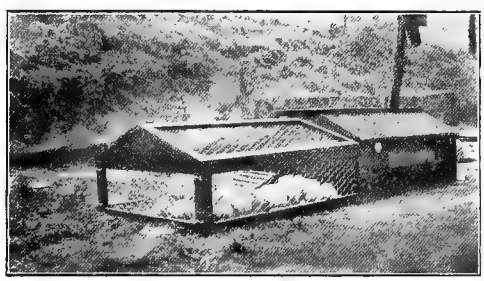
"Tell me what you eat and I will tell you what you are," might in a measure be as well applied to poultry as to people. We have seen this exemplified from placing eggs with different people to have chicks hatched and raised for us. From one, the birds would come home in the fall round-up, nice, large-framed, full-feathered, thrifty fellows; from another they would be little, crooked, rough-plumed scrubs, although the eggs came from the same pens and were equally good. The food and care made the difference. We lay no claim to being experts in this matter, as we are learning something every season. Our range is limited and we speak only of feeding under such conditions. We have raised our stock both with hens and in brooders, and with about equal success. When the chicks hatch they are let alone for about twenty-four hours, then they are fed a very few dry bread crumbs and dry oat meal. A small amount of dry egg shell is sprinkled where they will pick at it, and after three or four days fine grit is used. The oatmeal and dry crumbs are continued for two or three weeks. At the beginning of the second week a cake is added, made of sifted chop food (corn and oats) ten parts, poultry food one part, a little salt and baking powder, mixed with milk until moderately stiff and baked until it will crumble nicely. This we try to feed in such quantity as will satisfy and not over feed them. Our indicator is the crop. If it seems to be all right, all is well, but when it shows signs of being too full we shut down on the rations a little until they seem to be digesting the food thoroughly.

Millet seed is used after the first week and until they are turned out. It is scattered in the straw litter and they dig it out. A chicken loves to scratch if there is anything in it, and it pays to indulge this liking. At about four

weeks old some wheat is fed the same as the millet, and cracked corn and oats come along later.

We use a good deal of green food. When grass cannot be had, beets, sweet potatoes, and onions are used, sometimes chopped and fed in the mash, and sometimes fed alone. From the time the chicks are a week old we have some sort of green vegetable food where they can pick at it when they wish. Green mustard is something they like and is a splendid food. Animal food in some form is fed steadily after the first week. We have used blood meal, meat meal, and scraps from the butcher shop and find all are good and that a change is desirable.

Charcoal is kept in reach of the chicks from the first and at times they eat quite freely of it. We have tried the green ground bone idea and like it, except for the hard slow work and the difficulty in getting fresh bone when wanted, so we have dropped it and keep granulated bone where they can eat as much as they like, and that is considerable. This is not a substitute for grit, but is fed side by side with it. Fresh, clean water is kept within reach of the chicks from the first day and they are allowed to drink all they want. Milk is also given freely and we think it an excellent food.



Subjects of Experiment at Rhode Island Experiment Station.

As the chicks become older and are turned out to hustle we like to have a patch of green oats for them to run in. As the oats head out the grain begins to fall, the chicks will jump for it, and not only get plenty of exercise, but obtain one of the very best of foods for bone and feather growth. We like oats for a food from that time on, and last year we tried feeding them in bundles, as they came from the binder. The experiment proved so satisfactory that we shall try it more extensively this year.

What to feed is of no greater importance than how and when to feed. We feed our young chicks five times a day until a month old, after that three times. We try to feed in such a way that food will not be wasted by being tramped upon, or by being left to spoil. We remove the food dishes after every meal and try to give only as much as they will eat up clean. We have come to the belief that there is more danger in overfeeding than any other one thing, and that much cholera, roup and other diseases so-called are merely the result of over-feeding and indigestion. We have paid dearly to learn this lesson, and like many other people with dearly bought experience and well-founded belief, we still find that it requires constant care to keep from doing the very thing we know we should not. Our idea is to feed plenty, but do not over feed.

STRUTHERS SISTERS, Illinois.

Warmth an Essential—Egg Shell "Meal" and Prepared Foods.

The method of feeding that has given me the best results with young chicks, for the first twenty-four, thirty-six, even forty-eight hours, is nothing. All they need then is warm brooding, and this during cold weather I usually secure by the use of flannel-lined boxes or baskets, placed in the house near the fire. When they are ready for their first feed, they are placed with the hen and their bill of fare is limited. They are not given any water the first day. For food they have lightbread crumbs very fine and egg that has been boiled half an hour and mashed as smooth as I can do it with fork or spoon. One egg to two slices of bread is given and I salt and pepper the egg as if for my own eating. To this bread and egg, I add a generous handful of shell meal. By "shell meal" I mean egg shells that have been thoroughly dried, and then rolled till a fine meal. Long before the wee ones are due to hatch, the shells from the eggs used in my kitchen are thrown into a pan that stands on a shelf on the back of the stove. There they dry out thoroughly, and can be easily rolled.

This food is given five times a day for four or five days. Feed the hen whole corn, then she will not eat so much of the chick food. Give them water after the first day, where they can go to it at pleasure. After the first four or five days give millet seed for the 10 a. m. and 3 p. m. feeds. In a few more days give rolled oats (such as we use on our table) at one of these hours.

After a week old they are given fine grit till they are large enough to use the Mica Crystal grit. My young fowls have the run of the whole place, fields, pasture, barn lot, every place in fact but the breeding yards, and they even go there as long as they are small enough to squeeze between the pickets. Some of my fences are woven slat and wire fence. In this wide range, they pick up a great deal of their living, often coming up at night with crops so full that they care little for their evening food.

MRS. W. B. CHANDLER, Illinois.

Not What You Feed, but How You Feed It.

To hatch and raise chicks with success one must have eggs from healthy, vigorous stock. The next thing to look out for is lice. If hatched by hens, dust the sitter well at least twice during the hatch and the last time about three days before the chicks are due. Give her another dusting when chicks are about a week old. Chicks must be watched closely and when seen standing or drooping around you will generally find the cause is lice. The greatest loss with chicks is from over-feeding, which causes bowel trouble in different ways. I find by keeping them a little hungry they thrive better in every way. When first hatched chicks should be put into a warm coop or brooder, with plenty of coarse sand on the bottom. Do not feed for at least twenty-four hours after hatching. They will pick out considerable grit from the sand, and it puts them in a fair way to receive their first meal. For the first two or three days I feed only stale bread or crackers soaked in milk, squeezing it out and dry. After that I begin to feed millet, cracked wheat or corn and oatmeal. When about two weeks old I feed fine cracked corn, that being their last meal at night. By keeping away the soft food it does not give them a chance to get their downy feathers damp, which is a great drawback to young chicks. Their drinking dish should be made so they can get only their bills into it, and it should also be kept very clean.

After four or five weeks I feed a mash that contains about one-tenth beef scraps of some kind. I find it is not so much what you feed as the way you feed it, for I have seen chicks fed every well known food, with plenty before them, that did not thrive. If your chicks seem out of condition, stop feeding them one or two meals and you will find them much livelier. If they are nibbling at food all the time they will stand around more or less and not get the

exercise they need to insure health. Scratching or hustling around for their food insures vigor. Chickens when growing should have liberal grass range. If their quarters are limited they should be supplied with some kind of green food, and at all times should be housed in a clean, dry place.

J. H. JACKSON, Massachusetts.

Fresh Air—Lots of Light—Oats and Wheat and Ideal Food.

After the chicks hatch I let them stay in the nest until they are twenty-four hours old. For the first three days I feed on bread crumbs and keep fine chick grit before them at all times, so that the can help themselves. I prefer this to mixing it in the mash. After the chicks are three days old I feed in the morning a mash of oats, wheat and corn ground together, at the rate of two bushels of oats to one each of wheat and corn. With this I mix some bran, and twice a week add some animal meal. I mix this the night before with boiling water and in the morning I feed what the chicks will eat up clean. At noon I feed cracked wheat, and at night cracked corn. When the chicks are large enough I feed them whole wheat and a larger size of cracked corn. I also feed oats and table scraps when we have them. I give fresh water twice a day and use drinking fountains, so they will not foul the water.

I house the chicks in houses nine by six feet, with one window and a door of one-inch mesh wire netting. This kind of house gives fresh air and good light. Chicks are yarded in large yards until three months old and then have free range. I clean the houses three times a week and keep the lice out of them. Chicks raised in this manner are strong and vigorous and in the fall are in fine shape to sell for breeders or to go into winter quarters for layers. You will notice that I feed largely oats and wheat and a very little of corn. Oats are the best bone and muscle builders we have, and if I could feed but one kind of grain, I would use wheat, so by combining the two we have an ideal food with just enough corn to balance it. With the food and care I give my growing stock I can raise a large percentage of the chicks hatched, and while I do not raise chicks by the thousands I am doing a good business and raise more each year. I have had chicks weigh three pounds at fourteen weeks old, and to lay at the age of four months and seventeen days. I have a few pullets that have laid two hundred eggs in a year. While I do not encourage early laying it shows that chicks hatched early and kept growing will begin to lay early when eggs bring a good price. I prefer to hatch chicks in March and April for winter layers.

A. P. WINSLOW, Maine.

Plenty of Heat and a Chance to Reach It—Causative Feeding

I have no hard and fast method of feeding, as my aim is to have strong, healthy chicks that will grow on good food, even if not perfectly balanced, also to raise fowls as near perfection as is possible. The winnings of my birds at leading shows vouch for exhibition quality, and a record of 242 eggs from a pullet in 1899, speaks for the practical side. For brooder chicks my method is first, plenty of heat and a brooder where they can select the degree they wish. I want it fully 100 at the warmest place.

The rations are steel cut oatmeal, finely ground glass, and charcoal for five days; then I begin to give little bits of lean meat, and in a week I mix a good soft food of cornmeal, bran, middlings and meat meal, and feed lightly. All feeding must be what the doctors call causative. Watch your chicks. If they grow at once and keep at it, your method is good; if not, you must try to find the cause and change just a little. If you add meat and it affects the bowels just a little, simply hold it off a day. But if judgment is added to feed, meat makes the fowls grow to perfection. If the chicks are confined for eight weeks I of course add some vegetables, and after two weeks finely cracked corn. If you keep them growing for four weeks and get them out in the open air after two weeks you have almost a sure thing of it.

Pen of Light Brahmas, Reliable Poultry Farm.

For chicks with hens I use oatmeal and cracked corn, about half and half. I do not use flake oats. By all means get granulated oats and feed dry food at the start. I have started hundreds when out in the fields on just corn, only I want it sweet, and free from mouldy grains, and second, I want it finely cracked—about the size of one-third of a wheat grain. I feed the dry food a week, then begin with the mash, once or twice a day. If dry weather comes and they do not grow to suit me or as they should, I feed one feed a day pure meat, especially to Leghorns or any that feather quickly. Chicks cannot grow on wind, although air is essential. I am a firm believer in plenty of good balanced food four times a day.

W. W. KULP, Pennsylvania.

Give Sand, Grit and Fresh Water—Keep Different Aged Chicks Separate—Afford Range.

We have always hatched our chickens with hens, but this year I purchased an incubator and we shall try to hatch with the machine and give the chicks to the hens to raise. In the first place we try to have as fertile eggs as possible, and after making nests for the hens that want to sit, we let them sit a day or two before giving them eggs. This settles the nest and gives them a chance to find out if they really want to sit. We give to each hen thirteen eggs, selecting those of as good shape and as near the same size as possible. I have come to the conclusion that thirteen eggs are all one hen can cover. If you give them more they will surely break some, and in the end you do not get any more chickens. We always set from four to fifteen hens at one time, and then when they are through hatching we give each hen fifteen chickens as far as they will go, and reset those that are not given a brood. I prefer to set about twelve hens at one time, as a flock of eighty or one hundred chickens live and grow better if they are all of one age than if they are from one to three weeks of age.

We do not take the chicks out of the nest until they are from twenty-four to forty-eight hours old. We feed rolled oats (a cheap grade), which are fed dry, and also make a cake composed of equal parts of corn and oats ground together, to which we add a little bran and shorts

and a small part of animal meal. This cake is made with sour milk, seasoned with salt and a little baking soda is added to keep it from being too heavy. It is baked until well done and fed dry. As soon as the chickens are large enough to eat cracked corn and whole wheat (about two weeks old) we keep increasing this food and decreasing the rolled oats and cake.

Do not forget to keep your chicks in a dry place; do not forget to give them sand, grit and fresh water; do not let the older ones eat with the young ones, as they will get all the food and are liable to trample the smaller ones; do not think this is the only way to raise chickens, as you may have food and conditions over which you can judge better for yourself. Give your chickens as free range as possible and about October 1st separate the cockerels from the pullets and get them into winter quarters as soon as possible.

W. A. CONGDON, Illinois.

Dry Grains, Lots of Grit and Cool Water—Keep Them Free from Lice and Dampness.

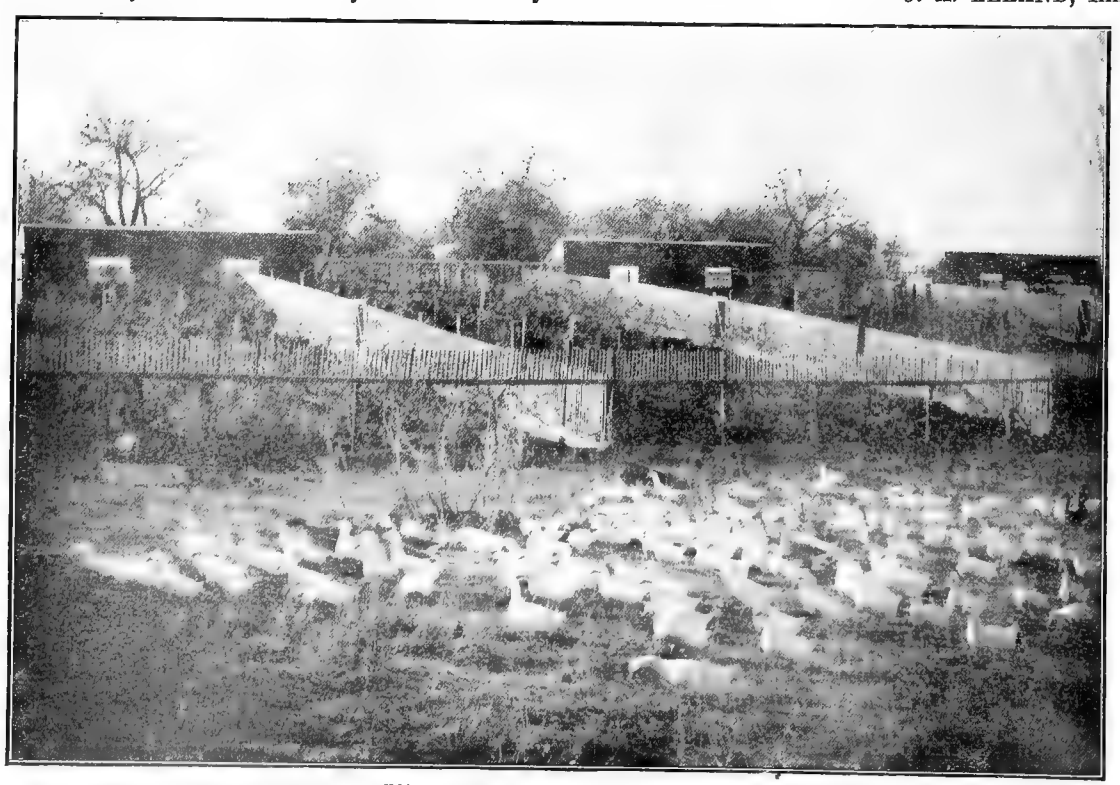
I have had the best success by feeding dry grains and plenty of grit and cool, clean water. Chicks require no food the first twenty-four hours, and very little the next twenty-four. The first feed should consist of a very little millet, some fine grit and water. The latter should be so placed that it will be always cool and so that the chicks are unable to get into it to wet and chill themselves or soil the water. I feed a mixture of wheat, steel cut oats, millet and plenty of fine, sharp grit, five or six times a day for the first week, four or five the second week, and finally when about a month old, feed them only three times a day, and when six weeks to two months old only twice a day.

Now begin to give them coarse ground or cracked corn, dry, and they are able to stand any kind of sound food, as for instance, table scraps if not too sloppy or greasy, onion tops or other raw vegetables, chopped fine, so that they can eat them more easily. From now on they should do nicely if fed regularly a variety of sound food and given clean, dry quarters, free from vermin to roost in. Care should be exercised in the quantity of food and the manner in which it is given. It is better to scatter all food, so that the chicks will have to scratch and hunt for it and to feed only as much as they will eat up clean for if too much is given at once, they will gorge themselves, which tends to make them lazy and brings on bowel complaints, nor will they take enough exercise. I do not believe that chicks will drink too much pure, cool water, if it is kept before them all the time, although some authorities maintain that water should only be given young chicks right after they are fed.

Neither old nor young fowls can stand dampness and probably a greater number of early chicks are lost on this account, rather than from lack of proper food and care. Would advise that chicks be kept in floored coops at night until the ground is thoroughly dry, or until they are at least a month old. Many people make the mistake of putting too many chicks together after they are weaned and as they grow so fast they are soon crowded, before one has time to realize some of them do not appear to do well, and thus many a good bird amounts to nothing either for the market or the show room. Chicks of all ages should not be run together, if it is possible to avoid it, and all sizes should have plenty of shade and a grassy range, although they will do well in a bare yard if kept clean and judiciously supplied with green food of one kind or another. Lice of many kinds are the worst foes of the poultryman, and in this case prevention is worth more than an unlimited amount of cure.

Clean the houses thoroughly each spring and fall, keep them clean between times. Whitewash the inside at least, and put coal oil on the roosts once a month or oftener. There are many good liquid and powder vermin killers on the market, but the former must be used with great caution, if at all, on chicks. There are certainly several successful ways of raising chicks, but they all contain as essentials, cleanliness, regularity, good judgment and perseverance.

J. A. LELAND, Illinois.



Life on the Reliable Poultry Farm.

INCUBATOR POINTERS—THIRTY-TWO OF THEM.

BY P. H. JACOBS.

1. Hatching chicks with an incubator is a winter pursuit.

2. Then hen seldom sits in winter, hence she and the incubator do not conflict.

3. Hens that lay in winter can not produce as fertile eggs at that time as in the spring, for the cold season prevents exercise, the hens become fat and the pullets are not as fully matured, while the male, if he has a frosted comb, suffers from cold, or becomes too fat, and is unserviceable.

4. Do not use extra large eggs, or small eggs. Have all eggs of normal size, and of perfect shape.

5. Do not be afraid to watch your incubator. It pays as well to keep awake at night to watch a hundred chicks hatch out as it does to keep awake to save a $5 calf from loss when it is dropped, and the chicks are worth more than the calf.

6. No incubator has brains. It will regulate, but can not think.

7. When chicks die in the shell the chances are that too much of a draft of air passed over them. When a hen is hatching she will fight if even a feather is lifted from her. She will not allow the slightest change of temperature, and she will hatch as well in a dry place as in a moist location. Pure air is not injurious, but draughts of air cause rapid evaporation and loss of heat.

8. Dry, warm nests in winter, and moist nests in summer is an old proverb, hence the moisture depends on the season. Less is required in the incubator in winter.

9. As the chicks progress in the eggs they give off heat, hence be careful of the lamp, hot weather, or whatever the source of heat may be.

10. Too much moisture covers the eggs and excludes the air from the chicks within the eggs.

11. No currents of air can pass through an incubator without a plentiful supply of moisture, but in incubators that have no currents but little moisture is needed.

12. Do not take out the chicks until you believe all are hatched. Leave the chicks in the incubator. If you take them out the heat will suddenly drop, and you will also let in the cold air on the eggs. Never disturb the eggs when chicks are hatching. Better lose a chick or two by trampling than all.

13. Test your incubator with moisture, no moisture, plenty of air, and air shut off, as each incubator may differ from the others.

14. Eggs will be aired sufficiently when they are turned. It is of no consequence to cool them.

15. If the chicks do not hatch out by the twenty-first day your heat was too low.

16. If the chicks begin to hatch on the eighteenth day your heat was rather high.

17. Do not put eggs in at different periods during the hatch, and do not hatch ducklings and chicks together.

18. The same rules apply to the eggs of hens, ducks, turkeys and guineas, as regard heat and moisture.

19. Never sprinkle eggs. It lowers the heat instantly (due to rapid evaporation), and sometimes kills the chicks in the shells.

20. If the incubator shows moisture on the glass do not open the egg drawer until it is dry. Cold air and dampness kill the chicks, the heat being lowered by rapid evaporation.

21. The reason the hen that steals her nest hatches so well is because you do not give her all sorts of eggs, such as large eggs, small eggs, and eggs from old hens and immature pullets such as you put in the incubator.

22. Send away the curious visitor just when your eggs are hatching.

23. Keep the incubator in a place of moderate temperature. A window on one side will make that side cooler than the other.

24. Do not expect to hatch without work. The man who expects to get chicks by trusting to the regulator to keep the heat regular does not deserve success. Work is required for other stock that need winter care, and the artificial hen is no exception.

25. Begin with one incubator, and learn, before you try more than one.

26. No matter how much you read, experience will be the best teacher.

27. Have your incubator warm before you put in the eggs.

28. A child can not manage an incubator, all claims to the contrary notwithstanding. Incubators are not toys. Do not turn over a man's work to a boy.

29. Let the bulb of the thermometer touch a fertile egg.

30. In winter the hen will not hatch over one-half of her eggs nor raise over one-half of her chicks. The incubator and brooder, if skilfully managed, will do better than this.

31. In a majority of cases the failure is due to the eggs and not the incubator.

32. Above all, follow the directions you get with your incubator. Do not try any of your "ideas," as it may be costly experience.

P. H. JACOBS.

FEEDING AND FORCING BROILERS.

Second Article by Mr. Arthur G. Duston—The Facts He Presents Have Cost Him Many Dollars in the School of Experience.

We will say that we have decided on the variety that we will run; our eggs are as fresh as possible and of uniform size; we have put them into a well-made incubator and with proper care have gotten out a good hatch which came along promptly, so that the morning of the twenty-second day we find the chicks nicely dried off. We now get our warmed, cloth-lined basket, with a heavy cover or shawl to prevent them getting chilled.

Right here I want to say, I believe more chicks "pass out," as our Chirstian science brethren would say, to the land whence no wanderer returns, from getting chilled in moving them from a warm, moist incubator on a cold day into the brooder than most folks are aware of, and those little fellows you had such fond hopes of, but lost last winter with what you called bowel trouble or diarrhoea, was really chilled in being changed from their birthplace to their temporary home.

Well, we have got them safely, we hope, into the brood-

er, which has been brought up to the temperature of the incubator. Of course we have placed our board in slides about a foot away from and in front of the hover, so that the babies can not get out in the long pen and not be able to find the way back and thus get chilled. Just bear in mind for the first week that to keep them warm is more essential than the kind of food.

The first day of their lives in a brooder, has almost passed and they have not eaten anything. Night has begun to come on and it is time to feed the hens, but, let us first scatter down for the chickens a liberal supply of rolled oats, the white flakes of which will instantly attract them, and they are left to themselves. In the evening, as we fix the fire preparatory to locking up for the night, we look at them and are pleased to find them scattered all over the hover bottom and their contented little "peep" is the last sound to fill our ears as we go out, and our mind is already filled with visions of juicy broilers and big breasted roasters and the perquisites thereunto attached.

The next morning as we turn out at daylight to see our orphans we find them calling for breakfast. We touch up the fire and then a feed of rolled oats is given them with a dish of warmed skimmed milk. We use an old fruit can for this purpose with a notch cut in the edge. Partially filled with the milk and inverted into a saucer, this makes an elegant fountain for small chicks. A saucer not much larger than the can is best, then the chicks will not get "stuck up." The milk on the down will stick them together as bad as paste would. Some of the little fellows that would eat will drink, so you save them along until they will eat.

That you will save more chicks by giving them warmed skimmed milk than by any system of feeding grain, is my way of thinking.

We next powder some charcoal in a dry bone or shell mill and this is put into a dish and set in for the chicks to eat. We have found this an excellent regulator for very young chicks, as well as older birds.

We are now going to feed every two hours until our young charges are turned over to the butcher. Let it be done by the clock; you will then be more regular and can more easily even up the day.

For the first week you are limited to rolled oats, millet seed (which is a semi-green food) and cracked corn, run through a mill to make it fine enough, then sifted to save the meal, which, of course, is wasted by throwing it on the ground. We have kept our milk before them all the time and have carefully washed the dishes twice a day, noon and night, as nothing gets any more filthy than do these dishes if left uncleaned, the fat of the milk, dirt and droppings all adding their mite to make it so, more especially as the chicks get older. Some think skimmed milk expensive to feed, but after trying it you will be convinced that the increased growth that comes from feeding it, gives you a good profit on it, and this is what we should always think of when weighing the cost of food. The real question is, can I get enough quicker growth by using it and give me a profit on it? For feeding choice "fancy" chicks I have heard it contended that whole milk was cheap to feed. I have been able to buy all the skimmed milk I want for five cents a can, eight and one-half quarts to a can, and I have used as high as twenty-six cans a day for broilers and roasters.

As we have put into each hover about one hundred chicks, we must see that the sand is carefully scraped off the top as often as necessary, probably twice the first week, which will be increased each week until about the third, then we begin to clean them regularly every morning. We run the wheelbarrow into the walk and lift the hover, which is hinged against the partition so it is easy to get at. We take a small dust pan, or, if you prefer, make a scraper, by driving nails through a stick, something like a rake, only closer together. Then scrape or rake off the top, going quickly from one to another.

For the first week we keep the board in the slides just forward of the hover, as stated before. Now the second week we will remove it and keep an eye on the chicks to see that they do not get lost or get chilled by staying away from the fire too long.

For this week we will feed about the same, only perhaps it will be well to try them on a little mash made up of one-third corn meal and two-thirds wheat bran, seasoned with salt and pepper, just the same as though we were to eat it ourselves. Mix well and add boiling water. Don't put in enough to make it sloppy. Allow it to stand a short time, then feed. Not much will be eaten, but they will get so before the end of the week that they will look for it, as you feed your soft and hard grains alternately.

The third week we always settle down to our regular routine, to be continued until about ready to market. During the second week we have cracked some wheat in our mill, so have had that for an extra dish and a change, giving corn as a last feed generally. A good many feed cut or pinhead oat meal to little chicks. This we have found to be a trifle pasty or gummy, and have dropped it, as more will get stuck up around the vent when this is fed than when not.

There is one thing that is absolutely imperative—that is, to get your chicks out on the ground. If it is bright and warm put them out for a few minutes when a week old. Do not let them stand "humped" up and shiver, but make them hustle around, by driving or by feeding a handful of millet seed. After the second week they must go out every day unless it storms, no matter if it is zero weather. After you have tried it you will see how essential it is, for you can not keep them on their legs under such high feed in any other way.

DUTIES OF THE THIRD WEEK.

As we enter upon the duties of the third week we will now get our routine started and will see the chicks push along for the next five weeks, at which time we hope to see two-pound birds ready for the market, and get sight of the returns for our labor. The first thing in the morning is a feed of hard grain; then comes a feed of chopped raw potatoes. As the chopping knife and tray were too slow, we got a mince meat chopper, had a new disc made with larger holes, about three-eighths of an inch in diameter, and ran the potatoes through that, catching in a pan the first and last to come out as it is nothing but water. The other is the pulp. Now take their feed dish and give each pen all they will eat. A little later we throw in a little cabbage, cut in strips, which they will seize and chase each other around for until it is all eaten.

This constitutes all the green food they have, except once in awhile we may substitute onions in place of cabbage. We have gotten our mash made for the day, and as 9 o'clock has come we will feed our first feed of it for the day, only feeding what they will eat quickly. We feed on tin plates, about fourteen inches in diameter and a quarter of an inch deep, with a wide fold at the top. These can be readily cleaned preparatory to another feed by scraping with the feeding shovel, which is a small shovel about four inches across, made of heavy sheet iron and a white iron handle. We have a pan to put the leavings in, if any. They go into the swill for the pigs. At 11 o'clock another mash, then the

dishes are picked up, taken into the kitchen or cook room and washed.

Again at 1 and 3 o'clock we feed the mash and if we have used good judgment we have had a hungry mob each feeding. If we have been liberal, we find they have left something each time and are not ready for their feed. When this is so just scant them until they clean up each time and do it quickly, taking care you have enough for all. You will find the number of plates will have to be increased, as the chicks increase in size, in order that each may have a chance. At 5 o'clock or before dark throw down a liberal feed of cracked corn.

We follow this bill of fare for about four weeks. As we have crowded the chicks pretty well, by putting one hundred in a pen we must take extra precautions against filth. At about four weeks of age a day's droppings is considerable on the floor of the pen so the floor is now raked over each day and the collections wheeled out. For this we must use a loop toothed rake.

We have by this time found our fountains small and easily tipped over by the chicks, so we have adopted new ones holding nearly two quarts, made of galvanized iron and cone-shaped on top, to keep the youngsters from roosting on them, and instead of the saucer we use a small deep agate pan, only a trifle larger than the fount. This we find to be very satisfactory as the chicks can not put their feet in it.

CHICKS NOW SIX TO EIGHT WEEKS OLD.

To come back to the six to eight-weeks old chicks. We must now think of finishing them off. We examine them, weigh a few, calculate how much flesh can be made on them in about ten days, for as broilers Boston has no use for anything over four pounds to the pair. We have fed so much bran that as we lay back the feathers on the breast we say, "They ought to have more color." How can we get it? We cast about for a way to get this. We know corn will do it, but we lose time if we drop off from soft feed to hard. The chicks won't grow as fast and we must turn them off as soon as possible to get the most profit from them. So we put into the mash all the cotton seed meal we can stir in and not make it "salvy" or "puddingy," as we call it. With a little treacle added we have accomplished the result.

We now have a fine yellow skin if we have not foolishly chosen a blue blooded carcass, but any yellow-legged variety will respond to the treatment. I would caution you against trying to feed this for too long a time, say more than two weeks, as the chicks will get cloyed by it and you cannot hold their flesh, to say nothing of making any, unless you keep their appetites "up to the clip." This being such a high feed, it seems to become nauseous to them. One would find it difficult to keep them on their legs if it were fed from the first.

We have now "forced" the birds for eight weeks and have obtained what we set out for, viz: Two-pound broilers at eight weeks.

This has been successfully accomplished on our farm with White Wyandottes. We have not done quite as well with any other variety. As I stated in my last paper, they will stand on their legs where Plymouth Rocks would be rolling on their sides with the same feed.

We put up two pens of 110 each, and at eight weeks they weighed two pounds each, and a portion two and one-quarter pounds each under this system of feeding and almost the same treatment. By continuing the regular feed we have made five and five-eights-pound roasters at fifteen weeks old.

One thing more before closing: If you ship your poultry to market alive, and it travels twenty to thirty miles on the railroad, feed the night before, not to heavy, but some, as the birds will empty themselves in the night and on the journey. Give them all the water they will drink before they start on their funeral ride. You will thus save a portion of your shrinkage to nobody's injury, but to their gain, I believe, as you help retain the juiciness of the flesh.

Some of these hints have been gained in the expensive school of experience, but if any earnest, honest poultryman can get anything of assistance from them he is welcome. As one word of caution, do not attempt to raise your breeding females under such hot-house methods, because you will sacrifice your size through early maturity, as after a period of forcing as given above it is no uncommon thing for pullets to lay at sixteen weeks, and we all know that is enough to stop growth. You may start your breeders in the brooder, holding off forcing fods, but get them out as quickly as possible.

The summing up of the discussion is, breed, feed and care. Let us not disdain to use the breed because it may be bred to "fancy points," as the fancy has given us our best and most practical varieties, and the nearer a typical bird we have, of almost any breed, the better carcass we have.

CARE OF BROODER CHICKS

The Brooder Chick from Egg to Maturity—Ventilation, Moisture, Temperature and Floor Space Discussed by Breeders who Know the Requirements of Brooder Chicks—Brooding Houses and Coops—Foods and Feeding—General Advice on Management.

(This symposium (the third on the Care of Young Fowls) is devoted to brooder chicks exclusively. To hatch chicks in an incubator is comparatively easy, and may be done by a novice, but to raise chicks after they are removed to the brooder requires a knowledge which does not stop at a thorough understanding of brooder operation. The movements and appearance of the chicks inform an experienced observer what is necessary for their well-being. To obtain the greatest growth in the shortest time, chicks must be healthy, comfortable and always on the jump for food. Improper conditions result in death. It is from men who are competent to raise brooder chicks with the lowest possible mortality that we have obtained the following useful information for our readers.—Editor.)

Advantages of Brooder Raised Chicks—Rations and Care.

One of the most necessary appliances connected with the poultry industry is an A No. 1 brooder, even though a hatcher is not in use. It is an easy matter to find a number of sitting hens, and by placing in the brooder the chicks hatched by them, you avoid feeding the chick's food to the hens, and they will soon begin laying. The chicks can be cared for and reared safely, no matter what weather prevails outside the brooder. They are free from vermin and if the broder is kept clean they will not be troubled with lice. There is no need of losing a chick if properly cared for. They will be much more tame and easier handled than those reared by hens.

For from fifty to seventy-five chicks a run of twenty

feet is sufficient for one or two weeks, after which the chicks should be placed in a larger inclosure or allowed to run at large. I believe in plenty of range, as chicks confined to small inclosures very seldom develop well, but often do develop off colored feathers in plumage, which nature provides against if they have large range. The run may be made of boards twelve inches high, a portion of which may be covered with cheese cloth. This will afford protection from wind and storms, also from the sun.

Chicks when first out of the shell can have no better food than bread for two or three days, then a mixture of cornmeal and bran (half and half in bulk), to which add a small quantity of bone meal, about one part to eight of the mixture of meal and bran. Wet this with water and it makes an excellent food for morning and noon. At night good, clean wheat and cracked corn, with oat flakes or hulled oats is unsurpassed. Milk is very beneficial if placed where fowls or chicks can drink it, but should not be mixed with the food.

A good brooder, an abundance of the right kind of food, coupled with a fair amount of common sense, will bring good results.

W. F. BRACE, New York.

Lessons from Nature—Interesting Experiments—Limit the Food Supply.

While we have most of our chicks raised with hens on farms, we still raise some in brooders. We allow the chicks to remain in the incubator from ten to twelve hours after they are all hatched; then we put them into a wramed brooder with the floor covered two inches thick with wheat bran. After they have been in the brooder two days we scatter a little millet seed in the bran, but not much for a week. This season we have used "Fidelity Chick Feed" alternately with millet and have had success. When a few weeks old we feed cracked corn and whole wheat, in fact anything the chicks will eat, as great a variety as possible, and not too much at a time, keeping them in a good appetite all the time, and they will take plenty of exercise. It is well to have plenty of chaff or cut straw, hayseed or anything of that kind to scatter their green food in to make them work, not forgetting grit and green food.

Use only a brooder so constructed that the chicks can get any degree of heat they want, and one that allows the chicks to get away as far from the heat as they want to, and they will care of themselves.

One thing in raising brooder chicks seems to us to be of more importance than anything else, and that is the feeding of the chick the first week of its existence. When a chick is hatched nature has supplied it with enough food so it can easily do without eating or drinking for a week or over. We will give one instance that will prove this without a doubt.

A few years ago we had a hen that would fly through a ventilator and get above a board ceiling in one of our chicken houses; there she layed a lot of eggs and hatched a dozen of chicks. Judging from the looks of the chicks when we first found them they were about ten days old, and during that time they had neither food or water. A stronger lot of chicks I never saw and they were as wild as deer.

In 1890 we took two hens with fifteen chicks each and put them into a cornfield a quarter of a mile from our buildings and left them to hunt their living as best as they could. The chicks had no water or fod, except what the hen found for them. After they were ten days old we went to see them and note results. We found the hens had not been ten yards from the place we put them, and such a sleek, healthy and vigorous lot of chicks we never saw. Being satisfied with results so far, we left them another week, but when we went to see them we only found a few feathers from the hens, as a pack of dogs had put a stop to our experiments, but we learned this one fact, that very little, of any food should be given to newly hatched chicks for the first three or four days at least, and we believe there are more chicks killed by overfeeding in the first ten days of their lives than at any other time. This hardly ever affects the chicks until about the seventh day, when they get diarrhoea and stand around with full crops and soon die from indigestion, caused by strong food and feeding. We all know what a hen that steals her nest does after her chicks are hatched. She does nothing the first few days but brood her chicks, then after they are three or four days old she will commence to scratch for them, but very little do they get for the first ten days. They secure a few small seeds at a time, and as they grow, and their digesting organs get strength they find more food, and most of the chicks live and grow to maturity; they develop very fast, too. Let us watch the old hen and learn lessons that will help us much in raising chicks with brooders.

We think exercise is of great importance and if one is so situated as to allow the chicks a good run it will be found very beneficial. If the room is limited use plenty of litter with dry feed scattered through it. Avoid sloppy food. Remember dry food is nature's food, and always remember, too, that little food is far better than too much.

AUG. D. ARNOLD, Pennsylvania.

On Brooders and Brooding.

Four years of experience with artificial incubating and brooding has settled definitely in my mind the fact that with it we can raise "better poultry and more of it." I mean by this, that we can not only raise a larger quantity, but a better quality. This is from the standpoint of a fancier as well as a marketman.

In my hands brooder raised chicks are superior in growth and development, shape and plumage to those raised by hens. There are many reasons why this should be so, and these will be apparent to the unprejudiced poultrymen. My exhibition specimens have invariably been brooder raised.

If I could have but one I would prefer a brooder to an incubator. I do not think an incubator superior to a hen for hatching, but I do think a brooder superior to her for raising chicks. To be successful the floor of a brooder should be built as near the ground as posible, should be capable of generating sufficient heat, and should have a regulator that will maintain the correct temperature. I believe a regulator on a brooder in which you expect to place newly hatched chicks is as important as that on an incubator. The heat should come from above, with just sufficient bottom heat to keep the floor dry. The temperature under the hover should be ninety degrees Fahrenheit for the first two weeks, with a gradual lowering from that on. Overheating is just as injurious and will cause bowel trouble just as quickly as will a chilly atmosphere.

Let me caution readers against buying cheap brooders, for they prove very expensive in the end. Out of the many brooders made and advertised, there should be no trouble to select a good one. Buy the best or none at all.

I have absolutely no use for an outdoor brooder, unless it is to be used indoors, and then I prefer an indor brooder. Imagine shutting up fifty to two hundred chicks in a brooder three by four feet for two whole days when the weather is stormy, and expecting them to do well.

I have made small houses, six by eight feet, with a window and door in front. In a corner of this house I place the brooder, and after the chicks are three days old I give them the run of the house. On pleasant days the door to this house is left open and the chicks are given the run of the yard. In stormy weather they are kept in the house. On the floor of this house is four to six inches of chaff and into this the food is placed. At the end of eight or ten weeks the brooders are removed and roosts are put in their place. The young are left here until placed in winter quarters.

For food for the first four weeks I use bread soaked in milk, squeezed dry as possible, millet seed, cracked wheat, and oat groats. After the fourth week cut green bone is fed twice a week in place of bread and milk, and cracked corn alone for night food. Chick grit, granulated bone and dry bran is kept before them at all times. Be careful and not overfeed. Small chicks will commence to scratch as soon as hungry, and they should be kept at it.

It is needless to say attention to details is necessary to success. Clean the brooder frequently and keep the surroundings in a sanitary condition.

Fresh, pure water should be kept before them. Get the chicks out on the ground as soon as possible if but for a few minutes every day.

With me the brooder chicks and their care is a source of pleasure, and their attention means a friendship between us which is noticeable when they become adult fowls.

DR. O. P. BENNETT, Illinois.

The Temperature of the Brooder Is of First Importance.

We have been raising chicks since 1893 and with the exception of the first year we have raised nearly all of them in brooders. We have at times raised nearly every chick put into them, and again, we have lost every solitary one, with many varied and interesting experiences between the two extremes, but the method with which we have had the best success is that which we here describe.

When the chicks are hatched we have the brooders all ready and warmed to a temperature of ninety degrees, which we consider nearly a perfect temperature (that is ninety degrees in the coolest part of the hover and not exceeding one hundred degrees in the warmest). We place the chicks under the hover and for one week keep the temperature at, or as near ninety degrees as it is possible to keep it. The second week, if all has gone well, we reduce the temperature to eighty degrees, and after the second week and for as long as the chicks need the heat in a brooder we run it at seventy to eighty degrees, or at whatever temperature the chicks seem to be contented. We consider the heating part of this brooder business of more importance than the method of feeding, as too much or too little heat will wipe out a whole brooderful of chicks before one is aware anything has gone wrong. Another thing—in the night when there is a change in the weather from one extreme to the other, one will, many a time, save a bunch of chicks by going out and changing the lamp flame, either up or down, as may be necessary. No matter if you are sleepy, if you wish to raise the greatest number of chicks, you must attend to this duty.

As to feeding, we have wheat, oats, and corn, equal parts of each ground together, and, with one-third its bulk in bran mixed with water to a stiff mass, a little soda added, and sometimes two or three eggs to a gallon of the food. This we put in a deep pan and bake thoroughly for two hours in a good hot oven. We use this food crumbled fine with a little more dry bran added for the first four days and feed three times a day just what they will eat up clean. At noon, after the fifth day, we feed a little wheat, cracked corn and millet seed until they can eat cracked wheat, oats and corn, when we feed equal parts of wheat and oats, but only half as much corn. After the first week we add a small quantity of green cut bone every week day in the evening food. When they are five weeks old we feed whole grain morning and noon and soft food (not cooked) and green bone at night, until they are nearly matured, when we omit the noon feed entirely.

We keep them in their regular brooders until they can do without the heat; then they are changed to a cold brooder for a week or ten days, and from there to our open front roosting coops. They remain in these coops until they become troublesome to the smaller ones, when we put the first hatched lot in our large pens, separating the males and females.

We give our young chicks unlimited range of an old orchard, except during the first two weeks, when we use a small pen ten feet square around each brooder for fifty chicks. We never put more than that number in one brooder.

For our early chicks, for green food, we use a small amount of clover meal in their food. Young chicks should be placed on the ground just as early as possible after the second or third day. The little chicks in cool weather should be placed in a sunny spot and in extremely hot weather kept in the shade.

CLARK & TROLL, Ohio.

Keep the Brooder Clean—What to Feed—Hens Bring Lice.

Yes, I have had some experience raising chicks with brooders. As to the number of chicks to a brooder, I have yet to find one that would accommodate more than thirty or forty chicks for me. There is much danger of over-crowding where more than forty are placed in the same brooder.

Special care is needed to keep the chicks very clean, and the fresher and cleaner the surroundings of the chicks the less liable one is to lose them.

In regard to feeding—I like pin-head oatmeal or rolled oats for the first four or five weeks, with a change to bread and milk or Spratt's patent chick food. An excellent change also and one that produces growth is fine cut green bone. As to the quantity, I give them what they will eat up clean. I would much rather keep them a little hungry than have them stuffed with food.

I feed about five times a day the first week; after that four times a day till they are nearly full grown. Cracked corn, wheat, buckwheat, ground oats and green cut bone is what I give them from six weeks old upwards. I keep plenty grit before them, also plenty of fresh water in clean fountains or dishes.

When weather permits I allow them to run at will, giving them practically free range. I have five acres devoted exclusively to White Wyandottes and raise about two hundred chicks on the home place. I farm out extra ones on different farms. I find that they do much better in small numbers. It is not how many I try to raise, but how many good ones. I enclose films, from which to produce photos. Select any that will help you to explain. Take notice that some are of hens and their broods. I raise some by nature's way, but have to be on the alert for fear of lice. Some films will show chicks, when six or seven weeks old, feeding in front of their roosting coops, which are used after weaning time.

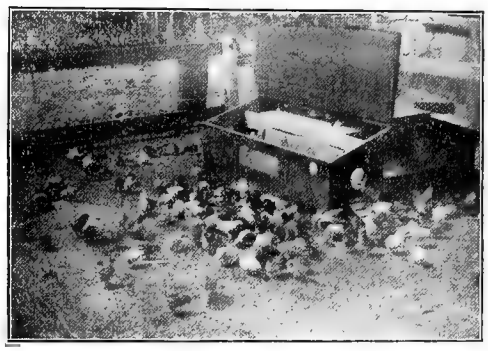
C. S. WETMORE, New York.

Five Dollars an Hour Earned by Raising 400 Brooder Chicks.

Your request of June 13th was duly received and found us with some twenty thousand ducklings on hand and two hundred tons of hay ready for the knife. This work supplemented with strawberries and weeds, leaves us, as you well know, but little time for literary work of any kind, but will try to contribute my mite to the general fund.

I had a little experience a few years ago, which I think will illustrate the possibilities of chicken growing on a limited area and may interest and benefit some of your readers.

During the latter part of March I got out a hatch of Light Brahma chicks, four hundred and one in number. I kept them in the brooder house for a few days, then, being short of room, put them outside in two outdoor brooders, inclosing them in a little space of six square rods, inside a wire fence one foot high. I think I have never suffered so



Brooder Chicks and Brooder.

small a mortality in all my experience with chicks, losing but three of the whole number and one of those killed by a dog. Those chicks commenced growing from the first and in three weeks' time began to hop over the wire, I hastily placed a four-foot wire around the pen intending to move them to different quarters when convenient, but they made such a remarkable growth and seemed so healthy, I thought I would see how long they could be kept growing in that limited space. I attended them myself. The yard was swept every day with scrupulous care and the excrements removed. The birds were fed systematically and always kept a little hungry. They never left that yard till they went to market, then weighing from five to six pounds each, dressed, and there was not a cull in the lot. Their plumage was glossy and fine. The birds were gentle and could be taken up at will.

When a little over four months old and about ready for market, I notified Mr. Hunter, then of Farm Poultry, that I had a show for him. He came out the next day and when he saw those chicks he would not believe that they had been grown in that yard, as there appeared to be but little more than standing room for them. He asked my men if I was not hoaxing with him, and he finally acknowledged that they were the finest lot of chicks he ever saw together.

They were fed four times per day till a month old, after that three times. They were started in with bread crumbs and hard boiled eggs chopped fine. One part egg to five parts crumbs and plenty of grit mixed in. After three days their food was equal quantities of wheat bran and cornmeal with a little fine beef scraps, and I gave them one feed each day of rolled oats and cracked corn. As they grew older they had a bucket of clotted milk each day, boiled potatoes and green grass. Toward the last, one feed of whole corn and over one-half a bushel of finely cut cornfodder per day. In fact nothing came amiss; they greedily devoured everything I gave them and appeared to have every confidence in my judgment. They brought thirty cents per pound in Boston market, aggregating nearly six hundred dollars, thus paying me for all food consumed and nearly five dollars an hour for all time in caring for them and had they been hatched two weeks earlier they would have brought thirty-five cents per pound. With one exception, this was my most successful experience with chickens.

JAMES RANKIN, Massachusetts.

Raising Chicks in Brooders.

We use both indoor piped sectional and outdoor hot air brooders. To begin with, our chicks are well hatched and come out strong, plump and active. Very early in the season, when the weather is still cold and frosty and no grass growing, we use the indoor brooders. These machines are set up, thoroughly warmed and tested before the chicks are put in. The brooder floors are sanded and the house floor covered with chaff or cut straw. During the first few weeks we keep the hovers very warm and if the chicks are too warm they crawl out where it is cooler. At night in particular we are careful to have a good surplus of heat, so that the chicks lie partly outside the hovers, as from midnight to morning the temperature of the room will lower considerably, so the chicks will go under the hover and be very comfortable. Were it not for this surplus of heat when left at night the chicks might be chilled before morning and then bowel trouble would make its appearance and many chicks die. Each room is sixteen by twenty feet and not unusually over four hundred chicks to each brooder.

The first few days the chicks are fed granulated oat meal only, with clean water (not too cold) for drink, and some good, sharp grit before them constantly. The first week we feed four times daily and but little at a meal. We then begin gradually working them on to a diet of cake, varied with cracked wheat. The cake is made of ground oats (hulls sifted out), cornmeal and best coarse wheat bran, about equal parts by bulk, with a very little high grade beef scraps mixed in while dry. The mixture is then moistened with some milk or buttermilk salted as for the table, leavened with soda, and baked.

The baking tins should not be quite full, as when the bread is done we turn it upside down on a board so the crust will be softened by the steam. As the chicks grow older the amount of beef scraps is gradually increased. This feeding goes on until the chicks are five to six weeks old, when a warm mash of about the same material as the cake is fed once a day, and whole wheat and cracked corn twice. This mash is moistened with warm water with a little salt dissolved.

Just as soon as we can get fresh clover or grass it is fed daily, cut in one-eighth-inch lengths. Chard, lettuce, beet tops or any such green stuff is also used. The hard grains are fed in the litter to induce exercise after the chicks are older and strong enough to work it out.

When the chicks are ten days to two weeks old and the weather is suitable they are let out in yards about fifty by two hundred feet in size, care being taken that they can find their way to the house when stormy. When they are about eight weeks old the yards are opened and the birds given free range.

When the chicks show a disposition to roost on top instead of inside the brooder, roosts are placed back of the brooder and the chicks encouraged to occupy them, when in a short time the brooder can be removed.

Just as soon as grass starts in spring, we begin putting chicks in the outdoor brooders, and when they are four to six days old we let them out on the ground in small yards in front of the brooder. As soon as they get familiar with going in and out and learn to go inside when the weather is stormy we give larger yards, running entirely around the brooder, and finally when the chicks are three or four weeks old we allow them free range. These chicks are fed same as in the indoor brooders, except that cut grass is omitted, as they help themselves to the fresh, growing article, and the exercise they get in pulling it off and running around the yards is a wonderful aid to growth.

In my opinion an outdoor brooder should have a light, cool chamber attached, where the chicks can feed and exercise when very young, or when the weather is bad, and into which they can retreat in case the brood chamber should become overheated. Outdoor brooders have some advantages over those indoor, but they require more watchful care. Their greatest point of superiority is that the chicks can be got out on the ground at a much earlier age, and in running about their yard, picking the fresh grass, etc., get much healthful exercise. When the weather gets very hot the outdoor brooder should be placed in the shade, and a shady run provided for the chicks when very young, as the intense heat of the sun kills a great many. When running at large the chicks will seek shade of their own accord.

We like both kinds of brooders, use both, and would not wish to be deprived of either.

H. J. BLANCHARD.

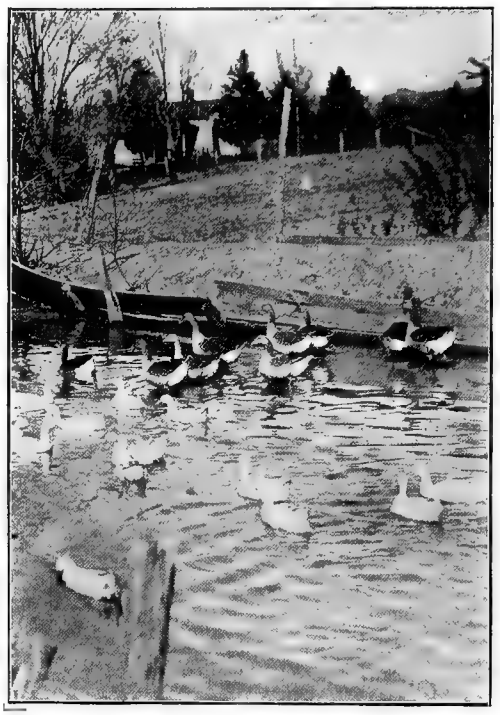
The Brooder Chick from Egg to Maturity.

Early in our experience of artificial brooding we became convinced of the fact that the foundation of successful brooding was laid months before the chick was hatched. By this we mean that unless the breeding stock is in the best of physical health we cannot hope for the best results in raising our young stock. Too many of the reasons assigned for the large mortality among chicks are, to say the least, of very uncertain signification, and not enough attention is paid to the poor condition of the breeding stock, which is, to our way of thinking, the main reason why a larger percentage of chicks do not reach maturity.

Our first attempt at brooding chickens artificially resulted in disastrous failure, but by close observation and many costly experiments, we finally adopted a method which is giving us gratifying results, and we feel sure that those who will try it will be pleased with it.

It goes without saying that the eggs must be well incubated, and every attention given them while under process of incubation. We leave the chicks in the incubator forty-eight hours after they come out of the shell. The morning of the third day we take them out of the incubator and carry them to the brooders, which have been previously warmed for their reception. We then give them their first feed, which consists of whole wheat bread, moistened with milk. We never place more than fifty chicks in each brooder, sometimes only forty. The temperature of the brooders is regulated by the disposition of the chicks on the brooder floor; if well spread out, we know they have sufficient heat, if all crowded in a corner we know they need more heat. That is our thermometer, and a reliable one.

We wish here to relate an experiment we made, in order to determine the length of time chicks can be left in the incubator without food. Five chicks were left in the machine, the ventilators wide open, and the heat regulated to 100 degrees. At first it was our intention to leave them in until they showed signs of weakness, but on the fourth day our courage weakened, and we fed them. They had up to this time showed no other signs but that of being very hungry, running to the glass front of the machine upon hearing the least noise. We marked these chicks and let them run with the rest. At maturity two of the cockerels weighed eight and three-quarter pounds each; three of the pullets six pounds, six and one-quarter pounds, and six and one-half pounds respectively. All of them lived to maturity and were always bright. Since then we always left our chicks forty-eight hours without food and believe this to be the very best way to start chickens growing.



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Our brooders are placed inside of a house eight by ten feet, with yards eight by twenty-five feet, each brooder occupying a separate house. The floor of the brooder is carpeted with cut clover, but the brooder house is filled in to above the sills with clean, sharp sand. The chicks are left in the brooder for two days, then let out into the house for three or four days, then the slide door to the yard is left open and they are given the run of their yards. When the chicks are six weeks old we take away the fence to the yards and give them the free run of the farm.

For the first ten days of their lives our chicks are fed only whole wheat bread moistened in milk every four hours. Water (warmed in cold weather) is always before them from the start, and is renewed twice or four times a day according to the weather. When the chicks are ten days old we still continue the wheat bread morning and night, the other two feeds are made up of the following mixed grains: Cracked wheat, 50 pounds; coarse oatmeal, 25 pounds; cracked corn, 10 pounds; millet seed, 5 pounds; fine meat scraps, 10 pounds. When fine meat scraps are not procurable, boil some liver, chop it up into fine pieces, and use that instead. Some heresy hunters will pick up their ears upon reading this and criticise us for giving meat to our young chicks, especially when given free range, but we know that it is impossible to grow the finest chicks without the free use

of meat, but it must be used with judgment and be of good quality.

At six weeks old we make the mixture of whole grains instead of cracked, still feeding it twice a day, but at this age the bread is replaced by a mash fed morning and night, composed as follows: Wheat, 50 pounds; shelled oats, 25 pounds; pearled barley, 15 pounds; corn, 10 pounds. We buy the grains whole and have them ground up together into a meal. To every 100 pounds of this meal we add 10 pounds of the finest quality meat scraps. We continue to feed our chicks four times a day until three months old, then we drop one meal, and feed only three times a day, mixed grains in the morning and noon, and mash at night. We aim to feed all they will eat at each meal, without overfeeding. Now and again when they do not appear hungry we drop a meal, and they are benefited by it.

At three months old we separate the sexes, giving the cockerels one part of the farm, the pullets the other.

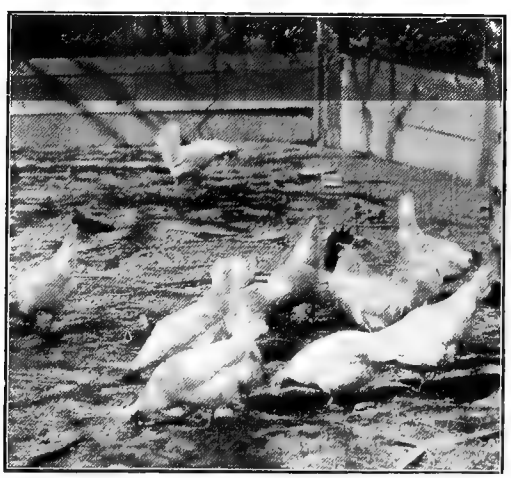
We have said nothing about charcoal, dry bran, tonics and condition powders, simply because they are unnecessary. Grit of course we use and find we cannot get along without it.

While we are painfully aware that our method is not perfect, we cannot overlook the fact that by following it, as here described, we have succeeded in bringing to maturity over ninety per cent of all chicks put in the brooders. Our chicks grow steadily from the shell up, our pullets begin laying at six months old always. They have produced two hundred eggs in one year. A good deal of this large egg yield was due to the care given the pullets while growing and after they began to lay, but had they not been bred from layers we could not have reached these results. If only those who decry the practice of breeding layers by the individual record system would try it, they would soon become converts to it. However, the proof of the pudding is the eating of it; give our way a trial before you condemn it; you will be pleased with the results.

C. BRICAULT, Massachusetts.

Feed and Care Given Flocks of Brooder Chicks.

As our present plan of feeding is giving such good results we will here give you a description of the care and feed given our chicks. We leave the chicks in the machines until



Feeding Time.

the morning of the twenty-second day, taking out the trays the night of the twenty-first day, thus giving the chicks more room and light.

The morning of the twenty-third day the chicks are taken out and put into out-door brooders and given a breakfast of dry rolled oats, which we feed for a week or ten days. A little chopped lettuce is much relished by the chicks also. From rolled oats we go to a mixed food consisting of the H. O. Co. poultry food with a little more rolled oats and meat meal added to it. This we mix up with curdled milk until it will crumble in the hand. This we feed until it is

An Interesting Study.

time for whole grain and cracked corn, and we find it is giving grand results. We neglected to state at the beginning that first and foremost the chicks are given plenty of fresh water as well as good food, all of which make chicks grow and keep them growing. Charcoal and fine grit are also among the necessities of proper feeding.

Great care should be taken to keep the brooders cleaned at least once a week, and aired every day.

Mr. Wyckoff has always used indoor brooders, but he always had a great deal of trouble in keeping the chicks warm early in the season and cool as the season advanced, and the result was the loss of chicks. There is one point in favor of indoor brooders, and that is in rainy weather the chicks have more room, but with the style of brooders we have now in use we have had no trouble on this score, as we only put seventy-five into each brooder, which is but half their capacity, thus giving the chicks plenty of room for different kinds of weather.

Attached to each brooder is a small wire run, where the chicks are let out for a week or ten days, until they get used to going in and out of the brooder, then the fence is removed and the chicks have free range every pleasant day until they are separated and put in the brooder house and taught to go onto the roost.

We think we have the best plan for young chick roosts we have seen. We use four saw-horses placed at even distances apart. On these we have eleven roosts, four inches wide by twenty feet long, placed about two inches apart. These are fastened to the end horses by boring holes through the slats and horses and putting spikes through both, thus holding them all in position. We find them easy to build, easy to clean and easy to take down and store. These eleven roosts will accommodate from three to four hundred half-grown chicks. Our brooder house is situated in a large pear orchard covering about eight acres; the soil is gravel and sand and is seeded to clover. We also have

two living springs, so our stock gets plenty of good pure water, lots of shade, ample range, with plenty of insects to keep them busy between meals.

GRAY & STORKE, New York.

Brooder Chicks and Growing Stock—Care and Food.

It is a delightfully easy thing to tell how to raise chickens. It is not quite so easy to successfully raise them. There is little need for any extended directions for raising chickens by the natural method other than in the points of food and cleanliness with some little attention to the details of housing and shade. With artificial hatching the business takes on a development and calls for much greater care and decidedly more attention to food and management.

Little need be said of the hatching, except that the best incubators should be used, the second rate and cheaper machines being generally unworthy of confidence, that is, the problem of hatching is of sufficient importance that only the very best means to this end should be accepted.

In producing eggs for hatching the very best attention must be given to the breeding stock, and if good results are to be had the birds must be the product of several generations of hardy, vigorous stock.

The strongest emphasis may be placed upon the fact that it is much easier to hatch chickens than it is to raise them after they are hatched, and the first two weeks in the little bird's life is a crucial period, and under some conditions the second two weeks is harder to tide over than the first fortnight, yet with due care and proper attention to the warmth and food they may be and are successfully carried to an age after which death is generally the result of accident rather than ailment or disease.

What they shall be fed when taken from the machine at the expiration of twenty-four or thirty-six hours is a question which has exercised the mind of every producer of chickens. Every conceivable sort of food has been suggested, recommended and tried in more or less cases. We believe that the simpler the ration the better the chicken and the surer the success in its raising. All fancy mixtures and fussy feeding notions may be safely eliminated. The old time mixture of boiled eggs and cracker crumbs is now-a-days pretty generally neglected. In some instances breeders are using this mixture successfully, but in more cases they are killing their chickens apparently by its use. We have tried practically every system from the egg and crumb diet to that of dry food alone, including baked cakes, bread crumbs and various oat foods and so on, et cetera, et cetera, and have gradually simmered down to the point where we now feed exclusively for the first two days a mixture of two-thirds wheat bran and one-third Indian meal moistened with milk, and to this we add about five per cent of fine gravel or grit. The chickens are fed all they can eat, in fact it is before them practically all the time for the first forty-eight hours, and from then until a week or two of age there is very little of the time when food is not within their reach. After the first two or three days they are fed in addition finely sifted cracked corn and rolled oats, chopped oats, cracked wheat, or in fact any grain or food which they will eat. We conclude it makes very little difference so long as they have a fair proportion of animal food which, with us, is in the form of ground beef scraps, and it may be just as well or better in the form of milk, either sweet or sour, skimmed or whole. When milk is fed to very small chickens it is better to moisten their food with it than that they have it to drink. If they have it as a drink they are quite apt to smear themselves with it making them sticky and dirty and both ill-feeling and ill-looking. After the first three or four days the grit is left out of the food, a supply being kept constantly within reach, which they eat as they require it. The warmth in the hover is started at ninety-five degrees, with the chickens all in. From that it is gradually lowered, more attention being paid to the action of the chicken than to the temperature as registered by the mercury. When the chickens are comfortable and settle down contentedly without overcrowding or pushing too much to the outside it is concluded that the conditions are right and they are doing well. When, on the other hand, they crowd and cry, not enough heat is supplied, and we give them more. It is impossible to give small chickens a satisfactory treatment where the brooders are run altogether by the thermometer, regardless of the outside weather conditions, and the indications of comfort, which may be observed from the chickens themselves. The brooder floors and pens should be scattered with chaff or covered with sand to induce action and exercise through scratching and working for particles of dry food, which may be thrown about in the litter. The one thing essential to the health of the chicken is abundant exercise. Without this they will not thrive, and success cannot be attained. In order to get the necessary exercise it is imperative that they have an abundant supply of fresh air and an outdoor run at all seasons of the year. A few minutes in the open air will do the smallest chicken good, and after they are a week or ten days old they may be trusted to run back and forth in pleasant weather almost regardless of how cold the outside temperature may be. Fussy coddling and over-heated compartments have been responsible for the death of more chickens than any other cause. Whenever trouble appears in a flock of chickens the first question with the average beginner, and sometimes with the more experienced person, is what their food has been. The attention and investigation is generally directed toward the food. The facts are that the strong, healthy chickens having abundant exercise and a good supply of fresh air will stand almost any sort of food without taking harm. The main thing is to get the exercise. It perhaps might be noted here that this is practically the secret of success in managing breeding stock as well as chickens.

Clean water should be always within reach of chickens and it should be kept in some such fountain as will make it impossible for the little birds to get into it. This will save frequent drenching and occasional deaths by drowning. In extremely cold weather it is better that newly hatched chickens should have luke-warm water than that it should be given to them icy cold. Many breeders do not give the little chickens any water until several days old, some even keeping them several weeks without it. We have not thought it the best way, and we give water from the first. From their very evident pleasure in drinking, it must taste good to them and we doubt any possibility of harm from drinking overmuch clean, pure water.

There is a good deal of question what the limit is in the numbers that may be kept together safely. Many advocate fifty as the best limit, while others keep from one hundred to two hundred in the same pens and under the same hovers. There is little doubt that for the beginner, at least, flocks of fifty or sixty will do better, and there will be a lower death rate than in flocks of one hundred and upward. We have built our brooder building with the pens three by ten feet, which are designed to accommodate from fifty to seventy-five small chickens. They will easily hold fifty chickens until six weeks of age if the chickens have an outdoor run.

They are then put in a pen four by ten feet and kept until well feathered out, when they are removed to colony houses of one description or another. Of course the early hatched and winter chickens must have heat practically throughout the winter.

Late birds do very well without artificial heat after the last of March and may be safely colonized in suitable coops at a few weeks of age—almost every kind of coop is used for this purpose, and it really matters very little what the style of the structure be, so long as it conserves the essential features, which are dryness and freedom from direct draught. For some years open front and bottomless roosting coops have been strongly advocated as being the best fitted for growing chickens colonized in groups of from thirty to fifty. Our experience has led us to do away altogether with open fronts and coops without bottoms. There is a constant trouble from colds caused either by driving rains or bunching up on the ground, thus drawing up the dampness, which ends in running nostrils, wheezing and general debility.

As the chickens grow older they are fed rather differently. They have their regular morning feed, with one at noon and another at night, generally the morning and the night feeds are of mashes composed of bran and meal of about equal parts, with from ten per cent to fifteen per cent of beef scraps added. Oyster shell and grit are always by them and green food is supplied as abundantly as is convenient. Where the runs are large enough so that the green food is not eaten down, no other need be given, but in yards devoid of grass some substitute will have to be added to the grain rations. In addition to these regular feeds three times a day many of the most practical and successful poultrymen keep a box of cracked corn open to them from which they may eat at pleasure. Many also keep a box of coarsely ground scrap, which is kept constantly filled and which may be had at all times.

As the chickens gain size and the cockerels mature they are separated from the pullets, leaving from twenty-five to thirty-five or forty pullets in a flock. The cockerels are removed to another yard and if designed for market birds are fed all the fattening food which they will take and as fast as they are in fit condition they are sent to market. The earlier hatched pullets should not be fed quite so much meat or animal food as the later hatched ones, or they will begin laying too early and will moult out in the fall, thus jeopardizing the supply of winter eggs. It is possible by forced feeding of animal food to induce very early laying, and we this season, without extra heavy strain, have started our Wyandotte pullets to laying at four and one-half months, which is too early to get the best size on the birds or the best results in constant egg production. Too early maturity is as much to be avoided as too late, that is, the pullet which grows along freely and gets a suitable frame and size before beginning to lay will make the strongest and most vigorous breeding bird and will in the end prove the most profitable.

We feed very little whole corn, as the cracked corn gives them more exercise in scratching, and feeding, and does not pack so closely together in the crop. Considerable shelled and whole oats are fed, together with some wheat; the wheat, however, is more sparingly fed on account of the extra cost. We are able to get the same growing value from wheat bran and beef scrap at a much less cost than we can get it from wheat, of which the best grades only should be fed. Smoked and damaged grains, such as are commonly on sale for poultry, are unfit for this purpose.

Very many fancy formulas are to be had for broiler feeding as distinct from roasters. We believe there is really very little difference and that the chicken that is properly fed and is in the right condition will be good to kill for broilers without any extra preparation, and chickens which are good broilers will if kept mature into good roasters. One of the really necessary things to do is to get rid of about nine-tenths of all the accumulated wisdom which has been loaded on to the chicken business, in many cases until it has nearly swamped it, and to get back to a few very plain principles. These briefly stated would be sufficient warmth, cleanliness, plain food, and plenty of it; this, together with a good range, will produce chickens at a satisfactory profit, if the breeding stock has been properly selected and bred.

One of the very necessary points is good shade and it must be had in some way, either by trees, board or brush sheds or otherwise. We have killed two birds with one stone, or rather saved several birds with one idea by building a number of houses on posts which leaves them elevated about twelve inches or fifteen inches from the ground. These coops are floored, which keeps the birds high and dry and free from dampness and at the same time allows them sufficient shelter from the sun, together with the draught, which is generally found nearest the ground, and on rainy days they bunch together under the buildings and enjoy themselves much better than they would were they obliged to stay inside. A board runway leads from the chicken door to the ground, giving them convenient passage to and from the inside. Since we have adopted this method of keeping the chickens we have had very much less trouble from colds and greater thrift than by the former method of colonizing in open front coops without floors. These coops are built four by eight feet and are four and one-half feet high in front and three feet at back, giving a sharp pitch to the roof, which sheds the water readily. They are covered with tarred paper and have one sash, six lights, nine by twelve inches, and a door twenty-four inches wide, and full height of the building, which is fitted with a screen for use in hot weather. There is an opening at the highest point at each end, which allows the heat to escape. This is closed in cold weather. The birds may be carried in this building through the winter if necessary, and before the chickens are large enough in the spring to be placed in them they are used for breeding pens and are very convenient for this purpose. These buildings are, as are all other quarters inhabited by chickens, thoroughly disinfected at frequent intervals with a solution of carbolic acid and water. Care must be exercised that too much carbolic acid is not used immediately before the chickens are shut in for any length of time as too much acid is quite fatal to small chickens. Any high grade disinfectant would answer the same purpose, the idea being to keep the house free from disease germs and to help the sanitary conditions. G. H. POLLARD.

Brooder Chicks—Feed and Care.

I want to tell you of my mode of feeding and caring for chicks. After the chicks are hatched I leave them in the machine at least twenty-four hours before placing them in the brooder. This makes them strong and vigorous. As soon as they are placed in the brooder I give them sand or fine grit and water. I keep water by them all the time, good, clean, fresh water.

My first feed is hard boiled eggs chopped up fine. After that I feed millet scattered among the chaff that is on the bottom of the brooder and run. I feed both millet and hard boiled eggs at intervals (just what they will clean up and

work for) for the first week, after that I give them a feed of cooked rice (cooked dry) for a change, also cut oats and corn bread. As the chicks grow older I add whole wheat and also feed some mash with a little blood meal in it about twice a week. One of the great points in feeding and care of chicks is "common sense and judgment." Study your brood and you can see at a glance how much and what to feed to supply their wants.

I remember one season I tried not feeding any food or water for the first forty-eight hours, etc. Well, the result was I lost all the chicks. As brooders (the leading machines) are nearly all properly constructed it remains for the operator to do his or her part, which if done there will be no trouble. I rear and have raised by farmers from 1,500 to 2,000 White Plymouth Rocks every year, and must say if the farmers follow the above method of care and feed we lose but few chicks. I have pullets laying now and cockerels like old birds. It may be this is all due to their being White Plymouth Rocks, but I think the mode of care and feed has something to do with it. U. R. FISHEL.

The Value of Exercise, Limited Food, and Even Temperature.

Our experience with brooders has been somewhat varied, and not at all "clear sailing" by any means. We had some very disheartening times while we were getting our "experience."

The poultry journals are full of advice regarding the operating of brooders. These methods sometimes seem directly opposed, and still, no doubt, they are the truthful experience of the writers. We believe that the greater number of failures with brooder chicks are caused by too much heat and overfeeding. We do not believe that brooders can be run successfully, generally, in cold weather without the use of thermometers. Chicks taken directly from the incubators and placed in the brooders will stand a far greater amount of heat than is good for them. Consequently if we judge altogether by their actions we may keep them at a much higher temperature than is good for them. This is reasonable, for we can so accustom a child to a high temperature that it will be uncomfortable in a room under ninety degrees, and none will deny that this amount of heat is injurious to the child. Ninety degrees three inches from the floor in the hover of the brooder is about right for the first week. This should be reduced gradually to eighty-five degrees the second week and to eighty by the end of the third week.

We have killed a whole lot of chicks, both in brooders and with hens, with kindness, i. e., with too much food. Now, we never feed oftener than three times a day from the very start, either with brooders or hens. This way works well with us and we shall stick to it. The danger of overfeeding with brooder chicks is especially great, as they do not and cannot take as much exercise as those with hens. Don't worry if they get hungry enough between meals to scratch good and hard. This is the making of them. It will help digest their food and ward off diarrhoea, which is only the result of indigestion.

All brooders should have an open runway or yard, and the chicks should be accustomed to running in this for at least a short time from the very start. Give fresh water to drink from the first. Keep fine grit in the brooders all the time. Keep the temperature right; have them take plenty of exercise; feed only three times a day, and "what you feed will not be so important.

We are very partial to millet seed. In fact we have said that we could raise chicks on this alone, with water and grit. Equal parts of corn meal, bran, shorts and clover meal, baked with soda or baking powder, makes a good winter feed. Stale bread, soaked soft and squeezed dry, is an excellent food for starting chicks. Put chaff in the yards or runs and sprinkle just a little millet seed in it and watch them scratch for it. This is our way, no theory, all practice. If your way is different, and you are successful, stick to it.

W. B. GIBSON & SON.

Feeding the Brooder Chicks.

I have used several kinds of brooders. I first began with outdoor brooders with bottom heat, but had little success, but that was about twelve years ago, before brooders were as well perfected as at the present time. For a while after that I hatched with incubators and brooded with hens and since have used top heat indoor brooders with success.

The brooder with which I have had the greatest success is one having a hot water pipe system, and with this I can raise a larger per cent of the chicks hatched than with hens, and the same number with much less trouble and expense.

I feed chicks after they are about thirty-six hours old, once every two hours through the day till about four weeks old. No one need fear that any food is too fattening for young chicks. They need carbonaceous or fattening food to keep them warm while they are small and to sustain their vigor during the period of rapid growth. There is no one food which is as good as cornmeal, either in mush or bread, but I think a variety of foods is better than any one alone. A very excellent food for chickens is bread made from two parts cornmeal and one part wheat middlings, with two tablespoonfuls of animal meal added to each quart of the mixture; this stirred to a stiff batter with sour milk, in which enough soda has been dissolved to make it light, and baked in thin cakes to be fed warm or cold. This bread may form the main food till the chicks are large enough to eat cracked corn, broken rice and small grain and the bread may be supplemented by hard boiled eggs chopped fine, and other palatable foods. I save the infertile eggs from the incubators to boil for the chicks. After they can eat small grain foods I feed a mash once daily of the same meal mixture as described for bread, and a variety of grain foods, such as steamed rolled oats, wheat and cracked corn, plenty of oyster shells and grit, and clean, fresh water, give access to a good grassy run, and a clean brooder. In short, to get the best results, chicks should be kept steadily growing from the time they leave the shell till they are fully matured. As they grow older they require proportionately more of the bone and muscle forming food and less of the more fattening materials.

The best way to care for the brooder is to clean it every morning and put clean sand on the floor to absorb moisture and to ease the chicken's tender feet from the hard floor.

GEORGE H. NORTHUP, New York.

Care of Brooder Chicks—Colony Coops and New Ground.

After many years with Buff Cochins we have almost adopted and believe the saying that, "If you hatch ten Cochin chicks and a board does not fall on them, you are almost sure to raise the whole ten." A good brooder, proper food, pure water, plenty of shade and green grass, freedom from lice, and the proper attention, will make Cochin raising the simplest thing in the world.

Our chicks are hatched both by hens and incubators, and we find absolutely no difference in the chicks, with the

exception that those hatched by incubators are free from lice.

It is almost impossible to raise to maturity chicks from unhealthy and improperly cared for parents. It is equally impossible to raise chicks that have been improperly incubated, whether by hens or incubators.

It is just as probable that you will get improperly incubated chicks from hens as from incubators; for how often do you see a poor, run-down, emaciated hen bring into existence a flock of chicks when she is so weak, poor, and run-down that she is barely able to stand. This is not the fault of the hen, but of the failure of the proper attention having been given her. One can readily understand how impossible it would be to start and develop into active and vigorous life chicks that have been brought into the world under such unfavorable circumstances. Therefore, our first aim is to get our chicks from healthy, well cared for parents, and then to have them hatched under the most favorable conditions.

When the chicks are hatched we leave them under the hen or in the incubator at least twenty-four hours. If they are taken out sooner than this, they are not so strong, and the chance of raising them is much lessened. They are then given a thorough dusting of Persian insect powder. This is very important, as they cannot thrive when lice are present.

We raise our chicks in outdoor brooders, using two hundred chick size, and put from forty to fifty chicks in each brooder. The brooder is gotten clean and is heated to ninety degrees the day the chicks are due to hatch, so that everything is in readiness for them. They are given plenty of water at once, and their first food consists of fine dry rolled oats. During the first ten days they are fed exclusively on rolled oats and millet seed. They are fed six times a day, alternating with rolled oats and millet. On the tenth day they are given in addition to the rolled oats and millet, well baked corn cakes, chopped fine. If they become droopy we add to and mix thoroughly with the corn cakes some finely ground Mica Crystal grit. This is the only medicine little chicks need. It is surprising to note how quickly they brighten up on this treatment. When three weeks old we gradually add to their rations crackeed wheat and finely cracked corn, cutting out the rolled oats. We continue to feed the millet and corn cakes in conjunction with the cracked corn and cracked wheat until they are six weeks old. We then cut out the millet and corn cakes and substitute hulled oats and American poultry food. The American poultry food is given at noon, and to this is added twice a week fresh ground green bone.

We believe in feeding frequently and in small quantities at a time, as overfeeding is sure to make chicks dull and stupid and eventually bring on indigestion and inflammation of the crop. In giving the different rations we alternate and change as much as possible in order to keep them from tiring of any one ration. We give them fresh water twice a day, being very careful to keep the same in the shade. As we use outdoor brooders we are able to have them constantly on the move and thereby give the chicks pure fresh earth and grass.

It is very important to provide plenty of shade in summer. It is equally important to place the brooder for one hour each day, while open, where it will be subjected to the direct rays of sunlight, as this method and cleanliness are the only means of preventing the origin and spreading of tuberculosis, which is sure to occur in a close, crowded brooder, especially if dark and damp.

When the chicks are first put into the brooder they are confined for from one to three days, the length of time depending on the state of the weather. The brooders being placed on a nice green grass plot, we then provide for each brooder, one hundred yards of wire netting, one foot wide, with one inch mesh. When the chicks are first liberated from the brooder we drive stakes into the ground and make a coil enclosing about three square feet of space. As the chicks become more active, and readily cover this space, it is gradually enlarged from week to week, until the whole hundred yards are in use. This method has saved us lots of worry and trouble, for when the chicks are young and are first liberated, if given too much space they are almost certain to stay away from the brooder, and it is very difficult to teach them to return to it. Then, again, brooder raised chicks have no mother to look after them and in case of a storm they can be very readily found and driven to a place of shelter. We have found that it is not so much the size of the run that makes healthy chicks, but it is the frequency with which they are changed from old to new quarters.

When they weigh about one and a half pounds or are nicely feathered, we divide them into lots of twelve each, being careful to have each lot the same size and devlopment. These are placed in colonies, each colony being all cockerels or all pullets. Each colony is provided with a coop four by five feet, three feet high in front and two feet in the rear. These coops are provided with a storm door, and also with another door covered with fine mesh screen. This latter door is used on warm nights, and protects the chicks from vermin, etc., and the outer door, which is hinged at the top, is lowered about one-third, which protects the chicks in case of storms during the night. The bottoms of these coops are covered with a thick bed of straw. This is to prevent the breast bones of the chicks from becoming crooked, which is very prone to occur with Cochins. We never provide them with roosts until they are one year old.

When they are eight months old they are provided with more commodious quarters, and those showing promise of becoming choice exhibition specimens are cooped either in pairs or singly with the object of preserving their massive foot and leg feathering. A. W. RUBY & SON.

Limit the Number of Chicks in Brooders.

The most successful way that I have found to raise chicks in brooders is the following. Build a brooder house for each brooder, say about six feet by eight feet, with a door and a window to the south. Have these brooder houses scattered about the orchard, about one hundred feet or more apart, each house to be furnished with a one hundred-chick brooder. In this put from fifty to seventy-five chicks. It is not advisable to put more than seventy-five chicks in any brooder, fifty would be better, as I find that I usually can raise more of the chicks when I only put fifty chicks in a brooder than when I put in seventy-five or one hundred, besides you will have stronger and healthier chicks at maturity. I have no yards for the chicks, but give them free range. I do not let them run out until about a week old, after which I let them run out on all fine days, but always keep them in until the dew is off the grass, at least until they are well feathered. If this is done you will not have much trouble with gapes. Begin feeding when chicks are about twenty-four hours old. For the first few feeds I find nothing better than bread crumbs. Feed the first week about four times a day with bread crumbs and oatmeal. After the first week, when I let them run out, I feed three times a day, soft food in the morning and either oatmeal, cracked wheat, cracked corn or millet at noon and evening. Change about from one kind to the other and then the chicks

will always have an appetite. When chicks are four or five weeks old I feed only twice a day. Feed whole wheat and corn just as soon as they can eat it. Always have plenty of grit standing around for them, and give them fresh drinking water. Keep the brooders and brooder houses clean and look for mites each time you clean brooders. Saturate the sides and bottom of the brooders with coal oil once in two weeks, and then the mites will not trouble you.

The foregoing is for chicks raised on a farm where there is plenty of range. I also find that farm raised chicks, as a rule, make stronger and healthier chicks at maturity and ought to be sold at better prices than those raised on small city or town lots, but they seldom are. You find that city breeders always ask double the price for their inferior stock, although it is no better than that raised on the farm. The best chickens for either the show room or for business are those that are raised on the farm which have unlimited rage. EMANUEL SCHIEBER, Ohio.

Brooding and Feeding Chicks.

In raising chicks in brooders the first thing to be considered is the brooder. A brooder should be used that will give the chicks plenty of warm fresh air. Some people have the erroneous idea that air must be cold in order to be fresh, which of course is false. A brooder may be so ventilated that the outside air is sufficiently warmed before reaching the chicks. Due attention should be given to see that it is kept at the right temperature, for if the temperature be kept too low or too high for a considerable length of time the result will be an unnatural growth of wings, and weak sickly chicks. The chicks should be kept so that they will lie down and go to sleep and not be obliged to huddle together to keep warm, neither be forced to the coldest corner of the brooder to cool off.

Another thing to be considered is the number to be placed in one brooder. The brooders that I use are two and one-half by three feet, placed in one end of coops, which are three by six feet. Such a brooder will accommodate seventy-five chicks nicely; we have raised more than that, but that number or less is better.

After the right brooder, with the right temperature and the right number of chicks are obtained, the next thing to be thought of is the food and drink.

There are many different methods of feeding, many of which we have tried with good results, but perhaps as good, if not the best method of feeding, for the first four or five days is oat flake and millet, with a few bread crumbs fed four times a day. After that gradually work them on to a mixture of cornmeal, wheat middlings, and wheat bran, with a few beef scraps for their mixed food, and cracked corn and wheat, which should be given after they have eaten their mixed food. Close attention should be given to the droppings, and if they do not become hard in two or three days a little black pepper may be mixed with bread crumbs moistened. Care must be taken that none of their mixed food be sticky or gummy.

Another and perhaps one of the most important things to be looked after in raising chicks is their drink. They should have fresh water placed in clean drinking fountains. A fountain that can not be opened and cleaned never should be used, for a slimy substance will form on the inside of the fountain and unless removed will surely cause bowel trouble. Many persons have lost nearly all their chickens from this cause and then wondered why they are not successful. If by reading these suggestions some of your readers are helped in their struggle to make poultry pay I shall feel repaid for my effort.

A. A. HARTSHORN, New York.

Better Too Much Heat Than Too Little.

How easy to rear young chicks if we only knew what to feed, how to feed, when to feed, and how much to feed, and a thousand other hows, ifs and ands.

In our years of experience in rearing chicks in brooders and by mother hens we find the results about the same in regard to the number raised and cost of food. But chicks reared in brooders are more peaceable and quiet and much easier handled, hence make better show birds. We also find that we are not troubled so much with lice and disease, for the simple reason that remedies are more easily applied. Again, we have the use of the hen in the breeding yard, and save the food which she would eat if left with the chicks. This is a large gain in rearing thousands of chicks per year, as the food for young chicks is quite costly.

Our method of raising chicks in brooders is as follows: After leaving chicks in the incubator or under the hen until twelve or thirty hours old, we place them in the heated brooder, with the thermometer registering ninety degrees, allowing the temperature to fall until the chicks are three weeks old, after which we use no artificial heat.

In regard to pen room, I have raised as high as two hundred chicks in brooders four by eight feet, and one hundred and sixty-five chicks in brooder three and a half by six feet, and only lost one chick, and that one in the small brooder) this season. We never have had as good results with small brooders. We leave our chicks in brooders the first two or three weeks, according to the weather, and give them a run in the yard ten by twenty feet, until six to eight weeks old, after which we place them on the farm. After trying many experiences, with good as well as poor results, we find this the most successful of all, with no extra trouble or expense. Any one can rear a brood of chicks in this way.

We offer a few suggestions in regard to feed and heat while chicks are in brooders and small yards. If you wish to avoid bowel trouble, give clabber milk once a day. We have learned this rule: Better have chicks two degrees too warm than one too cold. When chicks are too warm they will scatter over brooder and when too cold will crowd over one another, smothering weaker chicks.

We always feed one teaspoonful of sulphur in food to fifty chicks, twice per week during dry weather. This we think aids the feathering. IRA T. MATTESON, Ohio.

How to Successfully Raise Brooder Chicks.

One of the first things to be considered in raising brooder chicks successfully is the parent stock which must be in perfect health, properly fed and given abundant exercise to insure fertile eggs and strong chicks. A first-class incubator must be selected, one that will hatch from 75 to 90 per cent of fertile eggs, and when you get such hatches you will get strong chicks that will live if properly cared for. The next thing to be selected is a brooder, and this is equally if not more important than the incubator. You must get a brooder that imitates a hen as closely as possible; one that will let in any amount of fresh air; one that has a round cylinder with no corners for chicks to crowd in, and one easily heated with a lamp that will not blow out or smoke. I prefer the single brooders to the pipe system. In winter heat your house to 60 and 70 degrees and keep your brooders 90 degrees at the start, gradually lowering the temperature after twelve days, or do not let the chicks get chilled at any

time or allow them to crowd, for if you do bowel trouble will be the result which will take off a large per cent in a short time. Too much heat will weaken them and cause many to die, so you must be very careful, especially at night, about obtaining the right temperature, as it often grows very cool the latter part of the night, so a little extra flame should be left on in cool nights.

I use runs five feet wide, ten feet long inside of house, and outside runs fifty feet long well shaded in summer.

The next and most important of all is feed. I wish to say right here that overfeeding for the first four weeks of a chick's life has put more people out of the business than all other things combined. You can hardly feed too little. We feed four times a day for the first five weeks. The first three weeks we use principally dry feed and make them scratch for every meal but that given at night. We feed Spratt's Patent Chick Feed morning and night. At ten and two o'clock we feed millet seed, pinhead oatmeal and cracked wheat. We keep them well bedded with cut clover two to three inches deep, and throw all their feed in this. They also eat much of the clover. We feed very sparingly at first. Keep them hungry at all times. Much depends on keeping them at work; it assists in keeping them in good health. We keep grit and charcoal before them all the time, and fresh water is always before them. Care must be taken to keep their drinking dishes free from slime; they should be washed daily. Clean your broder every other day if you bed with cut hay, and every day if you use sand or bran.

After three weeks your chicks will begin to tire of this feed, then we give two meals a day of soft food composed of one part stale bread soaked in water, or better, milk, one part bran, one part hominy meal, ten per cent Spratt's Ground Meat. H. O. Poultry Food with ten per cent good beef scraps is a grand growing food and much easier prepared, but more expensive. We continue Spratt's Chick Feed once a day for two weeks longer, giving mash morning and night, using cracked corn and wheat once a day. If running for broilers make your mash one-half corn meal. We run but fifty to sixty chicks in one lot, as this is enough for any single brooder if you want them to live.

After they are old enough to leave the brooder and you cannot give free range make yards twenty feet wide by one hundred feet long and put sixty to seventy-five in a flock on grass yards with plenty of shade, dividing the pullets from the cockerels. Keep them free from lice and you will have birds of fine quality for breeders.

EDGAR BRIGGS, New York.

Principally a Question of Moisture.

"I can hatch the chicks easily enough, but to raise them is the question." This expression is very frequently heard from those raising poultry by artificial methods.

I have done a great deal of experimenting along this line during the past eight years. Some seven years ago I thought I struck the right idea for brooding young chicks when first hatched. I had three separate houses, 7x12. I built flues for each of these houses and put indoor brooders in them, also a small stove. Now, for the results. The chicks did fine for about a week and I thought now I am on the road to success, but, lo! I went to feed them one morning and a number of them looked like big toads swollen to nearly double size. I removed the stoves and the trouble stopped. I then worked along a few years with indoor brooders and cool, dry houses with varied success. In 1899 I commenced with outdoor brooders. This season I have used nine of them, raising some broods nearly to a chicken, while losing some broods almost entirely—all losses except a few with the universal disease, bowel trouble. Those brooded with hens occasionally died in same proportion. I concluded from observation that it was moisture and not the feed that caused the trouble, as I noticed if the weather was dry whether the temperature was high or low I raised about all the chicks, and also if I got them by the first ten days without bowel trouble they were all right. To satisfy myself that it was moisture the first week or ten days that gives them bowel trouble I put several hens with chicks up in a loft for a week. It was perfectly dry in this loft and I never lost a strong chick after this experiment. From this experience I shall construct a room in the loft of some of my buildings next season with plenty of light and ventilation without fire except in the brooder and keep all incubator chicks up above the ground for the first ten days.

A god many perusing this article will say, "He has not said a word about feed." I don't expect to say much about feed as it is immaterial what you feed if you solve the moisture problem. I can raise every chick hatched, as I have done it, on the same feed I feed old fowls when there is no moisture to contend with. Give the chicks plenty of grit and clean water, a little green food and you can safely feed them any feed you may have, if you keep them free from moisture the first two weeks of their lives.

As to space required for brooder chicks, of course the more the better. With my outdoor brooder chicks I use three boards making a triangular yard, the sharp angle coming up to the brooder, using two sixteen and one twelve-foot boards one food wide. I keep them in this yard with plenty of chaff to scratch in until they get large enough to fly over the board. Then I cut small openings in the boards for them to go out and in at will. If you have limited space this yard will accommodate probably forty until near frying size if you are careful about sanitary conditions. I am enabled to put forty to sixty in brooders three feet square, and keep them in these at night until frying size is reached. I then cull and run them in a movable brood house until four or five months old, gradually moving the brood house nearer to permanent house, and finally moving brood-house away.

O. E. SKINNER, Kansas.

RULES FOR RAISING CHICKS IN BROODERS

BY P. H. JACOBS.

1. If the chicks do not come out of the eggs until the 22nd day, or longer, it indicates that the temperature of the egg drawer was too low or eggs too old. They should begin to pip on the 20th day.

2. If they begin to come out on the 18th day it indicates that the average temperature was too high.

3. If chicks come out weak it indicates either too high or too low a temperature, or that the eggs were from immature pullets or over-fat hens.

4. Give no food for thirty-six hours after the chicks are hatched.

5. They should then be fed every two hours until one

week old. After that time feed four times a day until a month old, then three times a day will suffice.

6. Keep a little box of ground charcoal, one of clean ground bone and one of small sharp flint, before them, with plenty of coarse, sharp sand on the floor. Also a box of ground oyster shells, as grit, but in recommending these substances it may be stated that any kind of sharp small grit will answer.

7. The first feeding may be of pinhead oatmeal, rolled (or flaked) oats are ready prepared, and can be had of any grocer, being the prepared oatmeal for instantaneous preparation of oatmeal gruel. Feed them to the chicks dry, but they should not be used except as a variety, the pinhead oatmeal being preferred. Stale bread moistened with milk may also be given. Crumbled stale bread fed dry is also an excellent food.

8. On the third day after beginning to feed, vary the food by giving the oats one meal and prepared cake the next. The prepared cake is made by using equal parts of bran, ground corn and oats (corn and oats are usually ground together) and middlings (shipstuff) which should be salted to season it, intimately mixed, and cooked in a pan in the stove oven. Sift the corn and oats first, and feed the coarse parts to fowls. If fresh milk can be had the food may be mixed with it before cooking, if not, use water. Crumble the cake fine when feeding. It should be fed dry.

9. Millet seed, a gill to 100 chicks, may be scattered in litter, between meals, to induce the chicks to scratch, but never leave in the troughs food that is not eaten.

10. Ground meat is sometimes used for chicks, but results show that too much of it causes bowel trouble. If a piece of lean butcher's meat be cooked to pieces (or chopped fine after cooking), and fed twice a week, it will be sufficient. A gill of linseed meal to every part of the dry mixture (for making the prepared cake) given once a week, will be beneficial.

11. After the first week any kind of food, such as mashed potatoes, cooked turnips, crumbled bread of any kind, or any wholesome food, will be of advantage.

12. When ten days old the oats may be omitted, and wheat one day and cracked corn the next, may be used. Begin to teach the chicks to eat wheat and cracked corn early by sprinkling a little on the floor (about a tablespoonful daily) after they are a week old.

13. Young chicks do not eat much at a time, but they eat often. Do not omit a meal. Feed at regular hours.

14. After the chicks are three weeks old the cake may be omitted, the food being varied instead, but the quantity of bran should be reduced one-half.

15. Bran is indigestible if fed raw, and sometimes causes bowel disease, but if cooked, or well scalded, so as to soften it, the bran makes a good food, as it largely abounds in the phosphates, being the best bone-forming element that can be given.

16. Water should be given in a manner that only the beak of the chick can become wet. The chicks must not be allowed to tread in the water. Dampness is fatal.

17. Get some fresh stone lime, slack it with boiling water, then make a quantity of lime water. Keep it in a jug, corked. To every quart of drinking water add a gill of the lime water.

18. If the chicks appear weak, or have weak legs, from rapid growth, put a teaspoonful of tincture of iron in each quart of the water.

19. A young chick is naked, like a babe just born, the down being no protection, hence everything depends on plenty of heat. Better have the brooder too hot than too cold. If the chicks are with hens they must have a warm, light place, as a hen can not raise chicks in winter as well as it can be done artificially, as it is not her natural period of the year for so doing.

20. No thermometer is needed in the brooder, or under the hen. If the chicks crowd together, especially at night, they need more warmth. When they shove their heads out of the sides of the brooder ,or from under the hen, the heat is just right. Whenever the chicks do not sleep near the edges of the brooder, but get as close to each other as possible, give them more heat.

21. When the chicks show signs of leg weakness, have clogging of the vent, and bowel disease results, there is a lack of warmth in the brooder, especially at night. The night is when the chicks meet with the greater number of difficulties.

22. When chicks have leg weakness, and the floor of the broder is very warm, the cause to too much bottom heat. Bottom heat is excellent for chicks until they are a week old, but after that time there should be only warmth enough on the floor to not have the floor cold. All warmth should come from over the chicks. They feel the warmth on the back with more satisfaction than on any other portion of the body.

23. When the chicks have good appetites, but have leg weakness, the chicks move on their knees, but otherwise appear lively, it denotes rapid growth, and is not necessarily fatal. Follow directions in paragraph 18.

24. Feed the chicks on clean surfaces, or in little troughs; never leave the food to ferment. Clean off the brooders and floors daily. Keep dry earth in the corner of the brooder house for the chicks to dust in.

25. When you see the chicks busy and scratching, it is a sign of thrift.

26. A single night may ruin all. Never let the brooder become cold for an hour. Once the chicks get chilled they never fully recover.

27. When the chicks seem to be continually crying it means more warmth needed. The warmth is more important than the food.

28. If the chicks are stupid, drowsy, continually cry, or have fits, look on the heads and necks, and under the wings for the large lice. Also examine for the little red mites.

29. Never feed raw corn meal to very young chicks. Crumbled stale bread is always good for them.

30. Clover hay, cut very fine, and steeped in boiling water over night, and sprinkled with corn meal slightly, fed three times a week, is excellent, but unless it is exceedingly fine the chicks can not eat it. One of the best invigorators, however, is the decoction from the clover (clover tea) given in place of the drinking water occasionally, but it must be fresh and not stale.

31. Drinking water in winter should be tepid, not cold, and always fresh and clean.

32. Feed very early in the morning, as soon as the chicks come out of the brooders. Never keep them waiting for their breakfast. Do not leave food overnight, as it may sour. Get out of bed and feed them.

33. Milk may be given, but should be fresh and the residium carefully removed, but do not substitute it for water. Give water to the chicks from the start. Curds may be given two or three times a week. Also fresh buttermilk. Milk, however, is not necessary where it is difficult to procure.

34. A chick should weigh a pound when five weeks old—the average is a pound at six weeks old. It should be ready for market when eight weeks old. To fatten for market give plenty of wheat and cracked corn.

35. The White or Brown Leghorn male, crossed on Brahma, Cochin, Wyandotte, Langshan, Dorking, or Plymouth Rock hens, or grades, make excellent broilers. The Houdan crosses on large hens produce fine broilers. The Wyandotte and Plymouth Rock males are also excellent. The best results in hatching is when the Leghorn male is used.

36. Hatching should begin in October and end in April or May, but may really begin at any time. The best prices are obtained in April and May.

37. It costs five cents in food to raise one pound of chick. The cost of eggs, labor, buildings, etc., is extra. The heaviest cost is in the eggs (which are high in winter) as they often fail to hatch.

38. Hens are better than pullets for producing broilers. The males should not be less than twelve months old.

39. Eggs from hens that are fat, molting hens, immature pullets, or from hens in the yard with cocks having frosted combs, chilled eggs, or very small eggs, will not give good results.

MARKETING POULTRY PRODUCTS

Supplying Fresh Poultry Throughout the Year to Private or Wholesale Customers—How to Reach This Trade—Dressing and Shipping Stock.

James E. Rice, in Bulletin No. 20, issued by College of Agriculture, of Cornell University, Ithica, N. Y.

A LARGE part of the profits in poultry keeping depends on the marketing of the products. The poultryman must be a good salesman as well as well as a good raiser of poultry. Either he must have good markets to begin with or know how to make them. High-priced trade is not found "ready-made," nor can it be made "to order" by others, and transferred. The poultryman must make it himself. To build up a high-class trade requires time, skill, tact and high-grade products that somebody wants and that most people will not take the trouble to supply. Such a trade is worth working for. The easiest money to be made in the poultry business, or in any other business, is the margin o fprofit received for extra quality put up in an attractive package, delivered at the right time to the right market. This bulletin aims to discuss a few of the principles involved in the marketing of poultry products.

Solicit the trade of the rich consumer—the nearer the producer can come to the consumer in selling his products the higher will be his prices and the greater will be the labor and expense of marketing, but it pays. The highest prices can be obtained and the largest profits are made in supplying a retail trade. This is also one of the most satisfactory trades to cater to and is easy to get. There are hundreds of families in every large town that are looking for the person who will furnish eggs regularly each week the year round at a cent or two cents per dozen or more, above the retail store price. The stores in large towns and cities are frequently willing to pay several cents a dozen above the highest wholesale price for the right kind of eggs, delivered with regularity throughout the year. But the best paying customers, whether retail or wholesale—those who are willing to pay five to ten cents per dozen above the highest wholesale quotation—are hard to secure. Such trade should be the ultimate goal to be sought by all commercial egg producers, must first be educated up to York city is about twenty-one cents per dozen. A certain highest market price.

Extra Price is Clear Gain.

There is a fair profit, but no more, in producing eggs at the regular market prices. The largest profits must come from superior marketing and from special market advantages in selling eggs and stock. A difference of only a few cents per dozen makes a large increase in the income when several hundred fowls are kept. For example: the average highest market price per year for eggs in New York city is about twnty-one cents per dozen. A certain poultryman who has one thousand hens sold his eggs last year for an average of seven cents per dozen above the highest market.

Assuming that he sold from each fowl ten dozen eggs per year, which is a fair but not a high average, we find that at seven cents per dozen he received seventy cents per hen over and above what he would have received if he had sold the eggs at the highest wholesale quotation. Therefore from his one thousand hens he received the very comfortable sum of $700. This was all clear-cut profit, due entirely to good business methods, neat crates, careful grading of eggs, cleanliness, quality of products and regularity of shipment throughout the year. Is this worth trying for?

The average market price of eggs, unlike most other farm products does not vary materially for the same months one year from the other. The highest prices for eggs occur in December and January. The striking lesson in the study of prices is the remarkable uniformity in the price of eggs for any month during each of the seven years. Thus the poultryman knows in advance, with practical certainty, what he will receive for his eggs month by month during the year. This is a great advantage in growing and marketing any product. In this respect the poultryman has an advantage over the growers of apples, potatoes, hops, cheese, pork and most other farm products.

When the weather is coldest the price of eggs is highest and when the weather is warmest the price of eggs is lowest. In other words, eggs are always high in winter because they are scarce, and always cheap in summer because they are plenty. This gives us the hint that if we would succeed in commercial egg-production we must strive to overcome the winter conditions which retard egg-production and thus secure eggs when they will bring the highest price.

Working Up a Large, First-Class Private Trade.

It is an almost universal experience in poultry-raising that "the best advertisement is a satisfied customer." Trade grows by one satisfied customer recommending you to another. Poultrymen who can reach the rich guests at

summer resorts and those who live in communities where summer boarders are taken on the farms, have a good opportunity to secure customers for eggs. Frequently a large hotel, restaurant, sanitarium, hospital, and occasionally large retail dealers will pay nearly or quite as much as private families. This wholesale trade, however, is harder to secure, but easier to serve.

Making Good for Breakage.

In order to adjust claims for breakage with the express companies, it will be found more satisfactory to have the purchaser pay the express charges, even if it should be necessary—which usually is not—to have the express charges deducted from the bill at the end of the month. The consumer will then hold the express company responsible for rough handling. The one who is on the spot and finds the eggs broken can deal directly with the man who delivered them much more easily and satisfactorily than through a third party living at a distance. With strong, handy, conspicuously stenciled crates the breakage is not serious. If possible, avoid shipping to points where the eggs must be handled by two express companies. Each company lays the breakage to the other.

System in Delivery.

It is advisable to have a regular shipping day each week. This econimizes labor by bunching the work of cleaning, packing and delivering at the express office. It also simplifies the keeping of accounts. Once a week delivery will satisfy most customers. If all eggs are sold each week and the shipment lasts the customer a week, it is plainly possible that some of the eggs may be two weeks old when the last eggs are eaten. If they have been kept in a proper place, however, they should be perfectly satisfactory. By shipping to certain customers, eggs can be delivered before they are two days old, but usually this system is wholly unnecessary and multiplies the work.

Keep a Fixed Price.

There are three ways of fixing the price. The first is to agree upon a single price per dozen for the year and the number of eggs to be delivered each week. The lattr clause is necessary in order to insure fairness and not leave to either party the temptation to take advantage of the other. This might easily be done by a dishonest purchaser who would sell eggs to outside parties when he could get more than his contract price, or to the dishonest buyer who would purchase elsewhere when he could get eggs cheaper than the contract price.

The second plan is to decide upon a certain fixed percentage increase; for example, five to fifty per cent, to be paid above the highest market quotation each week, as quoted in the wholesale market. By this sliding scale there will be less incentive for either party to the contract breaking faith.

The third plan is to name a fixed price per dozen for the different months, varying the prices a certain number of cents, according to the demand which usually maintains at that particular season. A good scale of prices on this basis, which is being paid to a certain poultryman, is 25 cents per dozen for April, May, June and July; 35 cents per dozen for August and September; 40 cents per dozen for October and November; 45 cents per dozen for December and January; 35 cents per dozen for February and March. By this system there is an incentive for the customer to eat more eggs when they are abundant and cheap and to find less fault if he should not get his full supply when they are scarce and high. The production of eggs for each month of the year varies with remarkable uniformity each year. In supplying the trade where the quantity of eggs to be delivered each week is guaranteed, one must use his best skill to increase the production during the months of scarcity, because on those months will depend to a large extent the size of the trade which he can agree to serve during the year.

A Neat Package Is a Good Investment.

An attractive shipping crate has much to do with fixing the price of the product. The old saw, "Appearances are deceptive," seldom applies to attractive packages of farm products. The person who will take the trouble to prepare a neat package may be depended upon to be equally careful and painstaking about the quality of the goods which he puts into it. Buyers know this instinctively. A good product is worthy of an attractive package. It is unfair to good hens that lay good eggs to put their products in a rickety shipping box.

The box alone will be sufficient to put them in a class among the ordinary, every-day store eggs, thus reducing their selling price; therefore, a suitable package should always be supplied. If a shipping-box that costs only a few cents in money and a few hours in time will increase the price of eggs even a fraction of a cent per dozen, and the crates hold several dozen, not many shipments will have to be made in order to pay for the package. Then the satisfaction of knowing that a thing is done right is worth much.

Everyone who has had much experience in shipping poultry or eggs to market or for hatching, and who has used attractive boxes and coops, neatly tagged and stenciled with the name of the farm or the shipper and his address, can give numerous instances of various orders received from people who have been attracted by the package at the express office or the railroad station. A neat package also insures more careful handling because it indicates fragile contents.

A Well-Stenciled Crate is a Guarantee of Quality.

It is the earmark of honesty. The man who has poor products to sell keeps his name out of sight. Every product that is worthy of a reputation should be suitably and attractively stenciled. Attractiveness is not the only value to a stencil. A conspicuous stencil mark will save the loss of many crates in shipment, because they are less apt to be overlooked and carried by the station or put off at the wrong place.

Home-Made Serviceable Crates.

A good time to make the crates is on a rainy day. But, like most "rainy-day jobs," it is likely to be put off, and therefore may never get done. A serviceable and attractive crate that has withstood the test of time for shipping eggs to a wholesale and private trade is here described. These crates can be made at home by any person with ordinary skill.

Common standard egg-crates are purchased at the stores for from five to fifteen cents each, including the paper fillers. Be particular to select crates which have solid ends. The material for the sides, top and bottom should be first quality, three-eighths inch Georgia pine ceiling. For the bottoms of the small crates, the sides of the purchased crates can be used, if well nailed. If a thirty-dozen crate is to be made, one side of the purchased crate should be removed, and a new side made, using the Geargia pine ceiling. Then the other side is removed and renewed; then the bottom, after which the lid is made. This is held solid by cleats of the

same material nailed on the upper side at each end. The lid is hinged with 3-inch strap hinges and held down by a 3-inch hasp. The hinges should be screwed into the cleats in order to give greater strength.

One and one-half inch finishing nails should be used for the sides, 1½ inch box nails for the bottom, and No. 4 wire nails or screws should be used on the cleats. Cleats should be nailed across the bottom on each end to fortify and to stiffen the crate. The upper cleats serve as side handles. After the crate has been completed it should be sandpapered in order to smooth off the rough edges and the ends ,and then oiled. The crates are much neater in appearance and are more easily cleaned if they are oiled and shellacked, instead of painted. They can be made in sizes holding multiples of three dozen each; that is, three, six, nine, twelve, fifteen, up to thirty dozen. Therefore a three dozen case would be one filler deep, a six-dozen case two fillers deep, and so on; all the crates holding up to fifteen dozen being of the same length and depth, and differing only in height.

Preparing the Product for Market.

The first principle of good marketing is to have good quality to sell—quality sells itself. Few poultrymen have a right understanding of what is meant by good quality when applied to strictly fancy eggs or choice dressed poultry, unless they have been schooled in the experience of selling products to high-priced, critical customers.

A fancy egg should be new laid; that is, not more than one week old when it is delivered to the customer. It should be free from any foreign flavor due to improper feeding or to absorption of objectionable odors. The albumen must be firm, for beating. The yolk must be of a rich color and not rupture in poaching. There must be no blood clots. The shell should be spotlessly clean, uniform in shape and color, hard and smooth in texture. A fancy egg must be of large size—not less than two ounces each. To produce eggs of the highest quality requires skill and care. First, one must keep pure-bred fowls in order to secure uniformity in color, shape and size of egg. This is also true in raising broilers and roasters. There are many other advantages, also, in keeping a pure breed. Second, eggs must be selected each year for hatching that fulfiill all the market requirements for strictly fancy eggs; and no others should be used. At first only a small per cent of the eggs laid by the average flock, even of pure bred fowls, can be used for hatching. Each year, however, by this rigid system of selection, the percentage of disqualified eggs will be less and less, until even a large percentage of the first eggs from pullets can be marketed as fancy stock. Third, care must be taken to feed rations which contain sufficient nutriments of the right kinds to make perfectly developed eggs of good flavor and sound shell. Absence of shell-making materials results in soft-shelled eggs. A deficiency of meat or suitable grain will affect the firmness of the albumen. Lack of vitality in the hens will cause the membrane which surrounds the yolk to be weak and easily ruptured. Rough handling of the fowls will cause the follicles to burst prematurely and blood clots will be formed in the egg. Impure water or musty food will affect the odor or the flavor of the egg. An insufficient supply of yellow corn, clover and grass will cause the yolks to be light colored.

Keeping Up the Supply.

The poultryman who can not get a reasonable number of eggs every month in the year can not hope to secure the highest-paying trade. Consumers, large hotels and dealers are looking for the man who can furnish them with a definite, reasonable number of eggs during October, November and December. To such a one they will pay the highest prices, and they will take his eggs all the year round, in order to have the privilege of getting them when eggs can not be obtained elsewhere at any price.

These rich customers will not consider for a moment dealing with a producer who can not supply eggs during the three months mentioned. Therefore, one of the first requisites in working up a high-class trade is to be able to deliver the products regularly and continuously. Unless this can be done, one can not hope to secure much, if anything, above the regular market price throughout the year.

Every Egg Should Be Spotlessly Clean.

A dirty egg is a disgrace to the one who sells it. Do not blame the hens for dirty eggs; they always lay clean eggs, and they prefer to lay them in a clean place. Eggs for a first-class trade must be gathered regularly each day from nests that are especially fitted. The nests should be so placed as to be convenient for gathering. Life is too short to crawl under the barn and through the hay lofts each day to gather eggs.

If there is any doubt about the freshness of the eggs, give the customer, not the eggs, the benefit of the doubt. Do not take any chances—do not sell them. One bad egg will ruin the reputation gained by selling a thousand good ones, the bad egg "unpleasantness" will never be forgotten even if it should be forgiven by the customer who is paying forty to fifty cents a dozen for his eggs. As soon as the eggs are gathered they should be carried to a cool place and covered by a clean cloth so dust cannot settle on them.

A good nest is secluded and roomy and should contain an abundance of clean, soft straw and fine hay. Clover and sawdust are likely to stain the eggs. Excelsior is lumpy and sticks to the fowls' claws. Rye straw is too coarse and stiff. Clean floors and platforms and well-drained ground will do much to keep the feet clean, and thus prevent soiled eggs.

Cleaning, crating and packing eggs must be done regularly and carefully. This requires considerable time, but it is time well spent. Give the children one cent a dozen to gather, clean, crate and pack the eggs. They will make good wages and you will make good profits. A damp cloth is required to rub off any slight discolorations. If it is necessary to wet the eggs, they should be wiped dry before being placed in the crate; otherwise they will gather dust. They should not be washed unless absolutely necessary, because washing destroys the natural appearance of the shell by removing the secretion which covers the pores of the eggs and which prevents rapid evaporation from the eggs. Washed eggs do not keep so well as eggs in their natural condition. Sapolio or vinegar are both useful for removing stains. A little extra care and skill in preparing poultry for market will often make a large increase in the selling price. A casual glance at the dressed poultry offered for sale in most markets will reveal the fact that much of it, which is of inferior grade might have sold for top prices if it had been properly picked and packed. People judge poultry by appearances. A choice, young fowl, with skin dried and torn, often looks less attractive to a purchaser than an older and poorer fowl that has been neatly picked, plumped and packed for market. The expense of killing, picking and packing poultry is small in comparison with the first cost of raising it. It is a pity to see good poultry that has been properly fattened, sell among the inferior grades because of careless handling.

Dry Picking.

Dry picking of poultry makes a neat looking product, but it takes more time. The success of dry picking depends largely on the stick. This can only be learned by practice, and the practice must be with live fowls. If possible, one should see the operation performed by a skilled man. Hang the fowl by the feet, with a looped cord, so that it will bleed freely. Hold the head in the left hand, comb downward. Open the bill until you can see the slit in the roof of the mouth. Insert the blade of a knife in the slit and thrust it backward toward a point directly back of the eye. As soon as the brain is hit the knife should be twisted half way round, and, as it is withdrawn, should cut the arteries across the roof of the mouth.

When the brain is hit there will be a convulsive struggle, or "squawk." The stick will not be successful until the convulsions or "squawk" is produced. Picking should begin immediately with both hands, pulling the body feathers first, then the wing and tail feathers, holding the fowl with one hand and pulling the feathers with the other. As soon as the fowl is rough picked the pin feathering and finishing can be done more quickly with both hands. Special care must be taken in pulling the strip along the breast to avoid tearing.

As soon as picked they should be plunged into ice-water to chill them through. The operation contracts the skin and gives them a smoother and plumper appearance. The chilling is necessary if they are to be shipped long distances with safety. If the market requires poultry to be drawn, it should be done before chilling. A slit should be made extending from the end of the keel bone toward the vent, enough to admit the fingers. Then carefully cut around the vent and draw out the intestine. Insert the fingers and detach and draw the the gizzard, heart, liver, etc. By cutting the gullet and windpipe at the throat the crop can usually be withdrawn without making a slit in the breast. After thoroughly rinsing the inside of the body, the "giblets" should be placed inside. The fowl should then be chilled.

The Scalding Process of Picking.

Picking chickens by the scalding process takes less time, but does not produce as satisfactory results. Success in scalding chickens depends upon the temperature of the water, the time the fowl is immersed and the care with which the feathers are removed. The water should be just below the boiling point. The fowl should be immersed and quickly withdrawn and immersed again, in order that the hot water may penetrate through the feathers to the skin.

If the fowl is to be sold with head and feet on, care should be taken that these parts are not allowed to touch the water. Scalding will destroy the natural color. The body should be immersed until the feathers "loosen" up, which indicates that the skin is contracted by the heat and that the feathers can be easily removed. Pick rapidly, but carefully. If the water is too hot, or the fowl is left in too long, the skin may become cooked. If the water is too cool, the tender surfaces will peel, making dark, unsightly patches; the feathers will stick and the skin will be torn.

After picking the chickens they should be dipped in the hot water for a few seconds, and then in cold water. By this treatment they will keep longer than they will if scalded in water of a low temperature. When the picking is completed the wings should be folded behind the back and then immersed in cold water. When thoroughly chilled they should be laid on boards and hung up in a cool place to dry, unless they are to be shipped long distances, in which case they should be packed in ice in layers separated by clean rye straw. In packing, they should be laid in neat boxes side by side, backs downward, and the order reversed with each layer, so that they will be pressed in solid and retain the natural position.

Careful Grading of Poultry Pays.

All poultry should be carefully assorted according to size, color of shanks, age and condition. In other words, each grade should be uniform in appearance and quality. Good and poor stock should never go in the same package. The inferior will always reduce the selling price of the superior more than the good will raise the price of the poor. Each grade will sell better if sold by itself. A high-priced buyer will not want the inferior stock at any price; therefore, if different grades are mixed, the good stock will have to go to the cheap buyer.

Sell stock as soon as it is ready for market. When poultry is once fattened and ready to kill, it is likely to deteriorate in quality if it is not marketed immediately. Unless one desires to keep the early cockerels for a special market, to sell as roasters, or to be kept for breeders, the sooner the cockerels can be sold after they weigh a pound and a quarter, the greater will be the profit. After the cockerels weigh from two to three pounds each it costs more to produce a pound of growth.

The price declines faster than the increase in weight. For example, if early broilers sell for 30 cents per pound when they weigh 1½ pounds each, they would sell for 45 cents; when they weigh 2 pounds each the price will probably have dropped to 23 cents or less, and they would sell for 45 cents; when they weigh 3 pounds the price may fall to 15 cents, and they would sell for 45 cents apiece; when they weigh 4 pounds each, about Thanksgiving time, when the market is full, they might be sacrificed at 11 cents, or 45 cents each. Thus the surplus cockerels have been kept all summer simply for the sake of their society.

The loss in weight by killing is considerable. The per cent loss from live weight in killing and picking is about 10 to 12; the loss in killing, picking and drawing, with head and feet off, is 30 to 35 per cent. These figures will vary slightly with the condition of fatness and with the varieties of poultry.

The demand for dressed poultry direct from the farm is increasing, and should be supplied. Figure 201 shows our refrigerator crate ready for shipment. It contains 15 dozen eggs on one side, in paper fillers, and 20 pounds of dressed poultry on the other side in a galvanized iron chilling box. An extra refrigerator box is shown to the left, with the close-fitting cover, the partition which forms the ice chamber; also the bottom screen which provides drainage. The partition between the ice chamber and the chickens, when packed in the crate allows a space both at the top and bottom for circulation of air, the cold air settling through the ice-pack and up through the chickens, back into the ice-chamber again. The galvanized iron cover fits in tight, like a dinner pail cover, and is held firmly in place by the wooden cover of the shipping crate. During the past year eggs and poultry were shipped over 360 miles in this crate during the hottest weather. During the journey they were handled by two express companies, with a transfer through a large city. In every case the chickens arrived in good condition. This experiment proves clearly the wonderful opportunity which poultrymen have of supplying not only fresh eggs, but also fresh poultry, throughout the year to private or wholesale customers. This demand for properly fattened, well-dressed poultry is very large, and no particular effort has yet been made to supply it.

PEKIN DUCKS FOR PROFIT

Wonderful Increase in the Business—Poultry Raising is Now a Trade—Operating Duck Egg Incubators—Proper Care of Breeding Stock—It Does Not Pay to Cross Pekins—Formula for Feeding Laying Ducks and Young Ducks

BY JAMES RANKIN, BREEDER

THE wonderful growth and increase of the duck business in this country during the past twenty years has been phenomenal, and although it has been multiplied many times over (and never more so than during the last five years), yet the demand exceeds the supply. Though the prices for dressed birds the past season have ruled a trifle lower, which was the case with all kinds of poultry, the unusually low price of grain has more than made up the deficiency.

We will briefly describe our method of growing and marketing Pekin ducks. Though we have grown ducks more or less all our lives, principally for our own use, we started in some twenty-four years ago with thirty Pekin ducks to make it a business. From those thirty birds we grew more than fifteen hundred young birds for market, and we distinctly recollect the job we had in getting rid of them. The marketmen would look at us in surprise and say: "There is no call for that stuff. We do not want it." Now, though growing ten times as many, we can not fill our orders from those same men, and it is not alone what we grow, but the hundreds of thousands of birds that are grown by others all over the country.

Our methods at first were crude, and we met with some losses. It was weak legs, sore eyes, hump backs and other troubles, the cause and remedy for which we finally discovered. Too highly concentrated food, together with too little animal food, without the proper amount and quality of grit to enable the young birds to grind and assimilate it, accounted for a large share of all these troubles, and are responsible now for nearly all the leters with which we have been flooded the past season, all containing the same refrain: "My ducklings are weak-legged; many of them can not stand, and are dying. They have dysentery, sore eyes and abnormal livers. What shall I do?"

POULTRY RAISING IS NOW A TRADE.

It is well known by this time that the poultry business is as much a trade as any other department in life, and a man in order to succeed must possess, at least, two traits to qualify him for the business—intelligence and energy. His buildings should be neat and commodious, constructed with a view of reducing the labor to a minimum, also of securing good drainage. Above all, start in with good incubators and good brooding appartus. Secure first-class stock to start with. Debilitated, degentrate stock will never produce healthy young birds, and it is worse than useless to hatch thousands of young birds that come into the world with enfeebled constitutions and in no condition to live. But there are other sources of mortality aside from this. Cheap and improperly constructed incubators, with greatly varying temperature in their egg chambers, defective brooders, which mean extremes of heat and cold for the young birds—all contribute their share toward the death rate.

I have never thought that the variety of food given was as responsible for the poultry growers' troubles as the care, cleanliness and proper control of heat in both hatching and brooding the young birds. It is true that under proper regimen and diet, young birds will grow faster, develop better and weigh more at a marketable age than if the food ingredients were not right, and the old birds will also contribute a larger number of highly fertilized eggs when the food conditions are right. Our food formula for ducklings in different stages of growth, also for laying and store birds, I will give later on, and confine myself now to the care and treatment of the birds.

OPERATING DUCK EGG INCUBATORS.

Highly fertilized eggs should be used, if possible, as it will mean strong ducklings and more of them. See that the heat in the egg chamber is uniform. Use accurate glasses, and place them on the eggs in the center of the egg chamber. Run them at 102 degrees the first two weeks and 103 after the animal heat begins to rise. The eggs should be cooled a little once each day after the first week, and longer after the animal heat rises. A little moisture should be used after the eighteenth day, ventilating a little more towards the end of the hatch. Observing these rules, with a good machine and good eggs, the operator should hatch from 65 to 70 per cent of all the eggs used.

Do not feed your ducklings till after they are thirty-six hours old. Feed four times a day and no more at a time than they will eat clean, in fact, keep them a little short, especially during confinement in inclement weather, at is is an incentive to exercise, which they need in order to assimilate their food. Do not put more than one hundred in a pen; seventy-five would be better. Bed the little fellows, until ten days old with hay, chaff or cut straw, then with sawdust (if to be had), as the latter is both a good absorbent and disinfectant. Keep the pens dry and clean, both outside and in. The welfare of the ducklings depends upon this. Be sure to give shade in warm weather. It is not necessary to keep water by them, but give all they will drink, while feeding. The birds should be read for the market at ten weeks old. Breeding birds should be selected from the early hatched birds (I always select the largest and choicest), handling every one carefully. It is true that the early hatched birds are worth more in market, but I must keep them to breed from, as they will develop into larger and better birds than those hatched later, as the cool, temperate weather of the early spring will facilitate their growth and maturity much better than the extreme heat of mid-summer. The birds cost me more, but it is policy in the end, as they reproduce much sooner than the later ones.

PROPER CARE OF BREEDING STOCK.

The birds selected for breeding should be turned out to pasture or in large grassy lots, if possible, and fed on adulterated food. By this I mean bran, Quaker oat feed, with a little meal and grit. About November 1, these birds should be yarded for winter work. The yards should have been previously prepared for their reception. About August first, after the old birds are through laying and beginning to molt, they should be taken out of the yards and turned out to pasture. The yards are turned and sowed to barley, which crop serves a double purpose—that of disinfecting the ground and giving a heavy crop of green food for the birds. This green food is cut fine and mixed in their daily rations. When the time comes to yard the birds, this crop has all been cut and the yards are in fine condition for them. These yards are one hundred feet long and the same width as the pens in the building. Whenever we have room, the yards are run out fan-shaped, which of course makes them larger. Our green food now consists of green rye, obtained in the way described. As fast as our yards are emptied of ducklings, they are turned and sowed quickly to rye as this is a crop which resists winter's frosts. We now have about two acres of this rye, a perfect mass of green, about eighteen inches high. This largely constitutes our green food for winter. Just before a snow storm we cut large quantities of it and pile in up in a frozen state in some shady place, where it can be drawn upon at will.

Should this supply be exhausted while the ground is covered with snow, we always have several tons of fine clover rowen, cured for the purpose. This, with a few hundred heads of refuse cabbage, carries us through in good shape. I dwell particularly on this green food, because it is one of the necessities for the production of strong, highly fertilized eggs. Every one knows how necessary green food is for hens during winter confinement, yet it is even more essential for ducks. I now mix 15 per cent of this green rye, cut fine, with other food.

IT DOES NOT PAY TO CROSS PEKINS.

I am often asked if crossing the Pekin with other birds will not produce a better market bird than the thoroughbreds. In reply, will say, that I have crossed the Pekin in every conceivable way with other breeds, with an eye to securing a better market birds, but with unsatisfactory results. The birds either came out with weakened constitutions, were longer maturing and had dark pin feathers or unsightly blotches on the skin. This experience has more than ever convinced me that there is nothing, as yet, in the shape of a duck that will supercede the Pekin as a market bird. There is no bird that is under better control or that will respond sooner to generous food and care than the Pekin duck. Her fecundity is wonderful. Not even the far-famed Minorca or Leghorn can compete with her as an egg producer. Beginning, if you wish, at four and one-half months old, she will contribute her quota of one egg per day, with but little intermission, for nearly ten months, and as egg-producers for market alone she is more profitable than the hen. There is not a day in the year that we are without duck eggs. When the old birds begin to molt and are barren, the younger ones commence their work. I will now give my methods and formulas for feeding the young birds (at different stages of growth) for eggs, also for breeding birds.

FORMULAS FOR FEEDING DUCKS.

For Breeding Birds (Old and Young During the Fall.)—Feed three parts wheat bran, one quart Quaker oat food, or oatmeal, ground oats (or other substitute), one part cornmeal, five per cent of beef scraps, five per cent of grit, and all the green food they will eat, in the shape of corn fodder (cut fine), clover, or oat fodder. Feed this mixture twice a day, all they will eat.

For Laying Birds.—Equal parts of wheat bran and cornmeal, twenty per cent of Quaker oat food, ten per cent of boiled turnips or potatoes, fifteen per cent of clover rowen, green rye or refuse cabbage, chopped fine, five per cent of grit. Feed twice a day all they will eat, with a bunch of corn and oats at noon. Keep grit and oyster shells constantly by them.

For Feeding at Different Stages of Growth.—The first four days feed equal parts of rolled oats and cracker or bread crumbs, ten per cent of hard boiled eggs, chopped fine, five per cent coarse sand. Feed four times a day, what they will eat up clean. Brooder heat, ninety degrees.

When four days to three weeks old, feed equal parts of rolled oats and wheat bran, ten per cent corn meal, five per cent coarse sand, five per cent of fine ground beef cornmeal, wheat bran and Quaker Oat food five per cent of scraps soaked, finely cut clover hay, rye or cabbage. Feed four times a day. Brooder heat from eighty-five to seventy-five degrees. When from three to six weeks old, feed equal parts of fine grit, five per cent of beef scraps. Mix in green food. Feed four times a day.

When from six to eight weeks old, feed three parts corn meal, two parts wheat bran, one part Quaker oat food, ten per cent of beef scraps, five per cent of grit. Feed three times a day.

When from eight to ten weeks old, feed two-thirds cornmeal, one-third equal parts of wheat bran and oat food, ten per cent of beef scraps, five per cent of grit, oyster shells and less green food. Feed three times a day. They should now be ready for market.

We never cook the food for our ducks after they are a week old, but mix it with cold water.

I wish to emphasize several points again. Do not forget the grit; it is absolutely essential. Never feed more than a little bird will eat clean. Keep them a little hungry. See that pens and yards are sweet and clean, for though ducklings may stand more neglect than chicks, remember that they will not thrive in filth. If anyone fails in this business, it must be through his own incompetency and neglect.

With us, it is the surest crop we can grow. Independent of the elements, affected neither by floods nor drouths, heat nor cold, a concentrated cash product turned every three months, it makes the best returns of any crop on the farm.

JAMES RANKIN, Massachusetts.

CARING FOR DUCKLINGS.

BY GEORGE H. POLLARD.

In response to your request that we give you a few ideas concerning our methods of feeding and raising Pekin ducks, we feel it is right we should first explain that we do not raise so many, many thousands yearly; that there are others who raise as good, and if we should stop they would doubtlegs continue to successfully raise them. We find in raising ducks there are five esentials—muscle, water, food, shade and grit—and the greatest of these is muscle. Any one who has tried it will cheerfully testify to this truth. In feeding and raising young ducks, begin with the breeding stock. Strong, vigorous breeders mean healthy, wide-a-wake ducklings, needing a minimum of attention and easily raised.

This being the case, we give the breeders a large grass range, with plenty of shade and running water—believing nature webbed their feet for a purpose—though they can be successfully raised without the water. To each five ducks allow one drake and mate about thirty in a pen. Later in the season, about the middle of May, remove one drake from each pen. Feed night and morning what they will eat of a mixture of three parts each of Indian meal and wheat bran, one part each low grade flour and beef scraps, making sure it is beef scraps and not a poor quality of fertilizer, the whole salted slightly and thoroughly mixed, not too wet, with cold water. Never cook the food, except in winter, when it may be mixed with hot water. Do not feed at noon, as ducks on good grass range do not need it. If without grass range, feed all the green food they will eat each day—fodder corn, rye, grass, clover, or anything they will eat. Have water in pails or troughs convenient to feeding places at all times of the day and night, also oyster shell and grit, and do not forget the shade, they must have it.

In winter vary the feed by a liberal allowance of boiled turnips, mashed in with grain, say one-third turnips, every other morning, and iwth cabbage chopped fine or other green food that can be obtained, fed at noon.

After hatching which we do altogether with incubators, leave the ducklings quiet from twenty-four to thirty-six hours, according to the season when hatched, after which they may be put in a brooder heated from ninety to ninety-five degrees in the center of the hover—ninety-five degrees in winter—placing each carefully under the hover.

The food is prepared of two-thirds wheat bran and one-third Indian meal, wet to a crumbly mass with milk, either skimmed or whole, but not cooked. Cover floor under hover with chaff, or fine shavings, and in front of the hover, for two or three feet, with fine gravel or sand. Six or eight inches from front of hover place small troughs or dishes containing food—slightly sprinkled with sand the first time—and a fountain of lukewarm water. The fountains are galvanized iron cans, eight inches in diameter and twelve inches deep inverted in tin pans ten inches in diameter and two inches deep, and the water is kept near the top of the pan. After all this, simply keep the ducklings warm and let nature work. If they are worth raising they will gradually get out from under the hover, and it is astonishing how quickly they will begin to stow away the food and water. Beyond watching for the first few hours that none get away from the hover and become chilled, do not fuss with them and do not try to fill them up with boiled eggs and bread crumbs.

Keep food and water before them all the time for the first three days—and water all night(sure—after which they may be fed every three hours till seven or eight days old, when four or five feeds a day will be enough. After the fifth day they are generally alive to stay, or are dead, and they may be fed five per cent beef scraps instead of milk, or both At two weeks old make their feed of one-half meal, one-half bran and ten per cent beef scraps, which may be increased to fifteen per cent scraps, with three parts each of bran and meal and one part flour at three weeks.

Carry them on this food until killing time—ten to eleven weeks—not changing for any heavier or more fattening food, as advised by many. After the fifth week feed only three times a day. Feed green food or not, as is most convenient. If intended for breeding, it will be good for them, but is unnecessary for market ducks.

For best results, yard in flocks of from fifty to seventy-five, and give plenty of yard room, never less than thirty by fifty feet, for fifty birds five weeks old or over. In short, keep only healthy, vigorous breeding stock. Have shade and an unfailing supply of water and grit. Feed all they can be made to eat, at regular intervals, and do not skimp the meat scraps. Kill at ten or eleven weeks old and receive the reward promised for work well done.

GEORGE H. POLLARD.

STARTING WITH STANDARD BRED POULTRY

Opinions of Well-known and Experienced Specialty Breeders on How Best to Start to Establish Oneself in the Standard-bred Poultry Business—"Buy Stock and Save Time" is the General Advice—Follow One Line of Breeding and Place no Reliance on Haphazard Matings.

(The following is our symposium on "Starting With Standard-bred Poultry." The advice here given is in response to the question, "If you did not own a fowl, but knew what you did to-day, how would you proceed to again establish yourself in the standard-bred poultry business?" This inquiry was sent to about twenty-five prominent poultrymen who year after year produce birds that are winners at the foremost shows of the country, both in their own hands and in the hands of their customers. This subject was taken up with a view of helping the beginner, for it is by noting the experience of others, and their success along certain lines, that the men and women about to enter on this work may get a right start and "go right" until they too achieve success.—Editor.)

[*From the Reliable Poultry Journal.*]

Buy Eggs or Stock from an Expert Breeder.

If the variety I wish to breed were not difficult to mate I should start with eggs from the best breeder I knew of, buying his best eggs and not quibbling about the price. I should buy enough to be sure of a goodly number of chicks, and one year after I would stand side by side with him in quality of stock. Then each year for a time I should buy eggs or birds as occasion demanded and never go outside of his breeding for new blood. Then I should line breed my own stock, "inbreeding" if you please to call it that.

If the variety I selected were difficult to mate and breed and it were new to me, I should be governed by the amount of money I could invest, having in view the time I could afford to wait and devote to personal experiments. If I could afford it I should go to the best breeder of my chosen variety and buy a pair, a pen, or a yard of his best breeding birds, mated by him, as he would mate for his own breeding purposes. If he were honest I would thus get his ideas of how the variety should be mated; I would get the results of his years of experience at a great saving of time. I should not rush after his most expensive show birds unless I wanted to exhibit at once. If I wanted to exhibit I would buy exhibition birds for that purpose and choice breeding stock to breed. There is no time for, nor is it pertinent to your inquiry, to go into the whys or wherefores of this.

Having the few birds I could afford to buy as an object

lesson, I should then buy eggs of the breeder each year as long as I thought I needed them and so keep tab on his matings and his way of doing things as well as on my own way. With each purchase I should stand side by side with him, having immediate representatives of his improvements to compare with my own work. Thus, at a small outlay I would get the results of his years of patient labor and could adopt his way of doing things and at the same time see the results of my own way. I should try to better all his improvements if I could, and should have as good as he had direct from him, if I could not surpass him. This is a brief outline of the way I should build up a strain of my own.

H. S. BURDICK, New York.

Would Start With Stock—One Variety and Cull Closely.

If I wished to establish myself in the standard-bred poultry business and knew what I know now I should purchase stock in preference to eggs. I tried about ten or twelve years ago to establish myself through the egg route, but for me it was a failure. I should purchase the birds in the fall preceding the spring I intended breeding them, as first-class breeding birds can be bought cheaper at that time. I should visit the yards of several first-class breeders and exhibitors, selecting birds from the one that suited me best. I should buy males and females from the same yard if I could find what I wanted; if I could not get the male and females from the same yard I should get a male from the yard that came nearest in type, shape and color to the one from which I got my females. I should expect to pay a good price for the birds as breeders will not part with their best birds at small prices.

From this pen I should establish my strain, introducing now and then a male from the yard or one of the yards from which I purchased my first birds. Situated as I am now where my birds are raised on farms from five to ten miles apart, the introduction of a fresh male is not necessary under every three years. I should select one variety, as I have found from experience that one is enough for any breeder who wishes to be on top. Stick to one variety until it is a success. One should never quit anything until he makes it a success. It some times comes hard and high, but it is worth having when it does come and it is appreciated all the more.

I should subscribe for a first-class poultry paper, buy a copy of the American Standard and read everything I could find on the variety chosen, as every one has some good ideas and no one has them all, hence by reading only part I might miss something good. I should pay close attention to the small things—the large ones will take care of themselves—and should be careful in filling orders, always giving more than the money's worth, rather than less. And last, but not least, I should cull the flock closely, as show birds do not come from poor parents. K. S. TRIMBLE, Kentucky.

Time is Too Valuable to Lose in Experimenting.

By looking over the countless number of advertisements in the leading poultry journals one realizes how difficult it is for a beginner to decide of whom to purchase. It is a truism that "Experience is the best teacher," and it is never better exemplified than in the poultry business. If by accident or any other cause I should be deprived of my entire flock, I would turn to the best breeder for a new start—one with long experience, a reputation for fair dealing, and whose show record is unexcelled. A fancier who has shown successfully for many years must surely understand the business in every detail and in order to win a long list of prizes annually he certainly must have valuable stock. I should purchase of such a party, a few good birds, also eggs from his different matings, thus obtaining the benefit of his long experience. The following season I would procure from the same party such birds as I needed to strengthen and build up my flock. Out and out crossing is largely experimental, often disastrous, and should be practiced with care upon only a portion of the flock. By careful infusion of new blood, weak points may be eliminated and greater perfection obtained. WILLIAM F. BRACE, New York.

Would Buy Line-Bred Stock.

So much has been written on the subject of standard-bred poultry, it would seem that the work were complete. On the other hand we find the demand for standard-bred poultry greater today than it ever has been. To those about to start, this question presents itself: "How shall I proceed?" I would answer, if you are able, place your order with some good breeder that has bred his birds in line for years. Tell him what you want and the results will be highly satisfactory. If I were to start again in breeding it would be by buying stock. Still we have cases where the beginner has been successful in buying eggs, in some cases the start being a single sitting of eggs.

W. A. IRVIN, Nebraska.

Eggs from a Dozen or More Breeders.

If I did not have any poultry and wished to establish a strain of any of the standard breeds, I should buy eggs of a dozen or more breeders of the variety selected, and have them all hatched about the same time. This stock would be the starting point of my strain. This may be a rather short answer to your question, but it covers the ground as I have it in my mind.

ROWLAND G. BUFFINGTON, Massachusetts.

Buy Line-Bred Males and Females of One Breed.

If it were Barred Plymouth Rocks that I expected to breed, I should start by buying stock in the winter, or eggs in the spring. I should prefer buying stock, although I know many breeders of reputation today who started by buying eggs. I should buy my stock or eggs of a breeder of reputation, not only one having a reputation for breeding winners, but with a reputation for honesty and truthfulness as well. I should also expect of him that he practice double mating and had bred in line for years. I should want both males and females from the same strain.

W. S. RUSSELL, Iowa.

Starting a Strain With One Pair—Inbreeding.

This question is a practical and very interesting one and will tend to bring out valuable information that has been gained with "much tribulation," hard knocks, worry, and in most cases, much expense. What I shall say pertains to Barred Rocks. I "know" no other breed. Under the circumstances named, I should start as far from the "lower rung" as possible. If I knew a breeder who had fine birds and would sell eggs from his best, I should buy 50 eggs if possible for his pullet line and an equal number from his cockerel line. Then I should mate the very best pair raised from each line, and from this pair start my lines. I believe that no one will ever start a uniform and meritorious strain, except from one pair, then follow the "line" and out-cross very cautiously by infusing new blood, one-half at a time, through the females. Inbreeding hurts neither the vitality, nor the egg yield, if only the strongest and most vigorous

birds are used for breeding. There is a flock of fowls on a farm near me, in which there has not been a drop of new blood for fifty-eight years, and they look as much alike as peas. There has never been a diseased bird in this flock, and they are simply wonderful as layers, both in winter and summer. If I could not buy eggs in which I had confidence I should buy where I had confidence in both the breeder and his stock, a pair each of pullet mating and cockerel mating, on which to found my strain, and I should buy as fine pairs as I could possibly afford. I should much rather pay $100 for two pairs that were worth the money than to get for the same money twenty birds that were only worth $100. I sometimes think that we double-mating advocates make a mistake in advocating this method, as the single mating breeders make excellent customers. I say nothing of mating, as I take it for granted that a breeder of ten to twenty years' experience knows what to do with the "good ones" when he has them.

W. B. GIBSON, Pennsylvania.

Try Two or Three Different Lines of Blood.

If I had no fowls and desired to start again in the breeding of Barred Plymouth Rocks I should buy a few breeding pens of different strains and eggs of the breeders that I thought had the best. By getting eggs and stock from two or three different lines of breeding I would be surer of getting a good start, for if the eggs or stock from one did not prove as expected, those from another probably would. My idea would be to spend considerable in stock and eggs at the start, for I would of course desire to have a good stock on hand for the next year's breeding.

I speak of buying eggs. You will understand by this that I mean in case the proposed beginning were in the spring; if in the fall I should buy stock and then supplement this by ordering eggs in the spring. Regarding mating the progeny, I would use the judgment I have acquired by my long experience, in some cases mating birds of the same line of breeding, in other cases using some other blood, or perhaps a direct cross.

I would order stock or breeding pens mated for cockerels and others for pullets and others for general mating. I should not chance too much on one type until well started. After a year or two I would get the different lines and strains of birds well sorted out and sifted down, keeping only what would do me good, discarding all the rest.

E. B. THOMPSON, New York.

Buy from a Specialist.

I should select one or two of the leading varieties of fowls, such as would best please my fancy. Then I should look around for a reliable breeder who made a specialty of such breeds, one in whom I could place confidence. Especially would I want to get my start from one who had a large experience in the breeding of such fowls, as I consider culls from an experienced breeder better than the best birds from the yards of one who changes breeds each year, buying his stock from anywhere and breeding in a chance way.

Nor would I ever think of buying from a man who has from ten to sixty varieties of fowls, and if the breeder from whom I should decide to purchase would be willing to sell me eggs from his best matings then I should start with eggs, but not with one or two sittings. Too many persons look for more than they should expect from a sitting or two of eggs. The fancier who will treat his customers right when he promises to sell from his best yards and does what he promises, gives his customers a chance to get a good start in a variety at a comparatively small cost.

We have practiced this within the past two years, having purchased over $100 worth of Buff Rock eggs from one breeder. We select the best birds each year for our breeding yards, and breed up to standard points and our own ideas, thus establishing a strain of our own.

We would also say to those who start in the fancy, live up to the "Golden Rule," treat your customers right, do an honorable and square business, and your old customers will come back and new ones will be added from day to day. Never make any misstatements in your advertisements, but stick to facts, and you will succeed.

AUG. D. ARNOLD, Pennsylvania.

Advantages of Buying Stock—Quality Not Quantity.

If I were not in and wanted to establish myself in the standard-bred poultry business, knowing all that I know know from so many years of personal experience, I should decidedly start with stock of the very best of its variety obtainable from some old established strain. Many persons consider buying eggs by far the cheapest method to get a start. It is cheap in one sense, and on the other hand a "dear way," if experience and years of one's life are of value. With stock you have something at once to study and become familiar with—shape, color, and other standard requirements, gaining knowledge that will guide in after years to quickly distinguish the value of sectional qualities in a bird. In the progeny raised from eggs bought generally appear so few good specimens that the next year really you have only an indifferent lot to select from for the coming year's matings and have no intelligent knowledge of how they should be mated for best result. To the progeny raised from these you must necessarily look for the stock on which your reputation is to be gained as a breeder.

Now, you are in the second year, as you may say—stranded, as you do not know how to mate to produce the best specimens of the breed you have in your yards to reach the position in view in the poultry world. This is the point so many reach and give up discouraged, and here it is that the breeder who bought A No. 1 stock is in the lead. He is years in advance in knowledge and is already pretty well established. Paying liberal prices for the best gives tone to the breeder and his stock, and, too, he is advertised from friend to stranger. Such breeders are consequently soon known, and thus come in touch with the best breeders in the country. Starting right establishes your reputation. Always bear in mind quality; quantity is ruinous without quality to any breeder.

J. D. WILSON, New York.

Buy Eggs or Birds from Standard Matings.

If I were out of the poultry business, with the knowledge I have gained in the past sixteen years, and wished to again start, I believe I should either buy eggs or buy a breeding pen of some breeder who does not advise special matings. I am sick and tired of the so-called special, double or whatever you may term them, matings. Give me standard matings every time, or as near to it as you can get each year. The first eight or ten years of my experience as a breeder I bought eggs of fanciers who advertised eggs from prize matings at $10 per forty. The fowls that produced these eggs were bred by special matings and looked well enough, but what did I get? A fine lot of market chickens—culls. This somewhat discouraged me. Next season I bought a pen of birds. They looked nice when they arrived and I anticipated fine results, but when fall arrived

instead of having prize winners I again had disappointing results—a lot of culls, and as long as we continue this double or special mating system the same results will follow.

Buying eggs is the cheapest way to get a good start, provided you can buy eggs from fowls bred from standard matings. I am not attacking double or special mating breeders to injure their busines, but to compel them to breed according to standard, so that their customers can rely on the breeding of the fowls or eggs purchased. My efforts to get better birds each year have been rewarded since I got away from that old theory of special mating.

O. F. SKINNER, Kansas.

Start With a Pair or Trio.

First I should determine the breed I wanted, then I should select some reliable breeder and give him to understand just what I wanted. I should buy the best he had to sell and that I could afford. If I had but little money I should not buy more than a pair or a trio and have the breeder mate them as he thought best. If I found he was doing the right thing by me I should stay with him and secure new blood from him from time to time, as I thought my flock needed it. My preference would be to introduce the new blood through the female line, as I do not like to break the male line, if it can possibly be avoided. My advice to a beginner is, not to see how little he can put into a pair or trio, but how much.

After one becomes familiar with a breed and knows a good bird when he sees it, he can afford to buy eggs, for he may secure some very choice birds at very little cost. But to sum the whole matter up, buying stock has always been more satisfactory to me, and I have bought largely of both from breeders of national reputation.

Another point I would suggest is, do not breed too many varieties. One will give most any breeder all he wants to do to produce birds good enough to go into the show room with any degree of success in carrying off the prizes. Do not be in too much of a hurry. It takes time—you will have to crawl before you can walk, and sometimes you will find that your foot goes backward instead of forward. Do not let this discourage you, it belongs to the business, and the best of them have had the same experience. Attention, patience and industry are what it takes to succeed.

E. O. SUTTON, Missouri.

To Establish a Strain of Barred Rocks.

If I did not own a fowl but knew what I think I know today, I should proceed to establish myself in the standard-bred poultry business again as soon as possible. The first and most necessary thing to secure is a good location and buildings; next, to decide on the variety or varieties. After an experience of over twenty years with nearly all of the most popular breeds and varieties, I should keep only one variety, and that of course would be the Barred Plymouth Rocks.

Having made a selection of the variety, I should look for the breeder who could come nearest to supplying my wants. Of course I should wish to purchase of a breeder who has a record in the show room, and I should wish also to buy of one who has a record with his customers—a record of honesty and a willingness to part with some of his good stock. I believe that there are breeders who are so much afraid of losing prestige in the show room that they keep all their good stock and eggs for themselves.

Having found a breeder who is willing to divide the best with his customers, I should next size up "the pile" that I wished to invest. Should this be less than $100, I should start with eggs instead of stock, as I believe that for any amount less than this a better quality of stock can be obtained by buying eggs than in any other way. Should I wish to invest $50 or $75 I should write to the man of whom I wished to purchase and ask him to send me as many eggs of his very best as that amount would purchase. I should take particular pains to impress it on him that it was quality rather than quantity that I wanted. I should also state that I wished them half from cockerel matings and half from pullet matings, and I should ask that they be sent from two pens of each, marked so that I might be able to mate the cockerels of one with the pullets of the other in the cockerel matings, and the same in the pullet matings.

Let us suppose that the breeder in question should send me two hundred eggs, and that from that number I succeed in raising one hundred chicks. I would select the best cockerel from pen A for cockerel and mate him to ten of the best pullets from pen B for cockerels. Then I would select the best cockerels from pen B and mate him to ten of the best pullets from pen A. This would give me two pens mated for exhibition cockerels the second year, and if these birds were line bred, as they should be, they should in this manner produce a good percentage of exhibition cockerels.

With the pullet matings I should follow the same plan. I should select the ten best pullets raised from eggs marked pen C and to these should mate the best cockerel from pen D; thn I should select the best pullet bred cockerel from pen C to mate with the ten best pullets from pen D.

This would give me forty-four birds selected from one hundred raised, and with a proper knowledge of matings these birds should give me a good foundation for my future strain.

On the other hand, should I not be limited for capital, I should visit the yards of the same breeder and select two pens of the best birds he would sell me, one mated for cockerels and the other for exhibition pullets. This plan would give me a little better start in stock at the end of the first year perhaps, that is, give me a larger number of birds to sell or keep over. In this case the male birds could be mated to ten of their best pullets and the best cockerel from each mating could be mated with the original pen of females.

For the person who is limited as to capital I believe it to be far cheaper and easier to start by buying eggs.

M. S. GARDNER, New York.

Good Stock More Satisfactory Than Eggs.

The purchasing of stock or eggs should, in my opinion, be governed entirely by one's means. If capital be limited, eggs seem to offer the easier way to get establishd, although I believe the purchase of stock to be the better plan, and far mor satisfactory to both buyer and seller. It enables the buyer to know positively just what quality of stock he is breeding from ,and the satisfaction derived from it is far greater than from eggs, even though the chicks from the latter prove to be the equal of those bred from stock.

Knowing what I now know, if I were to start anew in the poultry business, I should do precisely as I did years ago, namely, purchase A No. 1 breeding stock and breed it to the highest state of perfection possible. This, of course, is a somewhat slow and tedious process, but one that is bound to be uccessful in the end, in fact it is the sure route to successful breeding.

DR. F. M. ROBINSON, New York.

CARE AND MANAGEMENT OF TURKEYS

From Shell to Market—Care of Adults—Setting the Hens—Care of Poults—Feeding for Market —Preparing Fine Specimens for Exhibition.

BY MRS. S. N. KING, BREEDER

THE first and greatest requisite to successful poultry raising is strong, vigorous stock. Whatever variety may be selected, be sure that your birds have not been weakened by disease nor by repeated inbreeding. Many persons engaged in this business select their best stock, male and female, year after year, and after a few years of this close inbreeding find their flock deteriorated in stamina, and with slight powers of resistance against the encroachments of disease. Their birds may be beautiful as the type is more easily fixed by use of the same family, but the chances are against a large per cent of the poults hatched reaching maturity.

On the other hand, a change of family or infusion of new blood every year is not necessary. If you have a male bird that is satisfactory, it is quite safe and desirable to use him two years, keeping the finest of the pullets, but avoid using a young tom and pullets of the same flock. Always breed in line of descent.

In selecting stock do it with a view to shape and color, rather than weight. My experience has proved to me that abnormally large birds are very unprofitable and disappointing, except for show birds. A young tom weighing from from twenty-five to thirty pounds and an adult weighing from thirty-six to forty are as large as can be used without danger of injury to the hens. Young hens weighing fifteen to eighteen pounds and adults eighteen to twenty are more prolific and better mothers than those attaining a much greater size. Hens weighing twenty-five pounds are not reliable for a full clutch of eggs. They usually lay a few at irregular intervals and in different places, as though it were a matter of unconcern to them whether their eggs were cared for or not. These eggs are frequently soft-shelled and infertile, so that they can not be depended on to add greatly to one's flock.

One tom and ten females is a good number for a flock but if it is desirable to keep a greater number of females, two toms can be used, keeping one in a small yard each alternate day, letting the hens have their liberty, as they need the range and variety of food which they obtain in that way, and which they would not eat if it were given to them in a yard.

TURKEYS REQUIRE RANGE.

Turkeys are impatient of restraint and will neither eat nor lay well when deprived of liberty. One spring we built an "ideal" turkey yard and I fondly hoped that the precious hours spent in watching the turkeys to their nests could be used to better advantage in other ways. We have a grove of maple trees in our chicken yard—planted many years ago, to afford shelter for my chickens. The rows of trees are twelve feet apart and we enclosed a space between two rows with a base board and six-foot wire netting. This we covered with two widths of the netting, fastening the edge of the side netting and securing the middle by guy ropes or wires attached to the branches of trees. At one end we had a door, also covered with netting, so that it was as nearly as possible "out of doors." We placed barrels on their sides, half filled with straw, putting an egg in each, and it was so delightfully "inviting" that I felt quite sure my turkeys would feel at home immediately, but it was a vain expectation. Every morning they walked into their new park as if they thoroughly enjoyed it and seemed content till 3 or 4 o'clock, when they would gather around the door wishing to come out, but lay in those ready-made nests they would not, except, perhaps, three or four, that laid an egg apiece. I finally learned that they had nests of their own, selected under brush piles and among corn fodder, and as soon as they were released they went to them, so I abandoned the plan that seemed so feasible and found that a boy with sharp eyes, in anticipation of a coin for every turkey nest found, was more satisfactory and practiceable than my fine new "summer house," and thus we learn by our mistakes, though they are often humiliating and not always stepping stones to better things.

I find that very early laying in this latitude (40 degrees north) is not to be desired, as many of the eggs are liable to be chilled and poults can not be hatched to advantage before the 10th of May. Sometimes we have a cold, rainy season even later than that and little turkeys seldom live through a protracted, cold storm. I think the hens are less apt to lay early if the quantity of feed is lessened as the severity of winter decreases.

Another objection to very early laying is that it induces late laying as well and a hen will frequently leave her brood when partly grown in order to raise a second family, which is fatal to the interests of both, as the first poults need a leader and protector until nearly full grown and the last are too small to endure the cold weather. In her native state the turkey hen does not lay till spring is assured and never deserts her progeny; so with our cultivation and civilization we sometimes get too far away from mother nature. If your hens are to act as brooders never clip their wings. They will need them in protecting their young from rain and dew.

There is great diversity of opinion as to the best way to raise young turkeys, but after an experience of twenty years I am unqualifiedly in favor of the turkey hen as a mother.

WHERE TURKEYS WILL SIT.

It is generally supposed that turkeys must sit where they have selected a nest in which to deposit their eggs, but as they frequently choose a place wholly unsuited to the purpose of incubation, either on account of location or because other hens lay in the same nest, it is often desirable to move them to other quarters. A few years ago I attempted to have them sit in barrels (laid on their sides near a fence) when their own selection was objectionable, but utterly failed to induce them to return to their barrels after leaving them for feed and water, although they would remain con-

tentedly enough until hunger again sent them forth. Last summer seven or eight of my hens found a large brush pile wonderfully well suited to them, but as it afforded scant protection from the sun or rain, I was obliged to change their location as each was ready to sit, and I experienced as little trouble as I do in moving my domestic hens to the "hatching house."

Fortunately we had an unused barn without partitions and with an earth floor, which was readily converted into a "turkey house." In one of the corners of this barn was placed a barrel, on its side, in which was plenty of cut straw and a nest-egg. Over the opening I hung a blanket, and at dark had the broody turkey brought to the nest. After dusting her thoroughly with insect powder she was carefully put into the barrel, and as soon as she became quiet the blanket was removed. In the meantime the true nest was made in a large and rather shallow box (I used soap boxes), with the date on which the eggs were due to hatch marked with crayon in large figures, so that they need not be unnecessarily disturbed. When the hen came out of the barrel, which was usually the next morning, she soon found the nest full of eggs, which she at once appropriated. The barrel served as a "trap" for the whole season, as only one or two hens had nests outside that were in safe and comfortable places. Sometimes there were nests all around the room, but I had no trouble about their crowding each other on the nests or trying to exchange. It was necessary to keep feed, fresh water and grit constantly supplied, but although the ground was spaded up for them there was no evidence of their taking a "dust bath," as they do when sitting out. This made it necessary to use insect powder plentifully. As it was difficult to remove them from the nests without endangering the eggs, I sprinkled it liberally on and around the eggs whenever I found a hen off her nest. I also dusted the hens as they were sitting. Each time that I set a turkey I also put turkey eggs under a domestic hen and gave all the poults to the turkey. I find twenty-five a good number for a turkey hen, as she can keep them dry, when a larger number would be more or less exposed to dampness in case of rain or heavy dew. Before giving the poults to the mother, it is well to dust her thoroughly along the back and on the outside of the wings, but not on the inside, as the powder is too strong to be inhaled by the newly hatched poults. It seems to me the most important thing in the care of young turkeys is to put them at once on grass, and for that reason very early hatching is not desirable.

When I began raising them I was advised to give each poult a grain or berry of black pepper as its first meal, to insure its future welfare, but it seemed so unnatural that I declined to follow that instruction. Since then as I have watched them, when less than forty-eight hours old, carefully selecting the seed pods from "pepper grass," in preference to blue grass or any other green food, I have wondered if there was not a good reason for what seemed to me only a "notion." For many years I have selected a sunny spot and had a triangular yard made (by using three wide boards) in which to keep the flock for a few days, or until the poults were strong enough to run well, but this was not satisfactory. The grass soon lost its freshness and the mother would almost invariably refuse to go under the shelter provided for her. In case of rain her feathers would be wet and the little ones would become draggled, a condition fatal to young poults. Of late years I have found it much more satisfactory to provide a large coop in which the mother can walk about comfortably and give the little ones free range. For this purpose I selected a spot under a large tree where there will be partial protection from sun and rain. It is surprising to see how soon the poults wander some distance from the coop in search of food, always, however, remaining within call of the mother's voice and quickly responding to her warning of danger. When she gives this particular note every poult will drop where it is and remain until released by her assurance of safety.

The first food for poults, which should not be given until they are twenty-four hours old, has been a matter of considerable experiment with me, but I have no success in feeding hard boiled eggs, though highly recommended by many. I have tried them for both chicks and poults but always with unsatisfactory results. I have found that the best feed for two or three weeks is stale bread soaked in sweet milk and then squeezed dry, alternating with curd or cheese made from sour milk.

To the cheese, which should not be cooked hard, but should be well drained, I add salt and a little black pepper. It is well to give occasionally a little coarse corn meal slightly dampened, and onion tops and dandelion stems or pepper grass cut fine, but never give sloppy food. After two or three weeks I add well-boiled wheat to the cheese, but great care should be taken that it is not allowed to sour, which it does quickly in very warm weather. I place the moist food on a clean board and from the first I frequently scatter a spoonful of rolled oats near the coop for them to find. Water should be given in shallow dishes, and it is a good plan to lay a float or board in the dishes, two inches smaller in diameter than the top of the dish, to prevent the poults standing in the water. The mother should be supplied with water, corn, wheat and grit, and the coop should be moved every day to fresh, clean sod. The danger just at this point is from indigestion, since poults are voracious eaters, and here on the prairie we have no natural grit. This danger can now be reduced to a minimum, since grit is manufactured in sizes suitable for poults and chicks as well as adult fowls. Fowls eat it greedily, proving that nature is ever true to her wants. Probably indigestion and lice cause a greater mortality among turkeys, old and young, than all other causes combined. Perhaps in places where the soil is sandy or gravelly the former trouble would not be so serious, but here where some sharp, grinding power has to be provided for them, they often suffer for lack of it.

I always keep a pile of sand and gravel in my chicken yard, but it is surprising how soon the little pebbles disappear, leaving a smooth surface of sand. Great care should be taken not to feed young turkeys too much at a time. This is the rock on which the frail bark of thousands of poults has struck and gone down together with the hopes and plans of their zealous but misguided owners. The natural habit of turkeys is to hunt for food and this they do slowly and deliberately all day long, thus the process of eating and digesting is simultaneous, but when fed abundantly they gorge themselves and in a few weeks fall a prey to their own greed.

KEEP MOTHER TURKEY CONFINED FIRST WEEK.

With very early hatched turkeys it is better to keep the mother confined in a large coop for several weeks, but when the weather is warm and dry she can be liberated at the end of a week. Never, save once, have I known her to return to the coop at night; neither do they seek the shelter of bushes or boards where enemies might lurk. They usually select an open spot for the night where they can see the approach of foes. Although this situation is exposed to dew and rain they can be depended on to sit close and keep their young

warm and dry unless the storm is prolonged until hunger compels them to move.

Notwithstanding the natural timidity of the turkey she shows a courage in the care of her young that I have never seen equalled in other flocks. I have raised poults with domestic hens with no loss, and, with encouraging prospects until they were weaned, when they lost courage, and, refusing to eat, wandered around in search of a mother or kept up an incessant "cheep," "cheep," that was pitiful to hear. At night they sought the company of some friendly hen and tried to slip under her wings, but in the morning they would renew their search for a mother until finally worn out with hunger and loneliness they nearly all died. At other times they adapt themselves more readily to changed conditions, showing that the difference was mainly with the mothers, those being the most desirable that encourage their poults to scatter out and forage for themselves instead of calling them all back every few minutes with an exciting and promising chuck. At one time I attempted to transfer a brood of three weeks' old poults from a domestic to a turkey hen, but while she was quite willing to adopt them they would acknowledge no allegiance to her. They had been accustomed to the cluck of the hen and would not respond to the persuasive crooning of the turkey. One characteristic of turkeys is that they are never cruel to each other's young. On the contrary, they usually form squads or colonies, sometimes two families uniting, sometimes all that are on one farm.

I have learned that the best mother is the one that assumes the whole care of her family and does not wait around to be fed. One summer I had a hen with eighteen little ones, and I was pelased to see her bring them up to the house several times a day, stepping around cautiously and looking in at the door in a tentative sort of way, as if to learn whether her family would be taken care of without any special effort on her part. To encourage her confidence I kept a pan of food ready for them, and how those turkeys did eat. But it was mistaken kindness, for when they were four or five weeks old they began to die from no apparent cause, and I am now convinced that it was from overfeed and indigestion. Of the eighteen only six remained and I have ever since discouraged turkey loafers. Now I feed but twice a day after they have their liberty, and frequently the mother takes her flock to the pastures and I do not see them for weeks, but we have a lookout committee to report as they roam about the fields.

Occasionally, though rarely, a whole flock will wander far enough away to fall victims to hunters. We have not as many foes to poultry as they do who live near the "timber," and consequently need not be so careful about housing the young, but we are not wholly free from losses by accident, as for instance, last summer on two separate occasions, a railroad train ran into my flock as they were taking their sun-bath on the rails, at one time killing twenty-four of my earliest half-grown poults.

FIGHTING THE LICE PEST.

Before insect powder came into general use I had recourse to grease with a little coal oil added, but it was dangerous to use this on young poults or on the mother hen, especially in damp weather, and rather than take such risks I frequently turned her out, depending on her taking dust baths, which she could or could not do according to the dryness of the soil. Next came the powder, but some danger to the little ones was connected with the use of this, too, and more, possibly, by withholding it. Probably all turkey raisers have been confronted with the query, to grease or not to grease, to dust or not to dust, that is the question. When I received my first can of liquid lice killer or paint I experimented on a brood of White Plymouth Rock chicks three weeks old. During incubation the mother had been in a clean, light, dry room with a soft, earth floor, so that she had ample facilities for dusting. I had dusted her with insect powder twice during the three weeks and again after hatching. She was placed with her chicks in a light, sunny room in the cellar, which was warmed by furnace pipes passing through it. Here, too, she had loose, dry earth for a bath, and on examining the chicks closely I found no sign of lice. However, I determined to test the merits of this much lauded insecticide by commencing with the smallest of my flock. After placing a paper in the bottom of a small wooden box and brushing it over lightly with the liquid lice killer, I put the chicks in and covered them over, leaving a half-inch crack for air. After leaving them for an hour I carefully removed them to a piece of white cloth and gathering up the corners I gently shook and brushed them, then opening it, I took the chickens out and looked for results.

While I did not find "a hundred dead lice" I did find enough to convince me that the paint was far more effectual than powders and so much more quickly and easily used. I gave the mother the same treatment. One occular demonstration is sufficient to insure the use of it for the future. By painting the nest boxes with louse paint, and keeping the broody turkey in a box similarly painted for a few hours before she is given her eggs, I believe the annoyance of vermin will be eliminated from turkey rearing.

WHEN AUTUMN APPROACHES.

The hen turkeys that have been out in the fields during the summer bring their broods gradually nearer home as autumn approaches, and before the middle of October the whole flock is together again an das comfortably established as though they had not taken a summer outing. Probably is is hereditary instinct from the ancestral wild parents that causes the bronze turkey to love to roam and take her young far from the haunts of men.

While there is an element of danger in this inclination to wander away with the young there is also an advantage of a varied diet and consequent rapid growth, besides a great saving of time for the attendant, but I can not believe that a larger per cent of poults would be raised if the mother were allowed to take them away as soon as hatched. At least my experience has been in favor of keeping the mother confined until the poults can run well. They are weak when first hatched, and a long tramp, even though slowly taken, is too much for them to endure. When I have given the mother and little ones their liberty as soon as taken from the nest, the largest per cent of loss occurred within the first two weeks.

While on the subject of poults I desire to add a word of caution as to the use of a liquid louse killer for very young turkeys or chicks. Their skin is extremely tender and easily irritated, therefore be sure to paint only the sides of the box in which they are placed, and have it large enough so they will not be crowded against the paint, also leave plenty of open space for fresh air for them to breathe and do not leave them in the box more than an hour or two.

The poults begin to perch on a fence when six or eight weeks old or as soon as they are well feathered. If the fence is high some strategy is repuired to get the little fellows to the top and it is interesting to watch the process of their getting settled for the night. A fence corner is frequently selected and the young turkeys fly as high as possible at first, then fly across from corner to corner, ascending with each flight, the mother in the meantime stretching her neck and

Dressed Turkeys.

peering around to encourage them in their efforts. It is evident there is a language which they understand and by which the mother controls, comforts or warns them as occasion requires. For that matter all of our domestic animals seem to be able to communicate with others of their kind and we, who love to watch them, sometimes catch the secret.

THE FALL AND WINTER FEED.

I have lately been experimenting with blood meal as a daily ration for a brood of White Rock chicks hatched February 15, and from their rapid growth I am satisfied that it will be a valuable addition to the feed for poults. It should be given sparingly—according to directions—and supplies the place of meat, besides it is always ready, an item of importance to most farmers' wives. The expense is slight since it is so condensed, that a teaspoonful a day would be sufficient for twenty young poults. This amount could be increased if it were found desirable to keep them on limited range, or in case of late hatched turkeys it would be excellent to promote growth. Turkeys hatched later than June are not good for breeding stock the following year, but they make delicious, juicy roasts. The fall and winter feed should consist of grit, corn and wheat, or oats may be substituted for wheat, if well filled out, but if light and husky they are dangerous. There is no economy in buying wheat screenings. They are liable to contain injurious seeds and are quite as expensive on the whole as clear wheat. There is no mistake made in feeding corn for fat, wheat for growth, and grit for the mill, and when the ground is covered with snow they should be given a vegetable ration of cabbage or potato peelings, but as soon as patches of grass appear they will find every tender blade. If, as is usually the case, turkeys have access to the feeding yard of cattle or hogs they will get all the corn they ought to have, but if they are deprived of this privilege it is well to give them a full meal at night—all they will eat up clean—and in the morning a handful of corn and the same amount of wheat for each turkey scattered if possible so that they will be obliged to search for it, but very few farmers have a scratching shed large enough for fifty or one hundred turkeys. I do not encourage my turkeys to eat or sleep in the chicken house, believing that keeping a line of separation between mine and thine conduces to harmony and healthfulness. I do not think it would be an advantage to turkeys to roost in a house unless it might be during a protracted storm. If they are not accustomed to it while young they gradually become inured to the cold, and nature has provided them with a coat that fits very closely in a rainy or cold season. I never had a turkey with frozen feet, although mine roost out of doors in the coldest weather. It is true they never go into tree-tops nor into trees at all, for that matter, but perch on the fence that surrounds the barn lot.

Many farmers object to raising turkeys on account of the expense and consider the amount of grain eaten by them worth more than the turkeys themselves. They do eat a great deal from November till May, but there is another side to that question. They eat a great deal from May to November that the farmer wants them to eat. Bugs, worms, larvae and weed seeds—destructive enemies of the farmer—form the chief diet of turkeys from spring till fall. We think they pay for their keeping by what they destroy, paradoxical as that may sound, and in their behalf, fearlessly challenge the comparative usefulness of "The Birds of Killingworth," as told by by the student in Longfellow's "Tales of a Wayside Inn." If any readers of this article grudge our feathered friends the grain they need, will they not read that little story again? If turkeys are raised for market they should be fed more liberally than if they are designed for breeders, although the incessant demand of buyers—for stock—is for great size, and this is a strong temptation to the feeder to sacrifice future usefulness to enormous weight. I am unable to understand the requirement, since the concensus of opinion among experienced breeders is that the largest turkeys are not as prolific, nor as vigorous, as a medium size, and they are not in demand in any market. While a few raise turkeys to sell for stock only, most breeders are raising for the market, or at least mainly for that purpose, and the market standard is for plump, well-shaped birds of medium size. Very few families—except, perhaps, at the holidays—want very large turkeys, but they do want good ones. Will it not, then, be wise to regulate the supply by the demand, and instead of striving to secure the heaviest bird, try to get the most symmetrical and beautiful? We have already gone beyond the standard in weight. Is it not time to call a halt in that direction before our work becomes impractical, and improve in shape and plumage?

In this series of articles I have not touched upon the diseases of turkeys, for the reason that I believe in the efficacy of prevention rather than cure. It is said that in China physicians are employed to keep their patients well, instead of curing them when they are ill; so with turkeys, if they can not be kept well it is usually labor lost to doctor them, because even if they live it will be with enfeebled constitutions and their offspring will inherit the same tendency, thus the flock will deteriorate instead of becoming stronger by the survival of the fittest.

PREPARING TURKEYS FOR EXHIBITION.

Preparations for the show room is very simple if the birds have had good care during the preceding weeks, and by this I do not mean that they should be fattened, but kept in good, thrifty condition, just such conditions as you would like to have them in if you were buying instead of selling. Washing their feet—if dirty—and putting a numbered band on the leg is all the preparation necessary for Bronze turkeys. On no account attempt to wash the plumage. The brilliancy would be greatly injured by soap and water, and a turkey takes perfect care of his own feathers. Of course, a careful breeder will look over his or her flock in the fall after they all get their freedom suits, and in case of any "off" feathers, will mark that one for the oven, though the per cent of culls in a flock of full blood turkeys is very small. Sometimes the wings of poults will be defective, but when the

adult feathers come in the fall they will be all right, and I have known feathers to come in a little splotched the second or third season after a molt of perfectly barred wings. By splotched, I mean the white bar is wider in some places than it ought to be, showing a lack of coloring matter. When this occurs it is likely to be followed by a perfect barring after the next molt. Some writers affirm that if an off-colored feather be plucked it is liable to be followed by a perfect one, I do not know how it is as I have never tried it, but I think it may be true as there is something curious about the division of coloring matter, but I should be extremely suspicious of a feather nearly all black or nearly all light. It would show conclusively that somewhere in the past history of that bird, blood other than Bronze, had been introduced and it would be very difficult to cross it out. It might disappear in one generation to reappear in the next. It would hardly be possible that every bird in a large flock should be excellently marked, but by severely and conscientiously culling for a few years a large per cent of them may be. The great risk in introducing new birds into a flock arises from the fact that so few who raise turkeys know what the markings o fthe birds ought to be or are. They probably know their weight but are unable to give a detailed description of them, being satisfied that they are "good" when they may be very inferior. A thorough knowledge of what they ought to be in every respect as to size, shape and markings is the only basis on which a breeder can sell with satisfaction to himself and his customers. It is not sufficient to say he has good birds, but he must be able to tell in what respect they excell or where they are faulty. If he does this honestly and truthfully it matters little whether he has a score card to go with the bird or not, providing always that he buyer knows, too. If he does not it is safer to have the score card to sell by, since it follows almost invariably that he least experienced are the most difficult to please, and the score card is a protection to the seller.

MRS. S. N. KING, Illinois.

CAPONS AND CAPONIZING

What Hon F. L. Washburn, of the Oregon Experiment Station, Says About Capons—Actual Experiments in Caponizing, With Results—Full and Explicit Directions in Caponizing (With Illustrations.)

THE commercial side of the business of poultry raising is coming rapidly into prominence. It has been surprisingly neglected in times past. But the time of change is here, and now the general government and several states are taking a practical interest in the subject. Experiment stations are at work investigating the mooted questions of poultrydom and the results can not be other than beneficial. The Dominion government to the north of us has also established experiment stations, and the poultry industry is now receiving intelligent and widespread attention. We trust that the day is not far distant when every country and state fair will have its large poultry exhibit, consisting of both pure-bred and commercial specimens, the former to comprise thoroughbred land and water fowls, bred to standard requirements, and the latter, crosses, capons, etc., produced with a view to the greatest commercial value.

In an official bulletin, F. L. Washburn, of the Oregon Experiment Station, gives results of a number of experiments in this branch of poultry culture, from which we quote as follows:

"A capon bears the same relation to a cockerel that a steer does to a bull; it is an altered rooster. As in the case of steers a capon is more quiet, lays on much flesh and fat and remains tender for many months after the operation. Caponized birds seventeen and nineteen months old have been killed here whose meat was extremely delicate and tender. They will, furthermore, weigh from 20 to 30 per cent more than a rooster of the same age, if kept the proper length of time, and in many eastern markets will bring from eighteen to thirty cents per pound. The comb and wattles do not grow after the operation. The feathers of the neck and saddle grow enormously long and become very glossy. They do not chase the hens; they neither crow nor fight. For a few months after caponizing they are very hearty eaters; but later do not consume appreciably more food than ordinary fowls."

CAPONIZING ON A FARM.

How Not to Succeed vs. How to Succeed—$1.00 to $1.25 Apiece for Barnyard Mongrels.

By J. C. HOOVER.

During the summer of 1894 I caponized 270 birds of all colors, sizes, ages, weights, etc., 100 for myself and 170 for my neighbors, charging them five cents each for the work, and contracted for the capons to be delivered any time after January 15, at 12½ cents per pound. Of the 270 caponized twelve died from the effects of the operation. Almost every one of these died within fifteen minutes after the operation.

My 100 were B. P. Rocks and averaged when caponized three pounds each—to large for safety, but I had good success. I did not want to take the room in my best poultry houses, which were arranged and yarded for fifteen laying hens each, so these 100 capons, to say nothing of almost as many hens and other fowls, were given free range with a single all-purpose farmer's chicken house to roost in. The house would possibly have accommodated fifty with some degree of comfort. Need I give the result? Every poultryman knows the evil results arising from that fertile cause—overcrowding. But this is for the benefit of the farmer who has but one poultry house, and for the inexperienced poultryman who should be willing to profit by the mistakes of others. The capons did as well as could be expected under the circumstances, which was but a very little gain in weight until about November 1. When the cold winds began to whistle and the free range did not furnish much forage they

showed signs of roup, which soon developed into the most malignant form of that dreaded contagion, and sixty-five of them gave up the struggle for life before I succeeded in stamping it out. Of the remaining thirty-five, some of them escaped the roup, others had it and recovered. These were put into good, dry, comfortable quarters, and were well cared for, but it was impossible to get them heavy or to be anything like good capons.

They were shipped January 20, by freight, to a commission house in New York, and on arrival I received the following: "Can't sell your guinea feathers at any price." To which I replied: "Mistake; no guinea feathers shipped. Please remit at once for capons."

In a few days I received the account of sale:

One box poor chickens, 125 lbs., at 11c...	$13.75
Charges	1.85.
Check	$11.90

"Those who want capons want capons, and want them to weigh from seven to nine pounds each. No capon dealer would buy these at any price; too thin and poor."

A check for $11.90, which by dividing the hundred into three or four flocks and properly caring for them, might have been increased to $125 at least, as capons were wanted at eighteen and twenty cents. That one mistake cost me not less than $100.

Do not let this statement make the impression that capons are delicate and will more readily contract disease than other fowls, for this is not true, and I am convinced from my three years' experience with about five hundred capons, kept in various ways, that they are hardy, and if any difference, will surpass in thrift other fowls given the same care. Do not overcrowd your fowls of any kind, for if you do your profits will be on the wrong side of the ledger.

Out of 175 caponized for my neighbors, I received 130, as per contract, at twelve and one-half cents per pound. As they averaged seven pounds (nearly), the average price was eighty-nine cents each. They averaged, dressed, six and one-half pounds (nearly). A capon will dress away about one-eighth. They were shipped at different times from January 15 to last of March, to New York and Buffalo. The average price received was eighteen cents per pound—the highest being twenty cents, and a few pounds of very undesirable birds going at eight cents, the lowest.

The farmers were well satisfied with the eighty-nine cents "apiece" for their "chickens," and no particular effort had been put forth to have the cockerels early hatched or to produce anything more than the common farmyard mongrels, except one or two families that have been stimulated up to produce early "full-blood" Barred Plymouth Rocks. This year a few specimens of this breed reached ten pounds, and brought their owners $1.25 each.

A house and yard stocked with a cross of the large breeds for capons alone might be had on every farm and the profits herein given would be doubled, for it is the heavy capon that sells for the highest price. Farmers in almost any district can ship their own capons and other poultry if they care to take the risk, and save all the money the middleman gets. I do not recommend any particular commission merchants, but there are some that make a specialty of capons.

CAPONS AND CAPONIZING.

Actual Experience Recited—Weight of an Eleven-Months Old Plymouth Rock Capon—Profits on a Barrel of Capons.

By DR. RICHARD SCHMIDT, BREEDER.

In answer to your request I give you my experience in regard to capons. I read about capons in Poultry Keeper and decided to try my hand. I was then breeding Light Brahmas, Plymouth Rocks, S. C. B. Leghorns and Houdans, and had started with a sitting of Cornish Indian Games.

I bought a caponizing spoon and hook from W. H. Wigmore, and with assistance of a scalpel, a pair of dressing forceps and a nasal speculum (used for a dilator of the intercostal incision) I went to work.

My hired man built a table for the purpose, boring two one-inch holes about ten inches apart on one side of the top for the purpose of making the cockerel secure. We attached a piece of manilla twine about eighteen inches long, to a nail on the right hand side of each hole, allowing the string to pass down through the hole, and fastened a brick to each lose end of the string. Now, taking a cockerel from my assistant, I passed both legs through the loop made by the string from nail to hole, and found my brick was heavy enough to hold the legs. The cockerel being on his left side with his back toward me I now took the right wing and passed the loop of the other string with a suspended brick attached, over it, and I had my fowl foul.

Making an incision between the last and next rib about one-half inch from the backbone, I etxended it about one inch toward the median line. Now, by using my nasal speculum for a dilator I found that the right testicle was in full view with only a thin serous membrane intervening. With the hook on the small end of spoon I tore open the membrane and said, Eureka! I removed the right testicle and then looked for the left, which, after much diligent search I found on the other side of the spinal column. The excessive manipulation to which the delicate membranes were subjected in my search for testicle No. 2 (left) caused me in future to designate left testicle No. 1 and right (or easiest one to get at) No. 2.

My first prospective capon died of uncontrollable "hemorrhagica interna" in about forty seconds.

My next one was a Plymouth Rock (I neglected to say my first was a Light Brahma) of the barred variety. I went through the same operation with him, except that I removed the left testicle first and made a brilliant success of it. He was out of a ten-pound cock and an eight and one-half pound hen, and at seventeen months old (I must tell it, for murder will out,) he defeated a Light Brahma cock, the preporty of a farmer of Marion County, Mo., by name Snodgrass, at Marion County, Mo., in September, 1892, by taking the blue ribbon given to the largest cock exhibited. My capon at fifteen and one-half pounds defeated a fifteen-pound Light Brahma cock. "Eureka" two times!!

In the spring of 1891 I caponized 167 cockerels, ate a good many, treated several of my friends to a capon dinner that Christmas, and shipped a barrel of capons to New York City, from which I realized $31.50 net profit. There were twenty capons in the barrel and they dressed two hundred and ten pounds at about eleven months old. Theye were incubator and brooder raised and fattened like pigs, in a row of coops, each 18x18 inches and 2½ feet high, giving all the corn and wheat they could clean up.

The mortality of capons in 1891 was 1.67. I lost two out

of one hundred and sixty-seven, one being my first and the other my fifth. The latter was lost on account of the use of a pair of scissors with which I thought to facilitate the operation. Having a very rebellious spermatic cord to twist off I snapped it in two with my scissors, since which time I have had no use for scissors in caponizing, for my would-be capon passed quietly away like No. 1, a victim of "hemorrhagica interna arteriae spermaticue," a very easy and apparently painless death.

Since 1891 I have caponized some cockerels each year, both for myself and for my friends. The present spring I propose to caponize all my Cornish and White Indian Game cockerels not coming up to the requirements of the standard, and shall exhibit some of them at the poultry shows which I patronize next winter. I expect to show some of the finest carcasses in capons exhibited and to give the Indian Game variety of fowls such a boom that every Indian Game breeder (myself excepted) will be ashamed of himself (or herself) for not doing more to make their loved variety noted.

DR. RICHARD SCHMIDT.

$2,347 WORTH OF CAPONS.

The Amount One Buyer in an Iowa Town Paid for Capons in Three Months.

Allerton, Iowa.

Editor Reliable Poultry Journal.

To dispose of at a profit the cockerels which usually predominate in the hatches, has been one of the problems for the poultryman and one that he has not completely solved. Caponizing offers to him a new and fertile field of operation, one that will yield him great profits and whose hidden treasures can not be exhausted, as food is always a staple.

Heretofore in the Mississippi and Missouri valleys what cockerels we could not get to market at a fair price during the brief broiler season had to be sold as old rosters at one dollar per dozen, if we were lucky enough to get that much. By the process of caponizing one bird can, with less cost to the producer, be made to bring from sixty cents to eighty-five cents, and a dozen birds thereby be made to realize to a poultryman or farmer from seven to nine dollars. This is no crank poultry talk, it is cold facts. We have been doing this well in this vicinity for four years. One buyer here at this point paid out $2,347 for capons alone in the winter of 1896-7, in December, January and February. One farmer's wife that winter brought in one hundred capons that brought her $90, and the next season she brought in one hundred and ten that brought her $97.50. Caponizing has increased the profits of the poultry business enormously in this vicinity, and our people are in the capon business to stay.

The operation, while requiring care, is a simple one and is being performed in this locality chiefly by boys and women and they seem to be doing a thriving business in the caponizing season.

As the contention for profitable employment increases and economic conditions drive us to glean the fields of production more closely, all these byways and corners must be worked out and every means of profit brought into operation. From a practical point of view it is just as necessary to caponize a cockerel for market and table use as it is to steer a calf or barrow a pig when meant to be used for food, in order to get the best results in weights and in consequent profits.

When we contemplate the prices that capons bring, ten to twelve cents per pound here at our own depot, when hens sell at from five to six cents per pound, the wisdom of caponizing must be plain to any one. If it pays to raise a calf to a steer or a pig to a marketable hog, it likewise pays to caponize and mature a cockerel. The poultry people in this vicinity are going to do their share this year towards pushing forward the western capon.—From Reliable Poultry Journal.

HAS GROWN RICH AT IT.

Mr. Allen, a resident of New York State, began as a boy years ago to buy common poultry and eggs for market, going from farm house to farm house. He kept branching out until he now buys and ships to Philadelphia and New York markets $150,000 to $175,000 worth of poultry and eggs each year. He stated that probably his business in this line will reach $185,000 this year. He buys practically all of this amount within a radius of twelve miles of Glassboro, so it may be seen that this is quite a poultry raising section. He has men with wagons who make regular trips through the country.

On July 6th, which is late in the season, Mr. Allen was paying ten cents per pound for young ducks and twenty-one and twenty-two cents per pound for spring chickens—the larger the better. "The duck market," said he, "is being overstocked this year here in the east. The price for ducks is now lower than I have ever known it to be, while the demand for choice spring chickens at good prices has been away beyond the supply. There is good money in spring chickens at the present prices."

"Capons pay well," continued Mr. Allen. "They bring twenty cents a pound from Thanksgiving to April 1st, then range down to fifteen cents. I bought five hundred from one man this spring. The largest pair I have bought this season weighed twenty-eight pounds, and I paid the owner twenty cents per pound for them. Capons should be marketed when from seven to twelve months old.

"I do all I can to encourage farmers and farmers' wives to raise better stock each year, to improve its size and appearance when dressed by using standard-bred males with their flocks. They have done this until I am now able to buy much choicer dressed poultry and to get top prices for it. I buy it all dressed and aim at the top of the market. As a matter of fact poultry is the best paying crop raised in this section. There is no doubt that it pays better than any other crop marketed. Many people have found this out and others will.

"Last year I bought five hundred and seven tons of dressed youltry, all within a radius of twelve miles of Glassboro. Farmers' wives raise the most of it. Now and then you will find a farmer who turns in and helps, but the women in this section raise most of the poultry.

"I like Wyandottes best for early fries, for broiling, but for five and eight-pound roasters, the Cochins, or crosses of the Cochins, are the best and tenderest. The introduction of Asiatics has increased the weight of market poultry in this section from two to three pounds per head. A cross of Light Brahmas and White Plymouth Rocks makes a fine roaster. I constantly advise farmers to buy big, vigorous, thoroughbred males to put with their common hens, and they are doing it. Those who do this and take pains soon find their poultry to be the best paying crop they raise."

CAPONIZING—HOW TO DO IT.

Full and Explicit Directions for Caponizing.

Every poultry raiser has each year a large number of surplus cockerels. These he finds it hard to dispose of at a profit. In the market can can seldom get for them (in their natural state) more than one-half or two-thirds of what he can readily obtain for pullets and hens. It is a fact, however, that when properly caponized and brought to a marketable size, he can obtain for these same cockerels, now developed into capons, twice as much as he can get for his pullets and hens.

A commission merchant, with whom the writer had a talk, reported capons selling at twelve to eighteen cents per pound in that city during the season, and the demand strong. He was then handling capons brought from Illinois, Ohio and Indiana that weighed ten, eleven and twelve pounds. They were killed when from ten months to a year old.

Directions for Caponizing.

From twenty-four to thirty hours before performing the operation select such cockerels as you intend to caponize (these should be from two to four months old), confining them in a clean and airy coop or room without either food or water. The best time to confine them is at early morning, as their long fast will then end about noon of the following day, at which time the operation is best performed. Should the day be cloudy or wet do not caponize them, but let the operation go until a bright and fair day. It is necessary that you have all the light possible in the matter. If it be a cloudy day, and you decide not to caponize, the birds may be given a little water and food if necessary, but it is much better to avoid this if possible, as it is very desirable to have their intestines quite empty, thus allowing their testicles to be more readily seen, besides giving the operator much more room in which to perform his work. Lay the bird on the operating table (this table is fully described elsewhere in this article) on its left side. Wrap the cord (Fig. 1) twice around the bird's legs, above the knees. In making one wrap only, there is danger of the birds kicking themselves out of the loop. Hook the other cord once around both his wings, close to the body. To the opposite end of these cords attach a half brick, or some other weight, letting them hang over the sides of the table. This holds the bird securely. Have all your instruments in readiness, that you may work quickly. Theard the Canula (Fig. 5) with a strong and long horse hair or fine steel wire (we think wire the best), letting the wire form a loop at the curved end, and extend well out at the other end. Now, after slightly wetting the spot, proceed to pluck the feathers from the upper part of the last two ribs, just in front of the thigh joint. Pull the flesh on the side down toward the hip; when operation is finished the cut between the ribs will be entirely closed by the skin going back to its place. While holding the flesh back with the left hand, with the right hand take the knife (Fig. 2) and insert it (cutting edge away from you) between the last two ribs, cutting first down, and then up a little way, following the direction of the ribs, making the cut not over one inch long. Cut deep enough to go through the skin and flesh, being very careful not to go so deep as to cut intestines. There is little danger of doing this, however, if they are empty, as they will be from the bird's long fast. The danger of cutting the intestines is when they are full, as in this state they press against the ribs. Should the cut bleed, stop a moment, let the blood clot on the thin skin covering the bowels,, and then remove it with the spoon forceps. Next take the Spring Spreader (Fig. 3), press it between the thumb and finger until the ends come together, inserting the ends in the incision, with the spring end toward the bird's feet (see operating table). Upon looking into the cut a thin tissue-like skin will be seen just under the ribs and enclosing the bowels. Take a sharp hook (Fig. 4) and pick the tissue pen, so that you may get into the bird with the instruments. The breaking of this skin does not cause the least pain to the bird. One of the testicles will now be brought plainly to view, lying close up to the back of the fowl. Sometimes both testicles are in sight, but this is not generally the case, as the other one lies beyond and more on the other side of the bird, the intestines preventing it from being seen from this opening. The testicle brought to view is enveloped in a film. This should be brought away with the testicle. Some people, in caponizing, tear the skin open and then take the testicle out. The danger in so doing is, that if the skin is left, there is danger of causing a "slip."

Now comes the only dangerous part of the whole operation, getting hold of and removing the testicles; but with a steady hand and plenty of light not one bird in fifty should be lost. Attached to the testicle and lying back of it is one of the principal arteries of the fowl, and this, if ruptured, is sure to cause death. It is here that the canula (Fig. 5) proves of great advantage. The hair (or wire) being small and very fine, is easily slipped between the testicle and artery without injury to either, and a clear, clean cut made. Take the canula in the right hand and adjust the hair (or wire) in it so that a loop about one-half inch long will extend from small end of tube, leaving the two ends of wire extending far enough out of the open end to secure a good hold. Insrt the end of the tube that has the loop on it very carefully and slip the loop over both ends of the testicle and entirely around it, hold end of tube close down to the testicle. When the testicle is entirely encircled by the loop, take both ends of the wire (or horsehair) which comes out of the other end of the tube with thumb and first finger,

Fig. 1.
Cord for Holding Fowl.

Fig. 2.—Knife for Making Cut.

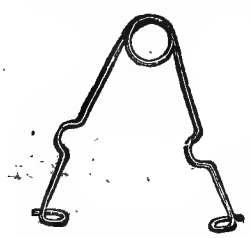


Fig. 3.—Spring Spreader.

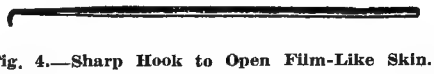


Fig. 4.—Sharp Hook to Open Film-Like Skin.

Fig. 5.—Caponizing Canula.

Fig. 6.—Caponizing Probe.

holding it tight, and draw up on it carefully but firmly, being particularly careful to have the loop around the testicle. Keeu the end of the tube very close to testicle all the time. If drawing up on the wire does not at once cut testicle, slightly turn from one side to the other (but not entirely around), then the testicle will come off. After removing it, carefully examine inside of bird to see that no piece is left in, and also to see that no foreign substance, such as feathers, etc., has gotten in. If any have, it is necessary to remove them, for, if allowed to remain, they are liable to cause inflammation. Sometimes a feather or part of the testicle may drop among the bowels; if this occurs move bowels around with probe (Fig. 6) until the object is found, then remove with open forceps. When the operation is performed, remove the spreader at once and the skin will very soon slip back over the cut and heal in a very short time. Never sew the cut, as it will heal just the same as any other small flesh wound.

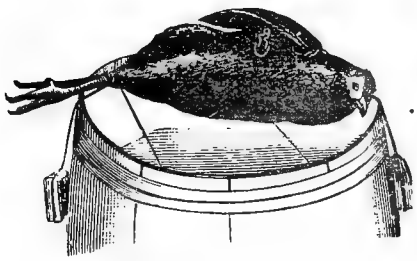


Table No. 1.—The Above, Photographed and Engraved from Life, Illustrates the Method of Holding Fowl Ready for Caponizing.

The bird can now be turned over on its right side, cut made and testicle removed in exactly the same manner as just described for the left side. Both testicles may be taken out with the one incision, but to the learner we would say this is attended with more difficulty than the two incisions. The other testicle being situated so far over on the other side, there is more difficulty in reaching it, besides danger in piercing artery running back of first testicle. To an experienced person there is no danger in removing both testicles from one incision, but to those who have not that degree of confidence given by practice we would recommend the two cuts. The bird recovers just as quickly as though one cut were made, and the operation is performed equally as quick if not quicker. If both testicles are removed from one cut, the lower must always be taken out first, for if the top one is first removed, the small amount of blood that may follow will cover the lower one, keeping it from view.

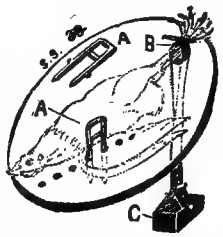


Table No. 2.—Can be Easily and Cheaply made —is Suitable for those who Intend Caponizing on a large Scale.

The Best Time to Caponize.

Fowls hatched in the spring make the finest capons. They can be cut before hot weather comes, which is a great advantage, although no ill results follow the operation at any time in the year. The bird should be from two to three months old (not over six months), and weigh not less than a pound to a pound and a half. The size is equally as important as the age. June, July, August, September and October are the months generally taken for caponizing, for the reason that spring chickens arrive at proper age and weight for market during the months of January, February, March, April and May, at which times there is the greatest demand for them in the cities, and the highest prices secured. That capons are in our markets at certain seasons only, is because the demand is far in excess of the supply. The time will be when capons may be obtained the year around.

Operating Table.

The top of an ordinary barrel (see illustration) meets all requirements of a table, admits of the birds being easily secured, brings the birds to the proper height with the operator; in brief, makes as good a table as can be desired. It costs nothing, as there is always an empty barrel lying around, or one that can be easily emptied.

Feeding Capons.

The question is often asked: "How are capons to be fed?" After caponizing give the bird all he will eat of soft food, and let him have plenty of water. Caponized fowls begin to eat almost immediately after the operation is performed, and no one would think for a moment that a radical change had been made in their nature. Now leave the bird to himself, as for the time being he is his own doctor. It is well to look him over two or three days after the operation, as in breathing, the air sometimes gets under the skin, causing "wind puff" or a slight swelling, in other words. Simply prick through the skin at the sides with a sharp needle, gently pressing at the same time, when the air will be expelled and the capon relieved. Within ten days from the operation the wounds will be healed over. A day or so after caponizing the bird should be allowed to run at large, treating him just the same as any growing poultry would be treated.

Killing and Dressing Capons for Market.

The capons should be allowed to grow until at least one year old. By this time they will have attained an imposing size. Some keep them even longer than a year. While this is optional with the raiser, yet we would not advocate killing them under one year old if they are being raised for market.

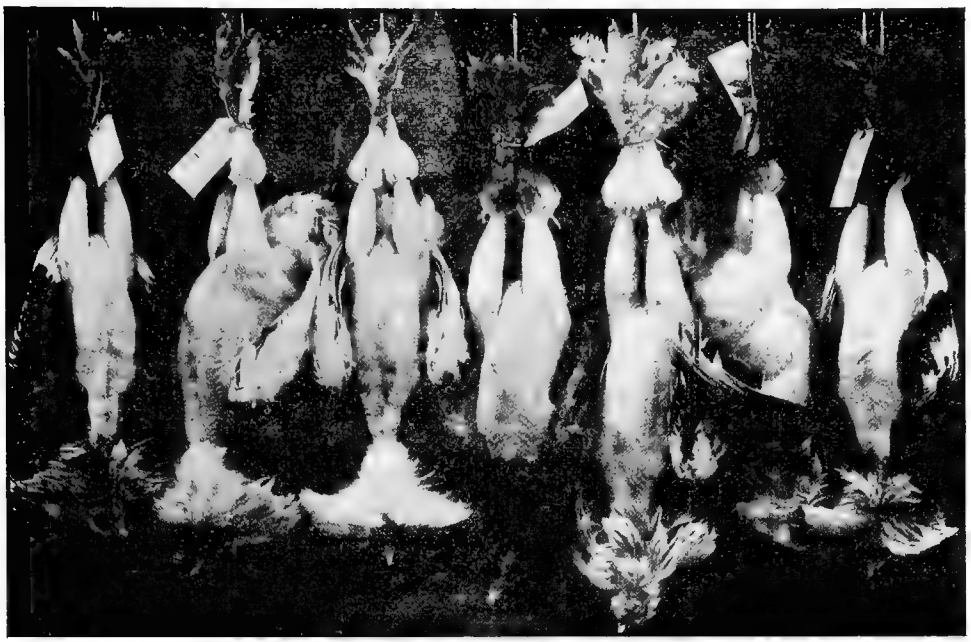
There is a great difference between the dressing of capons and an ordinary fowl.

When capons are ready for market, select such as you propose killing, and confine them. Keep them without food or water for about twenty-four hours before killing, that their crops may be entirely emptied. Now get ready your place for killing and dressing the fowls (if you have conveniences in the chicken house this will do quite well, or the woodshed, or any cool outhouse), and drive two heavy nails or wooden pins about one foot or less apart in an overhead beam. Make two nooses of strong string, each noose long enough to hold one each of the legs, and have the capons hang low enough to pluck with ease. Have a weight of two or two and one-half pounds attached to a hook, and when the bird is killed, fasten this hook in his lower bill after you hang him up for plucking. The weight holds the bird in position while picking and renders the operation much easier.

Next, procure a table to dress the fowl upon, and make a frame on the same principle as a small box without the ends and cover. In this you lay the capon, back down, to remove the intestines.

When everything is in readiness take your capon and suspend him by the two legs from the nooses. Catch hold of his head, and with your poultry killing knife cut vein of back of throat, through the mouth. Never cut this from the outside. Immediately upon cutting vein, run point of knife through roof of the mouth clear into the brain. This operation causes what is termed "dropping the feathers," making them come off more easily. As soon as the knife enters the brain the bird loses all sense of feeling. Begin plucking at once.

Poultry Killing Knife.



Capons Dressed for Market.

As to the style of dressing, the feathers are left on the wings up to second joint, the head and hackle feathers, also on legs half way up to drumsticks, all the tail feathers, including those a little way up the back and the long feathers on hips close to tail. These feathers add greatly to appearance of the bird when dressed, and are also a ready marker from other fowl in markets. Never cut the head off, as this is a distinguishing feature of the bird. A capon may readily be identified among a thousand cockerels, as the comb and wattles cease to grow immediately after caponizing is performed. Wash head and mouth well with cold water, being careful to remove all blood. A capon should not be torn in plucking. There isn o danger of this happening if proper care be taken. Place the plucked fowl back downwards in the box frame already described. Cut carefully around the vent and pull out the interstines. These will be found covered with fat, which, as they are pulled out, should be pushed back. When the end of the intestines is reached, insert your finger and break this off, leaving everything else in. As may be expected the fat will be found very heavy around the opening, and if slightly turned outward will soon become hard, which will give a rich appearance in this portion of the bird. Let the birds hang in a clean, cool place until thoroughly cold. For packing use a new box of the required size, lined with white paper (any good, clean paper will do). Pack the birds in solid, back up, being careful not to bruise them. Your birds are then ready for market. With a bird not torn and the feathers properly left on, you have a fowl which for inviting and "taking" appearance it is impossible to equal.

A "slip" is neither capon nor cockerel. He is much inferior to the former and a great deal worse than the latter. The "slip" is caused by not entirely removing the testicles. The smallest fraction left in the bird will grow again with no benefit to the fowl.

Our first advice would be, "Keep cool and make haste slowly." If you are rather tender-hearted, read the directions over carefully and then try your hand on a dead fowl. All surgeons do this in the first place, and probably it would be as well for you to follow their example. Have plenty of light. It is impossible to properly perform the operation unless you have this. After your first performance of caponizing you will be surprised at its simplicity. Always keep your instruments in perfect order. Before using the knife see that the edge is sharp and that he other tools are as they should be. After beginning the operation of caponizing there should be nothing to hinder you from going right ahead.

MARKETS FOR CAPONS.

Open Letters from Leading Commission Men Treating on the Capon Season, the Prices Obtainable, the Weight in Demand, Killing, Dressing, Etc. Best Breeds and Crosses for Capons—Suggestions for Feeding, Fattening and General Care.

With a view to securing reliable and timely information, "from headquarters," regarding the season for marketing capons, the prices obtainable, how to kill, dress, etc., we addressed letters of inquiry to several leading dealers in poultry and eggs in different cities.

We reproduce herewith cuts of capons, taken at Selby Poultry Co.'s killing and dressing plant of Quincy, Ill.; showing just how this class of poultry should be dressed for this market. You will notice that the feathers are left on the neck, legs, wings and rump, and also that the tail feathers are left on. Otherwise capons should be dressed for market the same as other fowls, except that they should be dry picked, as it would be impossible to scald them and leave part of the feathers on, and if they are scalded the same as other chickens, they will not bring any more than the price of common fowls, for they are distinguished more by the way they are picked than in any other manner. All other chickens sell better in the market scalded, while turkeys sell best dry picked.

Capons are in the best demand from the first of November until the first of May. The highest prices are generally obtained from January to May. For the last year or two there have been a great many common roosters dressed in capon style and sent to this market, which has hurt the capon trade some, but still good capons always bring a good price. The larger the birds are, the more they will bring per pound. Birds that weigh less than seven pounds each will not bring any more than common chickens, as a rule. Each year the call in this market for genuine, large capons

becomes greater. The reason of this is that people are becoming educated to the enjoyment of the luxury.

Looking over the quotations on January 1, we note that large and choice capons sold, dressed, at fifteen cents per pound, while mixed lots brought twelve cents per pound. What are termed "slips" (cockerels that have been imperfectly caponized) sold at from eight to ten cents per pound. A capon will bring upwards of three times as much as a cock. Capons grow to be larger and heavier than cocks and may, if well bred, be made to attain a size of from twelve to fifteen pounds each. A capon of such a weight will sell for from $2 to $3, while a cock will not bring more than fifty cents. Yet it costs just as much to raise cocks as to raise capons.

When raising capons the breed should be carefully considered. If the operation is performed early the capon will not develop a comb. The operation should be performed before the bird is three months old. It is a waste of time to use small breeds and scrubs, as they will only sell as second-class stock. The largest capons, according to our information, are produced by crossing a Dorking male with Brahma hens, and the best in quality are produced by keeping the pullets of the Dorking-Brahma cross and mating them with an Indian Game male. The capons so produced combine the size of the Brahma, the compactness of the Dorking, and the full breast and juicy qualities of the Indian Game. Other good crosses may be made by the use of Houdan male, with Brahma, Cochin, or Plymouth Rock hens, or the Dorking or Indian Game may be used in place of the Houdan. The hen should always be large. The form and quality are mostly derived from the sire.

A capon grows and fattens on a small amount of food. The first point should be to secure large frames and fatten them after they are fully matured. If the capon is produced from a large breed it should have plenty of time for growth—about fifteen months—for every pound is valuable. The food should be nourishing, but not fattening. Corn is unnecessary until near the time for fattening. Wheat, oats, pounded bone, meat, milk and green food, all that it can eat twice a day will be sufficient to help capons rapidly in growth.

Capons should be put in a small yard (not too crowded) three weeks before being sold and fed four times a day, giving plenty of corn and also a variety of other food. One of the best preparations for fattening capons is corn meal and ground oats, equal parts, adding half a pound of crude tallow to every quart of the mixture. Moisten the whole with skimmed milk or boiling water and season with salt.

Buyers are not so particular about the size of the legs and skin of the capon as they are of its size and attractive appearance in other respects, yet a yellow leg capon holds an advantage. Yellow legs may be secured by using Plymouth Rock males on pullets that have been produced by mating a Dorking male and a Brahma hen. Such a capon will be of excellent quality and will always bring a good price. Light Brahma males are also mated with Cochin hens in order to secure large capons, but they do not have that full breast which is imparted by the Houdan, Dorking or Game. If the color of the legs is of no consequence, the Houdan male and Langshan hen produce excellent capons when mated.

The comparison of a well-bred, well-kept and well-fed capon with a cock of the same breeding, will show that where a cock reaches ten pounds weight in a given period of time, the capon will weigh one-third more, and the difference in price is three to four times as much. If, instead of keeping the yards full of useless and unprofitable cockerels caponizing were resorted to, there will be a greater desire to have more cockerels hatched than pullets. By keeping good breeds, neighbors may be induced to use the eggs for hatching purposes. Then the surplus cockerels may be bought at a slight advance, as they will prefer to keep the pullets for their own use. By then providing the neighbors with pure-bred males every season there would be no limit to the supply of eggs for hatching cockerels for capons.

The Philadelphia Market.

Philadelphia, Pa., August 13.

Editor Reliable Poultry Journal.

Replying to yours of recent date, will state that capons are in active demand in our market from February 1 to May. Last season they ranged in price from twelve to sixteen cents per pound. It is not any advantage with us to have them unusually large, as birds weighing five pounds each sell as readily as those weighing seven pounds or more. For the past three seasons they have been ranging in weight from five to seven pounds each, which gives general satisfaction. Yours truly, PHILIP QUIGLEY,

303 South Front Street, Philadelphia, Pa.

POULTRY FOR MARKET.

Philadelphia, Pa., March 19.

You will find instructions for dressing and shipping poultry on the back of the enclosed circular. From the first of March to the first of November poultry should be shipped alive, or if shipped dressed should have sufficient ice in the barrel to prevent it from spoiling in transit. It would be safe to ship dressed poultry from November to March without ice, as during that time the temperature is lower.

Impress on shippers the necessity of permitting the entrails to remain in all poultry and game, with the exception of rabbits and venison; the entrails should be removed from the latter two animals.

I have had three shipments of Light Brahma cockerels from E. H. Upson, of Indiana, and got him thirteen cents per pound.

We charge five per cent for selling goods and deduct the expressage, etc. Thus:

1,000 pounds, 10 cents	$100.00
Less express	$10.00
Commission	5.00
Net proceeds	$ 85.00

If I have missed giving any desired information please let me hear from you. Yours truly,

PHILIP QUIGLEY, Commission Merchant.

Explicit Directions.

Selecting.—Select nothing but well-fattened stock. Full crops are undoubtedly a great injury to poultry, and often taint the whole fowl, giving it a sour, bad flavor; besides, if it is kept from feed twenty-four hours before killing, the food becomes fully digested and, having passed off, leaves the entrails comparatively clean.

Killing.—The best mode of killing fowls is to stick them in the mouth, being careful that they helped freely, and that the blood does not collect around the head, causing that part to spoil much quicker than it otherwise would. Pick the feathers while the fowl is bleeding and be careful not to bruise or tear the flesh.

Dressing.—Poultry should be dry picked, not scalded. They should then be hung up by the legs or spread upon

shelves in a dry place, but not in a draft where they will become "wind dried." They should not be packed until the animal heat has had time to escape. Care should be taken not to allow them to freeze before being packed, and it is much better to reach market free from frost. The head and feet should be left on; and should be well cleaned, but the intestines should not be removed.

Packing.—Barrels should be used for packing all kinds of poultry. Pack as compactly as possible, always lining the barrel with clean paper, and see that the package is so well filled that when the cover is on the contents will not be shuffled about in handling. Never use straw in packing poultry, for, besides creasing their bodies, there is always more or less chaff, which detracts from the appearance of the fowls.

COMMERCIAL DUCK RAISING—POINTS ON BREEDING, HATCHING, FEEDING AND MARKETING.

IN our talk about market ducks, as is natural, we begin with the breeding stock, which, at the start, brings us face to face with the question as to what species of duck it pays best to keep. Though several varieties have been given a fair trial, the popular vote today is unquestionably for the Pekin, as it combines more favorable points than any other variety, being very heavy, a rapid grower, prolific in egg yield, besides being a very handsome snow-wwhite bird with yellow feet and bill and a proud carriage.

How to Distinguish the Sex.

The females may be distinguished by their loud "quack-quack," while the male never speaks above a whisper, and then in a sort of sissing whistle. Another distinct feature about the drake is the two crisp little feathers that curl up on his tail.

Four ,at the most five, ducks go with every drake, and too much care cannot be given that the birds are thoroughly healthy and that no sickness has come near them, and that they have not been unduly forced for size or fattened to the injury of their digestive organs, and that they are given every possible aid towards devoloping into thoroughly vigorous stock. Plenty exercise, fresh air and enough right food to keep them in good condition (not fat) are absolutely necessary to attain the end in view.

Good Vigor of Breeding Stock Necessary.

It is a very decided mistake to think that because a pair of birds weigh a lot they will consequently and of necessity be better producers and their progeny weigh heavier.

It is the thorough-bred qualities and the stamnia of the parent that counts in the day of reckoning. The growing demand for heavy-weight ducks is one reason why so many ducks die in the shell and when young. If the eggs come from vigorous, healthy stock that has been fed correctly for egg production the ducklings can very nearly all be hatched and raised and made to weigh at eight to ten weeks old between five and one-half to seven pounds.

This season just past we raised a flock of one thousand with a loss of but seven birds. We got them, the market birds, up to five and one-half to seven pounds at eight and nine weeks old. Their parents, on an average, weighed between four and one-half and five and one-half pounds. We have also hatched from heavy weight birds and could not get them to dress at three months old over four pounds and lost a large percentage of half-grown birds. They did not have the vigor to stand the heavy forcing diet.

A large frame and fair covering of flesh is all right, providing the vigor goes with it, and the health; but if one has to be sacrificed, better let size go, for you can breed up to that; but it is hard to fight and win with enervated stock, for the strain on the digestive organs is very severe when they are forced for market production.

At between eight and ten weeks old we can get, as before said, a very good weight on our birds.

Those reserved for breeders should be separated from the market stock as soon as their voices allow the sex to be distinguished, which, on a rapid growth diet, will be at six or seven weeks of age. These birds require a food and care that best develops bone, muscle and vigor.

Handling Eggs for Hatching.

Regarding the care of eggs for hatching; they chill at about 38 degrees, it is therefore necessary if eggs are required during very early spring, to have a warm, dry corner and bedding provided for the laying ducks, where they can be secured until the eggs are promptly gathered in the early morning. These are to be kept in a shaded place of even temperature of say 50 degrees and turned daily. Rough-shelled eggs or mis-shapen ones will not hatch.

Duck eggs seem to require more moisture during incubation than do hens' eggs during testing, as the embryo duck is liable to be killed and great care should be taken only to subject the egg to the heat and light sufficiently long to tell its condition.

The birds should be kept in the incubator until thoroughly dry and the temperature gradually lowered to 90 degrees. A basket, lined with an old (warmed) quilt, is a good receptacle in which to convey them to the brooder. This has, of course, been thoroughly warmed and aired and the heat held steady at 90 degrees, which is right for the first week. Every week thereafter it may be lowered about 8 degrees. The outside (or yard) temperature should be 10 or 15 degrees cooler and when the babies are three to four weeks old the outside heat is right at about 65 degrees and they do not require artificial heat in the brooder.

They need good, sweet air and their houses to be kept clean and dry (chaff or straw makes a good bedding.) This is very important.

The drinking water should be tepid. Soft is healthier for them than hard water.

Feeding the Young Birds.

For the first two days, bread softened with milk and fed four times daily. For the first three or four days this season past we have, with good results, left a little food before them all the time, but after that we gave only what they ate up clean.

The in-door yards of our brooder house are eleven by five feet. We run about forty ducklings in each. The outside yards are twenty feet long. The netting is eighteen inches high and is one inch mesh. When the ducklings are four to six weesks old they are removed to larger pens and the flock divided into two, about twenty birds in each.

Here there is no hover, but we have a stove that can be easily lighted and used during storms to keep the air dry and prevent damp and chill. A week or two later they are "moved on" to the fattening sheds, which are constructed with a special view to ventilation, and where they remain, some sixty in each, with but little exercise till marketed.

In our brooder house out-door yards we use V-shaped troughs for holding the drinking water, with slats across to prevent the ducklings from fouling the water or getting wet. Our other houses are provided with a continuous trough, through which runs a stream of clear, soft river water day and night, forced up through gas pipes by a hydraulic ram.

Under the hovers of our brooder houses (also in the "summer cottages") fine chapped straw is used for bedding. But in the indoor and outside pens and yards, sand. In the latter a crust of compost soon forms over it, which, when dry, cakes. It is then easily removed with the help of a fork, hoe and shovel. Fresh sand is then substituted; also, the holes they so enjoy to make and "puddle in" are kept level so that the yards are dry after rains and no water is left in spots wherein the ducks can get wet and chilled.

Two and a half feet netting of two inch mesh is used for all but the brooder house yards.

Getting the Ducks Ready for Market.

When ready for market we separate and drive into a distant shed the number required, to fill our order. The bird is caught, held firmly between the knees, the head is bent over a block and it is stunned with a sharp blow on the back of the neck at the base of the brain. In the mouth is then inserted a long, thin knife blade, which is then run up into the brain and given a downward and backward twist, which, if rightly done, cuts the jugular vein. The dead bird is bled freely and then plucked rapidly, while warm, the coarse feathers first.

If marketed at about ten weeks of age there are no pin feathers on ducks, and they can be stripped quickly and easily when once the "know how" is acquired, but it is claimed that at four months old they are again clean of them. A despairing correspondent recently asked, "Will you please tell me if there is any age when ducks don't grow pin feathers?" We have picked ten weeks old birds in seven minutes, and it's taken one hour and fifteen minutes to pick one about four months old. But, of course, it takes longer, even if no pin feathers disfigure, for a seven than a four-pound duck.

Get the coarse feathers off first and second joint of wings first, then the fine ones, the down can be rubbed off with a damp thumb and forefinger. A knife helps "catch on" to stubborn short feathers. Place the bird on the knee, breast up, and with one hand holding the flesh firmly in place pluck with the other against the grain, first the feathers, a few at a time, and then the down. The thumb moistened and a little twist given, cleans to the flesh without breaking. When pin feathers grow too short to pull, scissors snip them off closely and improve the looks. If the flesh is accidentally torn it should be sewed up with a fine thread. The neck is cleaned half way up to the head.

After the ducks are picked, their mouths are carefully washed out and their feet cleansed, then they are placed in ice-cold water, which is changed in three or four hours. When the animal heat is exhausted they are packed for shipment in boxes between layers of straw, each bird in a nest of its own and separate. The box has air or gimlet holes, four on each side and near the bottom.

Here is a new formula of feed and was handed me recently by a small, but successful raiser of ducks. She says: "Bread and milk for the first few days; then one part Indian meal to two parts bran (beef scrap and sand added) till within ten days of killing, when reverse the parts, three of meal and one of bran. Three meals a day; a meadowy field and a puddle and no board to cover them after the "bread and milk age." What do you think! Didn't lose one and they all went off at eleven weeks old at forty cents per pound and twelve and one-half pounds to the pair.

This method, for a limited number of birds, seems the simplest, easiest, most economical and most satisfactory one that I know, if it works as she says. It is a contrast to the artificial method, which, for obvious reasons, is adopted where larger numbers of ducklings are raised.

FRANCES E. WHEELER.

POULTRY AND FRUIT COMBINED

Every Raiser of Poultry Should Consider the Matter of Growing Fruit in Connection Therewith —Plums and Poultry– Growing Plums.

WE feel that we cannot urge too often or in too strong terms the wisdom of combining fruit growing with poultry raising. The two go hand in glove together, one greatly benefiting the other and enabling the proprietor to grow two profitable crops on the same ground.

On the editor's seven-acre farm the production of poultry and fruit is combined to splendid advantage. We have at present some one hundred and seventy apple, peach, plum, cherry and pear trees, eighty of which have reached the bearing age. We have a patch each of blackberries, black raspberries, red raspberries and Golden Queen (yellow) raspberries. There is an acre vineyard and a strawberry bed 30x150 feet. This place was well set out to fruit when we bought it in 1890, and we have added more each year. In the spring of 1893 we set out seventy-six plum, peach and cherry trees. The young trees were two years old when received from the nurserymen. Two years later the Abundance plum trees in this lot of seventy-six bore quite good crops and last season, after being planted three years, they bore heavily. Damson plum trees set out at the same time have thus far borne only half a dozen plums. These trees are of much slower growth. Some Shropshire Damson plum trees set out in 1893 have borne light crops the last two seasons, but the fruit, all of it, has rotted on the trees both seasons before any of it ripened. They have proved an utter failure in our hands.

A dozen peach trees that were set out in 1893 bore heavily this past season. All these trees were set out in the 12x100-foot poultry runs, placed twenty feet apart, and the branches now extend over the fences on either side. They furnish an abundance of shade for the fowls, while the fowls reciprocate by fertilizing the soil and destroying bugs, slugs and larvae.

As a rule, the fowls will not eat fruit, not even when it falls to the ground. Their appetites are soon cloyed. We

have never seen a fowl of any variety fly into a tree to pick at or eat fruit. Two large plum trees stand in a comparatively small yard, occupied by S. C. Brown Leghorns. All or nearly all the plums from these trees are gathered after they have fallen to the ground. The fifteen or sixteen Leghorns in this yard do not offer to eat the ripe plums. They do not like them. Fowls will eat sparingly of ripened or wormy apples, peaches, pears and cherries that fall to the ground, but these fruits (and plums too, for that matter,) should be gathered from the trees.

We have six double, 12x30 foot poultry houses that open into yards located in the acre vineyard, and Brahmas, Plymouth Rocks, Cochins, and Leghorns have been allowed to run in the grapes the year round for two years past, and they have not injured the vines, nor eaten the fruit to any appreciable extent. We state the facts as we know them, from personal experience. Early in the spring they show a disposition to pick off the green fruit and leaf buds, but they soon turn their attention elsewhere, and what pruning they do to the grapevines does as much good as injury.

For three seasons past we have turned thirty to forty Pekin ducks into an eighth of an acre blackberry patch, only waiting until the bushes and weeds get a pretty good start. The ducks remain there all summer and fall, loafing, laying and hatching under the thick, shady bushes, and they do not eat the fruit, nor have they injured the bushes, so far as we can learn. They help to keep the weeds down.

Every year we allow young chicks to run at will in the red and black raspberry patches. They do well there, the shade and cool, mellow ground suiting them "to a T."

Any one can well afford to invest in some fruit trees for the home place. Few investments pay better. They add greatly to the value of a place, and the "annual dividends" are, as a rule, large and very welcome. Fifty cents or less invested in a good fruit tree this coming spring will be worth $5 to $10 in two years—and this increased value comes like manna from heaven. The machinery of the Almighty does the work. The sunshine, the rains, the dew and the air enlisti n your service to add to your wealth, to provide delicious morsels for you and yours. A man ought to make his home place as attractive, as productive of comfort as he can. He owes this to his wife, to his children, to his grandchildren—to the human race.

On the writer's home place ripe fruit can be gathered, any day, from June 1st, when early strawberries are ripe, until late October, when the fall and winter apples have to be gathered to escape freezing weather. First come the strawberries, then cherries, then early apples and plums, then red and black raspberries, then blackberries, more plums and the earliest peaches, then grapes, more peaches and apples, and these last with us until late September, the apples lasting until late October. To us it is a great pleasure to work among the fruit what little time we can spare.

We present herewith interesting contributions on the subject of fruit growing:

PLUMS AND POULTRY CAN BE SUCCESSFULLY RAISED TOGETHER.

By T. H. Scott, Breeder.

At your request I will give you my experience with poultry and fruit culture combined. I do not run a large poultry farm, nor yet a fruit farm, but I grow poultry and fruit on part of three city lots. My experience for twelve years is that a better quality of fruit and a very much larger crop can be raised where poultry has free range among the fruit trees.

I grow plums in all my chicken yards. I dig up the yards early in spring, half each year, and seed with clover and grass seed for my chickens. I use all my new manure on the land and around the plum trees, also all the wood ashes we make are put around the trees. In this way I get a double crop—a crop of chickens and one of plums. The plum trees answer as a shade for my chicks, which I claim is necessary, no matter what color of fowls you are breeding. Some claim that only white fowls require shade, but every chick requires shade in warm weather, and the more shade the better the plumage, even on black fowls. I breed Langshans exclusively and prefer lots of shade if I want to have a good, rich plumage. I have city water or a hydrant in my yards and can sprinkle yards and trees at my pleasure. I have also a bone cutter, which works fine, and I would not be without one again for twice the cost of it.

I had a very fine crop of plums this season, and have sent a photo of part of one side of a Lombard tree. This tree is nine years old and has had three heavy loads—this year it had eight bushels of very choice fruit. Several other trees had five and six bushels each, while the general run of plum trees in this vicinity did not bear extra well.

In regard to what variety of plums are most profitable as early bearers and heavy loaders, I will say that I have fourteen kinds, but I prefer the Lombard, Abundance, Shipper's Pride, German Prune and Imperial Gage.

All plum trees should be cut back when planted at least half the previous year's growth, the root then being more able to support and nourish the top. They should also be cut back the second year and the centers opened out and shaped properly. If this is done while the tree is young you will not have to cut off large limbs when the tree is older, endangering its life. I sprayed my plum trees three times with Paris green, just when the blossoms were dropping and twice afterward, about a week apart. T. H. SCOTT.

FRUIT AND POULTRY TOGETHER.

Some years ago there was a small farm of twenty acres put up at public sale to settle an estate. It was situated near the Pennsylvania railroad and within five minutes walk of the station. The writer of this account attended the sale, was the highest bidder, and of course got the property. He had previously been growing trees and plants on his father's farm and had an inclination that way. He was also interested in poultry and used the new place for the production of both. He paid $4,200 for the property—earnings made in previous years in trees and poultry without any outside help. He started with half a bushel of peach stones and afterwards planted ten, then twenty bushels as sales increased.

He raised pure-bred Light Brahmas; got headquarters stock to start with and soon was getting the prices he first gave and his customers became yearly buyers.

Some years ago the neighborhood became more thickly settled, and a considerable of the surrounding properties, including these twenty acres, were incorporated into a borough, and improvements went rapidly on, making a demand for building lots. All the old buildings, with three acres of ground, were sold for nearly what the whole cost at first. More of the property went in small lots for about one thousands dollars an acre, leaving only about ten acres to plant on and raise poultry. A new residence was built on the higher portion of the ground and several new poultry houses were also put up. Other ground was rented to raise nursery stock and the business was kept up.

No two occupations work better together than fruit and poultry raising. A yard in which chickens have been kept

for a few years, becomes well fertilized and in best condition for growing all small fruits. Since wire netting has become so common it is easy to grow berries, etc., in one place and poultry in another; occupied at different times by both. Stakes driven in with an ax can be used to fasten the wire netting to, and it is easily removed to another place, when fresh ground is required.

Often the neighbors' poultry is troublesome and their dogs quite as much of an annoyance. Here the wire netting comes in play again. I enclosed three and one-half acres with it to very good advantage, saving many dollars worth of young stock just coming up, also berries, grapes, etc.

In winter when the ground is free from snow, the chickens are let run among the trees, taking exercise, which makes them healthy fowls. They lay better than when kept all the time in one enclosure. Where two or more varieties are kept they can be let out alternately. The chicken yards are the best places to plant peach, cherry and plum trees. They thrive wonderfully there and often require a thinning out of the fruit to obtain best results. J. A. ROBERTS.

DISEASES OF POULTRY

How to Prevent, How to Treat, How to Cure—Remember the Old Adage, "An Ounce of Prevention is Better Than a Pound of Cure."

BREEDERS who look well to the sanitary arrangement of their buildings, and apply a proper system of feeding, have little fear in this direction. The best remedy is the keeping in mind at all times the old adage that "An ounce of prevention is better than a pound of cure." Fowls need but little medicine if properly cared for, the essential features of which are being well protected from the wind and rain, having dry, clean, light warm and well-ventilated quarters, with a good grass run in the summer and plenty of fresh, cool water. If these conditions are complied with, and the fowls are well fed, we would be willing to insure poultrymen against disease, unless it be introduced by some fowl that was already diseased.

ROUP.

Roup is an inflammation of the membraneous lining of the air passages, which often makes its appearance in the cleft palate, the mouth and the eyes. It is more destructive and harder to handle when let run awhile than cholera. Its first symptoms are slightly catarrhal, affecting the appetite and health of the chick but very little, and in the second stage it becomes ulcerous or diphtherial roup, and is nearly related to malignant diphtheria in the human family. It is caused from filth, bad food, cold and wet. The eyes water, the nostrils are closed, breathing becomes deep and difficult. together with coughing and suffocation.

Treatment.—Pen up every fowl in dry, warm quarters; keep out all the drafts of cold, damp air, feed hot bran, mashed potatoes and meat, and medicate the throat, mouth and nostrils with chloride of sodium or comon salt, as follows: Take a bucketful of warm salt water, put a teacup of salt to this amount of water; then, catching the fowl, examine the throat and nostrils, removing all chessy matter and pressing all mucous matter out of the nostrils, and then filling a pint cup for each afflicted fowl, hold it by the feet with head down, choke it until the mouth is wide open and then insert the head into the solution, comb down, so that the medicated water may enter the cleft in the palate and go out at each nostril and into the throat. Each should be separately treated. Not all from the same water, but one cup will do for all. Kerosene injected into the nostrils is good; also camphorated sweet oil. Ten drops of coal oil or kerosene added to two quarts of water for a flock of twenty fowls will often effect a cure, but when this remedy is applied do not attempt to prepare one of the flock for table use for three or four weeks thereafter, as the entire carcass will be tainted with coal oil. A great deal of this trouble may be avoided by keeping your poultry clean and their quarters free from dampness.

Important.—In treating roup, be careful to remove any discharge from the nostrils that may collect on the feathers under the wings or on the breast. Whisky or alcohol will wash off this discharge. Be sure to protect the sick fowls from all drafts and feed easily digested foods. When the fowls look stupid and droopy, feathers ruffled and no appetite, reduce their food even to fasting. If digestion is impaired give the following:

Tincture of Nux Vomica.....1 drachm
Alcohol dil. (half water).....9 drachms

Mix. Add 15 drops to half pint of water and let the sick fowls use it as a drink once or twice daily until better. This is a valuable stomach tonic, especially when the food disagrees.

Compound tincture of chinchona, 20 drops in a half pint of water, is often serviceable as a general tonic.

It often occurs that fowls have swellings of the head and feet which sometimes are troublesome. Where it is possible, use a bandage or compress with warm water; then apply the following:

Oxide of Zinc Ointment..... 1 ounce
Stramonium Ointment.....½ ounce

Mix. This can be applied in all cases where an ointment is necessary.

CHOLERA.

This disease is caused principally by keeping too many fowls in a limited space, bad sanitary management, unwholesome or irregular food, etc.

Symptoms.—The symptoms of chicken cholera are not well understood by the people generally, and it is probable that some men have that disease "on the brain," so much so, in fact, that whenever they lose fowls by an unusual disease that they do not understand they attribute their death to cholera. Many fowls go to their graves, so to speak, by other diseases, and cholera is blamed for sending them there.

Some of the prominent symptoms we give, and, so far as known, the condition of the internal organs.

External Symptoms.—The fowls has a dejected, sleepy and drooping appearance, and does not plume itself; it is very thirsty, has a slow, stalking gait, and gapes often. Sometimes the fowl staggers and falls down from great weakness. The comb and wattles lose their natural color, generally turning pale, but sometimes they are dark. There is diarrhoea with a greenish discharge, or like sulphur and

water, afterwards it becomes thin and frothy. Prostration comes on, the crop fills with mucus and wind, and at last the food is not digested, breathing is heavy and fast, the eyes close, and in few hours the fowl dies.

When fowls die it is very easy to say that they died of cholera, and so let it go; but if the symptoms were not substantially as given above, an autopsy would show that it was not that disease.

On dissecting a fowl that has died of cholera, the gizzard will be found to be filled with dried-up or sometimes with a greenish matter, and the crop will be inflated with sour mucus and food. The liver will be much enlarged and flabby, and so tender that it will easily mash in the hand, and generally split open, and in every case is much congested. The crop and intestines are much inflamed, and the latter are filled with a greenish matter. The heart is also sometimes enlarged.

Treatment.—At once remove all affected birds to a comfortably warm room, well lighted, the floor covered to a depth of three or four inches with clean straw or like substance. Let the drink be scanty, using freely "Douglas Mixture;" allow no other water.

Dr. S. J. Parker, of New York State, gives the following excellent prescription to be given in the earlier or indigestive stage of the disease, and we advise giving it a trial as soon as the fowls show symptoms of being affected. He says: "I find it best to force down the fowl's throat Eucalyptus globulus, ten drops of the strong tincture, common salt four to six grains, and half a teaspoonful of ground cayenne (red) pepper. One dose in a teaspoonful of water to be given at once. If the dose takes effect digestion is resumed, and in twenty-four hours the fowl is relieved or decidedly better."

The droppings must be drenched with the sulphuric acid water to destroy the germs and prevent the disease from spreading. When the birds are fed they should have only cooked food. Our experience and observation leads us to believe that if they can be cured at all, this treatment will give them the best chance for life.

To Prevent Cholera:

1. Remove all the affected birds.
2. Give tonics, liver stimulants and aids to digestion.
3. Give the fowls more space. This may be accomplished by diminishing the number of fowls or by increasing the area of their range and of their houses.
4. The poultry house should be thoroughly ventilated and be kept clean and dry.
5. The buildings, yards and places of resort should be thoroughly disinfected.
6. Give the fowls a "preventive" that will destroy or render inert the poison they have taken into their system. There is nothing known that will accomplish this as quickly and effectually as coal oil. The coal oil should be given three or four times a week, as follows: Take a feeding of corn or wheat and let it soak in the oil a few hours, then feed it to the fowls or mix in soft feed one tablespoonful to two quarts of cornmeal.

CROP BOUND.

Cause.—An over-amount of food given when the fowls are in good condition and when they have a ravishing appetite. Here we wish to call your attention to the danger of neglecting to feed for one or two days, then allowing the fowls access to all they can eat. Whole flocks have been exterminated from just this manner of feeding, and the owner would realize his misfortune by declaring it was cholera and advising his neighbors to have nothing to do with poultry.

The complaint is liable to affect fowls and chicks in confinement where no range is allowed, and in nearly every case the real cause is overfeeding them indigestible food. In most instances death is sure to follow, unless properly treated. It only requires about twenty-four hours for the symptoms to manifest themselves. The disease may be quickly relieved, as follows: Open the crop on the side, lengthwise, cutting a slit sufficiently long to remove all the contents, using a sharp knife. After this is done, thoroughly cleanse with warm water; then close with several stitches, care being taken not to sew the skin of the bird to the sack of the crop. Close the crop first, using coarse white linen thread; also have knot come on inside of crop; then take a few stitches in the skin. Place the fowl in dry, warm quarters; give no water the first twenty-four hours, and feed on soft food for two days. It will soon recover.

CANKER.

Cause.—Badly housed, uncleanliness, musty or unwholesome food.

Symptoms.—The breaking out of cancerous running sores on the head, in mouth or throat, accompanied with a watery discharge from the eyes and mucous secretion of the mouth and throat.

Treatment.—Wash the head and eyes and swab out the mouth and throat with a diluted solution of chlorate of potash and alum, equal parts, containing one-half water, and remove the ulcers with a quill, and apply nitrate of silver or powdered borax to the places left bare, to be repeated twice a day; also mix a teaspoonful of powdered sulphur in the food.

BUMBLE FOOT.

Causes.—This is caused by the birds roosting on a small, uneven perch, or in flying down from a high one upon a hard surface, thereby bruising their feet. It occurs mostly with the heavier varieties of fowls.

Symptoms.—It commences with a small swelling or corn in the ball of the foot, which enlarges, becomes soft and finally ulcerates.

Treatment.—Remove the bird to a place without perches. If the foot becomes ulcerated, first wash out the sore with castile soap and warm water, then dip the foot in a solution of one-fourth ounce of sulphate of copper to a quart of water; this may be repeated two or three times a day. If taken in time a cure may be affected by painting the part with iodine. When the tumor is soft or in the form of an abscess, puncture it with a knife and press out the matter, after which cauterize the part with nitrate of silver.

A linseed poultice bound securely on the affected foot will work a cure in many cases.

LEG WEAKNESS.

Cause.—This complaint should not be confounded with the previous one. It often arises from the inbreeding of the same strain of fowls for too long a period, but is usually caused by too high feeding, which increases the weight of the body out of proportion to the muscular strength of the legs; it more generally occurs in the large breeds, such as Cochins and Brahmas, particularly in the cockerels.

Symptoms.—Squatting around on their hocks, after standing a short time, as if tired; in bad cases they are unable to stand on their feet at all.

Treatment.—In an early stage give the following pill twice or three times a day: One grain of sulphate of iron, five grains of phosphate of lime and half a grain of quinine.

CHICKEN POX.

Causes.—This disease is frequently caused by unfavorable conditions of the atmosphere, and generally occurs in cold, wet weather. It is of an infectious character.

Symptoms.—The head, face or body is covered with small ulcers, containing an infectious matter.

Treatment.—First wash with castile soap, and then with a strong solution of chlorate of potash; also mix a little pulverized charcoal and sulphur in the soft food, about a teaspoonful of each to a pint of meal. Anoint the head with "Carbolate of Cosmoline" until cured.

Carbolate of Cosmoline consists merely of vaseline with about three drops of carbolic acid to the ounce of vaseline. Mix well.

GAPES.

Causes.—Foul water, exposure to wet, damp places, particularly at night, want of nourishing food, etc.

Symptoms.—The general symptoms, as the name implies, consist in constant gaping, coughing and sneezing, together with inactivity and loss of appetite.

Treatment.—Give the bird daily, until it recovers, a small piece of camphor about as large as a grain of wheat, and add a few drops of camphor or turpentine to the drinking water, or mix with the food, about ten drops to the pint.

DOUGLAS MIXTURE.

"Douglas Mixture" is made thus: Take of sulphate of iron (common copperas), 8 ounces; sulphuric acid, ½ fluid ounce. Put into a bottle or jug one gallon of water, into this put the sulphate of iron. As soon as the iron is dissolved add the acid, and when it is clear, the "mixture" is ready for use.

In hot weather, or when the flock is small, less may be prepared at once, but the above proportion should be observed. This "mixture" or tonic should be given in the drinking water every other day—a gill for every twenty-five head is not too much—and where there is infection it must be used every day, but where there is no disease, not so often, or in smaller quantities if it be used every day.

This preparation, simple as it is, is one of the best tonics for poultry known. It is alterative as well as tonic, and possesses, besides, antiseptic properties which make it a remedy as well as a tonic.

DIARRHOEA AND DYSENTERY.

Cause.—This is in many cases not a disease, but a symptom. Indigestion causes diarrhoea and the first object of the poultryman who has fowls so troubled should be to think over his method of feeding. The requisites for poultry, aside from the grain and animal food that is invariably fed, is grit and green food. These two necessaries are invaluable in keeping the digestive organs in good condition.

One of the effects of lice is diarrhoea, in fact diarrhoea is a complaint that may in many cases be remedied by clearing away the droppings and dust that infest many poultry houses and harbor lice.

In some cases boiled rice will improve the condition of the fowls after the precautions named have been taken. A small quantity of cooked mash given at frequent intervals will be beneficial. Never feed a full meal of this.

If not treated upon the first symptoms appearing, diarrhoea may develop into dysentery.

Symptoms.—The symptoms of dysentery are the same as those in diarrhoea in a more aggravated form. The watery discharges become streaked with more or less blood, and general weakness is very pronounced.

Treatment.—Prevent all exposure to cold and dampness, keep everything about those affected scrupulously clean. Give milk and lime water as prepared for diarrhoea, with a half teaspoonful of whisky added. At the outset of the attack give a half teaspoonful of castor oil.

An eastern authority, writing on the subject of dysentery, says: "Dysentery is due to overfeeding, by which the liver is gorged with bile and its function is arrested. The bowels are then disturbed by the presence of the bile and undigested matter, and the action of them is greatly increased, with cramps and spasms, due to the increased effort to expel the crude, offensive matter. The best thing to be done is to help nature in this, and to give a purgative, such as a small rhubarb pill, at night, inclosed in a small ball of butter or lard. As much powdered rhubarb as will make a pill, when mixed with molasses, as large as a sweet pea, is sufficient, and one should be given every evening. The food should be soft and nutritious, as oatmeal or linseed, boiled thick and given in balls, if not eaten readily. This medicine is recommended mostly for the fowl when first taken, and if a few only are affected the whole flock should be treated as a precaution. As a rule, there is but very little risk of infection even from a closely neighboring flock, if the fowls are fed and cared for as they should be, the house kept scrupulously clean, the food good and varied, as above suggested, and not in excess; if pure water is given in abundance, and the temperature regulated so that no extremes of cold, or, indeed, of heat, are permitted, but when coddling is the rule, one may look out for sick fowls."

CONGESTION OF THE LIVER.

By congestion of the liver is meant an increase in the amount of blood in the organ. Owing to the arrangement of its vessels, the circulation in the liver is influenced by the condition of the heart and lungs, and by the state of digestion. It is therefore very liable to suffer from change in blood supply.

Causes.—Excesses in eating; insufficient supply of sharp grit. The admission of irritating substances to the blood, as cayenne pepper, condition powders, etc., increase the tendency to congestion. When the heart is affected and the proper amount of blood is not forced through, an abnormal fullness of the venous system results and the liver is the first organ after the lungs to suffer congestion thus caused.

Symptoms.—A general langour is apparent; the face assumes a yellowish color; loss of appetite; diarrhoea is frequently present and great tenderness is evident upon pressure over the region of the liver.

Treatment.—Avoid all stimulants. The food should be some easily digested substance, as boiled oatmeal. Give one teaspoonful of Epsom Salts dissolved in water once daily for three days.

Congestion of the liver will frequently cure itself if the bird is given access to plenty of grit and the diet is restricted to plain foods in moderate quantities.

ACUTE RHEUMATISM.

Definition.—Acute rheumatism is a constitutional disease, characterized by fever and inflammation of the joints, occurring in succession.

Causes.—Whether dampness, cold or sudden chilling are direct causes, or are predisposing influences, is a question, but certain it is that attacks of this disease are more numerous when these conditions exist.

Symptoms.—Thirst and constipation occur. The legs become painful and refuse to support the body. Upon examination one or more of the joints are found to be hot and swollen. Very soon, probably the next day, other joints become affected, and those first attacked become less painful, and the swelling subsides. This tendency to migrate or shift from one joint to another is the most characteristic symptom of acute rheumatism. When there are no complications, the fowls begin to move about the fifteenth day and are restored to health in about three weeks.

Treatment.—There are a host of remedies for rheumatism. Salicylic acid in two-grain doses, in capsules, every four hours, is probably the best, but has the disadvantage of requiring too much time to administer. Another good remedy is to dissolve half an ounce of bicarbonate of potash in half a pint of the drinking water. To breed from birds subject to attacks of this disease is dangerous, as there is great posibility that the disease will manifest itself in succeeding generations.

WORMS IN POULTRY.

The symptoms are sometimes like those of the gapes, the chicks gasping for breath and sometimes coughing, but a careful examination of the wind pipe when dissected may fail to reveal any worms there. Then give the following treatment for worms in the intestines, as it has proved successful in several cases:

Two tablespoonfuls santonine.
Two tablespoonfuls sulphur.
Two tablespoonfuls powdered charcoal.
Two tablespoonfuls salt.
One-half teaspoonful cayenne pepper.
One tablespoonful powdered copperas.

Half of the above was mixed with six quarts of coarse cornmeal, scalded to a crumbly consistency and fed for supper to 200 chickens. The following morning four tablespoonfuls of sulphur was mixed with four quarts of meal, slightly moistened with warm—not boiling—water and fed for breakfast. In two days the chickens seemed more active and the cough was greatly lessened. The dose was repeated at the end of the week. It might be repeated at long intervals during the summer as a preventative measure if the malady was bad the first season.

Dusting with lime was tried, also smoking with sulphur, using a bee smoker for the purpose, but neither lime nor sulphur, taken by inhalation, was of any benefit.

COLDS.

Cause.—All or nearly all ailments to which domestic poultry is heir to start from a cold. Like human beings, they contract slight colds at every change of the weather. If these colds are attended to at once, they go as they come, but if allowed to become firmly seated, turn into canker and roup.

Symptoms.—We have known instances where birds in the pink of condition contracted colds and commenced to dump and appear lifeless, refuse to eat and develop an unquenchable thirst, all within five hours, but more frequently it shows itself in the form of swelled head, a slight watery discharge from the nostrils or a coarse, rattling sound in the throat.

Remedy.—If fowls so affected are attended to at once, no further trouble is experienced. A two-grain capsule of quinine administered night and morning will generally break up the most severe attack. When the bird has the "rattles" and finds it difficult to breathe, paint the exposed outside surface of the throat, between the wattles and around the outside portions of jaws with tincture of iodine and give two-grain capsuls of quinine night and morning. Where the head is swelled paint around the eye and whole of affected side of face and give quinine as mentioned above until cure is affected.

CONSUMPTION.

Causes.—It often arises in breeding in and in for too long a period, but most generally it is caused by a neglected cold, or being confined in dark, unhealthy places, which cause scrofulous tubercles on the lungs, liver and other organizations of the body.

Symptoms.—The symptoms are hardly noticeable in the early stages of the disease. In the more advanced state there is a cough with a wasting of flesh, and, consequently, indications of weakness, notwithstanding they are well fed. It is considered hereditary, and birds so affected should not be bred from.

Treatment.—Take a sharp hatchet and apply it just back of the comb. The bird will never be of use, either to breed or eat.

APOPLEXY, VERTIGO, EPILEPSY.

Causes.—Undue flow of blood to the head, which is usually caused by overfeeding.

Symptoms.—Running around in a circle or fluttering about, with apparently little control of the muscular actions.

Treatment.—Holding the head under a stream of cold water for a short time will arrest the disease; then place the bird in a somewhat darkened place by itself; feed sparingly on soft food for a few days. If this fails to cure, bleed from the large vein under the wing. Cut the vein lengthwise with a lancet or sharp knife; also give an aperient or a tablespoonful of castor oil to a large fowl, or teaspoonful to a small one.

SORE EYES.

Causes.—Overheating, dust, dampness or climatic changes.

Symptoms.—An apparent watering of the eyes, which, if not attended to timely, will turn into ulcerations.

Treatment.—Wash the eyes with castile soap and water, and give sulphur in food, and wash the eyes with diluted sulphate of lead.

COSTIVENESS AND CONSTIPATION.

Cause.—Too long continued feeding on dry food, without sufficient green vegetables, want of a sufficient supply of pure drinking water, or too close confinement.

Symptoms.—Unsuccessful attempts of the fowls to relieve themselves, although they make frequent efforts to do so, and when they succeed it is in small quantities and is hard and dark.

Treatment.—Give plenty of green food, mix bran and oat meal into soft food, and give ten drops of sulphate of magnesia to a pint of drinking water.

BRONCHITIS.

Causes.—The same cause that produces pip will cause bronchitis.

Symptoms.—Rattling in the throat when breathing, caused by cold settling on the lungs of the fowl, and the formation of mucus therefrom rising in the windpipe. If not checked, it is likely to result in consumption.

Treatment.—Remove to a dry place, and give Reliable Roup Coure with the feed, and slightly acidulate the drinking water with sulphuric and nitric acid.

DEBILITY.

Causes.—Overshowing at exhibitions, close confinement without fresh air, or it may be produced by a severe shock.

Symptoms.—Drooping without apparent cause, want of appetite, out of condition and general prostration.

Treatment.—Feed on good, wholesome food, a little at a time, give a raw egg daily until the appetite appears to return, when change to a little cooked meat, and put in ten drps of tincture of muriate of iron in the drinking water.

BLACK ROT.

Causes.—This disease is generally caused by want of exercise, continued sameness of food, indigestion and want of green food.

Symptoms.—Comb turning black, swelling of the feet and legs, accompanied by gradual emaciation.

Treatment.—The same as prescribed for indigestion will generally prove effective.

HERNIA.

Or Protrusion of the Egg Passage.

Causes.—It is caused by the exertions of the hen to expel an unusually large egg, or in old fowls the general relaxation of the system.

Symptoms.—Protrusion of the laying gut of the hen, which is forced out to such an extent after laying that it oftentimes does not recede.

Treatment.—Put the hen on a diet of rice and boiled potatoes. If the gut shows no inclination of receding itself, bathe the parts with lukewarm water, and after rubbing the protrusion with witch hazel, linseed or sweet oil, gently press it back into the body. Give daily a pill composed of two grains of calomel, one-quarter of a grain of tartar emetic, and one grain of opium; the above is for a large fowl, one-half a pill will be sufficient for a small bird. Do not give the fowl any stimulating food.

SOFT EGGS.

Causes.—Overfeeding and the want of the proper material for the hens to eat so as to form the shell.

Symptoms.—More or less inflamation of the egg passage, and the appearance of the egg itself.

Treatment.—Restrain from overfeeding, and place within reach of the hens plenty of old mortar or crushed oyster shells. Where it arises from the inflammation of the egg passage, give bolus of barley containing one grain of calomel and half a grain of tartar emetic.

BAD MOULTING.

Causes.—Though molting may not be classified as a disease, it is considered the most critical period of the year for old fowls. A greater drain is upon the system of the fowl during its change of feathers than at any other time, as not only does the life-giving process of nature have to be sustained, but an entire new coat has to be grown. But moulting is generally caused by either too close confinement, improper food or a constitutional weakness of the fowl, occasioned by too long in-and-in breeding.

Symptoms.—A general wasting away, inactivity of the bird during the time of process of moulting.

Treatment.—Take good care that the fowl is kept warm, and not allowed to go in the wet or rain; give soft, warm food in the morning, with good grain mixed with hemp seed in the evening, also a little chopped meat daily, or bread soaked in ale; also add our Reliable Roup Tonic to the drinking water, a teaspoonful to a pint of water.

CHICKEN POX.

Causes.—This disease is frequently caused by unfavorable conditions of the atmosphere and generally occurs in cold, wet weather. It is of an infectious character.

Symptoms.—The head, face or body is covered with small ulcers, containing an infectious matter.

Treatment.—First wash with castile soap, and then with a strong solution of chlorate of potash; also mix a little pulverized charcoal and sulphur in the soft food, about a teaspoonful of each to a pint of meal. Anoint the head with "Carbolate of Cosmoline" until cured.

FROSTED COMB AND WATTLES.

Causes.—Exposure to cold, freezing weather, more particularly at night.

Symptoms.—Discoloration of the top of the comb and edges of the wattles, which first turn a purplish color and afterwards become pale and bloodless.

Treatment.—Anoint the parts with the witch hazel oil, bathe with cold water, after which apply glycerine and "Carbolate of Cosmoline."

VERMIN.

Causes.—Filthiness of quarters, foul nests, want of earth baths.

Symptoms.—General wasting away, with a constant pecking and scratching of the body.

Treatment.—Clean out and fumigate the hen house by closing it up tight and burning sulphur therein; make new nests, with a dust bath mixed with powdered carbolate of lime, also put into the roots of the feathers of the fowls Persian insect powder, and if the bird appears suffering from debility, treat it the same as already prescribed.

CONTAGIOUS DISEASES.

Colds, roup, diphtheria are highly catching, and such cases should at once be isolated. Birds suffering from diarrhoea or cholera should be parted also, as they make the ground very unhealthy for the other stock. The slightest ailment should at first be treated as contagious and isolation effected. When the nature of the complaint is discovered, treat accordingly. Doctoring poultry is most troublesome and very expensive; prevention is better than cure.

CROWDING.

One of the commonest evils, and most fatal to success. Most amateurs go in for several breeds of poultry. Would advise starting with one or two breeds at first. The birds may be kept in comparative comfort during the winter months, but in the breeding season when the chickens begin to come, and in August, when pullets have to be separated from cockerels, and these again in October kept separate from adult hens—when these also have to be parted from their mates, and exhibition birds require each their roomy and separate pen—it is impossible to rear many breeds successfully, each having its perfect exhibition specimen. For this, space is a matter of necessity.

DAMPNESS.

Dampness in poultry houses is especially injurious to health. Care should be taken to stop all leakage, and to insure dry sleeping places. Birds will bear being out on a grass-run on the wettest days better than being housed in a damp place. Carelessness in this respect is the source of colds, inflammation of the stomach and liver disease, and is apt to develop scrofulous deposits should the strain be weakly in any way.

DROPPING EGGS.

This is caused by too stimulating diet, also by want of lime, oyster shells or grit for shell formation, also by the hens being too fat. Feed less, give no meat for a time, vary the diet with rice, potatoes and wheat. Give a dose or two of castor oil, and iron tonic in the water. Should this not cure the evil, give one grain of calomel and one-twelfth grain of tartar emetic.

DUSTING.

Poultry are in the habit of cleaning themselves in dry dust, mortar, rubbish or ashes by scratching the dust up in their feathers. This keeps them in health, and prevents vermin. Provide a dust bath for the purpose—a good large box with sides about a foot high filled with dust, dry screened mortar refuse, road scrapings, fine gravel or sand, or let the whole sheltered run be covered deep in the above, in which case no special bath is necessary. Hens are wretched if this absolute necessity for their comfort is not studied. The dust bath, however, has its dangers in the case of hens with newly hatched broods.

BONE DUST.

Very beneficial for the feeding of growing birds up to five or six months of age; a preventive of weak legs and diarrhoea; an aid also in postponing the development of young birds, while it provides materials needful for continuous growth, and gives strength and size to the frame. It should be about the fineness of coarse oatmeal, and should be sifted into and with the meals used, in the proportion of three ounces to the pound. Fresh bones chopped and pounded, or burnt bones, are not so useful for the above purposes as they are for laying stock or for birds of an age for exhibition.

HEREDITARY DISEASES AND EVILS.

Consumption is the disease most carefully to be guarded against. A consumptive strain will be a constant source of care and disappointment. Squirrel tail is sure to be reproduced in many of the young birds. Wry tail is also hereditary.. Crooked breasts, thumb marks on combs or any peculiarity in the spikes of the comb, white face where red is the proper color, is dangerously hereditary, ear-lobes splashed or marked with red where pure white is a point, vulture hock, all these defects will be reproduced. Birds with malformations or anything missing, such as being short a toe, or having any peculiarities, should not be used for breeding.

HOSPITAL.

Every poultry yard in which, say, even 100 birds are reared yearly, should be provided with a place specially devoted to penning sick birds, where an invalid can be at once isolated and properly doctored. This place must be open to the sun, screened from the east wind, dust dry, freely ventilated, yet free from draught, and warm. The hospital should be whitewashed with hot lime frequently, and perfect cleanliness maintained.

PULLETS NOT LAYING.

If they are over six months old, they are either over-fed, which can be ascertained by feeling their condition and weighing, or under-fed. If pullets are much exhibited and the runs often changed, this will prevent egg production. Should the birds be thin, give meat and a little stimulant, such as buckwheat and sunflower seed; if fat, reduce diet and give an aperient. Constant exhibiting is very fatal to laying.

EARLY OPENING OF HOUSES.

This has much to do with health, and if birds that rise with the sun are shut up in close, ill-ventilated roosting-places till 7 or 8 a. m., no success will attend the mismanaging owner. The roosting house should open into a covered run, which the birds can enter at their own free will, to find a little food and to amuse themselves till the attendant comes his rounds, which he must do in summer at 6 a. m.

TO PREVENT LAYING.

Birds for show have, at times, to be kept back. They are in show form just when they begin to lay, and never look so well after. If they are early and you wish to delay laying, and so prolong the period of growth, move the pullets about from one run to another.

SLIPPED WING.

This chiefly occurs with fast-growing cockerels and ducklings. The primary feathers, which are naturally tucked up out of sight, stick or trail out; the bird has no power to tuck them up. Should the same feathers stick out and appear twisted, so that the inside of the quill is outside, it is probably an hereditary evil. In the first instance, it frequently occurs from a number of cocks being kept together, giving rise to some ill treatment, constant racing about and nervous flapping of the wings; these being soft and delicate as yet, the birds fail to fold them in closely, and a habit is acquired of letting them hang down out of place. Tucking them up into place when the bird is asleep at night is sometimes effectual. But the best way is to sew a band around the wing-feathers near the shoulder, and attach this to another which is passed round the joint of the wing, to prevent it slipping off. It is work of patience and difficulty.

FRESH BLOOD.

If birds are bred in-and-in too closely, many evils will ensue—loss of size, fewer eggs will be laid and a general want of stamnia will be observable. It is well, therefore, occasionally to purchase a cock from one of the best yards, and if it is for show purposes, ascertain the pedigree and if possible see the pen from which he was hatched. It is the easiest thing in the world to introduce a glaring defect into your flock, and one of the most difficult to breed a fault out. Where birds are kept in separate runs and pens the produce for the following year or two will not be so nearly related as to require invigorating by fresh blood; in fact, any large breeder of a well-known strain will be very shy of introducing new stock for any purpose. By a wise system of crossing and separation, thoroughly unrelated birds can be kept ready to hand for the mating season.

FEATHER EATING.

A horrid practice, one might almost call a disease, to which fowls brought up in confinement are liable, which dirt and crowding encourage. Idleness is one cause; poultry are often kept in a pen where they have no means of scratching about or amusing themselves. The earth should be forked up, thrown into heaps, and straw thrown over it. This will give occupation and tend to arrest the evil. Want of fresh water is another source of the disease; the water should be replenished often, and kept in the shade. Cabbages tied up whole and tightly to the wall of pens will amuse and serve to pass the time, and a piece of meat hung on the wall furnish good exercise.

FIGHTING.

Extreme care should be taken to prevent this amongst show birds, as five minutes' sparring may upset all chance of a special or prize by injury to comb or feathers. Nail up cloth to all partitions eighteen to twenty-four inches high; this prevents all danger. In cold weather a severe fight may be serious. If the birds are ailing after it, put nitric acid in the water sufficient to taste it, and give a capsule of cod liver oil with quinine thrice daily. Slip a raw egg down the bird's throat now and then till vigor is restored.

HANDLING FOWLS.

If you catch a bird, leaving its wings free, a desperate struggle will ensue, likely to injure exhibition plumage, or to distract a broody hen from her vocation. Approach the bird from behind, place both hands firmly and quickly over the wing joints, then slip the right hand down and secure the legs firmly. All fluttering will thus be avoided, and the bird, held by the legs with the left hand, will not offer resistance. All catching and handling of fowls should be done at night, or after first making the pen dark, if this is feasible.

WASHING EXHIBITION BIRDS.

Get two tubs, fill the smaller one with a good lather of soap and water (for one bird half a pound of white soap is sufficient); stand the bird in the lather and wash it, using a softish hair brush, and with it your hand. Thoroughly brush and cleanse the feathers everywhere, leaving no spot untouched, and don't be afraid of wetting thoroughly. Use no half measure, and take care not to bend or brush the

feathers the wrong way. This done, having prepared warm water in the larger and deeper tub, dip the bird in and out freely and thoroughly rinse every vestige of lather out; lastly, take a can of merely chilled water (may be very slightly tinted with blue for white birds) and pour this over the bird, drain and dry as far as you can in a Turkish towel, place the bird in an exhibition coop and set it at a comfortable distance from the fire. As the bird dries and fluffs out, gradually draw away from the fire. Leave the birds all night in a warm kitchen, and next morning place them in their own preparing pen, which, meantime, has been laid deep in fresh straw. Let them rest here for twenty-four hours, or twelve at any rate, before the journey, otherwise a risk of cold is incurred. After the bath, when still wet, give a teaspoonful of wine, and later a meal of bread and meat scraps, which are gratefully devoured as a rule; by and by a handful of wheat as a treat cast in the straw will tempt them to scratch for it. A moist warm atmosphere must be kept up in the drying coop, or the feathers will not web properly; place water within reach, and add to it a little tonic.

If the birds are not drying properly, try to turn them so that the heat will strike all sides equally. Hard-feathered birds, such as Andalusians, Brown Leghorns, Malays, Dominiques, Game, Black Spanish, do not require so much washing. White birds and Asiatics demand the greater care. boiled in water to a jelly. This is much liked, and will lay

FEEDING FOR EXHIBITION.

Birds for show should be brought up as directed on page 60, and then about three weeks before exhibition special diet should be given; fresh meat once a day, a piece the size of a walnut; plenty of green food, and twice a week linseed, boiled in water to a jelly. This is much liked, an dwill lay on flesh and produce gloss on feathers. Bread and milk is excellent for birds that are going to or returning from a show; a few handfuls of hemp at odd times, and best wheat will get the birds into grand order.

TREATMENT AFTER EXHIBITION.

On the arrival of birds from an exhibition, feed them on soft and (if cold weather) warm food, containing a little of our "Poultry Tonic"; give a very little water containing a tonic. See that they are housed very warm. If they are shortly due at another show, give bread and milk for one meal daily, and rice and milk with meat. If the crop is loaded with Indian corn, feed very sparingly, even of soft food, at first, and if it feels hard, give a teaspoonful of gin on arrival; it will aid digestion.

VENTILATION.

Is a neglected but most important subject. Poultry houses are often either draughty or they are unventilated; if the first, the birds are always uncomfortable, and a late egg supply, owing to cold housing, will be the result; if the latter, serious disease will follow, such as diphtheria, or the birds will be dull, without appetite, the wings will droop, upright combs will get blue at the tips, and fall over limp and flabby. Besides the door entrance, every roosting house should have a window, which can be left open on hot nights, a wire screen of small mesh should be placed over it to keep out enemies; in the winter a piece of perforated zinc is preferable, as it prevents the wind rushing in, and yet gives enough air. If a window is not practicable, a hole under the eaves will answer, covered with zinc wire. The higher up ventilating openings are made the better. Foul air rises, and openings must be made or the fowls will suffer. Ventilating holes should be drilled in all artificial mothers, dryers and shelters; foul air generates very quickly where chickens congregate.

TREATMENT OF SHOW BIRDS.

Hatched in the three first months of the year, they must be well fed and housed, and yet allowed perfect freedom on grass runs wherever fine and dry. Soft food should have bone-dust mixed with it, and the meals should be ample and frequent, but never so large as to remain uneaten and to get sour. Meat and green food should be given in plenty. At from three to four months the cockerels should be separated from the pullets; no crowding, no want of cleanliness should be allowed, and no roughing it in bad weather, or the feathers will be soiled. These must be kept spotlessly clean and fresh, and care must be taken that no rough wire or ill-made doors, or awkward perches injure the plumage, on which prizes to a great extent depend. Three weeks before the show, pen the birds, cock and pullet, separately, giving each a friendly companion of their own sex; feed on bread and milk, wheat, and two or three times a week give linseed; boil to a jelly and mix with oatmeal till it is friable; this will gloss the plumage. Also give barley-meal, buckwheat, a little hemp and meat. Let the pens be deep in fresh straw, and see that the dust-baths are very clean. Two days before the show give night and morning a meal of rice boiled in milk, stiff, and plenty of wheat. A little meat chopped into the rice is much enjoyed. Rice is to prevent any chance of diarrhoea in the show pens, which entail extra soiling of the plumage. Green food should be given in plenty, preferably grass, lettuce and spinach. Forty-eight hours before showing, wash the birds if need be. Feed as above until an hour before starting. Lastly, wash the comb, face, etc., with soap and water, dry, and rub over with vinegar; give each bird a teaspoonful of wine—they will then sleep instead of fretting on the journey. Inside the hamper, at the side, tie the top of a loaf of bread soaked in port wine, and a head of lettuce, to pick at; this will bring them in good condition to the show pen. If shown in pairs, do not omit, three days before the show, to give the cock or cockerel a hen in his pen, but not one which is to be exhibited. He will then not take much notice when the show pullet is introduced into the exhibition hamper, which should be done about three hours before the train leaves to insure that no fighting occurs.

GENERAL TREATMENT OF COCKERELS.

During the first twenty-four hours give no food, and remove, till all are hatched, from the hen or incubator to a box having ventilating holes bored in the side, and a hot-water bottle slung by means of coarse flannel, so that the chicks may feel the warmth and the least pressure on their backs. When all are hatched, cleanse the nest completely, and well dredge the hen's body with insect powder; give her the chicks and place chopped egg and bread-crumbs within reach. The less they are disturbed during the first two or three days the better.

Warmth is essential, and a constantly brooding hen is a better mother than one which fusses the infant chicks about and keeps calling them to feed. Pen the hen in a coop and let the chicks have free egress. The best place to stand the coop is under sheltered runs, guarded from cold winds, the ground dry and deep in sand and mortar siftings. Further warmth is unnecessary if the mothers are good; and if the roof is of glass, so as to secure every ray of sun, so much the better. Cleanliness of coops, beds, flooring, water vessels and food-tins must be absolute. The oftener the chicks are fed the better, but food must never be left uneaten. Water must be made safe, or drowning and chills may be expected. The moment weather permits, free range on grass for several hours daily is desirable, but shelter should always be at hand.

Diet.—The longer the supply of hard-boiled eggs chopped fine is kept up, the better. As the birds get on, every kitchen scrap is invaluable, and the following mixtures may be given for meals in turn as convenient, variety being essential for success: First meal, as early as possible—6 a. m. —egg chopped, mixed bread crumbs; second meal, kitchen scraps, chopped fine in a wooden chopper, given warm, and mixed to a crumbling mass; third meal, rice boiled in milk, and dried up crumbly with Scotch oatmeal; fourth meal, barley-meal mixed crumbly with the liquor in which meat has been boiled; fifth meal, meat chopped fine and bread reduced to crumbs (not necessary daily.) These preparations given in turn and with judgment will, with occasional handfuls of small, dry grain and barley and buckwheat baked with water in the oven, give the chickens all that is necessary for building up the strong framework which is essential to a fine-developed bird. The use of bone dust must be omitted, and a constant supply of green food, together with mortar, oyster-shell, gravel and all manner of grit and dust should be insured. Pure water, never left to stagnate or freeze or to get hot in the sun, and if possible, milk occasionally, will render the diet perfect. Chicks so kept, the quantity given being increased with their size and appetite, will be found at four months, or, at any rate, at five, to be fit for table without the unhealthy and unpleasant process of cramming. If destined for the show-pen, they will be ready to "go in" for the further care and preparation needed for exhibition. At this age cockerels must be divided from pullets, and the chicken period may be considered over.

FOOD FOR CHICKENS

ADVANTAGES OF DRY FOOD.

WHETHER chickens should be fed water and dry grain or no water and sloppy food, until weaned, is a very far-reaching question. Personally we do not believe in sloppy food at all for chickens. Years ago cows were fed on sloppy food and mashes, but experience has taught us that dry bran and meal are more digestible and produce better results every way. The latter is the article of commerce now used more than the old pinhead oatmeal. It is soft and the little chicks take it readily. This we feed dry, scattering it on the floor for the chicks to pick up. We took a tomato can and filled it about half full with fresh milk, to which its weight of boiling water had been added, and inverted this can in a tin saucer, just large enough for the chickens to readily reach the milk but not large enough to admit their feet getting in. This can was replenished in the afternoon. We have never seen chickens relish a dish as much as that dish of milk. This lot of chickens was fed on oats and milk until a week old, when a bread made of ground oats, bran and Indian meal was fed to them. A little cracked corn, and wheat was gradually given them, and when three weeks of age the latter was the staple food, but fresh water was substituted for the milk after that. We never saw or raised a healthier lot than the above, barring only one chicken. The above system enabled us to save time, as the dry food could be given, without danger of spoiling or becoming foul, once or twice daily.

Another lot of chickens were fed on cracked corn, rolled oats and cracked rice from the first. They had all the water they wanted to drink and did exceedingly well. The great danger of sloppy food, especially in warm weather, is its becoming sour and producing bowel trouble. This is strikingly so when bran and meal are fed, and we prefer to feed both dry and let the moisture come from the water. Water is indispensable, especially to brooder chicks. The latter kept in too warm a temperature are apt to drink too much. This was illustrated recently while on a visit to a friend. Our friend had 120 chickens in a brooder and complained that they would do nothing but drink, and did not eat as they should. Investigation showed that the chickens were confined in a dry, hot brooder. He placed a pan of water in the brooder, lowered the temperature somewhat and found that the chickens stopped the habit of drinking water almost entirely. This leads us to think that the advocates of "no water" base their experience on chickens raised under hens. If such chickens are fed moist food and great care taken to keep the food clean and sweet, they can get along without a regular supply of water, but foraging in the damp grass certainly gives them a natural supply of moisture not always calculated upon. To watch chickens on a hot day and conclude they need no water is a thing that few men will believe. We have never seen any ill effects in chickens from water if allowed full liberty, but in confinement, under bad sanitary conditions, water is more apt to satisfy the cravings of a feverish and unhealthy lot of chicks than good food will. We saw a very healthy lot of chickens recently that were fed cracked corn and whole wheat only from the start. They had an unlimited supply of water to drink and were allowed unlimited range. Taking time and labor and general results as a guide we can state that in our experience we prefer the dry grain and water method with free range as the safest and most profitable.

COOKED MEAL FOR FOWLS.

It is too much the practice to feed raw meat to poultry under the mistaken idea that as the worms and insects which they seize with such avidity are uncooked, so should be any meat given them by their owners.

But the early worm which biddy takes in her empty crop, soft, pulpy and crushed by the bill before it descends the gullet, is one thing, and the coarse, dry, stringy, fatless flesh thrown to them "in the rough" and the tough, is quite another, even if the carcass of horse or sheep so bestowed is not still more objectionable on account of disease. True, these nearly "dry bones" may serve to while away a weary hour in the monotonous life of the poultry yard, and happily the fowls may labor under the impression that they are eating something. And so they may serve a certain purpose in the poultry world. But for real aid and comfort to the fowls save all your refuse meat, and buy in addition, "liver, lights and all," as the old story runs, from the shambles, and boil all together for two hours or more. Then chop finely and mix with meal in the water in which they are boiled. This dry, rich mess, showing bits of meat, like raisins in plum pudding, will be a dish fit to set before any "queen of the (poultry) harem," and she and her maids of honor will pay you for it in more than words, as your egg basket, high with pearls, will show on many a succeeding day.

COOKED FOOD.

It is some trouble to prepare and cook the food for a lot of fowls, but it is amply repaid by their more rapid development, and the larger price they will bring when ready for sale. The assertion, that they will grow more rapidly on

cooked than on uncooked food has often been demonstrated as correct by actual experiment, and a proof of the fact is that those kept principally on food that is cooked grew away from those which are cared for equally well, except that their food was given them in a raw state.

Market poultrymen, who raise chicks for the early market, give cooked food and find it to be necessary to secure successful profits in the business; and if this is true, the thoroughbred poultry breeder will gain likewise in the greater size and rapid growth of his stock, and thus get them ready for early sales, early shows and better prepared to enter the winter months. The males can be disposed of easier, the pullets will begin laying earlier, and the business will prove more of a pleasure.

Cooked feed should be sufficiently dry to enable the attendant to make it up into balls which will crack open when thrown out.

A USE FOR WHEAT CHAFF.

No better use can be made of wheat chaff than to use it as litter in the poultry houses, in which the hens can scratch and exercise. If a gill of millet seeds be scattered in the chaff the hens will work and hunt for the small seeds industriously until every one is found, and as the seeds are so very small, the hens will be more earnest and diligent, the seeds also being somewhat of a luxury. The chaff will also assist in keeping the floor dry, thus adding to the warmth and comfort of the poultry house during periods of cold or damp weather.

FEEDING WARM FOOD.

The poultryman who furnishes the flock with warm water twice a day, hits the nail squarely, and in this connection we say give them a good meal of warm feed on cold mornings, whether they be fancy fowls or running about the farm house. It will pay in either case as well as any investment you can make of your time. It may be made of almost any kind of ground grain or mixture of grains. We use a good deal of corn, ground cob and all together (quite fine). This gives them a roughness of feed they cannot well get in cold weather in the absence of grass and such filling feed.

AMOUNT OF FOOD REQUIRED DAILY.

In an experiment in England for the purpose of determining the daily amount of food consumed by different breeds of fowls, the following was the result:

Dorkings	6 ounces 391 grains
Games	4 ounces 275 grains
Buff Cochins	17 ounces 296 grains
Langshans	7 ounces 31 grains
Dominicks	4 ounces 326 grains
Brown Leghorns	4 ounces 398 grains
Hamburgs	4 ounces 120 grains
Polish	4 ounces 28 grains
Guinea fowls	4 ounces 182 grains

It will be seen that the Buff Cochins eat much more than any of the other breeds, and to show the increase of weight in proportion to food consumed it may be stated that each gained daily as follows for twenty days:

Dorkings	138 grains—laid 130 eggs per year
Games	92 grains—laid 100 eggs per year
Buff Cochins	77 grains—laid 115 eggs per year
Langshans	123 grains—laid 115 eggs per year
Dominicks	92 grains—laid 110 eggs per year
Brown Leghorns	107 grains—laid 190 eggs per year
Hamburgs	92 grains—laid 239 eggs per year
Polish	46 grains—laid 98 eggs per year
Guineas	— grains—laid 75 eggs per year

It will be noticed that the Hamburgs gave the largest number of eggs and the Brown Leghorns next, but the Dorkings and Langshans made the largest daily gain in growth, while the Cochins, though consuming enormously of food, did not show its effect either in eggs or the first twenty days' growth. Taking the three highest for weight at six months, the following was the result:

Dorkings weighed 10 pounds, 1 ounce and 685 grains.

Buff Cochins weighed 9 pounds, 13½ ounces.

Langshans weighed 10 pounds, 5 ounces and 437 grains.

The greatest gain was made by the Langshans, but for the food allowed the Dorkings are entitled to the honor. We give the above as the result of experiments in England. In this country the conditions would be reversed perhaps. Hamburgs seldom lay as many as 239 eggs, but in England the climate seems best adapted to both Dorkings and Hamburgs. In estimating the results, the kind of food should be considered, which was not given. We use corn largely in this country, and hence experiments here would be conducted differently. Chicks when hatched usually weigh about one and one-half ounces, those from the large breeds having an advantage. We hope some of our readers will conduct similar experiments.

HEATING POULTRY HOUSES.

Unless the weather is extremely cold the poultry house will require no heat. It should, however, never be at a lower temperature than 40 degres above zero, and this can be secured by properly lining a poultry house so as to prevent the entrance of too much cold air. The windows will allow of the entrance and absorption of a large amount of heat during the day, but at night the heat will be radiated away if the glass is not covered on the outside with a piece of batting or a shutter. But in regard to the best method of heating, we should suggest a stove with a sheet iron drum, a stove pipe being connected with the drum so as to conduct the heat to the extreme end. Openings may be made in the stove pipe at proper distances, to serve on the principle of registers for egress of the hot air, in order to warm every portion of the house. We do not say that a stove so arranged will heat a large poultry house, but it should increase the temperature sufficiently to prevent freezing of the combs and wattles. Too much heat should not be desired, as it will make the hens tender and more susceptible to colds and sudden changes.

HENS IN WET WEATHER.

The damp, wet seasons are more injurious to the fowls than is the cold, dry weather of winter. Dampness is the source of one-half the diseases. It is not so much the amount of water they come in actual contact with, as the constant humidity of the air and dampness of their surroundings. Damp weather means an accumulation of mud and filth in the yards and coops, which is always in a state of decomposition and a source of annoyance. To avoid this difficulty the coops should be cleaned daily and the floors sprinkled with fine, dry land plaster or dry earth. The yard should be drained, and every precaution used to turn the water away. In the case of chicks they quickly succumb to dampness. The moisture is constantly being evaporated, thus carrying off the animal heat. The same is true of adult fowls. They do not get wet as far as the water passing through the feathers on their backs is concerned, but the under parts of their bodies have no protection against the water on the ground, which soaks in and chills them, the result being roup and other diseases which arise from colds. A few pinches of red pepper in the food is excellent for them at such times.

ARTIFICIAL INCUBATION

General Remarks on Incubators and Brooders—Good Machines are Simple in Construction and Easy to Operate—The "Old Reliable" Briefly Described—Work Done with the Reliable, and Definite Information About How it was Done—The Reliable in Foreign Lands.

WITH due deference to the necessary hen (necessary as an egg laboratory) we are still forced to admit that she is not able to successfully compete with the modern incubator. In hatching eggs the shallow-pated and fretful hen is at a great disadvantage. It is her pea-sized brain against the brain of a man. It is her long list of bodily ills against insensible wood and metal. It is her patient (?) breast probed by the feeders of a thousand lice, against a machine that has no fear of such pests. And so on through the list.

Nor is this all. Rollins, in his ancient history, tells of artificial incubation being resorted to on the banks of the Nile by the Egyptians who built the ancient pyramids, in the shadow of which Napoleon said to his soldiers: "From those pyramids forty centuries look down upon you." We learn from recent reports, shown elsewhere in this book, made by the United States Consuls, that large "Incubators" or "Hatching Ovens", are now used by the Egyptians in hatching poultry.

Theoretically, the modern incubator should easily dis-

On the other hand there may still exist drawbacks to the incubator, but we are fully convinced that there is no drawback that cannot be overcome. The modern, improved incubator, when well made, is a complete success.

The writer has taken an active interest in artificial incubation for twenty-eight years past. We have watched the development and rapid improvement of the incubator.

We do not mean to say that twenty-eight years ago the incubator was a new thing. Not at all. 'Way back in 1845, on Broadway, New York, some ingenious Yankee was hatching out large numbers of chicks by artificial means and charging crowds of visitors 12½ cents per head to step inside and gratify their curiosity. To convince them that it was not a fraud this New Englander would break open eggs and show the chick at different stages of development.

tance the hen, and we freely maintain that a brooder that is built on correct principles and is properly handled, is as much an improvement over the hen as is the incubator. Both are much surer than the hen. That is the main point, and it is true for many reasons. In a properly constructed incubator the temperature is uniform throughout the egg chamber. It is very seldom, is it not, that your house lamp goes out? An incubator or brooder lamp should be every bit as trustworthy as your house lamp. The regulator is, or should be, a simple thing. A person is liable to be myst[illegible]ed in

thinking about the means of regulating an incubator, but as a rule they are both simple and trustworthy. Not only that, but we know from experience that properly fertilized eggs will stand pretty rough treatment. We have only to consider the hen's treatment of eggs to appreciate this. Time and again we have had hens stay off their nests until it seemed to us that the eggs could not possibly hatch. They would then go on with the job and at the appointed time walk demurely off, followed by from seven to a dozen happy chicks.

A few words more about the brooder. We have seen chicks that were raised in a brooder in April and May walk right away from those cared for by a hen during the same months—chicks of the same age and both lots free from lice. Every duck and chicken raised on our farm for several years has been raised in brooders, and out of many thousands we have not lost over four per cent from all causes. They grew rapidly and seemed to be entirely satisfied with their lot. Chicks raised by hens during the same period were fully one-fourth smaller and a larger percentage of those entrusted to hens were lost.

We strongly advise the use of incubators and brooders. If you do not feel able to buy both this year, buy a brooder. It will pay you and please you. Another year you will want an incubator. Don't buy a brooder simply because it is called a brooder. Don't do that. Study the matter over before you accept as pure gospel the magnified praise bestowed on any article that is offered for sale. In these pages you will find a cut showing an up-to-date brooder with perfect ventilating and heating system.

It is costly, if not impracticable, to raise poultry on a large scale by the aid of hens alone. The good incubator makes this easily possible—not for the men who have failed at everything else they have tried in life—but for the men who succeed as a rule with what they undertake. A man can multiply incubators as long as his pocketbook holds out. So he can hens, but he cannot make hens sit when they do not want to. All the king's horses and all the king's men can not do that with the "ornery" hen.

THE BEST INCUBATORS MANUFACTURED.

Among the best few incubators manufactured at the present time is the Old Reliable, the machine that has been used successfully for the poultry public for the last twenty-six years, and it has probably done more than any other machine to advance the methods used in artificial incubation. Ideas that were not thought of before the advent of this machine on the market are now used by a number of other manufacturers, a large number of whom are parties who were at one time connected with the present manufacturers of the Reliable. This machine has been simple in construction from the first, and every improvement that has been added to it since first patented and placed on the market, has been made with a view to simplify it both in operation and for practical use.

We shall confine our remarks about incubators to the "Old Reliable," as we hardly think that a better example could be furnished. Our purpose in introducing this incubator here is not to advertise it, but to discuss perfect and correct principles to be used in an incubator, how to guard against failure, and the case with which excellent results in artificial incubation can be obtained with a good incubator.

The real secret of the wide-spread success of Reliable Incubators is the even temperature imparted to all parts of the egg tray through the entire hatch, which is due to the elegant construction and arrangement of the heating apparatus, which is most amply complete. The nearer all possible variation in the temperature of the hatching chamber is overcome, the nearer it is to what is desired. Any sudden or extreme change is naturally injurious to the eggs and causes that great difficulty of chicks dying in the shell more than any other feature in artificial incubation. Especially is this true during the first week of incubation, when the chick embryo is first taking shape.

Another great essential to success with an incubator is to have the conditions in the hatching chamber uniform throughout. In too many machines that are made more to sell than to hatch, three or four thermometers placed at the same time in different parts of the hatching chamber will show a variation of from three to ten degrees. This condition of things is ruinous to good hatching.

The regulating device furnished with the Reliable Incubator is we believe, the most complete and trustworthy and sensitive in existence. It will do just what and all that is claimed for it. We herewith present an illustration of the sectional view of the machine, showing the regulator, just how it is connected, which, for simplicity certainly cannot be surpassed. That it will do the work, we do not believe we can give any better evidence than the fact that we use it on our machines.

This sectional view also shows how the Standard Reliable Incubator is made, gives figures and information as to the entire construction upon which the Reliable Company holds eight distinct and separate patents.

Good value is put into all Reliable Incubators furnished, and for twenty-six years past they have proven themselves a practical success in the hands of thousands of purchasers. The testimonials which appear in this book are only one of the many sources of the evidence of satisfaction that these machines are giving.

HOT WATER AND HOT AIR INCUBATORS.

The Reliable Incubator & Brooder Co., offers to the public this year, the best line of incubators and brooders ever offered to the trade. Their latest styles of incubators are made under their new patents, showing greater and more valuable improvements over the old style machines than ever before. They are making their incubators and brooders on scientific principles, combining every advantage in them that bring about the very best results. They have had over twenty-six years experience continually testing different ideas advanced regarding artificial incubation, and as a result, are in a position to know, from experience, how to hatch and raise the largest percentage of chicks, and what is necessary to constitute a strictly first class, good machine.

They make several styles of incubators—

First—The New Standard Reliable, both hot air and hot water, with and without brooder combined.

Second—The Reliable Bantling Hot Air and Hot Water Incubators, with and without brooder combined.

Also several styles of brooders, viz—The Indoor Hot Air and Hot Water Style, the Outdoor Hot Air and Hot Water style, and the Double Sectional Loop Hot Water Pipe Brooder.

They also manufacture and supply a Hot Water Heating System. This system you will find herewith fully illustrated and just as it can be furnished by them, and this system can be adapted to almost any size brooding house.

The question is often asked, "What is the best, hot-air or hot-water machines?" Our answer is, one hatches just as good as the other, the only difference is, should you by neglect fail to fill your lamp or allow it to go out, the Reliable Hot Water machine will keep up the heat from 6 to 8 hours, on account of the large body of water stationed over the tops of the egg chamber and surrounded on

top and sides by heavy insulation, not allowing the water to cool off. This is not in the hot air machines. We have no reason to speak a good word for one more than the other, for we make both kinds and know that one is just as good as the other. Naturally, those firms that only make one kind claim the kind they make is the best, which is natural for them to do. Not so with us, for we know from experience what both kinds will do, hence we are not partial and will tell the actual facts.

General Construction of the Reliable Incubators

THE CASE.

The walls of these machines are double; the space between them carefully insulated with the best of non-conductors of heat known. All lumber used is thoroughly seasoned.

The top above tank is heavily insulated with four thicknesses of cotton, separated by as many sheets of non-conducting, heavy cardboard, also, an extra layer of cardboard above and below.

The Standard Reliable Incubator has two separate doors, which are made extra thick, with extra heavy glass. This arrangement permits an easy observation of all parts of the egg chamber at all times, without opening the door of the machine. These doors close against a jamb, positively causing them to seal themselves, thus overcoming any chance of cold air entering the machine from this source.

The legs, as will be noticed by the illustration, are neatly turned, and arranged to extend with a shoulder underneath the corners of the machine, where they are secured with screws, giving to the whole machine the rigidity of a solid piece. Upon the compactness of the egg case depends almost altogether the ease with which the heat is kept regular, and upon an even temperature the results of the machine depend more than anything else, and it is the first great absolute necessity in natural and artificial incubators.

A DOUBLE HEATING SYSTEM.

A unique feature of the Reliable is its double heating system—a feature possessed by no other incubator, and one which gives a decided advantage in economy of operation.

In the hot water machines there are two tanks, a hot air tank above the hot water tank. This tank, in addition to heating the fresh air supply, before conducting it into the egg chamber, also radiates heat from its own surface, in sufficient quantity that, if necessary, the heat from the hot water tank could be cut off entirely and the hot air tank would maintain the temperature at the proper degree. This heat from the hot air tank is saved, whereas it goes to waste in other makes of incubators.

We have, therefore, a double system of heating, combining all the advantages of the hot air and hot water systems, overcoming all of the disadvantages of either.

Practically the same system is embodied in our hot air machines, there being two tanks, (both hot air,) one closed and running entirely through the incubator; the other open at the inner end, supplying fresh air and at the same time radiating the heat.

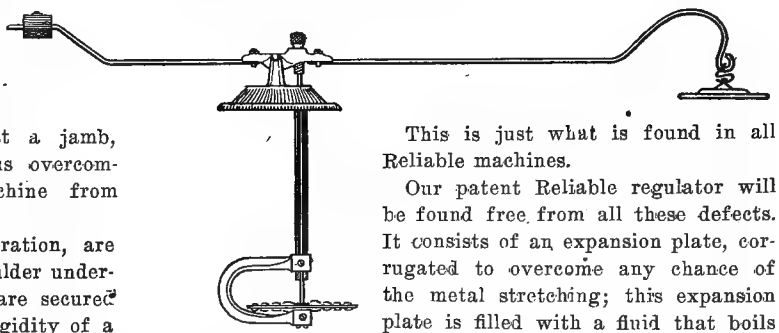
In all other makes of incuabtors the supplementary heat is lost, necessitating the use of an extra amount of fuel.

SAFETY FEATURES.

The lamps, burners and chimneys are all metal and are so constructed as to be perfectly safe. There is no breakage to cause frequent expense and delay, with the thermometer (for it is the only guide you have regarding the heat,) it cannot be too accurate, and insist upon every incubator thermometer being high grade and tested by the United States standard, instead of depending on the cheap articles used by some makers, because they can be bought for about one-third the price of a good thermometer.

THE RELIABLE REGULATOR.

Next to supplying the proper amount of heat to the hatching chamber, in importance is the regulation and evenness of this heat as it comes in contact with the eggs, thus necessitating a regulator that is extremely sensitive to the slightest change of temperature.



This is just what is found in all Reliable machines.

Our patent Reliable regulator will be found free from all these defects. It consists of an expansion plate, corrugated to overcome any chance of the metal stretching; this expansion plate is filled with a fluid that boils and forms a steam at a temperature just lower than 103, and is tested by hydraulic pressure at a temperature of 150 degrees and then hermetically sealed, thus positively insuring results desired without any chance of injuring any of its parts, and thus making it practically everlasting. As this steam forms, it expands the plate slightly, which, through the arrangement of the compound levers, raises the valve over the heater perceptibly, allowing the heat to pass directly out of the heater and cutting it off from the machine and egg chamber. This immediately causes the temperature to commence lowering until the proper temperature is reached, when the valve will have resumed the same identical position as it first occupied, and it will be found at no time has there been a variation of one degree from the desired point. No other regulator known will do this, although all manufacturers make the strongest kind of claims that they fail almost entirely to substantiate. Our regulator costs us considerable more than any other used for similar purposes costs; it is worth it many times over to the operator and consequently to us. So accurate is the regulator on these Reliable machines that no lot of eggs even entrusted to their care have been spoiled on account of overheating.

OUR REGULATOR ON OTHER MAKES OF MACHINES. Supplied for $3.00.

Without any intention of criticizing our competitors, we wish to say that our regulator is arranged so any one can understand it, easily adjust it, and operate it without difficulty. Possibly the greatest trouble with some of the regulators used is their complicated mechanism. All that is necessary to adjust ours is the simple turning back or forth of the thumb-screw. During the past season we have put over 500 of these regulators on other machines, and will furnish them to any one, with full instructions for attaching, for $3.00. When ordering, send rough sketch of machine, showing end at which heater is located.

THE EGG TRAY.

The trays are made of thoroughly seasoned material and are strengthened with cross bars. The bottoms of trays are covered with extra heavy gauze, producing an article that is durable and easily handled.

We furnish with each Standard Incubator a Patent Turning Tray, which is a time-saving device.

THE NURSERY.

As the chicks soon get on their feet when hatched, it becomes necessary to provide a means to remove them from the extreme heat of the upper egg chamber, and to get them out of the way of the hatching chicks. A nursery, which is located under the tray, fills the requirements exactly. The chicks that are hatched work their way to the front of the machine, where there is sufficient space to permit the chicks to get into nursery below, thus overcoming any occasion for opening the door of the machine.

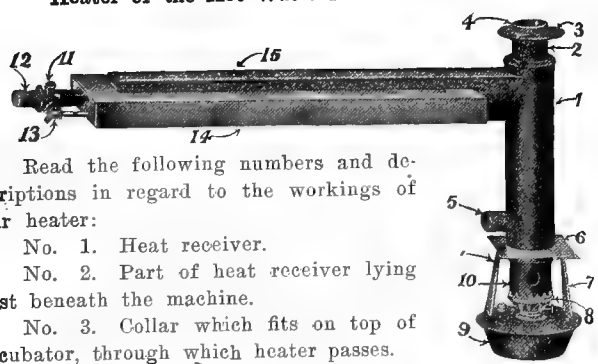
THE FINISH.

The material, as heretofore stated, used in the construction of our machine is as dry as it can be secured, consequently would readily absorb moisture, which would soon cause the wood to crack and warp were it not for the thorough finish. The inner and outer cases are given several coats of the best wood filler and varnish.

Both cases are thoroughly primed with filler and given time to dry. Then, they are given two additional coats of the best varnish, the first being allowed to dry thoroughly and harden before the second is applied. Also, it is perfectly dried before the machine is prepared for crating.

THE HEATING APPARATUS.

Heater of the Hot Water Reliable Incubator.



Read the following numbers and descriptions in regard to the workings of our heater:

No. 1. Heat receiver.

No. 2. Part of heat receiver lying just beneath the machine.

No. 3. Collar which fits on top of incubator, through which heater passes.

No. 4. Opening at the top of heat receiver, where regulator damper works on and off.

No. 5. Extension from the heat receiver, which passes underneath egg chamber, furnishing fresh, warm air.

No. 6. Collar underneath the machine, holding heat receiver in place.

No. 7. Metal hangers which hold lamp in place.

No. 8. Burner.

No. 9. Metal lamp.

No. 10. Metal chimney.

No. 11. Filling tube on outside of incubator, where copper tank is filled.

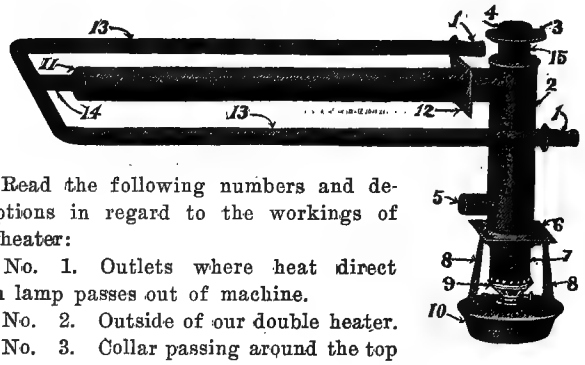
No. 12. Outlet pipe.

No. 13. Faucet to draw off the water from the copper tank.

No. 14. Copper tank.

No. 15. Double heating system, which also furnishes fresh, warm air to egg chamber.

Heater of the Hot Air 400-Egg Size Reliable Incubator.



Read the following numbers and descriptions in regard to the workings of our heater:

No. 1. Outlets where heat direct from lamp passes out of machine.

No. 2. Outside of our double heater.

No. 3. Collar passing around the top of heater outside of incubator, fitting on top of machine.

No. 4. Opening on the outside of heater, where damper works on and off in regulating heat.

No. 5. Opening from the outer chamber of heater passing through, supplying warm air underneath egg tray.

No. 6. Collar on the bottom of incubator around heater.

No. 7. Lamp chimney, fitting on the inside of heater and on lamp burner.

No. 8. Hangers which are attached to lamp and which should be attached to the machine, holding lamp in position.

No. 9. Burner and wick.

No. 10. Metal chimney.

No. 11. Opening where warm or fresh air passing out of our double heating system, and furnishing fresh, warm air to the egg chamber.

No. 12. Collar on the inside of heating chamber which holds the heater in position at heater end.

No. 13. Two outside pipes which carry heat direct from lamp.

No. 14. Center heater which carries the heat direct from lamp, emptying into pipe No. 13.

No. 15. Heater underneath the top of machine.

CUTAWAY OF STANDARD INCUBATOR SHOWING INTERIOR PARTS AND FIXTURES.

The following numbers give description of different parts and fixtures:

No. 1. Top boards on incubator.

No. 2. Packing in the upper part of the incubator.

No. 3. The balance bar of regulator.

No. 4. Expansion plate where small pin No. 6 rests in.

No. 5. Double heater carrying fresh, warm air into incubator.

No. 6. Regulator pin.

No. 7. Hot air pipe, carrying fresh, warm air in underneath egg chamber.

No. 8. Warm air space between double walls at lamp end of incubator.

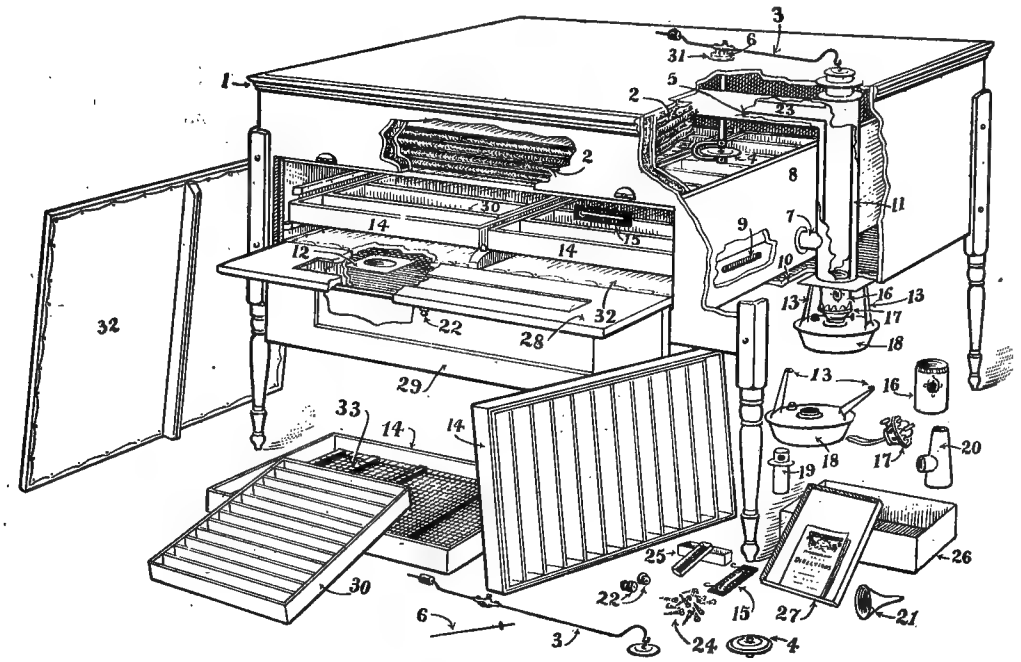
No. 9. Cutaway of end, showing where warm air, coming through pipe 7, empties out under egg chamber. There is another opening the same distance on the other side of heater used for the same purpose.

No. 10. Bottom boards on incubator.

No. 11. Outer chamber of heat receiver, which warms the air that passes in 5 and 7.

No. 12. Cutaway in bottom of incubator, showing ventilators bringing cool air from the outside, bringing it underneath the egg tray where the warm air from 7 passes through 9, which, coming in contact with this cool air, rarifies this air and causes it to sweat, which applies moisture automatically to the eggs.

No. 13. Metal hangers on lamp.



No. 14. Egg tray.
No. 15. Thermometer.
No. 16. Metal lamp chimney.
No. 17. Burner and wick.
No. 18. Metal lamp bowl.
No. 19. Outlet pipe.
No. 20. Metal egg tester.
No. 21. Funnel for filling hot water incubators.
No. 22. Two knobs, one for door 28, and the other for door 29.
No. 23. Pipe attached to heat receiver where the heat passes direct into it from lamp, passing through, carrying away the fumes from the lamp, emptying them out at the far end of the machine.
No. 24. Screws for fastening on legs and knobs on incubators.
No. 25. Thermometer box, which, when packed ready for shipping, is placed in Egg Tester 20.
No. 26. Box where fixtures are packed.
No. 27. Directions
No. 28. Inside glass door.
No. 29. Outside glass door.
No. 30. The slats or turning devices which belong to tray 14.

Cut of packing, as shown in the top of our incubator. See Figure No. 2 in the Sectional View of Incubator.

No. 31. Knife edge bracket where, balance bar No. 3 rests upon.
No. 32. Removable nursery tray underneath egg chamber, covered on the lower side with flannel and on the outside with burlap, leaving an inch air space between the two, where the air after passing in through 7 and 9, also 12, must pass through the space between them before it enters the egg chamber original.
No. 33. Screen wire in bottom of tray.

MOISTURE AND VENTILATION.

Next in importance to the proper heating of the egg chamber and the proper regulation of this heat, comes the question of moisture and ventilation. Indeed, we must say that they are of first importance, for more hatches are ruined by ill-ventilated incubators than from any other cause.

The questions of moisture and ventilation are so intimately connected, that they are practically one, and by successfully solving one in the Reliable, we have solved both.

An examination of the sectional view on page 13 will show the ample provisions we have made for a rapid circulation of pure, fresh air throughout the egg chamber. The cold air is taken into the incubator at L, where it comes into contact with the heat flue M, and is thoroughly heated before entering the chamber. At different points about the egg chamber, vents are provided, through which the air escapes. This ventilation is necessary, because of the constant discharge of carbonic acid gases given off by the egg in the process of incubation. This obnoxious, poisonous gas must be removed and replaced by fresh, pure air, with its life-giving oxygen, or the chick is poisoned and suffocated in the shell.

To a failure to provide for this extremely necessary circulation of pure air may be attributed the failure of so many of the poorly constructed machines now offered the public.

The Reliable has accomplished perfect ventilation by providing for a constant circulation of air through the machine (all heated to the proper temperature before entering the egg chamber); and to the rapidity of the movement of this air is due largely the success of the hatch, and almost entirely the drying process of the moisture in the egg. By the aid of the most powerful, sensitive and accurate of instruments, and with the assistance of the most expert authorities in the world, we have found just what is required and just how to secure that requirement positively, practically and simply.

So perfectly is all this provided for, that no artificial moisture is required, and the machine will take care of itself in this regard, as the moisture is provided in the Reliable in exactly the same manner as it is provided by the hen. The cold air, coming into contact with the heated body, gives off sufficient moisture for almost every hatch. Consequently, you do not require moisture pans with the Reliable.

Our moisture is thus supplied. The cold air passes in at N, up around the inner heater M, and is heated. It, then, passes through the tubing marked "Fresh Hot Air Supply," and is emptied out in and above the hot water tank in the hot water machine, and above the hot air tank in the hot air machine. Then, it must pass down, over on each side of this tank, and pass through D, which is the hanging or perforated wall. The cold air passes up through JJ, then passes through the double perforated, removable bottom; the warm air from the top and the cold air, coming in contact with each other, causes a sweat, and rarifies the air. The moisture from this

rarified air naturally settles upon the eggs, which forms a moisture without any artificial moisture whatever.

The old hen does not ask for a pan of water, neither do our machines. Some machines have been operated with moisture pans successfully, but they are exceptional cases, and not likely to happen again, for even the manufacturer using them is not able to tell you just how they should be used.

RELIABLE INCUBATOR AND BROODER COMBINED.

These are, of course, not adapted to operation in a cellar or a sunless room—for that matter such a place is not fit to raise chicks, either with a hen or in a brooder, and if an incubator is to be operated in the cellar, or a room where where is not plenty of light, then the plain machine, without top brooder, should be used; but if the room in which the incubator is to be run is well lighted, like a south, southeast or southwest room in a dwelling, or a good poultry house, or stable, then the combined machine is practical and economical. With this machine there is unquestionably a great saving of time, labor and expense in operating. The incuabtor and the chick can be attended to at the same time, and one lamp operates both machines.

An essential point in poultry raising, especially early in the season, is to get the young birds well started on the road to health at the time they leave the shell. With out nursery attached to the hatcher the little chicks, during the most delicate and tender period of their lives, are nicely sheltered and made comfortable. By an improved arrangement our combined Incubators and Brooders utilize practically all of the heat that is generated by the lamp, wasting none.

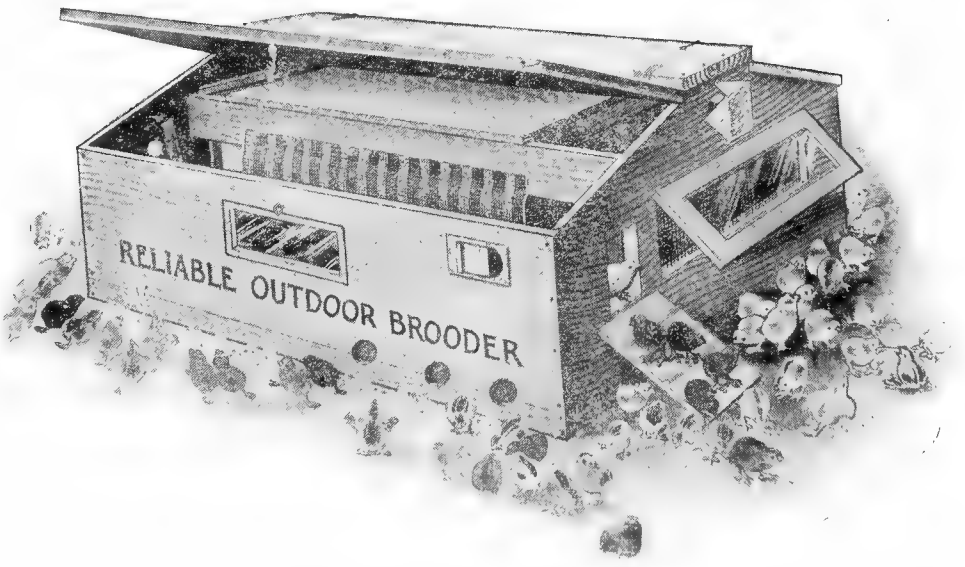
Heat is supplied to this top brooder directly from the lamp, not from egg chamber. In this combined machine we have simply built a brooder on top of a plain style machine, and by placing a large tube over the escape vent, which tube connects at its upper end with a tank, we have provided a reservoir to receive and hold, for the purpose of warming the brooder, every bit of heat that is thrown off by the regulator after the temperature inside the egg chamber has reached 103 degrees. IT IS SIMPLE, PRACTICAL AND ECONOMICAL. The heat thus furnished is top heat. The regulator bar is inclosed with metal, so the chicks in the brooder cannot interfere with or displace it, and the tubing is so arranged that neither fumes from the lamp nor gases from the hatching chamber can find their way into the brooder. A vent is located in the top of the brooder tank so as to create sufficient draft to cause the heat to pass up into this reservoir.

RELIABLE OUTDOOR BROODERS.

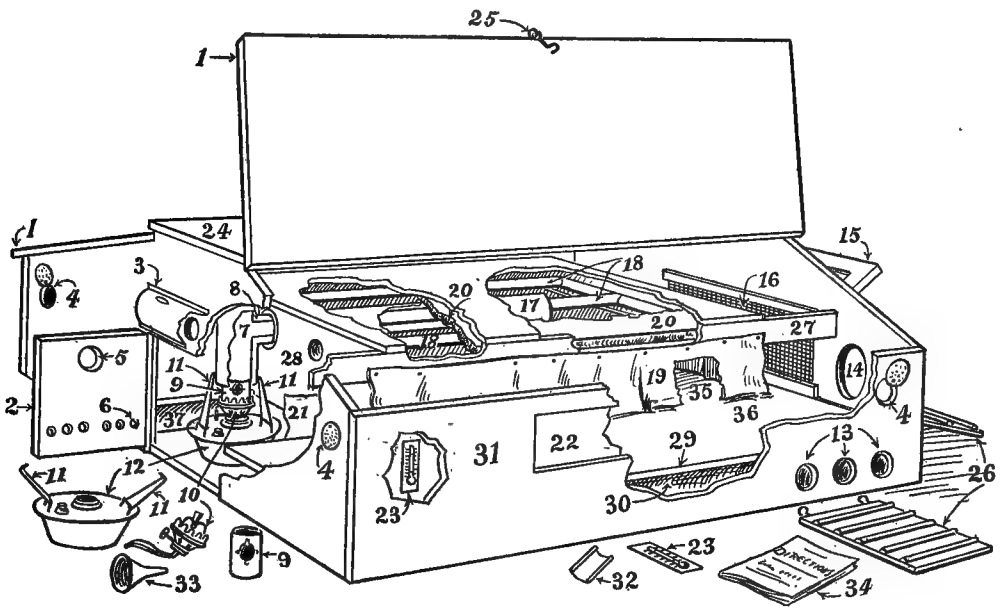
Hot Air and Hot Water. (See Illustration.)

We claim that our Reliable Hot-Water and Hot-Air Outdoor Broders combine more good points than any other make of outdoor brooders thus far invented, and we leave the decision to the reader's unbiased judgment. A practical and durable outdoor brooder has long been needed, and several attempts to produce one had resulted in failure, until we introduced this style of brooder, which proved a success from the first. We manufacture these brooders in four sizes, a 50-chick, a 100-chick, a 200-chick and a 300-chick size. They are manufactured in two styles, one being heated by hot water, the other by hot air. A brief description of these brooders will suffice, we think to recommend them to the judgment of experienced poultrymen. These brooders should be located in the inside of a building or under a tree, or in an orchard or grove. They have been in use for several years and have proved highly satisfactory.

The Reliable Outdoor Brooders are warmed by top heat exclusively. In the hot water style a copper boiler is located near the top of the brooder in the rear end, leaving about four inches of space between the top of the brooder and the top of the copper tank. The heat from the lamp passes through the body of water and heats the water to the desired degree. The heat that escapes from the copper tubing, after passing through the tank of water, empties out into the compartment where the lamp is located and is utilized by passing out through a tubing that is located above the copper tank and is connected with the lamp compartment, and allows no fumes from the lamp to enter the brooding chamber. It is arranged in such a way that all fumes from the lamp are discharged outside the brooder.



100, 200 AND 300 CHICK SIZE



Cutaway of Outdoor Brooder, Showing Interior Parts and Fixtures.

No. 1. Two metal covered doors opening and closing on top of brooder.

No. 2. Door closing up lamp compartment.

No. 3. Shield over ventilators in lamp department.

No. 4. Ventilators on brooder with slides attached opening and closing at will.

No. 5. Window in door or lamp department so the blaze of the lamp can be seen without opening door.

No. 6. Ventilators in door of lamp department.

No. 7. Where heat passes direct from lamp and heat receiver in pipe and through pipe 18.

No. 8. Where heat passes through the outer pipe into opening 17.

No. 9. Metal chimney.

No. 10. Burner and wick.

No. 11. Metal hangers to lamp.

No. 12. Metal lamp bowl.

No. 13. Three ventilators underneath floor of brooder. There are three ventilators at the opposite corner on the other side so as to give a circulation of air underneath floor of brooder so the floor will be kept dry at all times. These ventilators are covered with wire cloth so as to be rat-proof.

No. 14. Door for chickens to pass in and out.

No. 15. Glass door at end of brooder, to be closed or opened at will.

No. 16. Screening over opening, so when door 15 is opened, chickens cannot pass out, nor any varmints cannot enter.

No. 17. Opening where heat and fresh air passes out of pipe.

No. 18. Pipe where heat direct from lamp passes through.

No. 19. Curtain around inner hover.

No. 20. Packing above the heater.

No. 21. Metal casing around lamp department, so no air from that department can enter into the brooder; also, a positive fire protection.

No. 22. Glass in each side of brooder.

No. 23. Thermometer.

No. 24. Metal center top of brooder.

No. 25. Hooks which fasten each top metal door down to side of brooder.

No. 26. Runway, where chickens pass out of door 14.

No. 27. Frame to hold heating aparatus and curtain in position.

No. 28. Outlet pipe, where heat, after passing through brooder, empties into metal lamp chamber.

No. 29. Floor of brooder.

No. 30. Cutaway, showing space underneath floor of brooder.

No. 31. Outside of brooder.

No. 32. Thermometer holder.

No. 33. Funnel for filling hot water brooders.

No. 34. Book of directions.

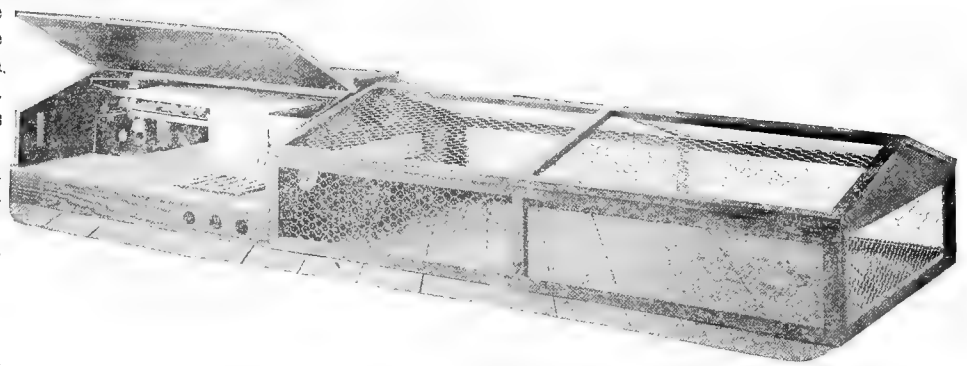
No. 35. Hover for chickens.

No. 36. Space outside of hover, where chickens are to be fed and exercised.

No. 37. Block which you will find marked "Take Off." This block is placed thereon, as fixtures are packed in the lamp chamber when shipping. This block must be taken off so as to allow sufficient fresh air to pass in the lamp chamber. You will find one of these blocks on each side of the lamp chamber.

RAT PROOF YARD FOR OUTDOOR BROODERS.

This reproduction shows the intersection of the Reliable Out Door Brooder with rat-proof yards attached. This brooder has a double heating system and is by far the easiest operated and with less trouble than any other brooder made. It is a positively safe and secure brooder. The chicks cannot crowd, and are always comfortable and healthy. It is well ventilated and cannot be overheated. On another



page is a reproduction of this brooder as in operation. The rat-proof yard, as here attached, is one of the most secure and will positively not allow rats, minks, crows or any kind of vermin to get at the chickens. They are built and shipped in knock-down and can be hooked together securely. They are made without bottoms, so they can be moved from one plot of grass to another. When these yards are used you know your chickens are safe. They are made and sold separate from

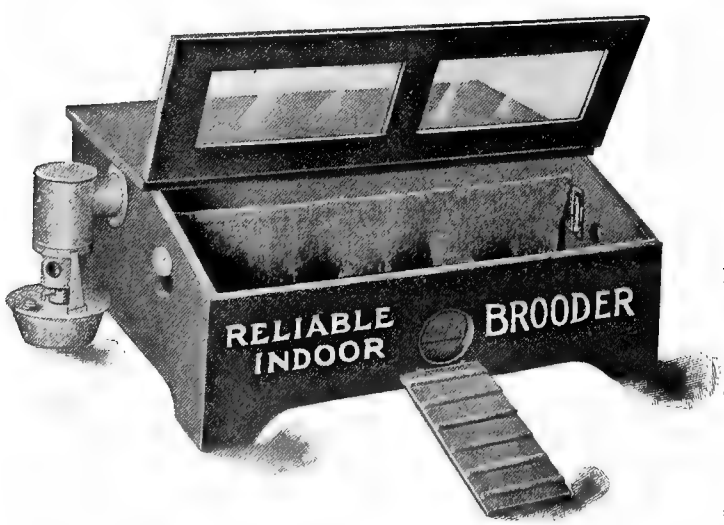
the brooders. The price of our out-door brooders as quoted are without the rat-proof yards. They are made in four sizes.

RELIABLE INDOOR BROODERS.

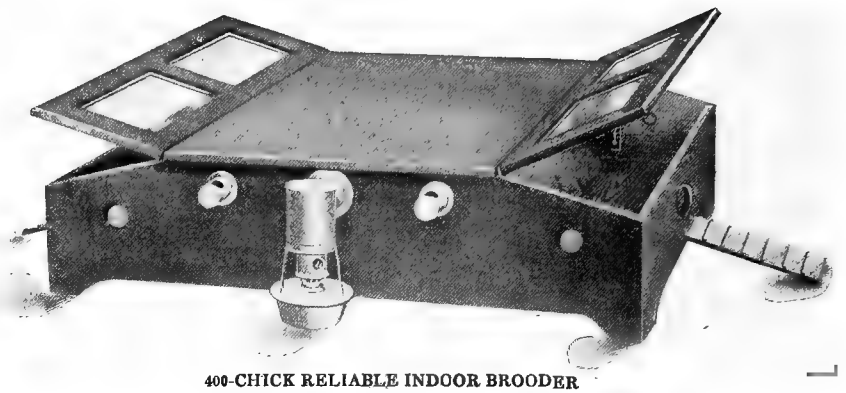
A brooder to be properly constructed must furnish top-heat and be so arranged that he chicks can, of their own accord, go to the heat or come away from it, just when they please. Here is to be found one of the main secrets of success in brooding chicks without the use of hens. This company, would, if it wished to, manufacture and sell a bottom-heat brooder. We did so for many years, or until we learned better. They can be made much cheaper, but we want our patrons to succeed, not fail. By all means, then, stear clear of all bottom heat brooders, and do not under any consideration consent to use a brooder which does not permit the chicks to go at will, both to the heat and away from it. The longer time, or the more time (on account of severe weather) the chicks have to spend inside the brooders, the more important these matters become. Bear in mind, that it is as injurious to chicks to overheat them as it is to allow them to chill.

The accompanying illustrations, reproduced from a photograph, give a good idea of what the Improved Reliable Indoor Brooders are like. The hot-water and hot-air brooders are exactly the same, except that the former is heated by means of water in a copper tank (same quality of copper as is used in the hot-water incubators), while the latter is heated in the same way as the hot-air incubators.

Both the hot-water tank and the hot-air reservoir are located in the top of the rear half of the brooders, leaving a space of six inches in the clear underneath them. In front of the tank and extending to the floor of the brooder is a curtain of heavy woolen cloth. This curtain partitions the



brooder into two equal parts, and, by retaining the larger amount of heat coming from the tank or reservoir in the rear apartment, furnishes two different temperatures for the chicks, one of which is fifteen degrees warmer than the other. The chicks (which are their own best thermometer) can go into either apartment as they please. If they feel at all chilly, they will go behind the curtain; if they should become too warm there, they will come out into the cooler apartment. Whenever the surrounding temperature will permit, they should be allowed to run out of the brooder into exercising yards. If they get a little chilly they will run back into the brooder as readily as they do under a hen. Unlike the notional old hen, the brooder is at all times ready to hover any or all of the chicks. With the hen a large per cent of the early hatched chicks die, because she will not hover them when they need warmth. This fact alone renders it impracticable to raise early chickens with profit by the hen method.



400-CHICK RELIABLE INDOOR BROODER

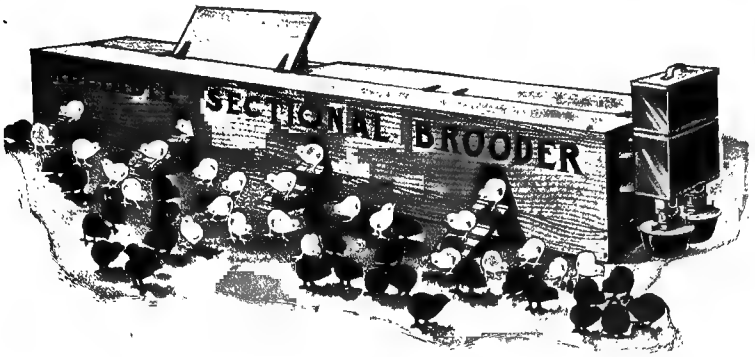
RELIABLE SECTIONAL DOUBLE-LOOP HOT-WATER BROODERS.

Herewith are shown our latest improved sectional brooders, which we make in lengths as follows: 3 feet, 6 feet, 9 feet, 12 feet, 15 feet and 18 feet. These double-loop hot-water brooders are made with pipes extending only one way from heater, unless they are over 12 feet long, when we extend the pipes both ways from heater; so in the 18-foot brooder the farthest place from the source of heat is only nine feet, and so arranged that where the brooder extends both ways from the heater, the heat can be shut off from one end of brooder, when not in use, if so desired, thus saving oil.

This double-loop hot-water brooder is meant for use in the sunny corner of a room, poultry house, barn, or in a small-sized brooder house. On page 47 is shown a style of house in which four or more of these brooders can be used to excellent advantage, the house being designed to secure direct sunlight in the pens on both sides of the central aisle. If one row of pens is desired instead of two, then a house with a simple shed roof is sufficient, with the windows (16x24 inches) placed under the eaves.

These sectional brooders are the most economical brooding device on the market. The heating system is perfect. In the interior view of the house shown the wire partitions to the pens or runs are omitted, so that a better view can be obtained. The rear ends of these partitions should rest on top of the brooder, just far enough back of the hinges to allow the doors to the hover (one of which is shown partly raised) to be opened from the aisle, in order that the attendant can clean out under the hovers each day or every other day without having to enter each pen. The pens can be entered from the central aisle through doors placed in the end partitions.

Before the chicks are placed in these brooders, put from four to six inches of dry sand on the floor of the runs, extending it in under the brooder (it has no bottom,) thus bringing the tiny chicks up four to six inches nearer the warm pipes than they would be if they stood on the floor of the house. A dirt floor is all that is needed for such a house, but it must be dry.



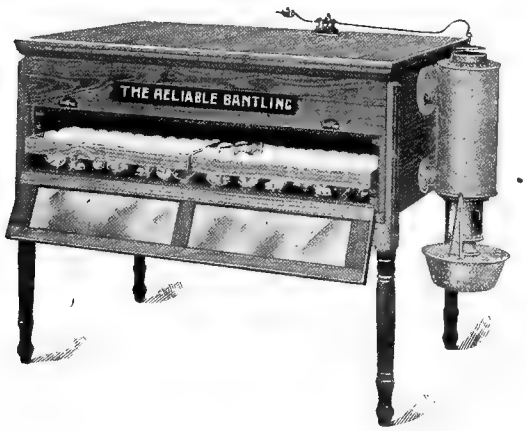
Two metal bowl lamps are furnished with each complete brooder; the water boiler and reservoir above them are made of cold rolled copper; the pipes are regular steamfitters' piping, and the lumber is extra select. In these brooders, the same as in our unequaled outdor brooders, a space is left between the back and the rear curtain, so that if the chicks go to crowding they will crowd each other out into a cooler air at one place, only to creep back in under the warm hover at another place.

We consider these sectional brooders a great boon to all persons using incubators and desiring to rear early chicks safely with the minimum of trouble and expense.

RELIABLE BANTLING INCUBATORS.

Hot Air and Hot Water.

In order to meet the demand for an incubator which can be sold at a lower price than we are compelled to put upon our high-grade Standard Reliable Incubators, we put upon the market several years ago our line of Reliable Bantlings, and have been more than pleased and gratified by the success they have attained.



We give them the same care in manufacture that is given our higher priced machines, and offer them to the public on the same broad guarantee given all our machines, warranting them to be superior to any other low-priced incubator made. They are hatching more fertile eggs and giving better satisfaction than any similar article in use today, and when it comes to the old hen, they have Biddy "beat to death." We have had reports of some phenomenal hatches in the Bantling, and we can send them to you with full assurance that they will give you satisfactory results, if placed in a room where there is no great change in the temperature, as they are single wall machines.

CONSTRUCTION.

The machines are made of high-grade, thoroughly seasoned lumber, which does not absorb moisture. They have double top and double bottom, both well insulated. The ends and back are made of one solid piece carefully rabbeted and cross-nailed at the corners. The legs are turned and carefully and substantially secured to the machine. The door has double glass front, is strongly constructed with wood frame, and closes against a rabbet or door-jamb, which is padded with felt. This positively seals itself when closed, excluding any possibility of air getting into the egg chamber in this way, which prevents a lower temperature in front part of it, making all parts of the machine heat equally.

TANKS AND MODES OF HEATING.

The tanks and mode of heating, ventilating and regulating are the same in the Bantling Hot Air and Hot Water Incubators as used in the Standard. Nothing but the very best cold rolled copper is used in all hot water tanks. All tanks are positively tested, which insures no leakage. The same double heating system is used in all Bantlings, same as used in Standard.

TRAYS.

These are made of the very best and most durable material. The eggs are turned by hand, for there is nothing that is better or more positive than turning eggs by hand; although this takes a little longer, it is more satisfactory. The nursery is arranged under the trays, as you will note by reference to the illustration. Its object is to provide a place for the chicks to rest and move about in while the hatch is being completed, which also keeps them off the eggs.

The regulator and thermometer are the same articles we furnish with the high-grade machines.

LAMPS.

The lamps consist of burner, lamp, fount, wick and chimney. It is an all-metal safety lamp of the same principle as that used on our high-grade machines.

The workmanship and finish throughout are up to the standard of our other machines.

RELIABLE BANTLING INCUBATOR AND BROODER COMBINED.

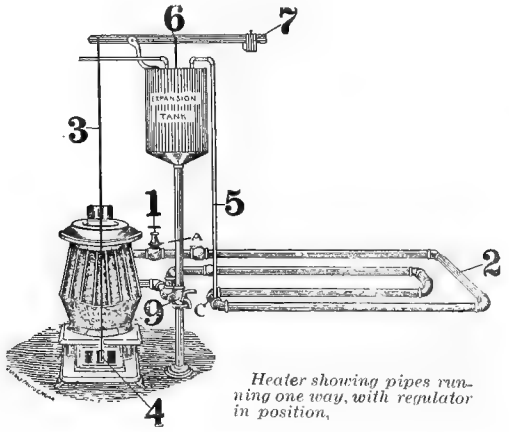
All combined brooders are made on the same principle, except the combined Bantling has only one yard.

IMPROVED HOT-WATER APPARATUS.

For Heating Brooder Houses. Guaranteed Perfectly Safe.

We furnish these heaters (the stove part) either with or without piping. We quote prices here for heaters alone, or with piping, supply tanks, automatic regulator, cocks and

everything complete. This apparatus is put together in our shop before shipment, and the different sections are marked in accordance with a diagram, with instructions for erecting, which we furnish the purchaser, thereby enabling him



Heater showing pipes running one way, with regulator in position.

to set it up correctly and thus avoid the expense of a special mechanic for that work. We will specially prepare this heating apparatus for any size house desired. For prices of other lengths than here quoted, write us.

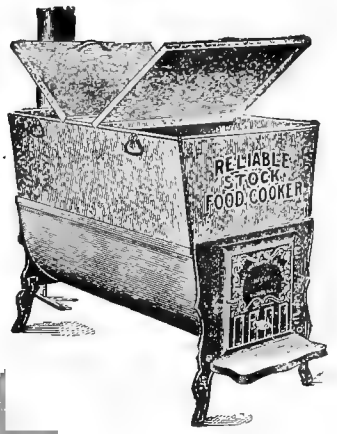
We positively guarantee that these heaters will heat the brooder houses for which they are designed in the coldest weather.

In houses 40 feet or smaller we run pipes only one way from heater, but in houses 50 feet and longer we run pipes both ways, unless ordered different, thus bringing farthest end of piping much nearer to the source of heat, as shown in drawing; and the system is so arranged that if only one end of the brooder is needed the heat can be shut off from the end not in use without interfering with the working of the end in use, thus saving one-half the fuel.

THE RELIABLE STOCK FOOD COOKER AND WATER HEATER COMBINED.

Cooked Food.

A large majority of the successful stock-raisers of the country need not be told of the advantage of cooking all stock food, for food cookers are fixtures on their farms, and they would not do without them. It is just the thing for the market poultryman who raises chickens for early market to cook their food. It is necessary to obtain the best results. Breeders of thoroughbred poultry who raise several hundred head each season, and who carry severals pens of breeders through the year will likewise find it to their advantage. They will obtain quick growth and greater size in their stock, and be enabled to get them ready for earlier sales or for exhibition at the early shows, and the stock itself will be more productive. The males can be disposed of earlier and the pullets will begin to lay earlier. All cooked food should be fed sufficiently dry so that it will crumble. This can be insured by mixing it with bran or with the Reliable Food described elsewhere in these pages.



Largest Thoroughbred Poultry Farm in the World

One Hundred and Thirty-five Pens of Standard-bred Poultry—Over $8,000 in Buildings—A Farm Where You May Obtain Show Birds or Breeders.

THE Reliable Incubator and Brooder Company now owns and controls about 7,400 thoroughbred fowls. On their large farm, located on the boulevard, in the beautiful suburbs of Quincy, there are to be seen no less than 135 pens of high-grade thoroughbred poultry, mated for breeding. Heretofore this company had 110 pens, but could not near supply the demand, and hence recently they have again enlarged their poultry plant, increasing the outlay in buildings to upwards of $8,000. Included in the above is a new brooding house and two-story packing and shipping house, 120x20 feet in dimensions, this brooding house having a capacity of 3,000 chicks. See the illustrations of farm and buildings, reproduced from photographs.

They are breeders of fancy poultry in the right sense of the words. They are not amateurs. They have conducted the breeding of fine poultry for over twenty years and have spared neither time nor money to perfect their birds and bring them to as near standard requirements as possible. Every fowl in their yards is bred on practical and scientific principles, and they are pleased to state that this part of their business has proved pleasant and renumerative; in fact, out of this industry was developed their extensive incubator establishment. They have exhibited their stock at Chicago, Peoria, Jacksonville, Bloomington, Springfield, Danville, Quincy, and other leading poultry exhibitions, and the high honors which have been awarded them is evidence of the high standard of their stock. The Reliable Incubator and Brooder Company is the only incubator firm in this western territory conducting its own poultry farm on a large and perfected scale.

In the foregoing pages will be found life-like illustrations of the diffirent varieties they breed, with descriptions of same. They are the most valuable and, therefore, the most popular of all varieties. By breeding in large numbers, aided by a complete system and a strictly modern plant, they are able to not only produce "as good as the best," but to sell choice stock and eggs at unusually low prices, quality considered. Under no circumstances will they send out disqualified or worthless stock, nor eggs from inferior stock. This they positively guarantee.

The list of average prices quoted in their catalogue is for guaranteed, pure-bred stock, bred to the requirements of the American Standard of Perfection—in other words, these prices are for good, strong, vigorous, highly productive THOROUGHBRED breeding stock, stock that will reproduce itself, true to shape, feather and prolific. Where fowls are wanted for eggs or meat, to breed for pleasure, or profit, or both, they can do as well or better by you than any firm or individual, with whom you may correspond.

Let them know what you want, and they will be pleased to advise or to serve you in any way.

This farm has been visited by some of the best known and most capable poultry judges in the world, and is used as a school of instruction and learning by teachers in numerous agricultural colleges and experiment stations and farmers' institutes. To give you a slight idea of its great size and thoroughness, we republish some of the letters that have been received regarding it and wish to add that never have any of the numerous poultrymen who have visited this plant been able to say they had anything to equal it or knew of as large and complete a plant anywhere in the country.

HIGHEST ENDORSEMENT FROM JUDGE AND BREEDER.

Carthage, Mo., May 15.

In November I first visited the Reliable Poultry Farm at Quincy, Ill., under contract with the Reliable Incubator and Brooder Co., to score 1,000 birds for them. I set out for Quincy with my mind fixed on those words: "Large quantity, poor quality." A short drive brought us to the Reliable Poultry Farm, nestled among fruit and flowers. A warm welcome awaited me, and during a three-days' stay I was royally entertained. I found a grandly arranged poultry farm, fine, substantial and well-painted buildings for the accommodation of the fowls by the thousand. It was not long before I had to rid my mind of many ideas formed in reference to large poultry plants, for pen after pen of ideal fowls fell to my view, grand elegant birds, able to stand up in any company and be a credit to their owners and to themselves. I went to work, and 760 birds were scored ere time was called, and I had to set sail for an engagement to judge the Albion show. The work was not completed and many worthy birds were left unscored. As our name went to score card after score card, with scores of 93 to 96, we said: "We find but few specialists with fowls as fine as these."

MR. C. A. EMRY

I found very few specimens with scores below 90 points, and I found men capable of consigning all unworthy specimens promptly to the market house, close cullers and firm believers in giving every customer 100 cents worth of value for every dollar entrusted to their care.

I paid a hasty visit to the Reliable Incubator factory and was shown over the large building by the genial president, Mr. J. W. Myers. I was truly surprised. The four-story building was thronged with busy workmen, and incubators and brooders in every stage of construction were examined by me. Every detail of the work was of the best, and, best of all, the employes are paid by the day to do good, honest work and build a substantial, honest machine.

It is my firm belief that the Reliable Incubator and Brooder Co. fully deserve the large trade bestowed upon them. I have heard many good reports from breeders who use the Reliable incubator, and the fact that I am using one myself, that I bought and paid for, is conclusive proof of what I think of them as practical and successful hatchers.

The Reliable people are devoted to their work and are ever striving for improvement in every way. They deserve great success and are achieving it. Fraternally,

C. A. EMRY.

TRAVELED OVER 1,000 MILES TO SEE.

West Salem, Wis.

Reliable Incubator and Brooder Co.

After traveling over 1,000 miles, round trip, solely to see your factory and farms, I have reached home safely, and look back with great pleasure upon the courtesies you extended. Your poultry houses and methods, on the "Reliable" poultry farm visited by me, are certainly worthy of study by those desiring the comfort, the convenience and the cleanliness for their fowls. The remarkable healthiness of the stock especially appealed to my practical nature, and their tameness bespoke care-takers who love the fowls not for money alone. If any distinction can be made among about 7,000 fowls with very few culls, your Light Brahmas, White Plymouth Rocks and Pekin ducks remain in my memory as exceptionally fine.

MRS. IDA E. TILSON

The heavy amount of mail I saw you receive and attend to, at your factory, and the large, busy force of clerks, showed that my wishes for your prosperity are met by facts. I saw and learned enough amply to pay me for my trip and give me great confidence in your methods, plans and promises.

Also was pleased with your progressive spirit that will certainly keep you in the forefront of manufacturers and breeders. Sincerely yours,

IDA E TILLSON.

Instructor of Poulttry, Minnesota State Farmers' Institute.

WHAT JUDGE THEO. HEWES SAW.

Quincy, Ill.

Reliable Incubator and Brooder Co.

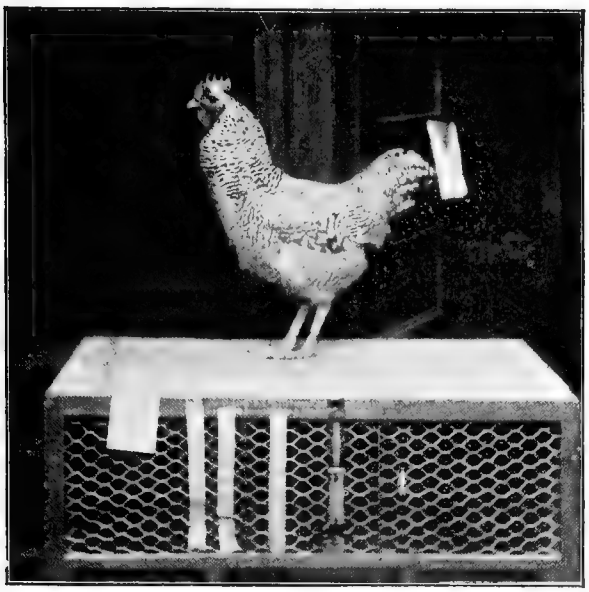
I have just completed a tour of the Reliable Poultry Farm, have looked over the stock and houses, and have no hesitancy in pronouncing them first-class. The quality of the stock is fully equal to that of our specialty breeders in Light Brahmas, Barred Plymouth Rocks and White and Brown Leghorns, while the Silver Wyandottes, Partridge Cochins and Pekin ducks are above the average. The Silver Wyandottes are especially fine—in fact, taken as a whole, I doubt if there are any of our specialty breeders who can show as good an average lot of birds.

MR. THEO. HEWES

There is a business-like way connected with this entire plant that makes one feel like there is really something in the business. The houses are well put together and constructed in such a way as to give both style and comfort to the fowls. The Reliable Incubator plant is too well knwn to the fraternity to need any mention here. I will say, however, that during these extreme hard times, they are furnishing employment to some fifty-five or sixty employes, and it is looked on as one of the very best industries in the city of Quincy.

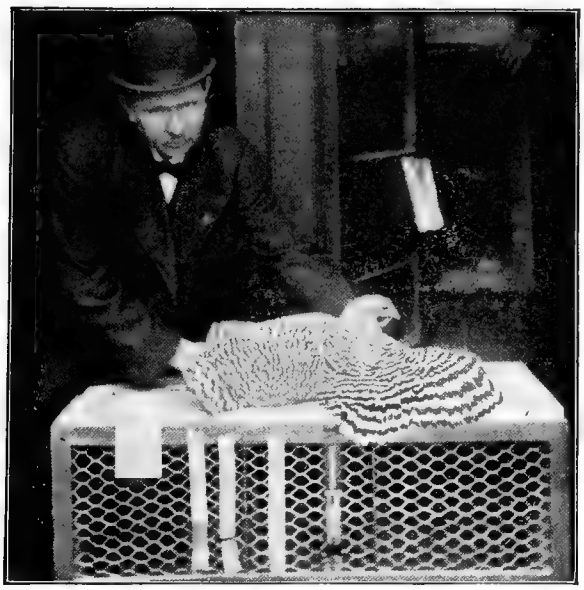
THEO. HEWES, Poultry Judge.

SCENES ON THE RELIABLE POULTRY FARM.
(From Photographs.)



Barred Plymouth Rock Cockerel.

Bred and owned by the Reliable Incubator and Brooder Co. Winner of first prize four times in November and December, 1907, and January, 1908. 108 birds in competition at last show.



Barred Plymouth Rock Pullet.

Bred and owned by the Reliable Incubator and Brooder Co. Winner of first prize four times in November and December, 1907, and January, 1908. 84 birds in competition at last show. See page 3 for pen of Barred Plymouth Rocks, bred and owned by the Reliable Incubator and Brooder Co. Winners of first prizes as pen at each of the above shows. Last show 21 pens in competition.

Crawfordsville, Ind., April 30, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill..

Gentlemen—I have been using your brooder for some time and it has given excellent success. I would not do without it. Your indoor brooder is far in advance of anything I have ever used. Yours truly,

MRS. ISAAC DAVIS,

No. Grant Ave., Box 107, Crawfordsville, Ind.

ENGLISH TRANSLATION OF THE RELIABLE AWARDS.

III. GENERAL INTERNATIONAL EXPOSITION
with advertising and sale
NAPLES
August-October, 1907.
Under the High Patronage of 60 towns of
Southern Italy.
Committee and Administration Office Via Roma 323.

Leandro Nardini, Agent for Reliable Incubators and Brooders.

Administration Office.
Naples, Oct. 31, 1907.
Mr. Leandro Nardini,
Rome.

It is with the greatest pleasure that I have the honor of announcing you that the Jury of this Exposition has awarded for the Incubator.

The diploma of the GRAND PRIX and Gold Medal.

Kindly accept my hearty congratulations for the well-deserved honor, and I present you my respects.

spects.

THE GENERAL MANAGER.
G. Petragna.

The present temporary certificate must be confirmed by the regular diploma.

THE ARKANSAS ALLIGATOR FARM.

Hot Springs, Ark., December 30, 1904.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—The incubator was received in perfect order. I think your new machines are excellent and well put together. I put it to work a few hours after I received it. I have been hatching alligators with your incubator and I enclose you photo showing you the success that I am hav-

ing. I hatched every alligator egg put in the machine in three successive hatches, and am well pleased. The last machine I bought from you I shall use for hatching alligators and also chickens. I shall recommend your machine to everybody wanting to purchase. I first got acquainted with your machine when managing the Florida Ostrich Farm; used it there to hatch ostriches with good results.

Wishing you the success you so well deserve, I remain,

Yours very truly,

H. I. CAMPBELL, Mgr.

HAMMOND STOCK FARMS, Ltd.

Hammond, La., Dec. 6, 1907.

Reliable Incubator Co., Quincy, Ill.:

It is perhaps a little late for us to express ourself as to the good quality of poultry we received in the lot of 800 birds we purchased of you last fall.

We can state without fear of contradiction that we received better value for money invested than any of the several purchases we made.

You can refer any prospective customer to us and it will be a pleasure for us to say a good word for you.

Exact reproduction of the Hammond Poultry Farm showing the Reliable Incubators in successful operation.

We gave the eleven large siz incubators of your 1907 pattern a good test with hen, duck and geese eggs and we take pleasure in stating that they give satisfaction with all.

The coming season we expect to do great work with the machines and you can refer any prospective customer you wish to us. Appreciating your business courtesy and anxiety to do the right thing by your customers, we are

Very truly,
Hammond Stock Farms, Ltd.,
T. S. SCANLON, Mgr

Milwaukee, Wis., February 22, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—I have one of your Standard Reliable Hot-Aid Incubators, 100-egg size. I purchased the incubator of you last year and obtained great results.

Thanking you in advance for your courtesy, I am,

Yours very truly,
W. R. THOMSON, 126 Miller Bldg.

Waynetown, Ind., April 4, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—I am now using six (6) Standard Reliable Incubators. My first hatch from one of your 200-egg size incubators this season was 162 Brown Leghorn stock.

Yours truly,
M. L. MATTHEWS.

Mineral Point, Wis., April 29, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—I think the indoor brooder I received from you a short time ago is the best I have ever seen. It works splendid, raises the chicks nicely, Yours truly,

FRED VIVIAN,
Iowa Co., Mineral Point, Wis.

Hot Springs, Ark., May 3, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—The outdoor brooders you sent us have proved themselves invaluable, as without them we would have lost hundreds of our baby alligators, owing to the unusual cold and frosty nights we have been having at this time of year.

We find they hold a steady and even temperature, are well ventilated, easily handled, and, in fact, cannot speak too highly of them.

As soon as the nesting season begins, we will place an order with you for two or three more of your large hot-air incubators, as last season we had such good success with them, hatching over 98 per cent of the alligator eggs.

Yours respectfully,
THE ARKANSAS ALLIGATOR FARM,
H. I. Campbell, Mgr.

Meriden, Conn., August 10, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—Received the incubator, tried it twice, and am more than delighted with it. Have seen three different ones tried and mine beats them all. I am more than pleased, and yet I have given it no attention at all; still it does splendid work.

I think I can sell one or two for you a little later. I shall always recommend it to everyone.

Respectfully, MRS. C. M. RULON,
Spruce St., Meriden, Conn.

Corydon, Ind., March 27, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—In the spring of 1906 I purchased a 200-egg size Standard Reliable Incubator from you, which has given the best of satisfaction. Yours for success,

EMORY O. LA HUE.

South Bend, Ind., March 26, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—I am using one of your Standard machines and seems as good and works as well as when I purchased it twelve (12) years ago. Yours respectfully,

MR. W. C. JACKSON.

Perry, Mo., May 29, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill..

Gentlemen—I send you today a kodak picture of my out-door brooder and chickens. This is the first hatch first

A Scene from Hammond Stock Farms, Ltd., Hammond, La.
A few of the thoroughbred chickens supplied to the Hammond Poultry Farms from the Reliable Poultry Farm

I had in my Reliable Incubator. I got 250 chicks out of 272 eggs. There were 22 eggs that did not hatch for some reason; didn't break them.

I have set my incubator the fourth time; it has hatched 880 chicks. I am going to set it again; this time will make it 1,000 at least. I set it in my pantry, as I could not get it in my cellar. I have Light Brahmas and Leghorns.

The brooder has done wonderful work, also. I could not do without it. I do not lose any of my chickens with this brooder. Respectfully,

MRS. JOHN W. SCOBEE,
Perry, Mo.

Canon City, Colo., April 20, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—I am going to send you the results of your incubator, as I promised. I like it very much, the heat regulator works good. I can regulate it to one degree and

A Partial View of Hammond Stock Farms, Ltd., Hammond, La.

it hatched out better than the hens that I set at the same time. How is this for a Bantling?

With the best wishes, I remain,

Yours very truly,
CHARLES PHIPPS, 612 River St.
Canon City, Colo.

Bradford, Ill., May 16, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—Some time ago I bought one of your brooders and I must say it is a dandy. I never lost a chick in it and it was out in the snow and rain. You will have several orders for brooders around here.

Yours very truly,
MRS. M. DICKERSON,
R. R. No. 5.

Siloam Springs, Ark.,
April 15, 1907.

Reliable Incubator and Brooder Co.,
Quincy, Ill.:

Gentlemen—The large brooder we bought of you last year gives perfect satisfaction.

Yours truly,
C. R. SAFFELL,

Little Rock, Ark., May 7, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

View of the Breeding House, Brooder House and Pigeon Loft, reading from left to right. Hammond Stock Farms, Ltd., Hammond, La.

Gentlemen—The 210-egg machine that I purchased about two years ago has given perfect satisfaction. I intend to get another, but I want nothing but the Reliable.

Yours very truly,
MR. C. A. WELLS,
In care Rosenbaum Machinery Co., Little Rock, Ark.

North East, Md.,
February 5, 1907.

Reliable Incubator and Brooder Co.,
Quincy, Ill.:

Gentlemen—I read in the Poultry Keeper that you had issued a new catalogue. I have been using your incubators and brooders and find them O. K., far in advance of anything else in this section of the country.

Will you kindly send me your new Silver Jubilee catalogue, and greatly oblige? I may be in the market for more incubators and brooders later on. Yours truly,

JAMES S. MAFFITT,
R. F. D. No. 2, North East, Md.

H. D. McMahan's Hatch.

Winterport, Me., Oct. 26, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—As I promised, will write you the result of your machines. My experience has proved to me that your regulator is much better than any others.

Will want one of your machines next year and will try to sell a few. I am recommending your machines to different parties. Hoping to hear from you, I am,

Most truly yours,
WALTER S. CLARK,
Pleasant Valley Farm, Winterport, Me.

Purchase, N. Y., Oct. 19, 1907.

Reliable Incubator and Brooder Co.,
Quincy, Ill.:

Gentlemen—Please send me the price of your Buff Plymouth Rock cock one year old, as I would like to get one to breed from. I have not as yet purchased any of your fowls so would like to try them.

If your poultry is as good as your incubators are will not be ashamed to recommend them to anyone.

Please answer by return mail,
Yours truly,
ALBERT S. BATES,
Purchase, Westchester Co., N. Y.

Fair Play, Mo., Sept. 25, 1907.

Reliable Incubator and Brooder Co.,
Quincy, Ill.:

Gentlemen—The incubator I recently purchased from you has given me entire satisfaction in every respect. I am enclosing a photograph which I took of my machine myself during the first hatch. In the way of "first hatch" I mean this is the first experience I have ever had with an artificial hatching machine, and I wish to state from the various other machines my neighbors have used, and comparing their poor success with the few troubles I have had, I can not speak too highly of the Reliable Incubator.

For the first hatch, I placed 160 eggs in my machine. These eggsI secured from different neighbors, but nevertheless I hatched 120 healthy and lively chickens.

In regard to moisture, I must say the Reliable is superior from "A" to "Z" to any other in moisture, and as the moisture question is one of the most important points in artificial incubation, I, as well as many of my friends who have seen my machine in operation, believe the Reliable is the incubator of today.

I wish to thank you for the machine you sent me, of which I am very proud, and assure you of my loyalty to the Reliable Incubator and Brooder Company, I remain,

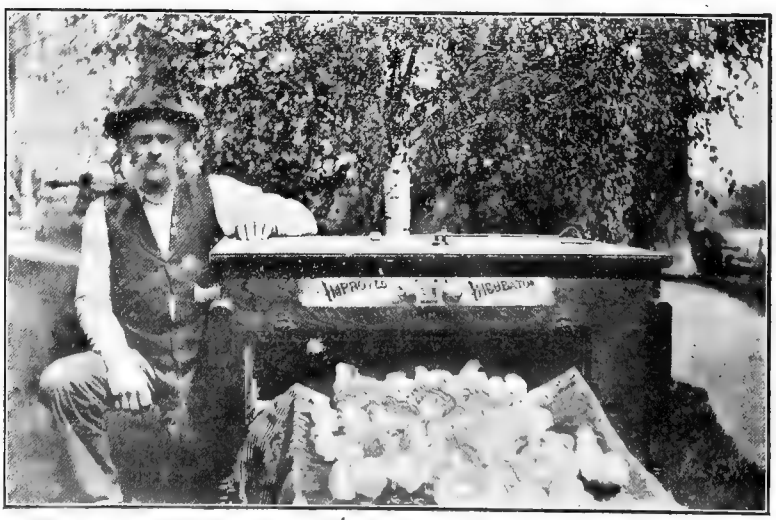
Yours truly,
H. D. McMAHAN.

Thomas, Okla., March, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—I will say a few words about your 200-egg size incubator I bought from you four years ago. It is in good shape yet, in fact it is just as good as new, and I hatched 195 good, strong chickens from two hundred eggs. That is good enough for me. Now, I want to buy five gallons of Lice Killer, the same I got from you before, but I have forgotten the price. Please send me the price of a five gallon can, and I would like one of your Annual Poultry Books. I think now that I will buy another incubator this summer, and I would like to get your prices on White Rose Comb Leghorn eggs by the one hundred lots.

Yours respectfully,
MR. CLARK McGAFFIN,
Thomas, Custer County, Oklahoma.



Scottsburg, Ind., March 6, 1907.

Reliable Incubator and Brooder Co., Quincy, Ill.:

Gentlemen—I received your catalogue. Thanks for same. I have one of the 220-egg size Bantling Incubators, and it gives me good satisfaction. Yours truly,

ELI J. RICKEY,
R. R. No. 1, Scottsburg, Ind.