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POULTRY
CULTURE
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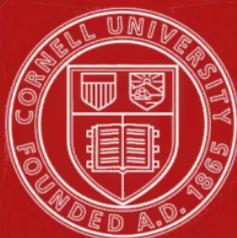
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AMERICAN POULTRY CULTURE

1796



Dark Brahma Male

AMERICAN POULTRY CULTURE

A COMPLETE HAND BOOK OF PRACTICAL AND
PROFITABLE POULTRY KEEPING FOR THE GREAT
ARMY OF BEGINNERS AND SMALL BREEDERS

BY
Roscoe
R. B. SANDO
Sando

ILLUSTRATED



NEW YORK
THE OUTING PUBLISHING COMPANY

MCMIX.

1919

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INTRODUCTORY

THE object of this volume is to furnish reliable and practical information on the profitable care and management of poultry. I have endeavored to take the reader, presumably a beginner, into the field of practical poultry work, telling him what to do, and how and when to do it.

I have catered especially to those who desire to keep only a small flock of fowls for pleasure or profit, but most of the matter contained herein will also apply to poultry keeping on a more extensive scale.

In order to make this treatise as brief and yet as comprehensive as possible, everything of a theoretical or imaginative nature has been omitted, as well as all unnecessary things. I have made use of only valuable and practical facts, which are the result of my personal experience in the handling of fowls on both a large and a small scale. This is, essentially, a business book for busy people.

R. B. SANDO.

POTSDAM, OHIO, 1908.

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**POULTRY KEEPING AND POULTRY
KEEPERS**

American Poultry Culture

CHAPTER I

POULTRY KEEPING AND POULTRY KEEPERS

ALMOST every man is interested in reducing the living expenses of his family. One way of doing so is by keeping a small flock of chickens to supply the family table with eggs and meat. My own start in the poultry business was made with a few hens on a back-yard lot, and I know from experience that home chickens are money-savers.

Counting the cost of feed alone, I found that we could produce our own eggs and chickens at a cost not to exceed one-half of that which we had been accustomed to paying on the market. Situated as we were, this was a decided advantage over buying, and this would probably hold true with every case where the little time required for the care of a small flock would only be utilizing that which would otherwise very probably be wasted or unprofitably spent.

Does It Pay? Some people seem to have the idea that their time is too valuable to look after

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even just a few chickens, but it is a fact that every business man must have a brief intermission from business and business cares each day, and during this time some sort of a recreation or pastime differing greatly from that of his other business is very desirable. The business and professional life of the average American citizen is so strenuous that if not "eased up" by some side-line, recreation or hobby it burns up vitality at too rapid a rate. As a means of recreation for body and mind, by healthful and profitable outdoor employment, the breeding of good poultry is supreme.

Aside from the matter of profit, the pleasure of having a nice, tender chicken whenever desired and eggs that are strictly fresh at all times, is quite an item; while if standard-bred stock are kept, there are many other pleasures and benefits peculiar to that branch, which will be discussed later.

Feeding. Any one who has a little yard room and no chickens, is not living up to his opportunities. The cost of keeping such a flock is less than one would suspect on first thought, because the fowls will utilize all the scraps and refuse material from the kitchen and table, which would otherwise go to waste, and they enable one to get back on his table this waste material in the form of good fresh eggs and juicy fowl.

There is no better feed for poultry than table scraps, and most families have enough of this ma-

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terial to constitute a large part of the food necessary to maintain enough chickens to keep them supplied with eggs and poultry meat. Sometimes, too, there are neighbors who will be only too glad to have their waste collected for this purpose. Parings of all kinds of vegetables, refuse leaves of cabbage and lettuce, onion tops, small potatoes, stale bread crusts, and all such things which are usually wasted, may well be utilized in this connection and will be found to give every bit as good results as would higher-priced materials.

Housing. Nothing expensive or elaborate is necessary in the way of a house for a small backyard flock of hens, although, of course, a nice house will add to the attractiveness of the place; but that makes no difference to the hens, so long as the homely-appearing house is comfortable. A building ought to contain at least one hundred square feet of floor space to comfortably house a dozen to fifteen hens, and ought not to cost more than ten dollars to twenty dollars, especially since waste material can often be utilized in its construction.

A piano-box poultry house (that is, a house made by joining together two piano boxes) makes a very serviceable and very cheap house for this number of fowls; in fact, as a general thing this type of house is the cheapest form available for a small flock. The addition of a window or two

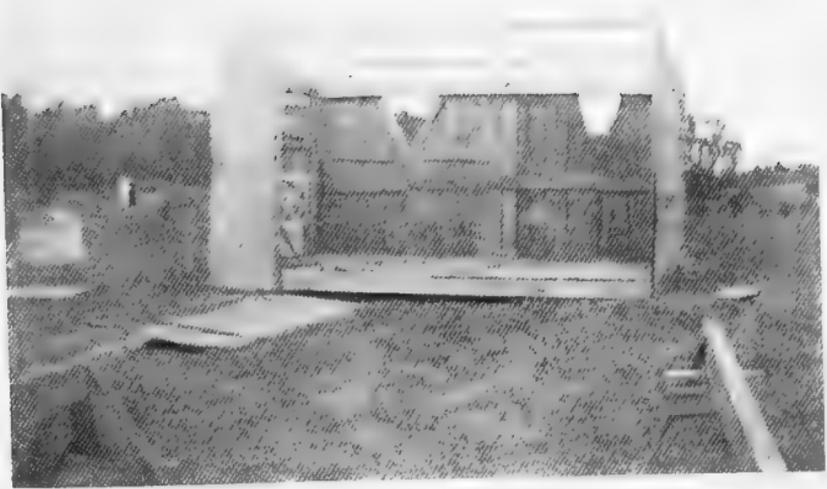
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and a door is all that is necessary, so far as the construction of the house itself is concerned, while the only interior fixtures that will necessarily cost any money are the roosts and nests. It is a very good plan to cover the exterior of such a house with roofing paper, as this makes it materially warmer and more comfortable during the cold winter weather.

Size of Flock Required. The number of fowls necessary to keep a family supplied with poultry and eggs depends upon the size of the family and upon their appetites for poultry products. As a usual thing, a dozen hens are sufficient for a family of four or five persons. From seventy-five to one hundred eggs a year from each hen is what may safely be expected by the novice with regard to the egg production of his flock.

What It Costs to Feed a Hen. One dollar a year per hen is the usual estimate of the cost of maintenance. Where all feed has to be purchased this figure is probably a little too low, but where use can be made of waste materials the expenses certainly should not exceed this figure.

As a business proposition, poultry keeping offers excellent inducements to ambitious beginners; in fact, there is money, pleasure and health in a properly managed and well-established poultry farm, but, like Rome, it can not be built in a day.



Courtesy of U. R. Fishel

Continuous piano-box poultry house, in course of construction and its completed state

POULTRY KEEPING AND KEEPERS

In starting into the poultry business, the average person gets too enthusiastic and attempts to do too much. That has been the cause of ninety-five per cent. of the failures with poultry, of which there are a large number. The better way is to start on a small scale, and enlarge as experience and capability justify. The idea that almost anybody can make a success with poultry on a large scale has been disproved times without number. In fact, it is next to impossible for a man with no practical experience to go into the poultry business on a more or less extended scale and make a success of it from the start. I know of no place where preparation is a more potent factor toward success than in the poultry business; in fact, I think I am safe in saying that experience and its application is the key to success with poultry.

A man would not think of establishing a large mercantile business unless he knew considerable about the trade, but many apparently intelligent people rush pellmell into the poultry business with no idea of its requirements or the returns which may be expected, except what they have gained from the many distorted stories which appear from time to time and which promise "enormous" profits from poultry. The men who are making the greatest successes in the poultry business are those who started in a small way and have gradually grown into the business, enlarging the scope

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of their operations only as fast as their experience and the returns from the business justified. That is the most sensible way of entering the field of poultry culture, and, indeed, the only sure way of avoiding partial or total failure. For the man who attains success with a small flock can, by following up the same general ideas and plans on a more extended scale, branch out and increase his flock and continue in a channel of profit.

Skill and brains receive as great a reward in the poultry business as in any other, while resourcefulness is an especially good asset for the poultryman. People who think that the poultry business is a "soft snap," and have some money they want to lose, need only to invest it in poultry. While poultry keeping is not particularly hard work, it is harder work than many people think. This is true, not because of the manual labor required, but because the attention must be constant and because it is made up largely of details which often become tedious and irksome.

The amount a man gets out of any business depends very largely upon the amount he puts in **The Profits from Poultry as a Business** it. There are failures and successes in every line of work, and poultry keeping is no exception. There are men in the poultry business to-day who are making twenty-five thousand dollars or more from their poultry business each year. There are other men

POULTRY KEEPING AND KEEPERS

who have lost almost that much on poultry in the course of a few years. The difference is in the men, not in the poultry business. More depends upon the man than upon the poultry business, whether the ultimate result be profit or loss.

We have long outlived the age when the verdict was almost unanimous that "poultry don't pay." There are too many men, now, making comfortable incomes from poultry, and too many whose annual earnings amount well up in the thousands, for there to be any doubt about the profitability of poultry. The blame for failure cannot any longer be attached to the business; it must be charged against the man, since it has been conclusively proven that poultry keeping is profitable under favorable conditions. There is no danger of the business being overdone, because the demand is increasing faster than the supply, and America is forced to import large quantities of poultry products every year. The trusts and combines never have "froze out" the individual producer, and never will, for the reason that the poultry industry is composed of too many million distinct units (small producers) for one or two persons to gain dominion.

Profits that are strictly *enormous* can be made from poultry only on paper; but skillful poultrymen find it comparatively easy to make more money from an investment of their own capital and labor

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in poultry than in any other business. Personally, I have made my own plant, the Sando Buff Rock Farm, turn out a profit of twenty-five per cent. per annum on my investment, but it cost several years of time and several hundred dollars in money before I was able to arrive at that result.

By the term "side-line" we mean as an adjunct to some other occupation, such as farming, Poultry as a fruit growing, gardening, or dairying. Side-Line There is no doubt but that poultry can be made to pay as great, if not greater, profits when handled in this way than in any other. Poultry keeping "nicks in" well with all of those businesses just mentioned, and it is no rare thing to find that a flock of poultry can be handled in connection with one of them with greater profit than would result from giving exclusive attention to the other business. This is because poultry are gregarious and utilize most of the waste products of these occupations.

And again, poultry keeping enables the farmer to bring into profitable use the unworkable hillsides and the rough rock lands, and the uncultivated woods and meadows, besides turning waste grains and feeds into a source of revenue. Fruit growers find that their trees yield more and better fruit when flocks of poultry have the run of their orchards, because in this way the trees are kept free from the many noxious bugs,

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worms and insects, while the poultry droppings have a very beneficial effect upon the fruit yield, because no manure is richer or more valuable than hen manure. The gardener and dairyman have many waste products which come in very handy for feeding to a flock of hens, while the product from the poultry can be marketed along with their other goods at no extra expense, but at considerable increase in price over that paid in the open market.

It is very probable that the greater part of this country's poultry supply comes from flocks cared for principally by women. On farms **Poultry Keeping for Women; for Invalids** the care of the fowls is usually left to the farmer's wife or daughter, because the men are too busy with the regular routine of farm work to "bother" with the hens; while in towns the absence of the men from the home during working hours leaves the care of the poultry mostly to the women, even when the men take an interest in the work. Women can raise poultry just as successfully as men, on a small scale; but, as a rule, poultry keeping on a scale to make a living for a family is beyond a woman's strength, unless she can press into service some male member of the family or has hired help.

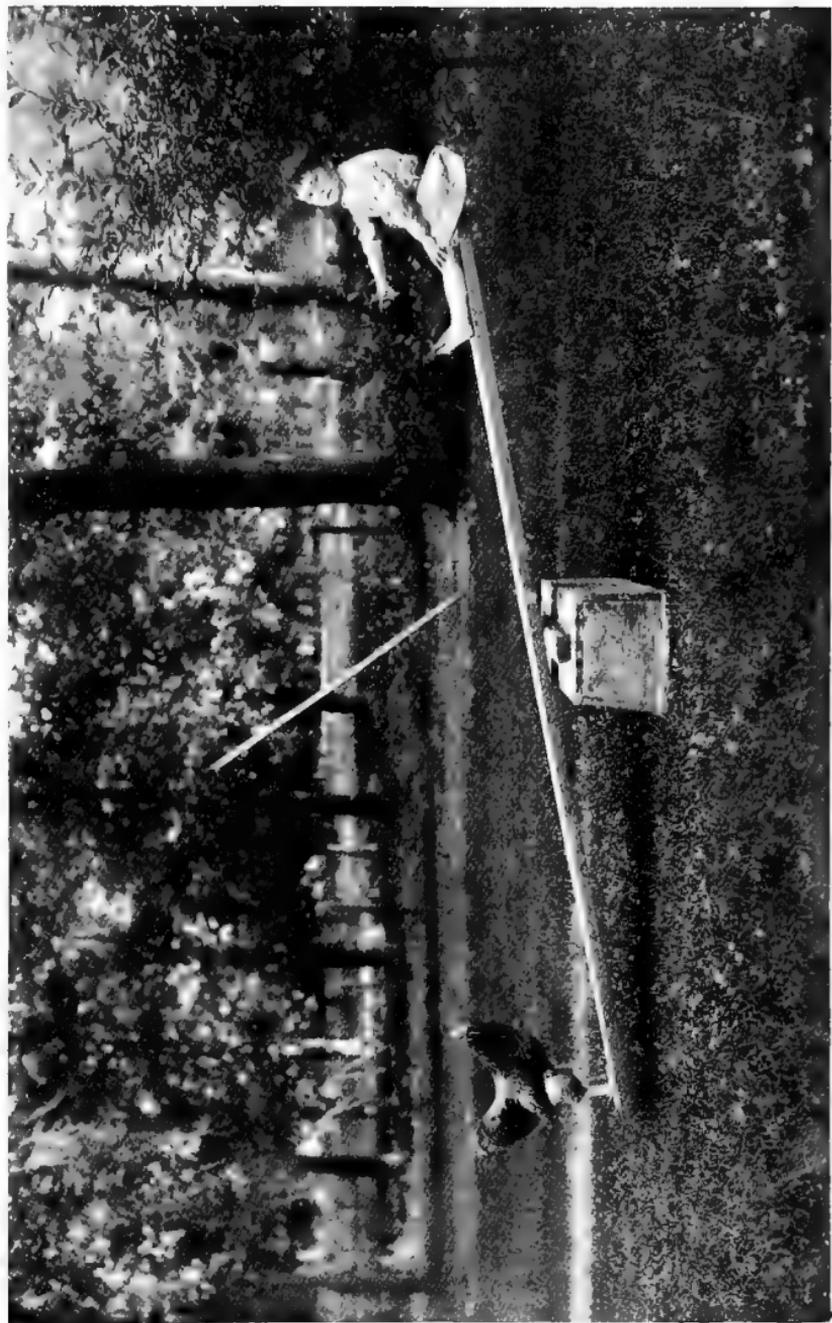
Many invalids are attracted to poultry keeping as an occupation, because the work is not confining and it is outdoors for the most part, and because

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there is not much heavy work connected with it. Also, the work is pleasant or even fascinating to a true lover of fowls and nature, and has a tendency to cause an invalid to look more on the bright side of things. Many a weakened, debilitated person has left the noisy, dusty city, with its incessant whirl of toil and strife, and found restored health and strength on a little chicken ranch, where he could be out in the open, breathing pure air, amid pleasant and interesting surroundings.

Invalids, like women, had best restrict their poultry operations, for otherwise it is likely to do them more harm than good. A person with comparatively little strength can look after a small flock of a hundred or more hens, but the work requires close attention, and if carried farther than the number mentioned it is likely to become too confining and monotonous for an invalid. A person who cannot give his fowls regular attention in all kinds of weather must not expect them to be very profitable. Invalids can make as much money with a *small* flock of fowls as any other class of people, and as the work builds them up physically they can develop their poultry business until it may ultimately yield them a good living income.

The man who can afford a country home, with beautiful surroundings and every comfort, and who considers poultry from the dollars-and-cents stand-



A Game of Seesaw

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POULTRY KEEPING AND KEEPERS

point only, has a lack of artistic perception. Beautiful though ponds, shrubbery and orchards may be, they are merely still-life etchings until poultry is introduced. Have ducks for your brooks or irrigating ditches, swans on your ponds, peacocks in the formal gardens, pheasants among the shrubbery, chickens in colony houses scattered throughout the orchard, turkeys roaming through the meadows—and your place will become a home instead of a show place. Consider them as you would wide porches, or any other feature which will add to the livable atmosphere of your home, even though you disregard the utilitarian side of the matter.

All poultry keeping for profit may be divided into two main classes—market and “fancy” poultry business. There are three kinds of market-poultry plants: those that produce eggs, those that produce meat, and “combination” plants.

The first kind cater exclusively to an egg trade, and usually keep a breed that will lay the most eggs, with little or no regard to the size or market qualifications of the stock. The second class of plants produce “squabs,” broilers, roasters, or capon fowls, marketing no eggs, but keeping only a sufficient number of adult fowls to supply them with eggs for hatching their products. The combina-

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tion plants try to fill the demands for both eggs and meat, and provide more nearly equal employment the year around, because the greatest activity with eggs is in the fall and winter, while the spring and summer is the busy time with broilers. The exclusive broiler business, or the broiler and roaster business, requires the most skill of any market branch, because it involves the hatching and rearing of a great number of chicks each year.

The egg trade should be worked up by the beginner first of all, and after he has made a success of that he can then branch out in the more risky broiler business if he desires. All branches of market poultry keeping require close proximity to a good city market for the highest prices and greatest profits. "Fancy" poultry breeding is a different kind of business and is treated at length in another chapter.

Perseverance is a great thing in the poultry business. The breeders who are prominent in the poultry world to-day did not gain their prominence in a single season. Most of the fanciers started with a very ordinary quality of stock and spent several years of time in getting their fowls to a high standard of excellence, and then spent considerable more time in establishing a show record and in getting their names and stock before the public, through advertising. Others, who have used rare judg-

POULTRY KEEPING AND KEEPERS

ment and started with the best stock obtainable, who have intelligently studied the principles of breeding and have given much thought to the work, have reached a position near the top in a comparatively short time.

There are just as great successes in the line of poultry and eggs for market, and success comes in much the same way. In starting, "learn to crawl before you attempt to walk." Produce goods of a superior quality, let the public know it, guarantee all eggs to be clean and fresh-laid and all fowls to be tender and palatable. Market all goods in an attractive form, and it will not be long until you will have all the business you can accommodate at a good margin above regular market prices.

There are no short cuts, there is no royal road to success in the poultry business; nor is the pathway strewn with roses. The author has not forgotten, in the enjoyment of his present success, the hard places over which he has passed. He has wrung the neck of an old hen that spoiled a five-dollar setting of eggs by quitting her job at the end of the second week; has had his incubator cook two hundred eggs in an hour; a home-made brooder catch fire and burn up, together with the fifty chicks that were being brooded in it and one end of the building in which the brooder was located; has seen a fifteen-minute shower drown a flock of chicks that cost fifty dollars in money and

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fifty score of dollars' worth of work and worry; fought lice, roup, gapes and cholera to a fare-you-well, and yet with all this trouble has been at least fairly successful. Remember, that "Keeping everlastingly at it brings success."

POULTRY HOUSE CONSTRUCTION

CHAPTER II

POULTRY HOUSE CONSTRUCTION

A GOOD poultry house does not necessarily need to be an elaborate or a costly one. The preservation and maintenance of the health and thrift of the birds is all that is required of any house. Elaborate houses are all right for Different Types those who can afford them, but one of Houses should not become discouraged because he can not have that kind; the finest poultry house imaginable, even though it be painted red, white and blue, and ornamented with gold-rooster weathervanes, cannot make a hen lay two eggs a day. As a rule, the more simple in construction a house is the more satisfactory it is. There should be as few nooks and ornaments as possible; start in with the knowledge that every little nook, corner, crevice and crack will be a ready-made breeding place for lice and mites, and shun them.

A poultry house may be built in any style and along any lines, to suit the owner's individual fancy, so long as proper attention is paid to these four prime requisites: light, warmth, dryness, and ventilation. Also, it should be free from drafts, and

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so constructed that the inner temperature will vary slowly with fluctuations in the weather. There should be numerous windows, and these should be so placed that the sun may shine into the house for several hours each day, especially in winter, at which time sunlight should be provided for as great a length of time as possible. These things, together with a good location, are essential; the permanent lack of any one of them invariably affects the health and thrift of the fowls, sooner or later bringing disease and loss.

Occasionally poultry houses are met with that are constructed of brick, concrete or stone, but these are very rarely used on thoroughly successful poultry plants. That they are more durable than frame buildings cannot be denied, but they also cost more, and it is a fact, which few experienced poultrymen would care to deny, that in buildings constructed of these materials there is always present in the winter time a very perceptible chilly sensation which is by no means desirable.

A poultry house should rest upon a firm footing, for convenience when building and to prevent the house from sagging out of shape later, and also because a good wall is a great aid in keeping the house warm and preventing drafts and cold currents of air passing along the floor in cold weather. It has been found that a concrete foundation is less expensive, more

**Poultry
House
Foundations**

POULTRY HOUSE CONSTRUCTION

effective in excluding water and varmints—such as rats, weasles, etc.—and more serviceable in every way than a wall made of stone. A hen-house wall need not be more than five or six inches thick. It should extend at least half a foot above the ground, and need not extend into the ground more than a foot, or far enough to prevent heaving by frost.

There are three kinds of poultry house floors in common use at the present time, viz., cement, earth, and board. The latter kind is
Floors scarcely ever employed in modern buildings now, and it is very probable that in the course of a few more years board floors in poultry houses will have become obsolete. However, wood is the best material for the construction of floors in portable houses and in houses having a space underneath them to be utilized as an exercising room for the fowls, but it is ridiculous to build the kind of a house last mentioned. Where earth floors are not desirable, cement may be used almost as cheaply as boards, and the floor will certainly be much more serviceable and satisfactory. A cement floor is easier to keep clean, more nearly rat-proof, more durable, and dryer when properly made than any other kind of floor.

A good many successful poultrymen use earth (gravel) floors because they are the cheapest. Also, fowls like to get on the bare ground whenever possible, and during the winter time indoors

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is often the only place where they may have this desire fulfilled. However, under certain conditions earth floors may become an abomination. If the house is poorly located in a damp spot, or the climate is such that heavy rains are frequent, then it is best to have a cement or board floor in the poultry house, as they will not conduct dampness so readily as earth, and dryness is a cardinal essential in every well-constructed poultry house. Then again, in case of disease, an earth floor is likely to become contaminated and the entire flock may become infected thereby, or the disease germs may lurk in the building for years; but a cement floor is very sanitary, as it may be thoroughly cleaned, scrubbed and disinfected. Cement floors are not chilly or hard on the fowls' feet, providing the floor is kept well covered with litter.

How to Combat Rats. If rats are bothersome, they may cause serious loss, and in such cases cement floors are the easiest and safest way out of the difficulty. Where earth or board floors are used, place fine-mesh galvanized wire nettings on the ground, thoroughly covering the space enclosed by the house foundation, before the floor is put in. If earth, this latter should consist of four inches of dirt in the bottom and about the same amount of sand and gravel on top, making the house floor at least half a foot higher than the outside earth—in order to avoid dampness.

POULTRY HOUSE CONSTRUCTION

Except in northern latitudes and exceptionally cold climates, single-walled houses are now much more popular than the double-walled ones—with perhaps a heavy packing of sawdust, earth or hay—which were considered quite necessary a few years ago.

Walls

In climates where the temperature seldom falls below zero, a wall composed of one thickness each of boards and tarred paper or roofing fabric makes a comfortable house. This construction may be arranged in two ways. The cheaper plan is to place unmatched boards (sheathing) next to the studding and then cover the exterior with the felt. The other way is to place the felt next to the studding and cover with tongued-and-grooved boards. This makes the house somewhat more attractive on the outside, but there is no other advantage.

In cooler localities the ideal construction of wall is, first, sheathing next to the studding, then a layer of tarred paper, and then cover with tongued-and-grooved siding. This is the kind of wall in use on the author's plant, and makes a house warm enough for any breed and any section of America.

A "combination roof" or a "gable roof" requires slightly more material to construct than a "shed roof," but that is one of the least of several reasons why I prefer the latter kind.

Roofs

A shed roof is the easiest to build; it gives the highest vertical front exposed to the

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sun's rays and allows the windows to be placed high up, giving the sunlight far back in the pens, and therefore provides the best possible conditions of sanitation, warmth, brightness and dryness; it throws all the rainwater to the rear, lessening the length of eaves-trough one-half and does away with the pernicious eaves-drip down in front, keeping the front of the house and the ground in front of that dry. A house with all of its roof sloping to the north is cooler in the summer, because it is never exposed to the vertical rays of the sun. Also, when the slope is all toward the north, a roof covered with prepared roofing will last much longer.

A leaky poultry house is an abomination, and with the many excellent brands of prepared roofing now on the market there is no excuse for a bad roof. A roof covered with this material makes a tighter house than one covered with shingles, and does it with less cost. Also, a roof covered with prepared roofing may be given a smaller degree of slant than a shingled roof, and that is an important point in poultry house construction, because it makes possible a type of house sufficiently high in the rear without excessive height in front in order to give enough slant to the roof. A shingle roof, however, has the advantage of responding less readily to outside weather conditions, and therefore is more cool and pleasant than other kinds in hot summer weather.

POULTRY HOUSE CONSTRUCTION

Plenty of light is necessary in a poultry house; sunlight not only carries warmth and good cheer, but also tends to arrest disease. But, **Windows** while too much light is impossible, there is such a thing as too much glass in a poultry house; not only because it makes construction expensive, but also because it makes a house too cold at night and too warm in the daytime, for glass gives off heat at night as readily as it collects it in the daytime.

Windows should be placed comparatively high up in the walls, and the greatest length should be placed up and down, not horizontally. The time when sunshine is most needed is when the sun is the lowest, that is, from September 21 to March 21; therefore the necessity for having the windows up high enough that the sun may be reflected well back in the pens, as otherwise only the space directly in front of the windows will be reached by the sun.

Following out this idea, the windows in a narrow house need not be placed so high as in a house having a greater depth, and consequently the walls would not need to be so high. In a house ten feet deep the highest point of the windows should be at least four and one-half feet from the ground; while seven feet should be the extreme height with a house fifteen or sixteen feet deep.

If the front wall is made high, make the rear wall comparatively low, and the house will be

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warmer in the winter, for the reason that there will not be such a large amount of air space for the fowls to warm with their bodily heat.

In selecting window sash, remember that those with small glass seriously obstruct the light, while very large glass break too easily and are more expensive.

While the exercising part of the poultry house should not be too warm, so that the birds may be induced to exercise in order to keep warm, they cannot handily move around while on the roosts, and this part of the house should be the warmest and most snug of all. However, there is no necessity for having a separate and more tightly constructed room, apart from the exercising quarters, for the location of the perches. With the roosts in the rear part of the house, and that part of the house the lowest as I have suggested, there usually is no necessity for any separation of the roosting and exercising parts of the house in the more pleasant sections of America. However, in cold climates, or with birds that have very large combs, it often becomes desirable to hang curtains of burlap or a similar loosely woven material down in front of the perches at night, but that is ordinarily as much extra protection as ever is necessary.

Where these curtains are used it will be found that they keep pretty closely confined the animal

POULTRY HOUSE CONSTRUCTION

heat generated by the fowls and make that part of the house warmer than would be imagined. They should hang clear of the perches several inches, in order that undesirable gases and foul air may fall to the ground; and use them only when necessary on very chilly nights, as fowls should always have the benefit of as much pure, unconfined air as possible. The curtains may be attached to rollers at the ceiling of house, and conveniently operated much the same as window blinds.

The matter of correct ventilation is one of the most vital features of poultry house construction.

Ventilating the House Pure air is even more important for poultry than for other domestic animals, because their body temperature is several degrees higher. Aside from this, there always is more or less of an unpleasant odor existing in poultry houses, and it is necessary that this be dissipated, as well as an abundance of pure fresh air supplied for the fowls to breathe. Also, in the roosting quarters, the warm air exhaled from the lungs of the fowls is always heavily charged with moisture, and this, coming in contact with the cold roof and walls, is condensed in a poorly ventilated building, and in freezing weather appears as hoar frost, which freezes in drops in cold weather or melts and drops to the floor when the house has been warmed up by the sun.

Up until the last few years this matter of cor-

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rectly ventilating a poultry house was a serious problem. The ventilators which work quite satisfactorily in dwelling houses and barns give very unsatisfactory results on poultry houses, and are little, if any, better than nothing at all. The method most in vogue a few years ago was that of having a loft above a loose ceiling in the poultry house, and much of the moisture and impurities of the air were supposed to be absorbed into the hay and straw with which the loft was filled. This was more or less unsatisfactory, however, and it was not until the recent introduction of the use of muslin or burlap as a partial or total substitute for window glass, that the problem of properly ventilating a poultry house reached a satisfactory solution.

The modern and model way of ventilating a poultry house is by means of window openings in the south side of the building, which are covered with a burlap or muslin curtain in exceedingly cold or disagreeable weather. During the remainder of the time, winter and summer, these openings are covered merely with wire netting. With the house constructed tight on all other sides, as I have advised, this system allows of a gentle diffusion of air with no direct draft. The principle is much the same as that involved in "you can't blow into a bottle," because all the available air space is already occupied.

POULTRY HOUSE CONSTRUCTION

Muslin and burlap are very much cheaper than glass, thus considerably lessening the cost of a poultry house, and the fresh air type of house has been thoroughly proven to have a beneficial effect upon the winter health and vitality of fowls. If muslin is used it should be of a quality that is comparatively loosely woven.

To those who have not had the privilege of testing the matter, this fresh-air treatment may seem a little radical, but its value to the human race (especially in cases of weak lungs or tuberculosis, or as a preventive of these ailments) is now universally recognized, and its invigorating effects upon the constitution of a fowl are practically the same. A fowl is provided with the warmest kind of clothing (feathers), and can withstand a great deal of cold if it is not accompanied by drafts and dampness.

**PLANS AND SPECIFICATIONS OF
MODERN POULTRY HOUSES**

CHAPTER III

PLANS AND SPECIFICATIONS OF MODERN POULTRY HOUSES

THERE are several types and many designs of poultry houses. Broadly speaking, however, all poultry houses may be classified in three divisions. The two extremes are known as "continuous houses" and as "colony houses," while the intermediate system is called the "scratching-shed house."

**Determining
the Type of
House**

Continuous houses are those that are divided into a number of similar pens, all under the same roof. The plan is illustrated in the picture, "A Modern Continuous House," and such houses may be built any length and size desired, and other pens may be added to either end of the building from time to time without in any way altering the general character or construction of the house.

Scratching-shed houses are simply open sheds alternated with closed houses. The open sheds furnish a protected place for the feeding and exercising of the fowls during the day, while the closed

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apartments contain only enough floor space to accommodate the roosts and nests and the feed boxes and drinking vessels. There is little to choose between the results from this plan and from the ordinary continuous house plan, with the front comparatively loose and with the muslin curtain. Both are invaluable in the winter time in that while they have comfortable roosting quarters, they also afford space in which the fowls may enjoy healthful exercise in fresh air, without being exposed to rain and snowstorms or chilling winds. The author prefers the ordinary continuous type of houses, such as described and illustrated in this chapter, because such houses are cheaper, more easily constructed and handier for the attendant than those houses in which the sleeping and exercising apartments are separate rooms.

Colony Houses. The colony plan is adopted by those who are of the opinion that fowls thrive best when not housed together in excessively large numbers. Their preference is a house which contains not more than seventy-five or one hundred adult birds, and it is a wise one. These houses are dotted over the farm at such intervals as convenience directs, some keeping the fowls yarded and having these runs adjoining, while others place the houses far enough apart to obviate the use of fences, giving the flocks free range with very little mingling of the members of different flocks. This

HOUSE PLANS AND SPECIFICATIONS

is the ideal way of housing and yarding poultry, and we recommend it to all who can possibly make use of it. It is impractical, however, where thousands of birds are kept, as the scattered houses make too much extra work and inconvenience.

In a long continuous house, in case of an epidemic or contagious disease, it is liable to spread from one or two pens to every pen in the building, but the colony system of housing keeps the flocks too widely separated for any general catastrophe. With the colony system any style of house may be used—either regular colony houses or one-pen or two-pen continuous houses, or the same-sized scratching-shed houses.

People who must necessarily use long continuous houses, on account of lack of yard room, will find that as a general thing the shorter houses give vastly superior results to the quite long ones.

Attractive Poultry Houses. No particular effort has been made to show especially beautiful poultry houses in this book. All buildings and coops illustrated and described are, first and above all else, practical; although at the same time I do not think any of them can be called positively unattractive or repulsive. The houses shown can, if desired, be constructed as cheaply as is compatible with satisfactory results in any house, and at the same time the man who wants a fancy hen-house can have his desire fulfilled in this same style of house

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simply by using a few fancy ornaments and by keeping the house and fence attractively painted and vines and shrubbery growing along the fence and in the yards.

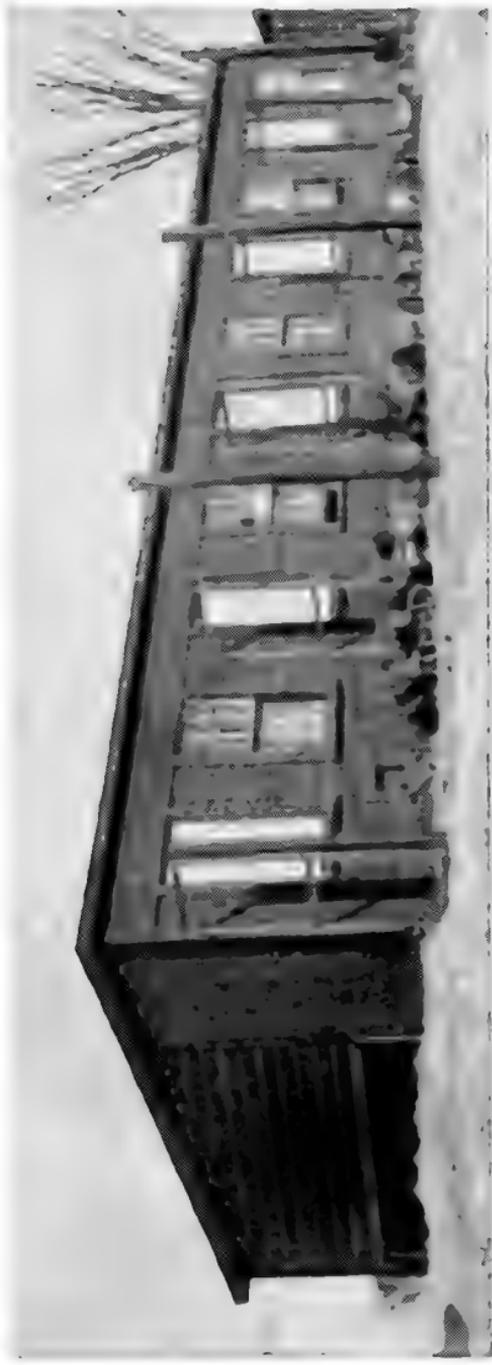
Cheap Poultry Houses. For the benefit of those who wish inexpensive poultry houses, I might state that it does not pay to try to economize too closely along this line; for fowls cannot thrive and pay a profit in the face of poor housing. With the present high prices of lumber and labor, it is next to impossible to build a satisfactory poultry house from new materials at a really cheap price. It is better to have a small house that is tight and well constructed, than a large one of inferior quality and unsatisfactory design.

Best Width for Poultry Houses. The more nearly square a house is, the less the cost of construction. However, no poultry house should ever be more than fifteen or sixteen feet deep, or the sun cannot reach the depths most remote from the windows. Twelve to fourteen feet is the depth preferred by the author for continuous houses.

Modern Continuous House No. 1. This building is 36 feet long by 12 feet wide, and contains three sections, or divisions, each 12 feet square. The front elevation is 9 feet and the rear 5 feet. The roof is covered with shingles. The windows are composed of two sashes, each containing six panes of glass 9 x 14 inches in size. The curtains



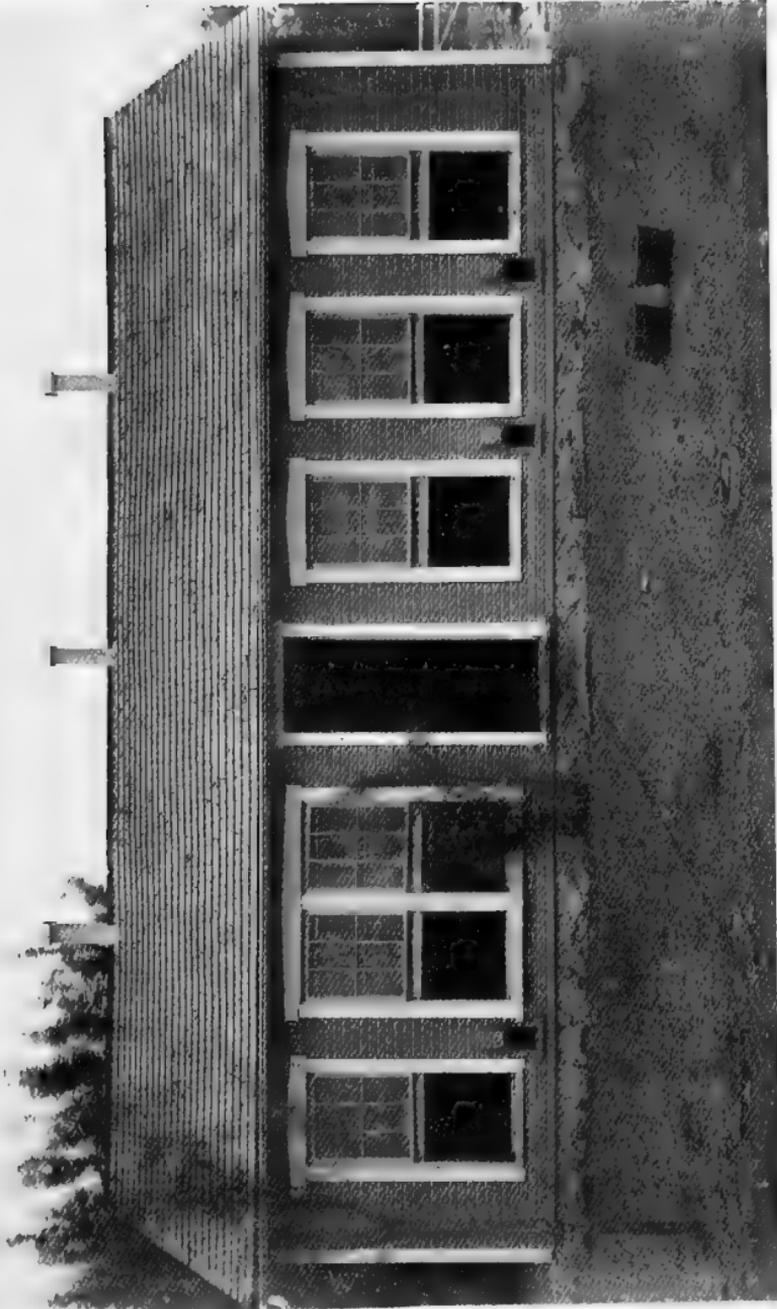
Modern continuous house, No. 1



Modern continuous house, No. 2



Modern continuous house, No. 3



A poultry house behind the times

Chief faults: The gable roof with good high front wall necessitates excessive height at comb of roof, making too much dead air space in the house for the fowls to heat in cold weather. The windows are placed a little too near the floor and too much glass is used in the building, making it colder in the winter. One or two of the windows might well be entirely omitted and one-half of the remainder should be covered with burlap or muslin instead of using all glass, doing away with the ventilators in the roof, which are worse than useless, anyway. The door had best be located in one of the end walls of the poultry house.

HOUSE PLANS AND SPECIFICATIONS

which provide the ventilation, and which are hung down between the windows, are $3 \times 6\frac{1}{2}$ feet in size, and are hinged at the top to swing back into the building, where they may be fastened up out of the way during pleasant weather. Later experience has shown that this house contains more glass than is really necessary.

Modern Continuous House No. 2. This building is 14 feet wide; 7 feet high in the front and 5 feet high in the rear. The roof is covered with roofing fabric, hence a lesser degree of slope is required than were the roof shingled. This house is divided into five pens, each pen having one glass and one muslin window, which furnish both light and ventilation in ample quantities. The construction of the front and the roof of this house is somewhat simpler and less expensive than House No. 1.

Modern Continuous House No. 3. This building differs from No. 2 only in length (having four pens instead of five) and in a few minor details, such as the location of the henholes, size of the window lights, and the arrangement of the muslin curtains, which in No. 2 are made all in one section in each sash, and in No. 3 are made in two frames and slide up and down, the same as the glass windows. This picture also shows what an attractive coat of paint will do for a poultry house. The height and general style of both Houses No. 2 and

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No. 3 are the same, and I am able to state, after an experience with all kinds of poultry houses, that, all things considered, this is the most thoroughly satisfactory type of house I have ever used or seen.

The inside arrangement of all three houses is extremely simple—the roosts and nests in the rear
General Construction of Houses Number 1, 2 and 3 and a drinking fountain and a hopper of grit and shells in each pen. These occupy only a few feet of floor space, so the fowls have ample room to scratch and exercise in the litter of straw which is always present on the floor.

During the winter time muslin should cover the ventilating frames, but in the summer time, or in warm climates, burlap will answer the purpose quite as well, and during pleasant weather in any season the cloth curtains should be entirely removed, giving the house a thorough sunning and airing.

There is an inside curtain of burlap which may be hung down from the rafters in front of the perches in cold weather, but these should be used only on extremely cold nights. In comparatively mild sections they are not needed at all.

The inside partitions between the several pens of the house are made of rough boards to the height of thirty inches or three feet, with poultry netting or fencing the remainder of the way up.

HOUSE PLANS AND SPECIFICATIONS

In long houses, every third or fourth partition should be boarded up entirely to the roof in order to prevent drafts from sweeping through the length of the house.

The gates, or doors, through which the attendant passes from one pen to another, are placed toward the front of the partitions, so that they close against the studding in the front wall of the house. The gates are hung to a 2 x 4-inch scantling which is placed in each partition three feet back in the house from the front wall. This makes all the gates come on a line with the outside door, which in all three houses is situated in the end wall, as shown in the illustration of House No. 1. There are no openings of any kind in the rear wall and the one end wall.

The bottom board of the inside partition runs the entire width of the house, and so, on this, the gate is set ten or twelve inches above the floor. Two boards of similar width are used to make the lower part of the gate solid and in keeping with the remainder of the partition. The upper body of the gate may be covered with any convenient netting or fencing. The 2 x 4 scantling previously mentioned is also useful for fastening the other boards and the wire used in the construction of the partition.

The hen holes in the front wall are 12 x 16 inches, being small hinged doors which may be

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raised and fastened with a hook to keep them open, and they are arranged so that when closed they may be hooked fast on the inside.

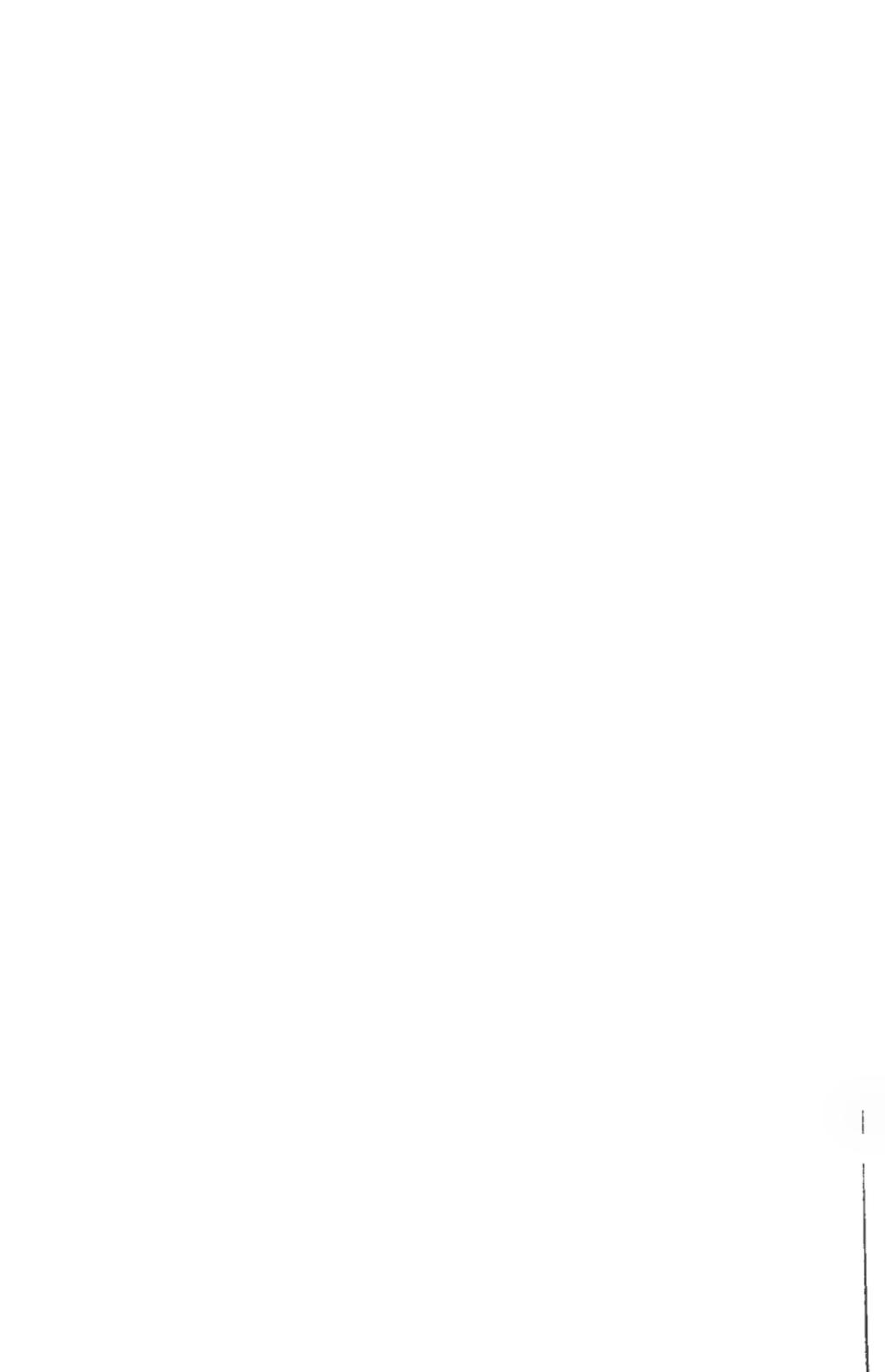
Passageways in Poultry Houses. Sometimes poultry houses are arranged with a "passageway" extending the length of the house, the idea being to save time and labor for the attendant by enabling him to do all the feeding and watering of the fowls from the passageway. However, this feature necessitates making the house larger in providing this extra space, which is useful to the fowls in no way and to the attendant for but a few minutes each day. Besides, most practical poultrymen value the close proximity to their fowls which is brought about by daily passing directly through their pens.

The type of Colony House in the most common and satisfactory use for adult fowls, and for developing youngsters, is that shown in the illustration, "The Colony System in Practical Use." This coop is practically the same in all respects as a one-pen Continuous House No. 2, the general type and dimensions being identical. This colony house may be constructed with the door located in the end wall and one window each of glass and muslin in the front, or the glass may be placed in the door and that and one muslin window may appear in the front wall.

The "Practical Roosting Coop," illustrated herewith, is designed especially for the rearing of



The colony system of housing poultry in practical use



HOUSE PLANS AND SPECIFICATIONS

young chickens from the weaning age until they get pretty well matured. In many ways this kind of a coop is not so serviceable or so perfectly satisfactory as a regular colony house like the one described in the preceding paragraph, but the small coop is cheap, may be moved from place to place quite easily, and fills the bill very nicely where not a great number of chickens are raised.

This coop is 3 x 6 feet in size, three feet high in front and two feet high in the rear. The bottom is of matched flooring laid on cleats and is removable, making it easy to set the main coop to one side and thus it may be cleaned much easier than were the floor stationary. The coop should be built in sections, with each wall and the roof separately constructed, so that it may be "knocked down" for greater convenience in handling and may be stored away during the winter without occupying an excessive amount of room. The lower two feet of the front wall is made of tight lumber, while the upper twelve inches is covered with one-inch mesh wire netting. The small door for the fowls is contained within a larger door (twenty-two inches wide by thirty-four inches high) which gives the caretaker free access when necessary. The coop has an adjustable hood which lies flat on the roof when not in use, and which may, when necessary, be adjusted at any convenient angle to shelter the inside of the coop

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from the sun or rain; in cold or very stormy weather it may be lowered flat against the front.

This coop is rather small for adult fowls, except bantams, but with the addition of one or two small glass windows it makes a fairly satisfactory open house for four or five medium-sized fowls. It is light and easy to move, and may be carried without much exertion from one part of the premises to another, thus giving the fowls the benefit of new ground and fresh vegetation.

The "Roosting Coop for Chicks After Weaning," illustrated on another page, is 3 x 6 feet in size, three feet high in the front and two feet high in the rear. Not more than twenty-five chicks should be housed in a coop of this size. A perch runs the entire length of the coop a half-foot from the rear wall. Such a small coop gives satisfactory results only in pleasant weather or when located in a well-protected place.

POULTRY YARDING AND FENCING

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CHAPTER IV

POULTRY YARDING AND FENCING

IN the wild state, fowls naturally roam in the fields and woods to make a subsistence. They thus exert themselves and secure much exercise, which helps to keep them healthy and hardy. In domestication, at least a portion and sometimes all of the fowls' food is provided for them, but it still is very important that they take an abundance of exercise to keep the blood circulating and the bodily functions active.

Freedom to rove at pleasure and in safety is the ideal condition for health and happiness among fowls, but of course this is possible only where the poultryman has access to a tract of land of considerable size. On farms it is a good plan to allow unrestricted range over tillage, meadows, pasture, and into woodland. Everybody agrees that an orchard makes an ideal place for the ranging of poultry, but not everybody is blessed with an orchard.

While free range is very desirable, it is not at all necessary for success with poultry. However,

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where fowls must be yarded they should have as large a space as possible, up to the point that **Yarding Poultry** satisfies their apparent longings for room. Where houses with several divisions are used and it is desired to pen each flock separately, the runs should be rather narrow and as long as possible or desirable. Comparatively narrow runs are desirable because they induce the fowls to range away from the house, and they thus get more exercise than would be the case with square yards.

Double Yarding. Perhaps the best possible system when keeping poultry in confinement is to have two runs for each pen of fowls, using them alternately. In the one have grass or green stuff of some kind growing, while the fowls are eating it off in the other lot. In this way the ground gets occasional rests from the presence of fowls; the ground is plowed under several times a year, and the growing stuff helps to remove impurities from the soil. Where this plan is followed, yards may be arranged in both the front and rear of the house. Where only one yard is allowed to each flock, that one should by all means be to the south of the house.

With the double-yarding system the location of the house should be the highest point of all, and the ground should gently slope away from the house in each direction. With the single-yarding

POULTRY YARDING AND FENCING

system the slope should be to the south, or south-east, and if that is not a natural condition, cutting and filling should be engaged in to bring about that result, as it is essential; for then the ground will dry off quicker after rains and much of the filth and droppings which collect in the yards will be washed away from the house.

It is not a good plan for the poultryman to have to pass through the poultry yard to get to the house; this often is inconvenient and always annoys the fowls, especially if strangers or visitors intrude when the fowls are in the yard.

The site for the poutry house must be high and dry, and the land should be well drained. This is essential to the life of the house as well as to the health of the fowls; for a poultry house, like any other kind of a building, will not last long when the sills are wet and damp for weeks at a time—they are sure to rot out and make extensive repairs necessary. Also, it is unhealthy for fowls to range over ground that is damp, wet, or even muddy.

Well-drained sandy loam or gravelly soil is probably the most desirable kind of ground; it is best for the house and best for the yards, too; for with porous land the filth and droppings are absorbed by the ground at every rain, thus keeping the runs clean and healthful. A poultry house should never be located in a valley or other depression, where it is in such a position that it will get the wash of

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the surrounding land, or where there is danger of the water backing up around it during a sudden thaw in the winter or spring.

“How *little* room do I dare to allow to my flock?” is a much more common question among **The Least** small poultry keepers than “How **Yard Room** *much* room should I allow?” All **Advisable** that is absolutely necessary of any yard is to supply enough room to enable the fowls to take sufficient exercise to keep in a good healthy condition. Anything above that amount is simply for the purpose of giving the fowls more enjoyment and pleasure in life, the stimulating effect of which is very desirable; anything below that amount of room cannot help but result in the deterioration of the health and strength of the birds.

A great deal depends upon the nature of the breed as to how much room they must have. The two extremes of type are probably the Cochins and the Leghorns; the former, large and sluggish as they are, will contentedly submit to a confinement the closeness of which would positively worry the active, alert Leghorns. The Plymouth Rocks, Wyandottes, and other medium-sized breeds, are between these extremes. Where the object is merely eggs for market, a smaller yard room will answer the purpose than where the object is eggs for hatching purposes. Carefulness

POULTRY YARDING AND FENCING

on the part of the attendant to provide plenty of good clean litter for the birds to scratch in, green food from the garden, scraps from the table and kitchen, etc., often atone for a lack of yard room for the fowls and make possible a success not dreamed of by the careless attendant.

Larger yard space per head is necessary in the case of pens of four to ten birds than where fifty or more birds are kept together. For flocks of fifty fowls, fifty to seventy-five square feet of yard room per fowl might well be placed as the minimum space for maximum results; in permanent yards, especially if uncultivated, at least one hundred square feet per fowl should be allowed. This would mean about three acres of land for one thousand adult fowls, and that is about as "intensive" as practicable; five acres would be much safer, especially for breeding stock. A flock of a dozen fowls, more or less, should have at least three hundred square feet, if they belong to the American or English class. The Asiatic breeds, with good care, will often do well on little or no range; Leghorns and other nervous breeds should not be attempted on a small plot. All figures given are strictly minimum; the more space allowed the better.

The poultry keeper must remember in all these cases that the less the yard room for his flock of poultry the more constant his care in management

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will have to be. Among these matters deserving special attention is that of the double necessity for **Sanitation of Yards** keeping small yards in a perfectly sanitary condition. Large yards may be purified both by cultivation and by the growing of crops on them. Small yards can be kept free from impurities only by cultivation. Fresh, dry loam is capable of deodorizing large quantities of droppings, and a small yard may be kept comparatively clean in this respect if it is raked, spaded, or cultivated in some other way quite frequently. Whenever possible, the yards should be made of sufficient length and width to allow the use of a horse cultivator, as it is quite a task to cultivate by hand even a small plot a half-dozen or more times a year. Aside from the value of purifying the soil, it always is an advantage to supply green food for the fowls by growing grass or grain in the runs, which lessens the labor of supplying green stuff and the birds relish it more when they can eat it as it grows.

Poultry fences may be either stationary or portable. In the case of the latter, they had best be **Construction of Fences** made in sections of about twelve feet in length, with a base board and top board so that the fence will stand moving without harm. Picket and lath fences are practical only for small yards, and where good appearances are an object they may be attractively designed and

POULTRY YARDING AND FENCING

painted so that they will present a more pleasing appearance than a wire fence. Wire netting has until recently been in very common use among poultrymen, but now woven-wire fences are the most popular, because they are stronger, last longer, and are more serviceable in every way. Cedar posts are probably the best, while chestnut ranks next with regard to durability. Galvanized staples are used for attaching the wires to the posts.

The height of the fence depends very largely upon the breed kept. The quiet, sedate Asiatics may easily be kept in by a fence four feet high, and sometimes three feet high is plenty. American breeds usually require a fence four or five feet high, the latter height being the safer. Fences for the active Mediterranean breeds usually have to be at least six feet high, and sometimes seven feet in height is necessary.

It is best always to have a base board around a poultry fence, because then the fowls are less liable to burrow underneath and get out of the pen, and also less liable to get their heads caught in the mesh in the wire. This board should be something like a foot in height, except where the yards are side by side and contain pugnacious male birds, and then they should be at least two feet, or high enough that the birds cannot see and torment one another, as otherwise they will pick at one another and try to fight through the

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fence, and more or less serious injuries to combs and heads will be the result. Use no top rail unless absolutely necessary to support the fencing material and then the fowls will have no ostentatious object to aim at in flying up to mount the fence.

Protection from the hot rays of the summer's sun is as necessary to fowls as protection from the chilling blasts of winter. Of course **Shade in** natural shade is best, but if that is not available, shade can and should be provided. **the Runs** Arrangements for artificially shading parts of the yards include wooden shutters, frames covered with cotton cloth, and supports on which are placed birches and evergreen branches. These "covers" also make good shelters from hawks where such enemies to poultry are present.

Trees, etc., for Shade. Natural shade can be secured by means of bushes, shrubs, or trees of almost any kind. Two birds may be killed with one stone, as it were, by planting those trees that bear fruit or nuts, as the trees will be a source of revenue as well as providing shade for the fowls. Plum, peach, apple, pear, apricot, and cherry trees—all are excellent for poultry runs. Trees bear exceptionally well here on account of the rich poultry manure deposited in the yards by the fowls and because the poultry keep the trees free from injurious worms and insects. In some local-

POULTRY YARDING AND FENCING

ities grapes thrive well in poultry enclosures. The vines may be trained to posts in the yards or to the boundary fences. They should, of course, be so pruned that they will bear their fruit up from the ground far enough that the fowls cannot reach it. Evergreens may well be used for wind-breaks, and will also furnish shade; arbor vitæ, white pine and Norway spruce are also excellent in this connection.

POULTRY FIXTURES

CHAPTER V

POULTRY FIXTURES

PERCHES should all be on the same level and no higher than two or three feet above the floor. By having the perches all on the same level there is no strife for the highest positions, as otherwise always occurs, and the fowls are always found evenly distributed over the perches; while by having them low there is no danger of jars and bruises occurring to the legs or bodies of the fowls in jumping or falling off the perches.

Roosts The instinct of self-preservation prompts fowls to perch on the highest point they can reach when taking their quarters for the night; they naturally desire to be above danger from below. This instinct is a very apparent one, and it is strange that we so often see in use the old undesirable ladder-like arrangement of the roosts, each cross-piece a little higher than the preceding one, the first one being within a few inches of the floor, while the last one is up almost to the roof. If one will look into such quarters at night, after the birds have retired, he will find that, no matter how much room

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there may be on the roosts, only a portion of the lower space is occupied, while the higher poles are crowded, and the fowls are as compactly pressed together as if the packing process had been done purposely in order to get all the fowls as high up as possible.

There are several potent objections to such roosts, not only so far as the health and comfort of the fowls are concerned while they are sleeping, but also because the roosts are unsightly, unhandy and filthy. By all the fowls striving for the topmost perch they frequently crowd each other off, and harmful results often follow such accidents. Even when there is no crowding, the highest perches are so far removed from the floor that heavy fowls often fall when getting off in the morning, or if they do alight properly, the distance is so great that their feet are often injured and sometimes even bruises and jars to the body result.

The best perches are from two to three inches wide, slightly rounded at the upper edges, and one or two inches thick, or heavy enough to prevent sagging or breaking with the weight of the fowls. It is best for the roosts not to touch the walls of the house at any place, as otherwise lice and mites can spread all over the building. In this event it becomes impossible to totally exterminate them; but if the roosting fixture is not attached to the house in any way the vermin cannot get off the

POULTRY FIXTURES

perches, but must remain and can easily be reached with a lice-killing material. Aside from this, it is quite an advantage to have the perches so that they can be removed to the outside of the building and thoroughly cleaned and disinfected several times a year.

The illustration, "A Simple and Satisfactory Roost," shows what is perhaps the most easily constructed, perfectly satisfactory type of roost the author ever used. There certainly are not many hiding places for vermin about such a roost, it can be made by almost any one at little or no expense, and may be moved about very easily and handily. The perches are eighteen inches above the floor, which is the height I prefer for medium-sized breeds; perches only a foot or so high are best for the Asiatic breeds, while the Mediterranean varieties like to perch well up from the floor. The best space to leave between perches is about fourteen inches.

The nest boxes should be large enough to allow the hen plenty of room to change her position while on the nest, but should not be too large, or broken eggs will result, which may lead to the egg-eating habit. Eleven by fourteen inches is about the correct size for medium-sized fowls, and other breeds in proportion. Each nest should be separate and not joined to the others, as this facilitates cleanliness and

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makes it easier to get after lice and mites. Soap boxes or similar boxes, which any one can secure of the family grocer, cost little and are perfectly satisfactory. The nest boxes may be of any reasonable depth, but if more than six or eight inches deep it is best to have one side partially cut away so the hens can enter without jumping down upon the eggs which may be in the nest. A quiet, secluded place is very desirable for the nests; the hens prefer to deposit their eggs in apparent concealment, and in a rather dark place they are less likely to disturb the contents of the nest and break the eggs. One nest for every three or four hens is sufficient.

Nesting Material. I like excelsior about the best of anything we have ever used for nesting material, and advise its use. Hay and straw (especially the former) are usually too coarse and unyielding to be comfortable to the body of the hen. Hay chaff makes a comfortable nest, but the hens are liable to scratch in it for the seeds it contains. Use cedar excelsior, as this has a tendency to keep down lice and mites. The old nesting material should be removed every few months and burned and replaced with fresh; this not only keeps the nests clean, but also destroys vermin, filth and vermin being detrimental to success with poultry business.

Trap Nests. These are designed to distinguish

POULTRY FIXTURES

the laying from the non-laying hens. They keep the hen imprisoned when she goes on the nest until she is released by the attendant. These nests furnish the only certain means of knowing which hen is laying and how many eggs she lays in a certain period of time. The best of these nests are patented, so we cannot give plans; but they may be installed at a cost of, usually, from twenty-five to fifty cents each. Those wishing such nests will find them advertised in the poultry papers. It takes a little time to visit the nests three or four times a day, but one who is trying to build up a laying strain will receive ample reward for all labor expended in this direction.

Flocks, each hen in which lays two hundred or more eggs per year, have been made possible only by careful selection of the breeding stock, through several generations, from the data furnished by trap-nest records. All characteristics and qualities of poultry are largely matters of selection; this is as true of utility or market qualities as of fancy points. Any poultry keeper can, in the course of a few years, establish a reputation for having birds of extra-large size, extra-good layers, or extra-fine exhibition stock, if only he will breed carefully and judiciously with those ends in view.

Nest Eggs are entirely unnecessary as well as undesirable, unless medicated eggs are used for the purpose of keeping down vermin. These eggs

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are made of materials which give off an odor destructive to the vermin in the nest and on the bodies of the hens which frequent the nest.

By the term "droppings boards" is meant a platform under the perches to catch the droppings from the birds while on the roost at night. Droppings boards are a great convenience in a well-kept house; a neglected house is better without them. Where the droppings are removed every morning or two it is much easier to sweep them off the droppings boards into a basket or bucket than it is to shovel them up off the ground, and the house is cleaner afterward, because every particle of manure may be removed from the boards. But if the droppings are allowed to accumulate, the boards become saturated with liquid manure, and, being necessarily close to the perches, they make bad conditions worse and compel the fowls to breathe impure, foul-smelling air.

The best droppings boards are made of matched flooring, or any other material that is smooth on one side. The platform should extend beyond the sides of the roost eight or ten inches, in order that all the droppings may be secured from the fowls on the outer perches. For a single perch the board should be about twenty inches wide; for two perches, three feet wide. A two- or three-inch strip had best be placed around the edge of the platform

POULTRY FIXTURES

to prevent the droppings being scattered by the fowls.

The height of the droppings boards from the floor depends largely upon whether or not the nests are located under them. At any rate they should not be more than two feet above the floor; this makes them easier to sweep off, and the attendant is compelled to breathe less dust and impure air. The perches may be from eight to fifteen inches above the droppings platform; a foot makes a nice height.

Where house room is plentiful, the author would recommend the use of separate and simple **Hennery** roosts and nests, as these are not only **Outfits** cheaper than the more complicated "Hennery Outfits," but are more easily kept clean and free from vermin. However, where house room is limited, the Hennery Outfits, which we illustrate in this connection, may be used to excellent advantage, as they are compact and convenient and occupy little or no floor space when set on legs as in the illustrations.

Both of the fixtures illustrated were factory-made. Such fixtures are usually more workman-like and cost little more than it does for one to make them himself. The illustrations show the fixtures attached to the rear wall of the poultry house, but I prefer to have them clear of the wall by at least a few inches if possible; this is on ac-

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count of fighting vermin, as explained early in this chapter. My personal preference is for the horizontal droppings board rather than the slanting one, because fowls that happen to fall or get pushed off the perches can obtain no foothold on a slanting platform, but must slide (through droppings and all) until the horizontal base board is reached.

For the benefit of those who wish to make their own fixtures, the dimensions and details of construction are given herewith. The nests are 11 x 14 inches in size, inside measurement. The fixtures illustrated are five feet in length, but may be made any convenient length. Any number of perches may be used on the fixture, but not more than three are desirable. With very small flocks, sometimes only one perch is necessary. A fixture, five feet long with two perches will accommodate about fifteen medium-sized birds—more of small breeds, and fewer of large breeds. As a rule it is best to have the fixture long and narrow; this not only gives sufficient length in the fixture in which to construct all the nests necessary for the hens, but also conduces to the good health of the fowls while sleeping, as it is not best for them to be bunched up in too concentrated a mass. The droppings boards are fourteen inches above the bottom of nests, allowing the hens plenty of head room in the nests.

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All wood used in the construction of fixtures should be as light as possible without making the outfit flimsy; nests and the partitions between them, as well as the droppings boards, had best be made of one-fourth or three-eighths inch stuff, together with the hinged strip in front which laps down over the tops of nests. The irons connecting the perches are one-half inch in diameter, and swing in castings in the rear so that they may be raised from the front and hung back against the rear wall of the house, giving a clear and unobstructed droppings board, which may be easily swept off.

Food hoppers for the use mentioned in Chapter Nine can be made at home or purchased, just as the poultry keeper desires. If home-made they cost little or nothing except the labor of **Construction of Self-Feeding Hoppers** quired, but if the poultryman has no liking for manual labor he can get good ones made of galvanized iron or tin that will be more durable than any he could make himself, as well as affording better protection to the feed if they are to be used outdoors. Grocers always have an abundance of small boxes lying around, and it takes very little labor to convert these into efficient self-feeding hoppers, and the cost is practically nothing.

The principal of construction can be readily gathered from the accompanying photographs. The pictures show hoppers having several compart-

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ments, but they may be made with one compartment or several, just as the owner prefers. Of course, the larger the hopper the less frequently it will have to be filled. For small chicks they may hold only a few quarts, but for adult fowls it is more economical to have them hold a bushel or one hundred pounds of feed, and then they will not need to be filled so frequently. In the latter event they should be made three or four feet high, and then they will not occupy so much floor space.

The hoppers are replenished with feed from openings in their tops, or the entire top may be hinged if convenient. The base board at the bottom of hopper should be high enough to prevent waste of feed, but also low enough that the birds may eat conveniently. It may vary in height from two to four or five inches, according to the size of the birds. The trough at the bottom and front of hopper, and out of which the birds pick the food, should not be deep enough (that is, extend back far enough) to allow the fowls to get their feet in it and scratch the food out, or to allow small chicks to crawl entirely into the receptacle, but should allow plenty of room for the bird's head.

Pans and troughs are unsatisfactory and away behind the times as drinking vessels for poultry.

Drinking The regular drinking fountains are
Vessels better in every way; they reduce the
labor of the attendant because they do not require

POULTRY FIXTURES

so frequent filling or so much attention with regard to cleanliness, because it is next to impossible for the fowls to foul the water if the fountains are properly arranged and located, and they also prevent fowls from becoming wet and soiling their plumage, or little chicks from drowning. They come in various designs, shapes and sizes; we illustrate several patterns that have given us excellent service here on the Buff Rock Farm, but there are many other good ones.

The one-quart size is the best to start little chicks with, and then the size may be increased as the chicks grow and require more and more water. The one-gallon size will need filling but once a day for fifteen or twenty fowls, and that or a larger size saves labor when used for adult fowls or large young stock.

There are also on the market now several styles of fountains which allow the use of a lamp under them during cold weather, and thus the water may be prevented from freezing and will be comfortable to the fowls all day long. This is an especial advantage to the man whose business or other duties keeps him away from his fowls except of mornings and evenings. Those who are in the market for something of this kind should visit or correspond with a poultry supply house.

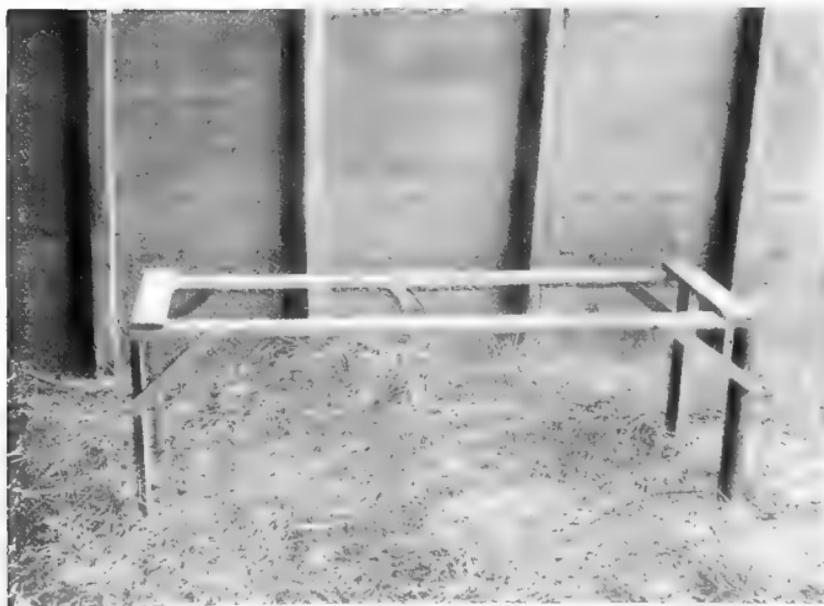
In addition to the foregoing specially mentioned

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appliances and devices there are numerous other **Miscellaneous** ones, although some of them are **Equipment** designed principally for the large breeder and do not come under the jurisdiction of this book; they include bone cutters, feed cookers, feed mixers, grit crushers, hay cutters, etc. Grit crushers enable the operator to make his own grit, and this is economical in some sections of the country, where a natural supply of satisfactory sharp stones and gravel is available. Hay cutters enable the owner to cut his own clover or alfalfa into short lengths, thus furnishing an excellent supply of green food for the winter months. Green-bone cutters (not bone mills, which are for grinding dry bones and are of little value) are discussed in another chapter.



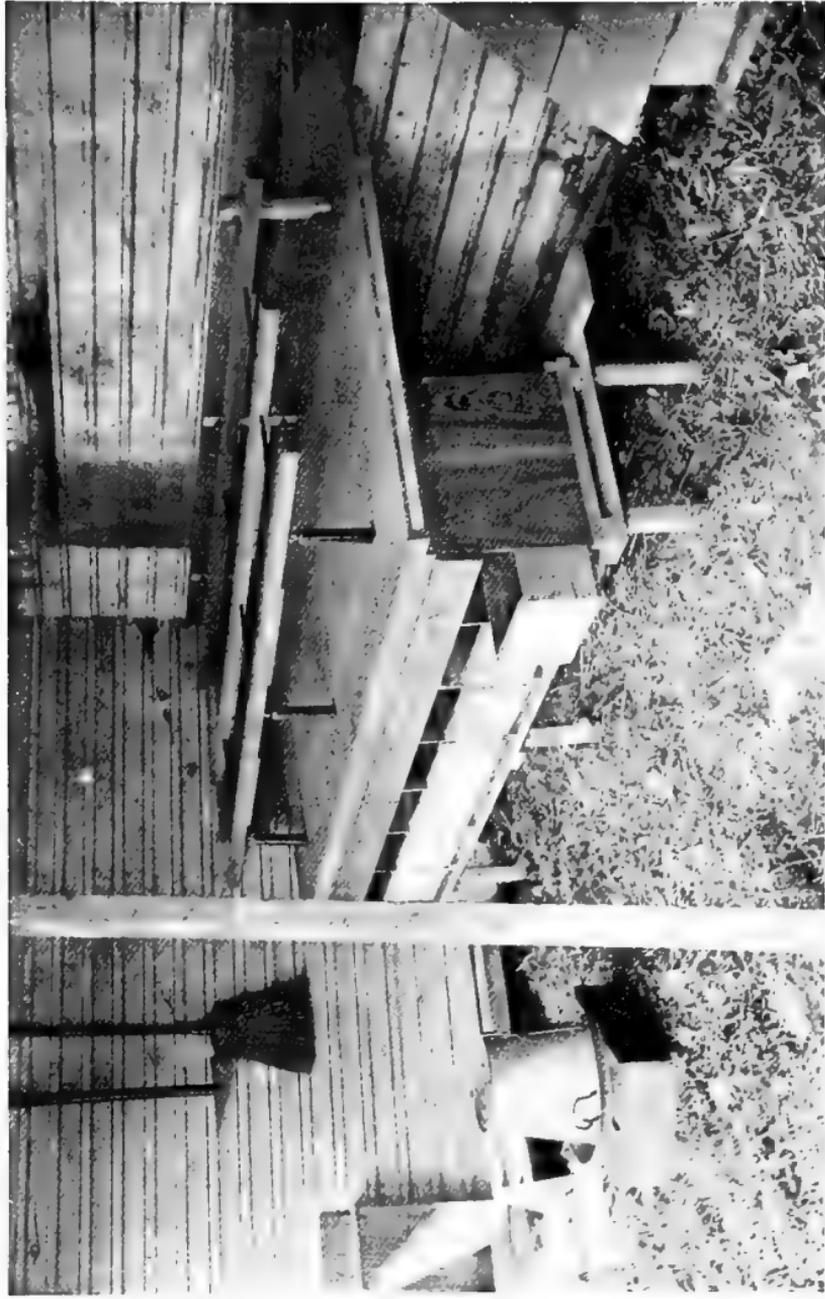
A nest perfectly satisfactory to both hen and attendant
Made from a grocery box costing five cents



A simple and satisfactory roost



Henery outfit with slanting droppings platform



Hennery outfit with horizontal droppings platform



Drinking fountain and home-made self-feeding hopper



A "wall" drinking fountain and a boughten self-feeding hopper made of galvanized iron

INCUBATORS AND BROODERS

CHAPTER VI

INCUBATORS AND BROODERS

EVERY poultry keeper who raises more than two or three hundred chickens each year now takes it for granted that one or more incubators and brooders are to be a part of his equipment. So far as the author is concerned, I would not give up incubators and brooders if I were going to hatch only one hundred chicks a year, and I am perfectly sincere in believing that an incubator and brooder would be a good investment for every one who raises that number or a greater number of chickens annually.

Artificial incubation and brooding are no longer experiments; the best of the machines on the market to-day have proven, in the hands of practical poultry keepers the country over, that they are capable of giving every bit as satisfactory results as the old hen herself, and of doing it, too, with less bother and annoyance. However, the incubator or brooder that can beat the old hen at her own game has not yet been invented, and probably

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never will, aside from the fact that machines are always ready for business and are not inclined to any sudden flights of fancy like an old hen, and consequently do not refuse to sit at a critical time nor do they trample and kill the little chicks.

The expense of operating an incubator is slight, and the time and labor required are of no great consequence, and certainly are much less than that which would be required to look after broody hens attending to the same number of eggs. Our experience has been that, on the average, it requires four or five gallons of oil to run a 240-egg capacity machine one hatch, and three or four gallons for a 120-egg machine in moderately cold weather; in warm weather it takes much less.

There is nothing tedious or irksome connected with the operating of a good incubator. The only care a good machine requires is keeping the lamp filled and the wick trimmed, turning the eggs morning and evening, and looking at the thermometer two or three times a day to see that the correct heat is being maintained, which is 103°. To be sure, some of the machines on the market, that are more cheaply constructed, require more close and constant attention than this; but this is not the kind of machine to buy, because with incubators, as with everything else, "the best is always the cheapest." We never allow our incubators to interfere with our sleep, or to prevent us from going visiting of

INCUBATORS AND BROODERS

Sundays, because with a standard make of machine such close and constant attention as this is not necessary.

There is more than one good make on the market. The beginner should consider the experience of those who have tried different machines. Don't pay much attention to testimonials reporting 100% hatches, but get a machine that has given satisfaction on the large, successful poultry farms. This is the very best advice I can give to the man who knows nothing about it himself.

The small poultry keeper is in a position to profit as much, accordingly, by the use of incubators and brooders as the larger breeder. With a small flock it frequently occurs that scarcely any eggs are received at times when the greater part of the flock are sitting or want to sit; or, if he has a non-sitting breed, he has to either use an incubator or buy broody hens, and the machine is certainly preferable.

Here are several points of advantage of machines over hens which the small breeder will do well to observe: Broody hens may be "broken up" immediately and started to laying again in a week or two; it is absolutely true that it is easier to attend to an incubator and brooder than it is to look after a half-dozen or more fussy old hens, which are always untrustworthy and never pleasant to handle nor easy to manage; the chicks are all

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the same age and size, and may all be kept in one flock with a great saving in time and labor; and machine-raised chicks are decidedly easier to keep free from lice.

It is always best for the beginner to follow closely the instructions sent along with the machine he is using, because different makes of machines, different locations, and different climatic conditions require vastly different methods of operation; and the manufacturer of your machine ought to know better than anybody else how to operate it for best results.

There are, however, a few general principles which may be laid down that will hold good with every make of machine and in every climate, and which sometimes are not found in incubator instruction books, even though they are important to one who has never had experience.

Make sure that your thermometer registers exactly correct. Test it at the beginning of each hatching season with a physician's thermometer. This may be done by holding the two instruments in a pan of water and stirring gently and steadily to keep the temperature of the water uniform. A half degree variation in the thermometer may ruin a hatch. New thermometers sometimes are imperfect, and old ones will occasionally show a slight variation from one season to the next.

Have the incubator setting perfectly level, as

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otherwise the distribution of heat and ventilation to the various parts of the egg chamber will be unequal.

No oil should be used in the lamp that does not test 150 degrees or higher; by observing this requirement much smoke, soot, fumes and gas will be avoided, all of which are very undesirable in incubation.

It is best not to turn or cool the eggs until the third day. After that they should be turned at least twice a day. They should be neither turned nor cooled after the first egg is pipped.

The best hatches are completed inside of eighteen hours from the time the first egg is pipped.

If the proper temperature has been maintained right along, the hatch should be all cleaned up by the morning of the twenty-first day.

Too high a temperature will quicken the hatch, while too low a temperature will prolong it.

After each hatch, and before a new hatch is started, give the egg chamber a thorough cleaning and disinfecting. Thoroughly clean the heater and scour the burner. Use a new wick for each hatch.

With a standard make of machine the location does not make so very much difference. The small poultry keeper often cannot afford to have a specially constructed incubator cellar, but these are necessary only where a number of machines are operated, and the man who has only one or two

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machines can secure about as good results with them located in one of the rooms of his dwelling. A cellar makes a very good place for the location of the machine, providing it is dry and well ventilated; a damp, musty cellar is the poorest place possible for successful incubation. There are only two rooms in the ordinary house in which we would not want to run an incubator on account of results, viz., a room with a fire in, because the hatches would probably be poor; a bedroom, because the fumes and gases from the machine would make the atmosphere unhealthy to sleep in.

A good brooder is every bit as important as a good incubator, if not more so, for the reason that **Construction** it is more difficult to raise chicks than **and Operation** to hatch them, and it is the number of **of Brooders** chicks raised, and not the number hatched, that makes or unmakes the profit. A poor brooder will kill the chicks faster than a good incubator can hatch them.

A good brooder is considerably more than merely a box with a lamp set inside it, and sells for more money. Many beginners seem to have the idea that any kind of an arrangement will serve the purpose of a brooder very well, so long as it keeps the chicks reasonably warm. The more experience one has, however, the more he realizes what a serious mistake this is, and the more he appreciates what a really good brooder means



The type of outdoor brooder in most successful use on the author's poultry plant

INCUBATORS AND BROODERS

toward his success. As a rule, home-made brooders are unreliable, and I could not think of recommending them.

A point that I have found to be very important, and which is often overlooked in brooder construction, is that of having a sufficiently large amount of glass in the walls or top to allow an abundance of light and sunshine to enter into the brooder. Chicks will stand around outside in the rain or cold rather than go into a poorly-lighted and ill-ventilated place. See that the brooder is well ventilated; pure, fresh air is very essential to rugged health and strong vitality in chicks.

While the floor of the brooder should be up off the ground several inches, those that are set up on legs, leaving an open space underneath through which the cold wind may blow at will, are very undesirable. This is especially true if they are to be operated outdoors or in a cold building; for then it becomes an extremely difficult matter to maintain an even temperature in them, and an excessively large amount of heat is required to keep them sufficiently warm. Also, it is a pretty difficult matter to teach chicks to go up and down a step-ladder every time they go in or out of the brooder.

BREEDS DESCRIBED

CHAPTER VII

BREEDS DESCRIBED

ALL standard-bred poultry is divided into "classes," of which the most common in America (because the most practical) are known as the American, Asiatic and Mediterranean classes. Four other common classes are the English, Games, French, and Bantams. All breeds that do not come under one of the classes named are prized mostly as novelties and are more or less impractical and undesirable for American purposes.

In the following descriptions a few terms may call for explanation. For instance, the words "sitters" and "non-sitters." Many of the egg breeds have been bred for eggs so exclusively and continuously that they now very rarely exhibit a desire to incubate, and these are called the non-sitting varieties. Where we have applied the term "sitters" we do not mean to imply that the hens are especially persistent in desiring to incubate, but merely show the natural instinct to reproduce.

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All eggs are classed broadly as "white" or "brown," but there really are many shades and tints of color, and some eggs are so nearly intermediate that they would be hard to place in either class. The Mediterranean breeds seldom depart from their usual white or very light-tinted eggs; but the brown-egg hens frequently lay eggs that in color vary from deep brown to light flesh color. Other things being equal, the hen whose eggs are truest to type in color is the most desirable, although a variation in color of the egg shells does not necessarily imply impure breeding.

* * * * *

THE AMERICAN CLASS

In this class are found the general-purpose breeds of America, the most important of which are the Plymouth Rocks and the Wyandottes, although for the last few years the Rhode Island Reds have been well up in the front ranks. All three of these families are very hardy, lay brown eggs, are good sitters and mothers; grain and flavor of flesh excellent. They also stand confinement well, but are good foragers when they have the range. They average about the same with regard to egg production, but the Plymouth Rocks have the advantage of the largest size, Rhode Island Reds next, and Wyandottes last.

BREEDS DESCRIBED

There are three standard varieties in the Plymouth Rock family, viz., the Barred, White, and Plymouth Buff. With all of them the comb is single and serrated, and medium to small in size; the ear-lobes are red, while the skin, beak, legs and toes should be of a deep-yellow color. The bodies are well balanced with regard to shape and symmetry, being of neither a blocky nor an angular type. Standard weights are, cock, $9\frac{1}{2}$ pounds; cockerel, 8 pounds; hen, $7\frac{1}{2}$ pounds; pullet, $6\frac{1}{2}$ pounds.

Barred Plymouth Rocks. Breeds may come and breeds may go, but it will be a long time before one of them usurps the prestige of the Barred Rock in America. For years they have stood at the head of the procession, and to-day it is very probable that there are more Barred Plymouth Rock chickens in this country than of any two other breeds, on account of the large numbers of them to be found on the farms. The bars on feathers should be narrow and parallel and alternately white and bluish-black in color. The double-mating system* is generally used in breeding exhibition Barred Rocks, and considerable skill is required in breeding this variety for fancy points, owing to the difficulty in getting the proper shade of color and correct markings of plumage.

* By "double mating" is meant the use of two separate matings to produce birds of standard color and markings in each of the two sexes.

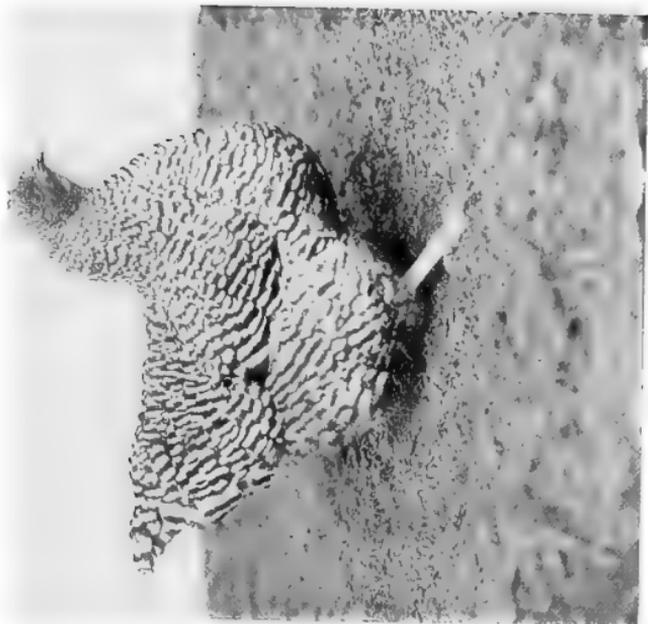
AMERICAN POULTRY CULTURE

White Plymouth Rocks. Have the same general characteristics as the other Plymouth Rocks, and in addition are the easiest to breed true to color of any variety in this family. The only difficulty is in getting the plumage *pure* white, without any brassiness or creaminess, and the skin and legs a deep yellow color; it is a rather difficult combination, but careful breeding for the past few years has accomplished much.

Buff Plymouth Rocks. The latest standard addition to the Plymouth Rock family, and the most popular buff breed in the American field today. As in all buff varieties, the desired color is a uniform shade of rich, golden buff, free from black and white, although either of these two colors appearing in wings or tails is not a disqualification, owing to the scarcity of absolutely solid-colored specimens.

Columbian Plymouth Rocks. Bred only in small numbers as yet and exclusively in the hands of fanciers. Not yet recognized as a "standard" variety, but will doubtless be very popular when more nearly perfected, as they combine the unexcelled utility qualities of the Plymouth Rock with the beautiful color and markings of the Light Brahma.

There are also the Silver and the Partridge Plymouth Rocks, but these are neither common nor "standard."



Barred Plymouth Rock Female



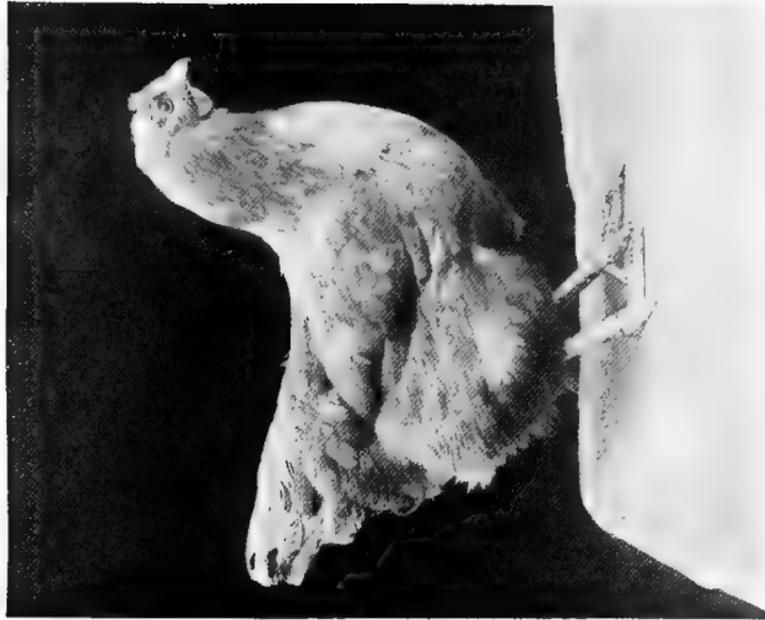
Barred Plymouth Rock Male



White Wyandotte Male and Female



White Plymouth Rock Male and Female



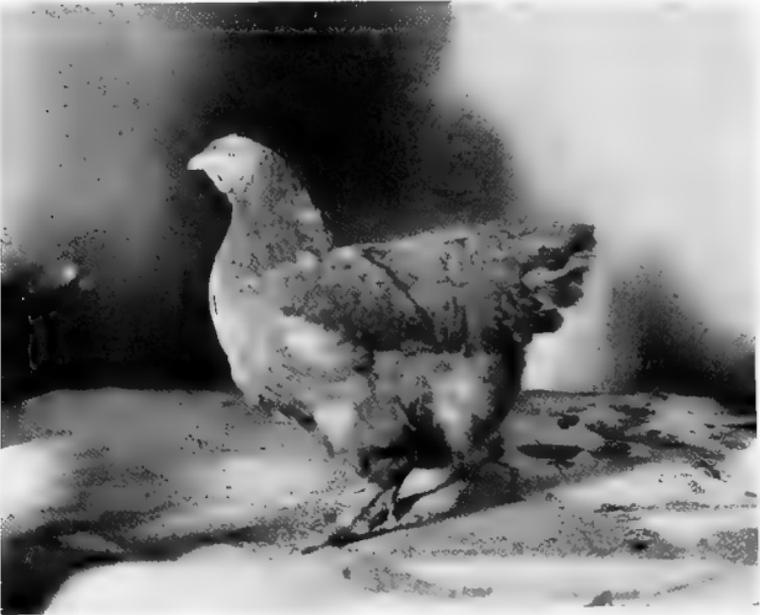
Buff Plymouth Rock Female



Buff Plymouth Rock Male



Buff Wyandotte Male



Buff Wyandotte Female



Silver Laced Wyandotte Male



Silver Laced Wyandotte Female



Columbian Wyandotte Female



Columbian Wyandotte Male

Courtesy of A. D. Arnold



Rose Comb Rhode Island Red Male



Single Comb Rhode Island Red Female



Light Brahma Male and Female



Black Langshan Male and Female



Dark Brahma Female



Rose Comb Black Minorca Male



Buff Cochon Male



Buff Cochon Female



Buff Leghorn Male



Buff Leghorn Female



Black Leghorn Male



Black Leghorn Female



Single Comb White Leghorn Male



Single Comb White Leghorn Female



Single Comb Black Minorca Male



Single Comb Black Minorca Female



Silver Spangled Hamburg Female



Courtesy of G. L. Preston

Silver Spangled Hamburg Male



Houdan Female



Houdan Male



Buff Orpington Male



Buff Orpington Female



Courtesy of Walter F. Knutzen

Cornish Indian Game

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tapers to a fine point near the extremity of the feather.

Golden-Laced Wyandottes are the same as the Silver-Laced, except that golden bay takes the place of white in their plumage.

Silver-Penciled Wyandottes have the same kind of plumage as the Dark Brahma. This variety, as well as the Laced, are beautiful and practical fowls.

Partridge Wyandottes have the same color and markings as the Partridge Cochin.

Black Wyandottes are black in all sections and are rarely bred.

Columbian Wyandottes. The latest addition to the Wyandotte family. Immensely popular from the start, mostly because they deserve it, but partly because of the craze for new varieties. In color they are counterparts of the old Light Brahma; otherwise they do not differ from the other varieties of 'Dottes.

Rhode Island Reds are not a strictly "new" breed, but they have been recognized in the American Standard of Perfection for only a comparatively few years. They are a general-purpose breed; fair layers of brown eggs; medium in size, sitters. Standard weights, cock, 8½ pounds; cockerel, 7½ pounds; hen, 6½ pounds; pullet, 5 pounds. There are both rose-combed and single-combed varieties, the latter being the most common.

BREEDS DESCRIBED

At first the Reds were only locally popular, as their name would indicate, but now they are bred quite generally. In hardiness and other general qualities, these fowls average about the same as the other American breeds, which is equivalent to saying that they are an excellent fowl. In color they are mostly of a reddish buff, but black is called for in tails and wings.

The Buckeyes are attaining more or less prominence, but they, like the Reds formerly were, are still a local breed, as their name indicates. They are hardy and good layers of brown eggs, but the beginner had best select an established and well-advertised breed. For this reason we omit mention of a number of more or less prominent but comparatively untried breeds.

The American Dominiques are a very old breed and one time quite popular, but were superseded by the Barred Rocks, which resemble them in color and are the more desirable in several respects.

The Java family has two varieties, the Black and the Mottled. The latter are black and white in color, while the former are solid black. This is also an old breed, but now "out-of-date," as it were, and rarely bred.

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THE ASIATIC CLASS

Light Brahmas. This is the largest breed of chickens there is. They are a strictly meat breed and especially good for roasters and capons. They are docile and stand confinement well; fair layers of large brown eggs, rather persistent sitters. Their low pea combs and heavy feathering of both body and shanks enable them to stand exceedingly cold weather, and they usually lay a large portion of their eggs in the winter time. Standard weights are, cock, 12 pounds; cockerel, 10 pounds; hen, 9½ pounds; pullet, 8 pounds.

Dark Brahmas have the same general characteristics and nature as the Light Brahma, but are not so widely bred. Standard weights are, cock, 11 pounds; cockerel, 9 pounds; hen, 8½ pounds; pullet, 7 pounds. In color they are white, gray and black combined, and their delicately penciled and marked plumage is exceedingly pretty when bred to standard requirements, but if allowed to deteriorate becomes most disagreeable and unsatisfactory to the breeder. They are good for dirty or smoky cities and towns, as they will not readily show soot and dirt. For beauty they are often preferred to the Light Brahmas, but the latter have the call when it comes to practical purposes.

BREEDS DESCRIBED

The Cochins are hardy and easily raised, as well as the least restless of all breeds in confinement.

Cochins They are fair layers of brown eggs; persistent sitters. Have single combs, which are serrated, and small to medium in size; ear-lobes red; bodies and shanks heavily feathered, more so than the Brahmas, which are preferred to the Cochins by most people. Standard weights, cock, 11 pounds; cockerel, 9 pounds; hen, 8½ pounds; pullet, 7 pounds. Color of skin and legs, yellow.

There are four varieties of Cochins—Buff, Partridge, White, and Black. The latter two are rarely bred. The Buffs are the most popular variety—in fact, the only variety that could really be called popular at all, as the Partridge are not bred extensively. The Buffs are usually considered as having the most pleasing plumage, and breed more true to feather. The color combination of the Partridge Cochin is much after the pattern of the Dark Brahma, but the color is red and brown and black, instead of the steel-gray effect of the Brahmas.

There are both White and Black Langshans, but specimens of the former variety are rare, because there are too many other good
Langshans white breeds. The Black Langshans are well suited to dirty or smoky locations, where the plumage of a light-colored bird would soon

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become ruined, but they are not popular as market birds on account of their white skin, feathered shanks and black pinfeathers. They are fairly hardy; good layers of brown eggs; sitters; combs single and medium in size; shanks and toes feathered. Standard weights, cock, 10 pounds; cockerel, 8 pounds; hen, 7 pounds; pullet, 6 pounds.

THE MEDITERRANEAN CLASS

This is the only class in the Standard rivaling the American class in popularity in this country. Their chief excellence lies in the great number of eggs they produce, the most prolific breeds in existence being in this class. There are five Mediterranean breeds—Leghorns, Minorcas, Andalusians, Spanish, and Anconas. They are all noted for the size of their combs, their trimly built bodies, stately bearing and extreme alertness.

The Leghorns are characterized by rather small size, yellow skin and legs, white ear-lobes, and great activity and sprightliness. All varieties of the Leghorns are hardy and very prolific. It is a rare thing for a well-bred Leghorn female to become broody, and they therefore are especially valuable as egg-producers. The average flock of Leghorns will produce from 150 to 200 eggs each per year, while in special instances hens have laid more than 250 eggs per year.

BREEDS DESCRIBED

Pullets commence laying at four or five months of age, and all varieties lay a snow-white egg of good size.

There are seven varieties, the Single-comb Brown, Rose-comb Brown, Single-comb White, Rose-comb White, Single-comb Buff, Single-comb Black, and the Silver Duckwing. All are identical except in color. The rose-combed varieties are probably the best for very cold climates, as their combs are smaller and lie closer to the head of the bird, and therefore will not become frosted so easily; however, the single-combed varieties are the most common in all climates. The single-combed birds are usually considered the more attractive appearing, and all they need to be good winter layers is comfortable housing and good management.

The Single-comb White Leghorn is the most widely bred of any. The next in order is the Single-comb Brown, while the Single-comb Buff would probably come in third, with the Rose-comb Browns fourth. Black and Silver Duckwing Leghorns are comparatively rare. Leghorns have no standard weights, the larger birds being given the preference. When bred to a good size they make a very fair broiler, as the young stock grow rapidly and feather out very quickly.

Minorcas Minorcas are noted for "large" things. They are the largest of the Mediterranean breeds and have the largest combs

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and lay the largest eggs of any breed in existence. They also are very prolific, rivaling the Leghorns in this respect, and are not quite so wild and nervous as the Leghorns. Their bodies are long; wattles of a very large size; ear-lobes large and white; a non-sitting breed; legs dark-colored, and skin pinkish-white or flesh-colored, and therefore the breed is not well adapted to American market purposes.

There are three varieties in the Minorca family—the Single-comb Black, the Rose-comb Black, and the Single-comb White. The latter are comparatively rare, and they are a “sport” from the first. Single-comb Black Minorcas are the best and most popular variety, and they have almost the same size as the Plymouth Rocks, the standard weights being, cock, 9 pounds; cockerel, $7\frac{1}{2}$ pounds; hen, $7\frac{1}{2}$ pounds; pullet, $6\frac{1}{2}$ pounds. Standard weights of the Single-comb White and the Rose-comb Black Minorcas are, cock, 8 pounds; cockerel, $6\frac{1}{2}$ pounds; hen, $6\frac{1}{2}$ pounds; pullet, $5\frac{1}{2}$ pounds.

Hamburgs. Among practical poultrymen this breed is not rated so high as the Leghorns, but many people prefer to keep the Hamburgs because they appeal to them as more attractive and pleasing to the eye. They have rose combs like those of the rose-comb varieties of the Leghorns; are just as prolific layers as

BREEDS DESCRIBED

the Leghorns, but while the egg is very pretty and snow-white in color, it is considerably smaller than a Leghorn egg. The birds average a pound or so lighter in weight than the Leghorns, but have no Standard weights. Besides being too small for market purposes, their white skin and leaden-blue-colored legs are against them. The Silver Spangled Hamburgs are the most widely bred of all the varieties in this family, and are usually considered the most handsome. The three other most common varieties are the Golden Spangled, the Golden Penciled, and the Silver Penciled. The White Hamburgs and the Black Hamburgs are rarely bred.

Andalusians. There is but one variety of the Andalusian family. This one has the unique distinction of wearing the national colors—its face and eyes being red, its ear-lobes white, and its plumage blue. In shape and size they are between the Leghorns and the Minorcas. In common with other breeds in this class, they are prolific layers of large white eggs; have large combs, and are non-sitters; legs slaty-blue in color. They are an old breed, but have never become popular and probably never will.

Anconas are purely Mediterranean or Leghorn in type and general characteristics, the only variation being in color, which is an evenly mottled black and white throughout. The birds are of

about the same size as Leghorns and, like them, have no Standard weights. They are excellent layers, but only fairly popular.

Black Spanish are prized mostly as novelties, and they are one of the most striking examples of the fancier's skill of any breed in the Standard. They are pure black in color of plumage, while the wattles, ear-lobes and entire side of the face are ivory white. Aside from the peculiar abnormal development of the skin and face, they resemble the Black Minorcas very much. For practical purposes they are excelled by almost any of the breeds in the Mediterranean class, and this variety is rarely bred.

Polish may well be regarded as a strictly ornamental fowl. They are neither popular nor common, and the only reason they find a place in this book is because people who want a more or less practical breed of chickens of an entirely "different" character may have this desire gratified in the Bearded Polish. They are of about the same size as the Leghorns, or slightly smaller; rather delicate; fair layers of white eggs; non-sitters; have very large crests or beards; small V-shaped combs; ear-lobes white; legs slatish or willow-colored. The leading varieties are the White-crested Black, the Bearded Golden, and the Bearded Silver Polish.

BREEDS DESCRIBED

THE FRENCH CLASS

Houdans are the only breed in the French class popular enough in America or possessing merit enough to warrant description in this book. The Standard recognizes two other, French breeds—*La Fleche* and *Crevecœurs*—but they are rarely seen here. In color, the *Houdans* are black and white, mottled; in young fowls the black predominates, but as they mature the black becomes less in evidence. *Houdans* have five toes on each foot, but the fifth is separated from the others and bent upwards and is of no use in walking. The *Houdans* are crested, but not so heavily as the Polish. They are generally preferable to the Polish, as they are more profitable, hardier, and more common. *Houdan* crests should not be divided at the top, as is the case with the Polish. They are excellent layers of white eggs; practically non-sitters; usually fairly hardy; ear-lobes white; shanks pinkish-white mottled with black; flesh good, but not well suited to American markets on account of its color. Standard weights, cock, 7 pounds; cockerel, 6 pounds; hen, 6 pounds; pullet, 5 pounds.

THE ENGLISH CLASS

This class must base its claim to American notice chiefly on the fact that it contains the *Orpingtons*,

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a breed originated in England not many years ago and recently admitted to the American Standard of Perfection. The Dorkings also belong to this class, but it is only their old age and one-time popularity that causes them to come in for even this casual mention; they are outclassed by almost any of our American breeds.

Orpingtons are a good general-purpose fowl, but not adapted to the present requirements of most American markets on account of white skin and legs. They are large and stately in appearance, with long, round, deep bodies, and very full breast development. Their eggs average about the same in color and size as the Plymouth Rocks, and they lay about the same number of them per year; but it will likely be some time before they will displace any of our American breeds of the same general class, because the *Orpingtons* are not so well adapted to this county and its market requirements, although it is possible that this objection will largely disappear within the next few years.

It is true that the unpopularity of white-skinned fowls is largely a matter of prejudice, but the beginner or small breeder will find that he can not readily change public opinion, whether well founded or not, when he goes to market his product. If you prefer the *Orpingtons* and want them merely for your own use I have no objection

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to offer against the breed. There are three well-established varieties, the White, Buff, and Black, and their popularity in this country is about in the order named. In each of these varieties there are single-combed and rose-combed sub-varieties. Standard weights, cock, 10 pounds; cockerel, 8½ pounds; hen, 8 pounds; pullet, 7 pounds.

THE GAME CLASS

There are many different varieties of the Games, differing greatly in character and general appearance, but the only practical variety is the Cornish Indian Game. The others are bred mostly for fighting or exhibition purposes.

These birds have many good qualities, and more of them could be grown in this country to good advantage. The name "game," as **Cornish Fowls** applied to these fowls, is a misnomer, as stock from good practical strains have no more "fighting blood" in them than many another breed of chickens.* The Cornish hen, however, will fight bravely for her young, and she will fiercely assail attacking hawks or other vermin. These fowls are great foragers, and will find most of their living if allowed plenty of range. The young

*There has been considerable agitation as to the inappropriateness of the term "Indian Game" in this connection, and the promoters of the breed are insisting that it be known simply as the Cornish Fowl.

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are very hardy and mature early. The hens are fair layers of tinted eggs, and are more or less inclined to broodiness.

Perhaps no breed of fowls dresses with less waste than the Cornish Indians; one with no experience would be greatly surprised how compactly they are built and the amount of meat that is on their carcasses. Game flesh is firm and very fine grained, although sometimes it is somewhat dry. The birds are very full in the breast and broad at the shoulders; backs are convex instead of flat or concave, as in most other breeds; earlobes red; pea combs; skin and legs yellow; Standard weights, cock, 9 pounds; cockerel, $7\frac{1}{2}$ pounds; hen, $6\frac{1}{2}$ pounds; pullet, $5\frac{1}{2}$ pounds. In color the Cornish fowls are greenish-black intermixed with red. The White Indian Games are identical with the Cornish Indians except in color, but are rarely bred.

THE BANTAM CLASS

The Bantam family is not of great practical use, but are bred mostly for ornamental purposes or for playthings for children, as they become very tame and like to be petted. While, of course, impossible for market purposes, Bantams can often be used to furnish eggs and some meat for a small family so situated that they could not keep a large fowl.

BREEDS DESCRIBED

Bantams will thrive with less house and yard room than any other breed, and they may be housed in a dry goods box, and kept on a lawn or in a garden without injury where it would be impossible to keep any other breed without ruining many things.

Bantams of a good strain will lay as many eggs in a year as most of the larger varieties, but they lay the smallest egg of all the chicken family. While Bantams can scarcely be used on the table until they have attained their full size, at that time they are, weight for weight, the equals of any fowl, as they make plump carcasses and their meat is very sweet and fine grained.

There are twenty-five or more different varieties in the Bantam family. The newest additions to the family—the Light Brahma and the Dark Brahma Bantams—are about as handsome and useful as any, being miniature counterparts of the large Light Brahmas and the Dark Brahmas. The eight varieties of the Game Bantams are very common and excellent. About the same may be said of the Seabright Bantams, of which there are two varieties, the Golden and the Silver. These birds are unique in that the birds of both sexes are nearly alike in appearance when well bred, the difference being very slight indeed. The Cochin Bantams are miniature reproductions of the large Cochin family. The Buffs are the most

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common variety, and when well bred make a pleasing appearance as well as being about as practical as any. In America the Buff Cochin Bantams are probably the most common of the entire Bantam family.

SELECTING A BREED

CHAPTER VIII

SELECTING A BREED

IN Chapter Seven will be found brief descriptions of the standard breeds most desirable for either profit or pleasure. The breeds to be illustrated have been selected very carefully, and the beginner will find that those thus favored are the very best for the purposes suggested in their descriptions. With this information at hand, it ought not to be so very difficult for him to make a selection from the varieties illustrated, because it is certain that they are all capable of giving good satisfaction, and all one needs to look out for is to see that the breed is adapted to the purpose or purposes to which he intends to cater, and that its shape, color and general appearance is pleasing to his eye.

Other things being equal, the variety that suits one's taste the best should be selected, as that is the one to which he will give his best care and attention. Success with poultry depends so much upon personal care and attention that it really is worth a great deal to have a flock of fowls that

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readily appeal to one's affections, for the care of such a flock will be easy and spontaneous, while otherwise it would be tedious work and comparative drudgery.

Less stress is placed upon the importance of the breed now than formerly. This is well, because the man, the housing, the feed, and the general management, each plays a more important part toward success or failure than the breed, providing any judgment at all has been used in the selection. Of course a man who tried to run a market poultry plant with Leghorns, or an egg farm with Cochins, would have some reason for blaming his failure upon the breed, but he had better blame it upon his poor judgment. There is scarcely a breed in the Standard which cannot be made to pay a profit in the hands of an expert poultryman.

The man who wants to keep poultry merely for pleasure need not, of course, consider the practical or utility side at all; but most people want to get, if possible, at least *something* in the way of financial returns as well as pleasure from their hobby.

The American breeds are the breeds for the masses; most people find them superior to all others for any purpose whatever, except that of specializing for eggs and eggs alone. The man who wants a breed that will take advantage of all opportunities in the way of ranging, without getting into too much

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mischief; that will not require an extra-high fence to keep them enclosed; that will stand confinement if not too close and severe; that are both good market birds and good egg producers—to him I would recommend one of the American breeds.

The man who wants a quiet, easily confined breed, that are fair layers and extra-large table fowls, ought to give the Brahmas his first consideration, with the Cochins next in order. The Brahmas are also fairly good for producing broilers, and without a superior for roasters. Large broiler growers, however, find the Plymouth Rocks, Wyandottes or Rhode Island Reds, best adapted to their purpose, as they feather out more rapidly and mature quicker.

The man anywhere, and with any sized flock, who wants eggs and eggs alone, should confine his attention strictly to the Mediterranean breeds; they are the egg producers par excellence. While all are good layers, the Leghorns and Minorcas are probably the best. The Leghorns are usually credited with the ability to lay more eggs in a year than the Minorcas, but the Minorca eggs usually average considerably larger, and that often is a point which one cannot afford to overlook, inasmuch as the time is coming when eggs in America will be sold by the pound instead of by the dozen.* The

*This method of selling eggs is at the present time practiced in most foreign countries and in a few of the Western States of the United States.

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man who breeds Leghorns of a good size can also look after the market side of the business, too, because Leghorn chicks are very hardy, grow fast and feather out quickly, and have nice yellow skin and legs. Though they never get "big," they make their first pound of growth in a comparatively short time.

The Minorcas, while larger than the Leghorns, are not nearly so well adapted to American market requirements. In this country birds with yellow skin and legs always sell first and at a higher price than the other kinds, though this is a matter of prejudice and is being gradually done away with.

With regard to the color of eggs, some markets prefer a white-shelled egg and others a brown-shelled egg; the beginner should ascertain the preference and consider this as a factor when selecting his breed. All American varieties lay brown-shelled eggs, while all Mediterranean varieties lay white or light-tinted eggs.

White-plumaged fowls are not the most desirable for dirty, smoky locations, or for sections of the country where hawks and other prowlers abound. Fowls with dark plumage do not make the best market variety, on account of the black pinfeathers on the dressed carcass.

Here are a few additional points the beginner can well bear in mind when selecting a breed:

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(1) Non-sitting varieties make it necessary to depend upon other hens for hatching, or upon artificial methods; and this is often inconvenient or costly with a small flock.

(2) The ornamental and other strictly "fancy" breeds which are not prominently mentioned or illustrated herein, are not extensively bred and trouble will be experienced in securing stock of them, as well as of those varieties described as "rarely bred."

(3) The newer varieties breed less true to feather than the old, well-established varieties. On the one hand, this requires greater skill in breeding and makes the percentage of culls greater, while on the other hand it causes good specimens to bring higher prices.

The advice that the beginner should not attempt **Advantages of** to handle more than one breed is old **Specializing** but nevertheless true. It is absurd to start out with several breeds with the idea of testing their relative merits; nine times out of ten the man who tries this plan never learns any one variety well enough to get the best out of it. After the beginner has made a success with one breed, he may try to repeat the operation with another breed, if he desires; but it is not likely that he would care to sacrifice his reputation as a specialty breeder after once getting it and realizing its advantages.

Having selected the breed you like best and

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which seems best suited to your needs, stick to that one breed; for, though a few disadvantages may crop out, remember that no breed is perfect in *every* respect. Concentrate all your energies upon developing to the utmost the special qualities in your breed, and you will soon find that careful breeding pays. Don't change around so often, or make so many crosses, that you can't tell what breed you have if somebody should ask you. Pure-breds are always preferable to crosses. Not only are pure-bred fowls more uniform and attractive, but nine times out of ten the man who crosses two breeds in an endeavor to combine the good qualities of each breed in one fowl, instead combines the bad qualities.

There is no room for argument as to the advantages of standard breeds. Pure-bred live stock of **Why Standard Breeds Are Best** every kind is better than mongrels or scrubs, and the difference is just as marked with poultry as with anything else. The progressive poultryman of to-day will have nothing to do with stock other than pure-bred; not only fanciers breed pure-bred fowls, but also all successful market plants, whether the specialty is eggs or meat, or both. Standard-bred poultry means a more attractive and handsome flock of fowls, because they are all uniform in size, type and color; it means more eggs and larger size in the birds, because the pure-bred fowl is the

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result of selection extending through a long course of years; it means more money when sold in market, on account of the uniformity in shape, size and color, and the added attractiveness caused thereby; it means quicker and more uniform growth in the chicks; and, last but by no means least, it means healthier, hardier stock. Pure-bred fowls require no more feed or attention than any other kind, and the only difference in cost is in the original investment, which is small compared with the advantages to be derived.

There are three good ways for the beginner to stock up with pure-bred poultry. One is to purchase a breeding pen of his chosen variety, another is to purchase the eggs and then hatch and raise his own flock, while the third is to purchase "day-old" chicks. The two first-named methods are the oldest and most common in America. Of these, each has its advantages and its disadvantages, and people have all kinds of results—good, bad and indifferent—from each. In brief, it may be said that in buying stock the risk of total loss, as well as the possibility of getting fine stock very cheap, is less than in buying eggs. When one buys stock he secures for his money something tangible and real; when he buys eggs he secures greater possibilities for his money than with stock, but these may or may not develop.

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Starting by Buying Stock. Buying the fowls is quite sure to require a heavier original outlay, but you know then just what you are getting, and are taking no chances on the hatchability of eggs or on disease and accident while raising the chicks. You are paying your chosen breeder for the actual results of his years of experience as a fancier, and are taking advantage of that in getting him thus to select and mate your foundation stock.

The amount of money that would have to be expended in making such a start would depend both on the number of birds and the quality desired. A trio (that is, two females and one male) can be purchased for ten dollars or fifteen dollars that would give very satisfactory results, unless exhibition stock were desired, when the prices would run anywhere from ten dollars or fifteen dollars apiece to double and treble those figures. When birds are taken in pen lots (that is, eight or ten females and one male) considerable reduction is usually made on the price per head. Fifty dollars would secure ten excellent birds of any breed. Fairly good breeding and utility stock, entirely satisfactory to all who do not value or cannot appreciate the fine and technical points of a breed, can be secured at a cost of from one to three dollars each.

The beginner should always start with the best stock he can, for he will save time and money by so doing if he wants to work himself up toward

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the top. Pullets or yearling hens usually make the best investment for the beginner, because a hen that is two or more years old when bought usually cannot profitably be kept in service longer than one more season.

The best time to buy fowls is in the fall. Stock can be purchased for less money at this time than at any other, and the early buyer gets the selection. After the first of June in each year there are many opportunities to buy at very low prices some of the stock which breeders have used in their breeding pens, because they must make room for the crop of youngsters coming on. Most of these young birds will also be offered for sale after September first, ranging from four to six months in age at that time; they, too, are quite desirable, and if one is prepared to winter them properly, he will find that his stock will have almost doubled in value by spring.

Not only will you get the greatest value for your money in the fall, but you will also have the time and opportunity to study your fowls, to learn their individual characteristics and peculiarities and to learn how best to feed and manage them, so that you may be sure everything will be in smooth working order by the time eggs are desired for hatching. It always requires some time for fowls to become accustomed to new surroundings and a new feeding system and rations, and for this

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reason many who purchase fowls in the spring are often sorely disappointed because a supply of eggs is not readily forthcoming or the eggs do not hatch well.

Starting by Buying Eggs. For one who has not made his start with a breeding pen by March, I unhesitatingly recommend the egg plan as better. The expense is less and one feels that he is starting at the very foundation. He learns the business in all its detail—incubation, brooding, rearing, feeding, housing and marketing; but this often is no advantage, for the simple reason that failure is liable to occur to the man who has had no experience, and then he has nothing else to fall back upon, as would be the case if he had a good pen of old birds.

The man who would sell you a pen of fair breeding birds for fifty dollars would probably supply you with two hundred eggs for thirty dollars, and these eggs would come from breeding pens worth two or three times as much as those you would have secured for fifty dollars. It would take your eight or ten hens six weeks to produce the two hundred eggs, perhaps longer. Buying your eggs all at one time, you have twenty of your fifty dollars remaining, with which to buy an incubator or to buy broody hens to hatch the eggs. Also, you have your chicks all of the same size and age, which is a big advantage over having several dif-

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ferent lots of chicks which would require different feed and treatment the summer through. All your purchased eggs will not hatch; neither do those produced at home all hatch. Broody hens may bring with them lice and disease; but you would need to buy broody hens to hatch the eggs from your own pen of birds, unless you let them stop laying in order to hatch and raise their own chicks, and that would be neither wise nor profitable.

Prices of eggs usually run from one dollar to five dollars, per setting, though ten dollars or fifteen dollars per setting are now getting to be more or less common prices for eggs from noted prize winners. The common prices are three dollars and five dollars for eggs from high-class exhibition stock; one and one-half to three dollars for medium exhibition and good practical stock. So-called "incubator eggs" are sold by the hundred at from four to ten dollars. At the former price they are generally from culls,* and used mostly for hatching broilers. At the higher price they ought to be from very fair breeding stock, though probably bred more especially for utility purposes. Don't be afraid to order eggs from a distance; the shipment of eggs from a reliable breeder, no matter where located that does not give results, is the exception rather than the rule.

*The word "cull" in this sense does not necessarily imply lack of practical or utility value, but simply indicates that the fowl is deficient in one or more "fancy" requirements, although descended from good, pure-bred stock.

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The thing to be most sure about, no matter which method of starting is employed, is that you deal with a man who will give you what you pay for. Don't be misled by offers of cheap fowls or eggs. The man who has invested good money in breeding up a flock of fowls, and has devoted his time and attention untiringly to the business year after year, cannot afford to sell eggs from his best pens for a dollar or two a setting. Hens that are worth ten dollars each lay eggs that are worth three dollars per setting; if they do not bring that much, the breeder has little margin for his investment, labor and experience.

Starting by Buying Day-old Chicks. The sale of newly hatched chicks, instead of eggs for hatching, is a late and promising innovation for giving beginners a start in the pure-bred poultry business. While probably still in its infancy, this trade already is making serious inroads upon the sale of eggs for hatching. It gives the beginner most of the advantages of buying eggs in the way of low expense, and at the same time does away with the uncertainty of the eggs hatching well.

There is considerable danger of improper handling or chilling of the chicks along the route, yet such losses are not much greater with chicks than with eggs; perhaps the greatest danger of failure lies in the unpreparedness or incompetency of the inexperienced person to raise the chicks

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after he has received them. Shipped as soon as they are taken from the incubators, the chicks need no food for two or three days, and that generally allows them ample time to reach their destination; but upon arrival they need careful and prompt attention, so that they will get the right kind of a start. Prices on ready-hatched chicks are usually about twice as much as for eggs for hatching, the most common prices being from fifteen to thirty cents each.

FOODS AND FEEDING

CHAPTER IX

FOODS AND FEEDING

OF all the factors governing the results from a flock of poultry, none is more important or vital than the feeding of the fowls, and perhaps on no other is there a greater scarcity of definite working instructions; in fact, the beginner often complains that he is compelled to resort to too much "guesswork" in feeding his poultry, and the complaint is not without foundation. Perhaps his only consolation is the old saw, "Experience is the best of teachers," albeit in this case it is also the most expensive.

Absolutely nothing definite can be stated with regard to the quantity of food a certain number of fowls should have. Different breeds, **Quantity of** different feeds, and different climates make a vast difference in the quantity of food that is necessary or desirable. Most beginners who take a pride in their birds want to be kind to them, and are so kind that they do them harm by feeding too much. There also is such a thing as not feeding enough, and underfeeding is as bad as over-

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feeding, with the added danger of being more difficult for the beginner to ascertain.

The shade of difference between a fowl that is well-fed, and yet not over-fed, is something that can be learned only by experience. Both the kind and the amount of food are factors. So far as rules regulating the amount of food are concerned, if mashes are used, feed only as much as the birds will eat up clean in a short time; if dry grains are used, feed so that the birds will always be ready and anxious for the next meal. The indefiniteness of such instructions may be exasperating to the inexperienced, but they are the best that can be stated for general use.

Frequency of Feeding. As to how often to feed poultry, most practical poultrymen feed three times a day in the winter time and twice a day in the summer time. Where the birds are fed three times a day in the winter, by feeding so that they have to work for their food they keep more comfortable and are busy and contented for a greater part of the time than where they receive food at only two periods. In the summer this makes little difference, because the birds can be out of doors.

How to Acquire Skill in Feeding. The best way to acquire skill in feeding poultry is not by studying "scientific formulas," etc., but by practicing feeding, closely observing results, and using one's own judgment according to the results

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obtained. However, the beginner must have some sort of a foundation from which to start, and that is our idea in stating the various constituents, etc., of the feeds. The experienced poultryman attaches little value to any such information, except the merest generalities and general principles, because he knows that it is impossible to follow arbitrary rules and get the results the rules anticipate with the uniformity which would justify the use of such rules; he knows he had to learn by experiment and observation how much to feed and when and how to vary his rations. The inexperienced person should handle his fowls as frequently as convenient, and by examining the breast bone and between the thighs of the fowl one can, with a little practice, tell very well whether the fowl is too "lean" or too corpulent.

Food stuffs contain, in greater or lesser degree, three elements which are essential in the feeding of all live stock and fowls. They are protein carbohydrates (including fat), and ash. The protein is that part of the food which makes flesh, blood, muscles, tendons, etc., and serves to replace wasted tissue and make growth or form some product, such as eggs. It is the most important element in feeding stuff—in fact, the commercial value of a food depends largely upon the amount of protein it contains. A ration deficient in protein never gives satisfaction,

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because no other food can fill its position. Foods rich in protein are called nitrogenous foods.

Those elements of a food which go to make fat, heat and energy are the carbohydrates. These are burned in the body, and any surplus above what is necessary to supply heat is stored up in the body as fat, to be drawn upon later should insufficient carbohydrates or carbonaceous food be supplied.

Ash is the mineral portion of feeding stuffs, and goes largely to make bones, egg shells, etc. Less of this material is needed than of the other two, and in making up a ration little attention need be paid to it, for most feeds contain a sufficient amount without any special provision being made.

A "balanced" ration is one in which protein and carbohydrates are combined in such proportion that they will fully supply the needs of the fowls but at the same time there will be no surplus of either. A "wide" ration is one which contains too large a proportion of carbohydrates; its continued use will cause the fowls to become too fat. A "narrow" ration is one too rich in protein; its continued use will affect the kidneys and liver, because they will have been overtaxed in endeavoring to dissipate the excessive amount of nitrogen. To be sure, the over-supply of protein will, to a certain extent, take the place of the carbohydrates that are lacking, but this should not be allowed to

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any great extent, because it is a hardship on the fowls and is more expensive than to furnish the needed carbonaceous food.

The most satisfactory ration for laying hens is generally regarded as 1 : 6; that is, one part of protein to six parts of carbohydrates. Many authorities consider this too wide a ration, but much depends upon individual conditions and circumstances—the breed, the physical condition of the fowls, the time of year, etc. With large, sluggish breeds a narrower ration might give the better satisfaction, say, for instance, 1 : 4½ or 1 : 5. Of course the proportion should be kept as nearly correct as possible, but a slight difference one way or the other is not such a vital matter, because fowls seem to have the ability to adapt different feeds to their own present demands and requirements. The smaller and more active the fowl the wider the ration that can safely be fed to it, because it will the more rapidly use up the surplus carbon, inasmuch as they have more energy to maintain. All fowls need a wider ration in cold weather than in warm or hot weather, because more is needed at that time in order to maintain their bodily heat. Growing stock require a wider ration than mature birds, and stock to be fattened require a wider ration than laying or breeding stock.

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FOOD VALUES

The nutritive ratio of a food or ration expresses the proportion of digestible protein compounds to the digestible carbohydrates and fats. The average composition of all common feeding stuffs has been obtained by careful and extended chemical analyses. Nutritive ratios vary in different sections of the country and with different varieties and brands of the same food stuff, but those given below are as accurate as any that could be given for general use:

GRAIN FEEDS

Wheat	1:7	Buckwheat	1:7.4
Wheat Middlings	1:5	Sunflower Seed	1:6
Wheat Bran	1:4	Millet Seed	1:5
Indian Corn	1:10	Kaffir Corn	1:9
Gluten Meal	1:1.5	Peas and Beans	1:3
Oats	1:6	Hemp Seed	1:5
Oat Meal	1:5.7	Linseed Meal	1:1.5
Barley	1:8	Malt Sprouts	1:2.5
Rye	1:7.5	Rice	1:11

VEGETABLES, ETC.

Green Grass	1:7	Turnips	1:8
Green Clover or Alfalfa	1:5	Potatoes	1:12
Dried Clover or Alfalfa	1:3	Red Beets	1:5
Mangel Wurzels	1:5	Lettuce and Cabbages	1:2

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ANIMAL FOODS AND MILK

Beef Scraps	1:0.8	Fresh-cut Bone	1:1.2
Dried Blood	1:1	Whole Milk	1:4
Animal Meal	1:0.5	Skim- and Butter-Milk . .	1:2

The beginner should bear prominently in mind that fowls require a variety of foods as well as **Variety in Feeding** properly proportioned rations in order to do well. Oats are the best balanced grain used for poultry feed, yet it would be the height of folly to make oats an exclusive diet day after day. Corn, wheat and oats are the three staple grain feeds for poultry, and many breeders obtain very excellent results by feeding equal parts of these three grains. This surely is a simple ration, and, if green stuff is fed in connection with the grain, the whole "balances" fairly well, although for summer feeding, or in the case of an Asiatic breed, the ration is a little "wide," and I believe in such cases it would usually be best to reduce the amount of corn used.

At least three different grains should make up the fowls' ration, and a combination allowing the use of more than this is very desirable, unless in the summer time when the fowls are enjoying free range. When combined and mixed, the grains should give the average ratio desired, according to the suggestion above. A good combination is

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equal parts of wheat, oats, barley, and peas; another is oats, wheat, buckwheat and corn, using about half as much of each of the latter two as of the former two.

As previously intimated, any combination may be used, so long as the correct proportion is maintained. It is a good plan to have several different combinations, changing the bill of fare each day, as desirable variations in the diet stimulate the appetite and promote the general health.

In making up a grain ration, the properties of the other foods—animal and vegetable foods—should also be taken into consideration, as they, too, exert quite an influence. Do not overlook this point.

The Benefits of Exercise. Grain should always be fed in litter of some kind, so that the birds will have to scratch and hunt to get it out. It is a good plan to keep the floor of the poultry house covered to a depth of a foot or more with cut clover hay, straw, dry leaves, or some other loose material. Nothing has a more pronounced favorable effect upon the thrift and general health of a flock of fowls during the winter months than plenty of good exercise in a fresh, invigorating atmosphere. Scratching apartments in the poultry house, covered with plenty of good litter, are all that is necessary.

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There are now on the market many brands of "prepared feeds" by the use of which the most inexperienced person can do away with all uncertainty as to the correctness of the feeding ration he is using. These feeds can be secured of almost any incubator company or poultry supply house, and most grain dealers also handle them, as their popularity has increased steadily and rapidly and to-day the demand is surprisingly large in every section of America. These feeds are composed of a number of different constituents, forming a pleasing variety, and are properly "balanced" according to the formula of an expert in the science of poultry feeding. They are manufactured for every and any purpose and for fowls of any and all ages.

The feed for the first few weeks of the chicken's life is known as "Chick Feed"; after that comes the "Developing Feed," which is especially adapted to chicks from four weeks to four months of age; and for Broiler chicks there is a supplementary "Fattening Food" which forces a rapid development. Then for mature fowls there are the "Scratch Foods" and the "Dry-Mash Feeds," which furnish a complete and well-balanced dry grain or mash feed for breeding or laying stock.

These feeds cost very little more than it does for one to buy his food stuffs and mix them him-

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self. In the case of the experienced poultry breeder this slightly increased cost is usually enough to cause him to formulate his own rations, but the beginner can well afford to pay a few extra cents—or even dollars—for this “sure thing” in the feeding line—at least until he has acquired some practical personal experience. The feeds for youngsters cost from two dollars to three dollars per hundred-pound bag; those for mature fowls seldom cost more than two dollars per hundred pounds, which is clearly only a few cents more than it would cost for an ordinary mixture of the same amount of wheat, corn and oats.

There are two methods of feeding poultry, the “mash” system and the “dry-feed” system. The former employs the use of wet or damp mixtures of soft (ground) food. The latter employs the feeding of only dry grains and seeds, and is now the most popular among practical American poultrymen, because it is Nature’s way of feeding. The dry-feed system does away with all bother and labor of cooking and mixing food, and by throwing all the seeds and grains in a deep litter the birds are compelled to scratch and hunt for all the food they get, and they thus secure much healthful and invigorating exercise. This also keeps them busy, contented and happy, and in the winter is a great aid toward keeping up the bodily warmth of the

FOODS AND FEEDING

fowls. In short, it may be said that for general use the dry-feed system is 'handier, cheaper and usually better than the old way.

There is another way of dry-feeding, and that is the use of self-feeding hoppers, such as are illustrated and described in Chapter Five.

Feeding from Hoppers This system involves the least time and labor of any, and for that reason is a special favorite with busy people or business men who are compelled to be away from home except of mornings and evenings. The hoppers need not be filled oftener than once a week, and the feeding matter requires no attention other than that. As many different kinds of grain as possible should be kept in the hoppers, either separately or mixed together in the proportions suggested at the beginning of this chapter, and the birds will pick out the amount of each kind that instinct teaches them they need. The entire idea is to let the fowls exercise their natural tastes and inclinations in the feeding matter, and they may go to the hoppers whenever they want to, eating whatever kinds of grains they want to, and as much of each kind as they want to. The supporters of this system claim that Nature never guides falsely, and that therefore the bother and worry of "balancing" the ration is done away with.

The plan is very good for chicks and growing stock, and has so been used on the author's poultry

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plant for several years, but it is not at all practical for adult fowls in confinement or for use during the winter, as it encourages laziness and the fowls are sure to overeat, becoming over-fat, and sooner or later will be falling ill with liver or bowel disorders. In fact, the only condition under which I could recommend the hopper system of feeding for mature fowls is in the summertime when they have ample range to induce lots of natural exercise and activity, and then the fowls will not overeat from the hoppers, because the bits of food they may pick up out on the range are more palatable and attractive than the dry food in the hoppers.

Ground food is preferable to whole grains for use in hopper. Use little or no food that is extremely fattening for adult fowls. Cracked corn and middlings (shorts) should be used sparingly. Wheat bran, ground oats, buckwheat, etc., may be fed with comparative freedom. While there is no danger of the fowls overeating themselves on the hopper plan, there is a great deal of danger of them becoming over-fat, for though they may eat only a small quantity of food at a time and their crops may never be excessively full, as is sometimes the case after a meal, yet they manage to get away with a great deal of food in this way and it is a well-proven fact that hopper-fed fowls consume more food than those that have food placed before them only at intervals.

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While the writer neither uses nor recommends the free use of mashes for breeding birds, many **Use of Mashes in Feeding** good poultrymen do. While hens often will lay more eggs when fed freely on soft food than when fed mostly on dry grains, I do not believe the condition either a natural or a strictly healthful one. While there are no objections to feeding mashes to hens that are being forced for heavy egg production—in fact, that is the most profitable way to feed stock kept for eggs and eggs alone—still the breeder who wants strong, rugged breeding birds, fertile, hatchable eggs, and vigorous, lifeful chicks, had better feed mashes comparatively infrequently—say, once or twice a week—because dry-feeding is more in harmony with Nature.

Birds that are being forced for heavy egg production, and which will be discarded after the first or second season, may be fed a mash every day—or even two mashes a day—during the season of highest prices for eggs. Breeders who are more solicitous for the constitutions of their fowls, and who want them to remain profitable for two or three years, should confine themselves to no more than four or five mashes a week. The prominent poultrymen who believe in mashes do not feed them to their *breeding* birds more than two or three times a week, and many only once a week. In general, my advice to the beginner would be to feed mashes

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no oftener than absolutely necessary in order to work up the table scraps or other waste materials. Aside from their value in this connection, wet mashes have nothing for which I think they should be recommended to a beginner, for in unskilled hands they often produce looseness of the bowels and other light ailments which may get the beginner in a good bit of trouble before he can correct matters.

The best time to feed the mash, whether morning or evening, is a mooted question. There is a potent objection to soft food at either time. If a mash is fed in the morning the hen will, of course, greedily consume all she wants in just a minute or two, almost without moving out of her tracks, and then, her appetite being satisfied, she has no incentive to rustle around further, but becomes inactive and lazy and goes back on the roost or seeks a quiet corner where she may doze undisturbedly. The objection to a mash in the evening is that it is so readily assimilated, that the digestive organs become empty before morning and bodily heat is not maintained. The latter objection is perhaps the less potent, and most poultrymen who use mashes feed them in the evening. Another good way is to feed the soft food in the morning, but give the fowls only about half as much as they would desire, and then supplement this with a few handfuls of small grains and

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seeds scattered in the litter. With the beginner there is danger of overfeeding in following this method, as it really is giving the birds two meals at one time.

Two good mashes, for feeding alternately, follow:

Composition of the Mash. (1) equal parts of cracked corn or cornmeal, ground oats, wheat bran, and middlings; (2) two parts bran, one part cornmeal, one part ground oats and three parts fine cut clover or alfalfa hay. Table scraps and refuse from the kitchen may also be mixed in with the mash. If ground beef scraps or other similar material is to be used, mix with this soft food—about one pound for twenty-five hens.

A pinch of salt added to the mash makes it more palatable, and, besides, salt seems to be demanded by the fowls in greater quantities than is supplied in ordinary foods. A little linseed meal in the mash every week or ten days is a good thing for fowls, while it may be fed every few days with beneficial results to molting birds or young chicks growing feathers.

The best way to prepare the mash is to mix it thoroughly, in a pail or tub, with boiling hot water; cover with a heavy blanket, and then let stand several hours before feeding. If it is to be fed in the morning, prepare the mash the previous

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evening; for evening feeding, prepare it in the forenoon. Unless covered the heat and aroma will escape.

Soft food should always be fed in clean troughs to avoid contamination and waste. Clean them out thoroughly after each meal, and scald them out every week or two. Several small troughs are better than one large one, because every flock contains domineering hens which will prevent the more timid ones from getting their share when the food is all at one place.

The man with only a small space of yard room for his poultry wishes for the delightful free range of the farm for his poultry, and in the winter every poultry keeper wishes for springtime or summertime conditions, so that his fowls might lay more eggs. To bring about these conditions by "artificial" means of feeding is now entirely possible.

Green Cut Bone. This feed will efficiently take the place of bugs, worms, and insects for the fowls. This feed is produced merely by cutting up fresh bones secured at the local meat market by means of a bone cutter, which machine may be purchased at a cost of from ten dollars upward, depending upon the size. There are cheaper ones, but they are too small to be practical, requiring excessive time and muscle to operate.

Beef Scraps. Where one cannot secure a regu-

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lar supply of fresh bones, or where it is not economy to spend time and strength running a bone cutter, it will be found that there are many prepared meat foods on the market which will answer the purpose quite as well, although the cost may be slightly higher. These are designated by various names, but the food in most common use is known as "ground beef scraps." This consists of ground animal flesh and a small amount of bone, with all waste and grease properly extracted, and will keep for an indefinite period of time if kept dry. The cost varies from two dollars to three dollars per 100-pound bag.

Alfalfa and Clover for Poultry. To take the place of green stuff in the ration, clover and alfalfa are the best. The poultry keeper may, if he prefers, purchase a small "hay cutter" at a cost of from five to ten dollars, and with this cut his own green stuff. This is the cheaper way, but on a small scale it is almost as cheap and easier to buy the stuff already dried and cut into the proper lengths. With both clover and alfalfa there are two sizes, known as the "short cut" and the "mealed." The former is from a half-inch to two or three inches in length, while the latter is almost as fine as cornmeal. It makes no particular difference whether clover or alfalfa is used, or which size is used.

Whole wheat is a favorite feed for fowls, and

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perhaps the majority of poultrymen make it their main feed. Many people feed it almost exclusively to their fowls, and the results cannot be called un-

Wheat satisfactory. Screenings have not the feeding value of wheat, and should not be used unless the fowls seem to relish them and they can be secured at a very low cost. Bran and middlings are ground wheat separated into parts, the former being the exterior and the latter the interior of the grain. Bran can often be used to advantage during warm weather, when a light, bulky food is required, as it is neither heating nor fattening. Middlings are very fattening, are greatly relished by fowls, and are especially good for growing youngsters and for fattening old fowls. Either product may be fed dry in self-feeding hoppers, as well as damp and mixed with mash.

Corn Corn is the best-liked poultry food. Although this is true, it should generally be fed only in limited quantities, except perhaps to the Mediterranean breeds, for it is heating and fattening; on this account it is a good food or fattening young stock and is a good winter feed for all kinds of poultry, as it helps to maintain the bodily warmth. Old fowls do not become fat so readily on cracked corn as they do on whole corn, for the reason that they have to work harder to get the former; hence, cracked corn may be used with

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less caution, and indeed in most cases may be fed with comparative liberality. Always feed corn in the evening, rather than during the day.

Oats are an excellent poultry feed, but fowls do not, ordinarily, take to them as readily as they do to wheat and corn. Oats are good for growing stock, going largely to build up muscle and flesh; and make an ideal summer food for old fowls, because they are neither heating nor fattening, and are small enough to induce plenty of exercise when scattered in litter. Rolled oats are excellent for baby chicks, and ground oats for growing stock.

That the sharp, pointed hulls of oats may damage or even pierce the fowl's craw is a common belief in some sections of America, but this is a fallacy over which no one ordinarily need worry. If the fowls are allowed to frequently gorge themselves on oats, or if the oats used are very sharp and stiff, some trouble may be experienced in this direction; but a good grade of oats used judiciously will do no harm whatever.

Buckwheat, while no better than the three staple grains just mentioned, may often be used to good advantage to make variety in the ration.

Kaffir corn is relished by fowls almost as much as Indian corn, and may be fed with less caution, as it is less fattening.

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Millet seed is not only nutritious, but, being very small, there is nothing better to scatter in the litter as an inducement for the fowls to take the exercise they require in order to keep their bodies strong and rugged. Throw a handful in deep litter in the morning, and there will be some there nearly all day for the fowls to scratch and hunt for.

Rye is not much used for poultry, as the fowls do not like it very well.

Beans and peas are rich in nitrogenous materials. They are used quite commonly as poultry feeds in foreign countries, and their use as such is rapidly increasing in America. Ground to meal, they may be used in small quantities in mashes.

Rice is palatable to fowls and is a valuable starchy food. When available without excessive cost, rice may well constitute a part of the daily ration of old fowls and makes an excellent feed for little chickens.

Sunflower seeds make a good occasional feed for poultry, as they tend to keep the feathers smooth and oily. For this reason they are especially valuable during the molting period.

There are many other feeds that, while they possess no special merit as a poultry feed, are good for adding variety to the ration. Hemp seed and linseed meal are very rich in nitrogenous ingredients, and may be used in limited quantities to

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good advantage. Waste bread and broken crackers can often be secured at small cost, and are nutritious and greatly relished by poultry.

Animal foods in the ration are necessary to take the place of the bugs, worms and insects which the hen would pick up in the course of her daily ranging if unconfined. Green cut bone and ground beef scraps are the most common feeds used in this connection. "Animal meal," "bone meal" and "dried blood" are the names of the three other common commercial feeds. Infertile or stale eggs can well be utilized as a poultry feed, feeding them hard-boiled or mixed raw in the mash. Milk, whole or skimmed, sweet or sour, or buttermilk, is greatly relished by fowls and is very nutritious. It may well be used freely where available at low cost but care must be exercised to maintain satisfactory conditions of cleanliness in feeding.

Fresh, tender grass and the new blades of growing grain are greatly relished by fowls, especially if they are allowed to do their own harvesting, that is, pick at the green stuff right where it has grown. Lawn clippings are very good. All the varieties of clover and alfalfa are excellent, and these, as well as grass, may be stored away and cured in order to supply the fowls in winter. The material should be cut up fine and steamed when used, feeding it separately in troughs

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or as a foundation for a mash. Clover is not only highly nitrogenous, but is also rich in lime, a substance required by the hens for producing shells for their eggs. Clover contains nearly thirty times as much lime as corn in proportion to their flesh-forming elements, and it is in a much more soluble form in the clover than in oyster shells or similar material. Another thing, clover is not only nutritious, but bulky, and aids in the digestion of the grain.

Cabbages and mangolds are greatly relished by poultry. These should be cut in halves and hung up off the floor so that the fowls will have to jump a few inches to reach them. A good way is to stick them on nails in the walls of the house. Potatoes are very starchy and good for fattening. The fowls will also eat turnips, beets, carrots, and apples. All of these, as well as potatoes, may be fed raw, whole or chopped in pieces; or they may be cooked and added to the mash. Onions are nourishing and have a tonic effect, but if used freely are liable to impart a strong flavor to the eggs. Lettuce is greatly relished by fowls, and is especially good for little chicks, as are finely chopped onions and onion tops. In short, it may be said that almost any kind of grass, vegetables, bulbs or tubers that the fowls will eat are good for them.

Grit. Without grit or its equivalent in the gizzard the hen cannot properly grind and digest her

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food. Poultry have no teeth, but do all the grinding of their food in the gizzard. Grit, in the form of pebbles, gravel and sand, may usually be found in sufficiency by fowls having free range, but in confinement it is very essential to provide a supply so that the birds may keep their gizzards constantly supplied with millstones.

Oyster Shells. Laying hens call for extra large amounts of carbonate of lime for making egg shells, which may be supplied in crushed oyster shells. The shells will also furnish grit, but not enough to suffice, as they are soluble.

Charcoal contains no nourishment, but is one of the best poultry "correctors" known, having a healthy influence, especially in cases of indigestion or improper feeding. It may be fed in granulated form, like grit, or in powdered form and added to the mash. If you want to avoid bowel disorders among your fowls, use plenty of charcoal. We keep it in hoppers before our fowls all the time.

In order to stimulate young stock to eat large quantities of food, so that they might make more rapid growth, or to make oats more attractive to old fowls, so that we might feed larger quantities of that grain than of any other in order to avoid fattening the birds, I have often resorted to the practice of soaking the grain in water for twenty-four hours

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or such a matter before feeding. The birds not only relish the grains more when treated in this way, but the size of the grains is also increased and the feed will go further. Fill any ordinary pail, kettle or tub three-quarters full of grain and thoroughly cover with water, letting stand about twelve hours before feeding.

Sprouted Grains. One time, while soaking some wheat in this way, I accidentally overlooked one pail of feed, and two or three days later, when it was discovered, a great deal of the wheat had begun to sprout. This was fed to the birds, and the extreme relish with which they ate it seemed significant. After that we did considerable experimenting with sprouted grains for poultry, not only wheat, but also oats. As a result of this I have continued using sprouted grains for poultry down to this day, and will continue doing so, as the results have always made the extra work profitable.

There is nothing better to cause young stock to eat large quantities of food, and there is no surer way of improving the palatability of oats so that the old fowls' diet may be composed almost, if not quite, entirely of that grain without the fowls objecting to it; also, where fowls are kept in close confinement, the sprouts go a long way toward solving the green-food problem, as the birds like the sprouts better than any other kind of green stuff that can be supplied. In fact, I consider and

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have proved this idea to be of inestimable value toward the most successful feeding of poultry in confinement. The ordinary feed bill may be considerably reduced by the use of this method, for one pailful of dry grain will fill two or three pails when sprouted. I know of no better feeds than sprouted grain and green cut bone with which to stimulate egg production in a natural, healthy way, or to cause rapid, thrifty growth among young poultry.

Wheat germinates quicker than oats and makes the better feed for young stock, as it keeps them in better flesh. The sprouts should not be allowed to get more than one-fourth of an inch long on wheat and one-third or one-half of an inch long on oats, if the full feeding strength of the grain is to be preserved; the green food value of the sprouts is gained extra. If this food is desired mostly to supply green stuff, the sprouts may be allowed to develop to a length of several inches before being fed.

In preparing the feed, first soak the grain for twenty-four hours in a pail or tub; then empty in a box with holes bored in the bottom, which will allow the water to drain off; if necessary, divide the grain among several boxes, as it should not be more than four or five inches deep for best results; lay several thicknesses of heavy cloth or a blanket over the grain, so that it will not dry out too much or

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lose its warmth; sprinkle with warm water and thoroughly stir the grain around morning and evening, in order to prevent the sprouts from matting together in masses and to equalize the germination of the sprouts in various parts of the box; in a day or two they will commence to generate heat, and then may soon be fed. In the winter time the germination must be carried on in a comparatively warm room, but in the summer time almost any location will do.

A constant and never-failing supply of pure, fresh water is as necessary for the health and com-
The Supply of Drinking Water fort of poultry as any other kind of live stock. At the same time it is unnecessary to supply water three or four times a day, except perhaps in extreme cold weather, when this has to be done to keep the water from freezing. Fountains should be of sufficient size that they shall not have to be filled more than once a day; but no matter how big the fountain is, fresh water should be supplied every day, as otherwise it will become stale and more or less foul. When fresh water is given, it should not merely be added to that already in the vessel, but all the old water should be thrown away and replaced with fresh. Warm water should always be supplied in cold weather, especially to little chicks. It is a good plan to scald out the drinking vessels every week or two, adding a little good disinfectant

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to the hot water in order to prevent or kill disease germs.

For old fowls it is desirable to have the vessel up off the floor a little distance, as otherwise they will scratch and throw considerable dirt and litter into the water and soon foul it. In this connection regular wall drinking fountains may be used, as illustrated in Chapter Five, or if the other kind is used, they may be set a few inches above the ground on little shelves or boxes. A cheese box, split in halves around the sides, is a cheap and efficient means of accomplishing the desired end.



HATCHING AND REARING CHICKS

CHAPTER X

HATCHING AND REARING CHICKS

BEFORE setting any hen, make sure that she means business and is really in earnest in her apparent desire to sit; this is especially important if the hen has never before had similar experience. The strength of her determination **Hatching** may be tested by letting her sit on sev-
with Hens eral spoiled eggs for a few days. If she is very fidgety and nervous she might as well not be set, as she will in all probability make a poor hatcher as well as a poor mother.

Most hens that leave their nests after the end of the first week do so because of lice and not because of "contrariness," as is generally supposed. Mites and lice thrive better and multiply more rapidly on sitting hens than any other place I know of. And a hen afflicted with vermin cannot and does not ever rest well, nor can she hatch with any degree of comfort. Even under favorable conditions it is a tiresome and weakening task for a hen to sit steadily for three weeks.

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As soon as a hen shows inclination to sit, she should be thoroughly dusted with a reliable brand of insect powder, and this operation may profitably be repeated once or twice during the hatch. Provide dust baths in which the hens may wallow when they come off to feed; this breaks the monotony of sitting life by providing the hen with enjoyable exercise, as well as smothering many of the vermin in the dust. Neither lard nor grease of any kind should ever be applied to the body of a hen while she is sitting, as it would be fatal to the embryo chicks.

As many hens as possible should be set at one time, for in this way the infertile eggs may be tested out at the end of the first week and the remaining good eggs divided up among the number of hens necessary to cover them, sending the other hens back to laying again or resetting them. The use of this same plan after the chicks are hatched also simplifies matters then, because a hen usually is capable of looking after a greater number of chicks than she herself can hatch; that is, three hens can brood as many chicks as four or five can hatch.

The three great things, so far as location and environment are concerned, for comfort among sitting hens, are quiet, warmth, and subdued light. The nests should be large enough to allow the hens plenty of room to change their positions, but over-

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large ones are to be avoided, as the eggs will roll around in such nests. Excelsior makes the best nesting material; straw and hay are usually too coarse and stiff.

I always keep a little slip of paper attached to each nest box occupied by a sitting hen, and on this is written the date when the hen was set and when she will hatch. Some other people I know of write on each nest box with chalk, as this can be erased at the completion of each hatch. Certainly some such method should be followed, because serious mistakes are often made when one trusts the remembering of dates to his memory.

Whenever possible sitting hens should be located where they cannot be disturbed by the members of the main flock, as this will often prevent broken eggs and deserted nests. If an egg should happen to become broken in the nest, always remove the soiled nesting material and replace with fresh and wash all soiled eggs, or otherwise the pores will become closed and the ventilation of the chick will be interfered with, and a foul smell be present in the nest.

Ordinarily, the less a sitting hen is disturbed the better. I never sprinkle the eggs nor indulge in any of the other unnecessary and often harmful practices sometimes advised. Briefly, the best way to care for a sitting hen is to let her alone; she knows her own business.

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In a perfect hatch the chicks begin to pip the shells on the twentieth day, and all are out by the twenty-first day. Hatches that end at the end of the twenty-first day. Hatches that hatch abnormally early or late are not desirable, as the chicks are not so strong and thrifty as those that hatch at just the proper time. The more nearly simultaneously a hatch comes off, and the quicker the hatch cleans up, the better. The best hatches I ever had were those that reminded me the most strongly of popping corn.

As a rule it does not pay to help chicks out of their shells. A chick that has not sufficient strength and vitality to free itself from the shell without aid does not deserve aid, for it will scarcely survive many days, or if it does, it will not amount to much, but probably will always be a runt. Then, aside from this, it is always more or less harmful for the attendant to interfere at hatching time. If the hen is disturbed she is likely to move around and trample on strong chicks that would otherwise have fared all right. With an incubator, a frequent opening of the doors at hatching time is bad practice, because this allows the cold outside air to blow in over the weak, wet chicks, chilling them and drying out the air and absorbing a large part of the moisture that is very essential in the hatching chamber at this time.

However, I find that it usually is a good plan to open the incubator doors when the hatch is about

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two-thirds over; this is done because by this time the empty egg shells are getting almost too numerous for the size of the egg trays, and sometimes there are large, perfectly dry chicks which have failed to find their way to the nursery below, but which should be quickly dispatched there to get them out of the way of the chicks just hatching; also, empty egg shells sometimes slip over pipped eggs, shutting off the chick's supply of air by enclosing its breathing place.

Should there happen to be any crippled or deformed chicks in the lot, they should be promptly killed. It usually is only a waste of time to try to raise such chicks, and it always requires more time and effort than the chicks are worth. This is a point over which beginners always hesitate or falter, but the law of Nature of "the survival of only the fittest" is sure to obtain sooner or later, and one might as well save himself unnecessary trouble by taking the matter into his own hands right at the very outset as I have suggested.

Warm, dry, comfortable quarters should have been provided for the old mother hen and her brood some little time before necessary to remove them from the nest. In the case of a brooder, the lamp should be started at least twenty-four hours before the chicks will need to be placed in the machine, so that the flame may be regulated to maintain the correct temperature.

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It is best not to be in too big a hurry to remove chicks from the incubator or from the nest. No chick should ever be disturbed until it has become thoroughly dried off and has had some little time to gain strength. When removed, incubator chicks should be placed in a deep basket and covered with warm cloths or burlap. With a hen the chicks should be cared for in much the same manner while being transferred to their coop, while the mother may be carried in the hands of the attendant.

Just prior to exclusion from the shell the chick takes into its body the comparatively large unabsorbed remnant of the yolk of the egg, and this alone is sufficient to support life for several days. The author never feeds his chicks until they are at least forty-eight hours old; frequently not until they are sixty hours old, and sometimes not until they are seventy-two hours old. Chicks have been known in extreme cases to thrive when given no supplied food until they were five or six days old, so to withhold food for two or three days is no hardship, but really the best thing that can be done. No water is given until after the chicks have been fed their first meal; after this time it is kept constantly before the chicks as there is thus less danger of over-drinking than where water is supplied only at intervals. Grit and charcoal are also placed

HATCHING AND REARING CHICKS

before the chicks at the same time they are given their first meal, and these materials are kept constantly before the chicks ever afterward.

There is no infallible formula for the feeding of little chicks; this applies with equal force to the kind and amount of feed. The dry-feed method is now very popular and in the most common use. By the "dry-feed" method is meant the rearing of little chicks on small grains and cracked seeds, without any such thing as "soft food" or mashes. I have been using this method of feeding chicks on the Buff Rock Farm for several years now, and results have been very satisfactory indeed; so much so, in fact, that I would not now think of returning to the tedious and more expensive mashes and johnnycake methods. While, to be sure, the day of this last-mentioned manner of feeding is not yet quite past, still the novice will be on much the safer side if he adopts the dry-feed method exclusively.

Chicks not only relish a variety of foods, but actually require a variety for maximum growth and thrift. There is no better way to provide variety than to use one of the prepared chick feeds. These feeds contain eight or ten different kinds of small seeds and cracked grains, are fed dry and with absolutely no waste, and are mixed together in just the correct proportions so that the feeder is relieved of the bother and uncertainty of

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“balancing” the ration. These feeds contain everything in the way of grain that a chick needs to promote vigor and growth, and chicks may be raised on this prepared feed alone until they are five or six weeks old, providing meat and green stuff are supplied. The feed may be purchased in any quantity desired, and usually sells for two to three dollars per hundred-pound bag. At that price it is as cheap as anything that can be fed to little chicks with satisfactory results.

There are very few cases where it is not better for one to purchase the prepared feed than it would be for him to mix it himself. However, at out-of-the-way places, where railroad facilities are poor and transportation charges excessive, it sometimes is cheaper to mix the feed at home. In this case, here is a good formula to follow:

- 45 lbs. cracked wheat
- 20 lbs. cracked corn (with meal sifted out)
- 15 lbs. millet seed
- 10 lbs. hulled oats
- 10 lbs. broken rice.

If the hulled oats cannot be procured, pinhead oatmeal, such as can be purchased at any grocery, may be substituted.

Never feed chicks on a bare surface. Scatter all their food in a litter two or three inches deep, as this induces the chicks to take healthful exercise scratching and hunting for the grains. It also is a

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great aid in keeping the chicks busy and contented. Chicks that do not get sufficient exercise are susceptible to leg weakness, bowel diseases, and other ills; therefore, make them work for all they get, and have no fear that they will not get enough food because it is buried in litter. Chaff from the mow floor makes the best scratching material, especially when the chicks are quite small, as they greatly relish the minute hay seed it contains.

If you make use of soft food, first of all be sure that you are feeding a mash and not a slop. Then be careful to place all food in small troughs or pans; never throw soft food upon the ground or upon the floor of the brooder, where it quickly becomes fouled and a potent source of disease. Only as much should be placed before the chicks at one time as they will eat up clean in a few minutes. The troughs or pans should be thoroughly cleaned after each meal and scalded with boiling water every week or ten days. In a word, keep everything sweet and clean; soured, contaminated food and filthy troughs are frequent sources of bowel disorders among little chicks.

Wheat screenings can often be fed at slight cost, and in such cases their use is all right; but where they cost nearly as much as wheat, use the latter grain, as it contains more nourishment. Milk I do not consider quite so excellent a food for little chicks as do many people, not because the milk is

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not nourishing, but rather because of the great danger of soiled, bedaubed plumage on the chicks and general unsanitary conditions in feeding it. Our chicks receive little, if any, milk until they are at least ten days old. After that time, however, it may, if obtainable, be given rather freely with no ill results, so long as proper cleanliness is observed in feeding.

There are other feeds besides grain that fill important positions in the chick's bill of fare. Meat, green food, grit, charcoal, etc.—all have their proper places. For meat, green cut bone is probably best, but there is not much difference in the results obtained from the use of this material and the prepared meat foods.

Green food is of great assistance in securing thrifty, rapid-growing chicks. It may be supplied in various forms and ways, as best suits the convenience of the attendant. Lettuce, cabbage, rape—in fact any kind of vegetable matter—all are good for the chicks. The important part is to see that they get *something* in the way of green stuff, as otherwise there cannot be maximum growth and thrift.

Grit should be placed before the chicks as soon as they are given their first meal, and should be constantly accessible to them ever afterward. This material is the only teeth the chicks have, or ever will have, and without it they cannot properly

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grind and digest their food. Coarse sand will answer the purpose fairly well for the first few days of the chick's life, but after that some coarser material must be provided.

Charcoal is of great assistance in keeping the chicks' bowels well regulated, and it is invaluable in cases of bowel disorders or improper feeding. Keep some setting around where the chicks may pick at it at all times, but remember that if exposed to the air it will gradually lose its valuable properties, as it will absorb the impurities from the air.

Cleanliness is very important with little chicks. Filth allowed to collect in any quantity, whether in
The General the brooder, roosting coop, or yards,
Care of lowers vitality and invites disease.
Chicks Keep the floor of the brooder or coop lightly covered with sand, hay chaff, cut hay or clover, or some similar material, and sweep this out, together with the droppings and accumulated filth, every two or three days. If the coops are crowded, they must be cleaned that much more frequently. It often is a good plan to put a layer of heavy paper on the floor of the brooder, and then all the litter and droppings may be removed simply by taking out the paper. Disinfect the brooders every few weeks.

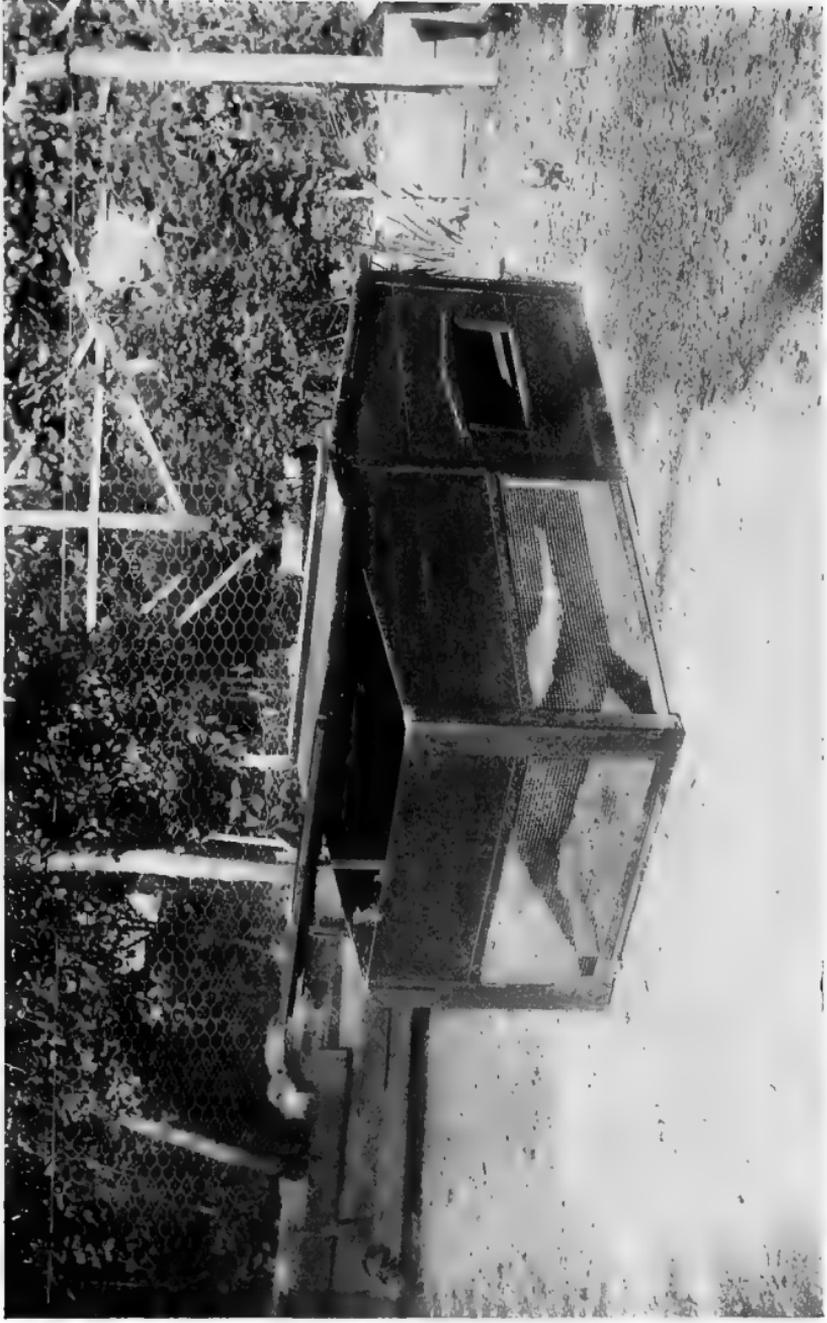
Don't hatch out more chicks than you feel absolutely sure you can properly look after. When the

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first pretty downy little balls of life arrive it is a temptation to want lots of them; but most people who raise a limited number of chickens lead busy lives, and after the first enthusiasm passes off—usually at the end of the first week or two—they find that either for lack of time, room, or, alas! sometimes of inclination, the chicks must suffer. And it is an indisputable fact that, in order to attain maximum success with little chicks, no detail, no matter how small and insignificant it may seem, dares to be slighted; every little thing counts, and a few chicks well cared for are better property than twice that many half cared for.

Don't put too many chicks together in one bunch; large broods are entirely unnatural, and death from crowding often results. It is better in all respects to limit the number of chicks kept together in one lot, whether they are kept with hens or in a brooder. Crowding usually develops many unexpected troubles, as well as those commonly known to result from such practices. Fifteen to twenty chicks are as many as one hen of good size can satisfactorily look after, while the biggest individual brooder made should not contain more than one hundred chicks. Most machines give the best results when they contain not more than sixty to seventy-five chicks, and forty or fifty is usually the safest number.

Lice and mites often cause much disappoint-



Coop No. 1 for old hen and chicks

HATCHING AND REARING CHICKS

ment and loss with little chicks. Hen-hatched chicks are sure to be more or less lousy, and even incubator-hatched chicks are seldom free from the pests. The only sure way of keeping the vermin under control is to begin fighting them as soon as the chicks are hatched and keep it up all along the line. A reliable brand of louse powder will fix the body lice, but has no effect upon the red mites which infest the coops. These must be eradicated by spraying or painting the coops or brooders with some good liquid lice paint or with common kerosene oil. For further advice on this subject, see Chapter Fifteen.

The Best Temperature for Brooders. The maintenance of the correct temperature in the brooder is a very important matter. It seems to be comparatively easy for the average beginner to keep his brooder either too hot or too cold during the night, and the one extreme is about as common and as serious as the other; chilling produces bowel disorders and other ailments, while too much heat will give you a bunch of "hot house" chicks that are lacking in vitality and stamina.

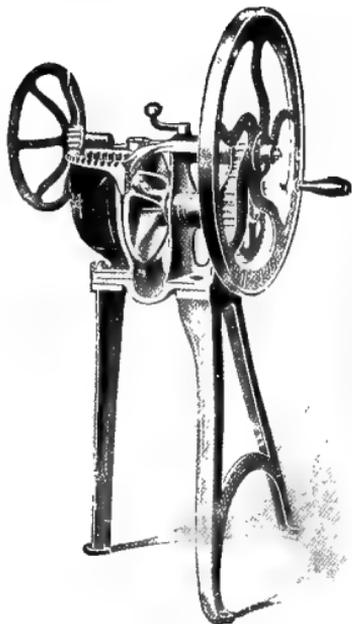
Most experienced poultrymen regulate the temperature of their brooders more by the actions of the chicks than by the use of a thermometer. When the chicks spread out on the floor of the brooder in a contented manner and soon go to

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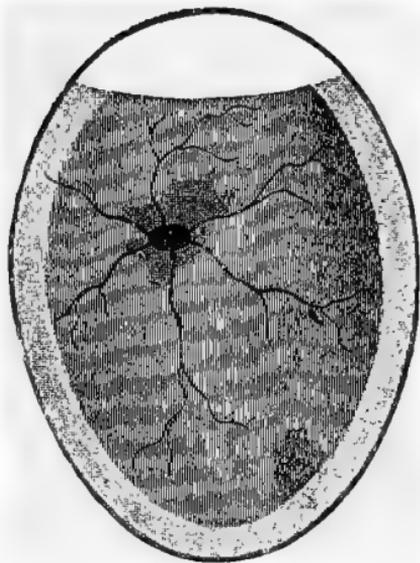
sleep, the temperature is just suited to them; if too cold, they bunch up and each one tries to get as close to the others as it can; if too warm, they scatter apart as widely as they can, spread their wings out from their bodies, and breathe faster than ordinary, or even pant.

So far as rules are concerned, ninety-five to one hundred degrees is usually considered the best temperature to maintain under the hover for the first day or two. Remember in warming up the hover that a bunch of chicks in it will raise the temperature five to ten degrees with their animal heat. Gradually lessen the amount of heat supplied from the time the chicks are placed in the brooder until they are able to do without supplied heat. At the end of the first week the temperature should not exceed ninety degrees. At the end of the third week the temperature of the hover, when the chicks are in it, should be about eighty degrees.

It is very desirable that the brooder temperature be reduced as rapidly as possible, and the chicks weaned away from artificial heat. How rapidly this may be done depends very largely upon the weather conditions, and also somewhat upon the nature of the breed to which the chicks belong. In winter or early spring it may be found desirable to supply heat in the brooder until the chicks are five or six weeks old. At all times, however, it should be remembered that a bunch of lusty, grow-



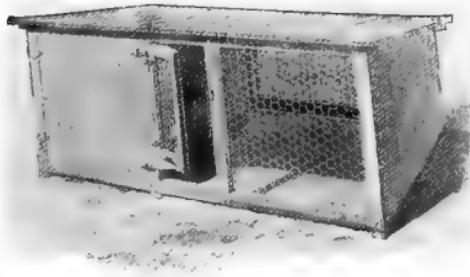
Bone Grinder



Fertile Egg



Egg Tester



Coop No. 2 for Hen with Chicks

HATCHING AND REARING CHICKS

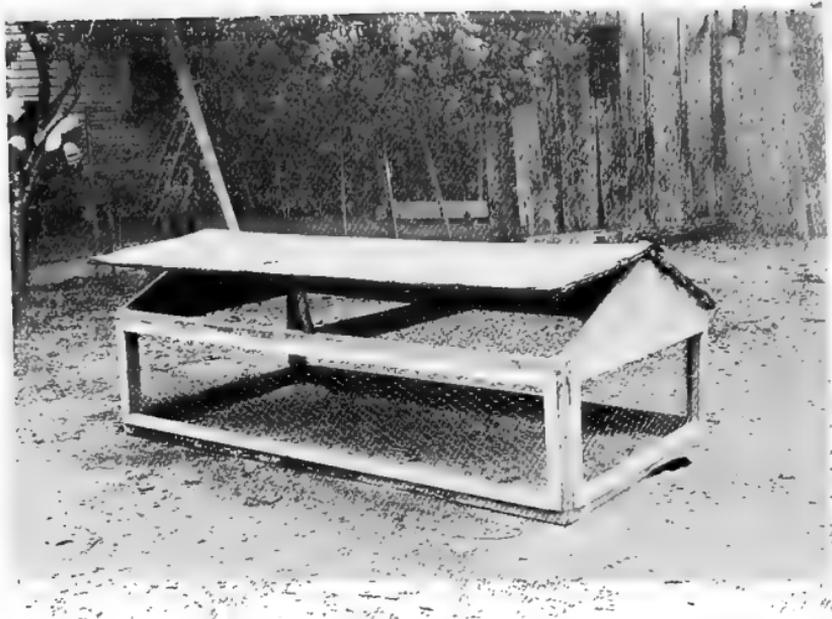
ing chicks generate a surprisingly large amount of bodily warmth, and they should be made to become accustomed to do without artificial heat as soon as possible, both for their own hardiness and thrift and for the economy of the owner.

The illustration entitled "Coop No. 1 for Old Hen and Chicks," shows an excellent brood coop for hen and chicks. It is 3 x 6 feet in size, 30 inches high in the middle and 22 inches high at ends. The illustration shows one side of the coop, and the other side is just the same. The back is boarded up solid. The window in each side is 6 x 18 inches. The wire screen is 12 inches high. The roof is covered with roofing fabric and hinged as shown in picture. To facilitate cleaning and to prevent damp sleeping quarters, the rear half of the coop has a removable board floor, which lies on blocks that raise it two or three inches above the ground. A slat partition may be placed in the middle of the coop, if this is desired, confining the old mother hen to the rear of the coop and giving the little ones the run of the entire coop. After the chicks are a week or so old they should be given their liberty outdoors, and then the hen may be allowed possession of the entire coop if this be desired. It usually is best not to allow the hen her freedom, as she will often lead the chicks into undesirable places, such as wet grass, shrubbery, etc.

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The illustration entitled "Coop No. 2 for Hen and Chicks," shows a coop which in many ways is even more satisfactory and convenient than the one previously described. It is 4 feet 6 inches wide, 2 feet deep, 1 foot 9 inches high in front, and 1 foot 3 inches high at the rear. As can be seen from the illustration it has two apartments—a closed or house part, and a wire-enclosed shelter or exercise room. The house part—1 foot 9 inches by 2 feet—is provided with a removable floor, and is separated from the exercise room by a wooden partition with galvanized wire-cloth window and a door which admits light and air. The exercise room—2 feet 6 inches by 2 feet—is closed at the end, and screened with fine-mesh galvanized iron wire back and front, providing a roomy shelter for the hen and chicks. The combination door in the front of the coop permits the chicks to enjoy the advantages of free range, while the mother hen is safely confined.

Either one of the two brood coops described and illustrated may be used as a home for the chicks long after they are weaned by the hen, also for a small flock of chickens that are old enough to be taken from the brooder or brooder house and colonized out-of-doors. A number of these coops with broods of chicks may safely be placed in the garden or berry patch, where the little chicks can range at will, and thrive on bugs and worms with-



Chick shelter No. 1



Chick shelter No. 2. Same as No. 3 except arrangement of roof

HATCHING AND REARING CHICKS

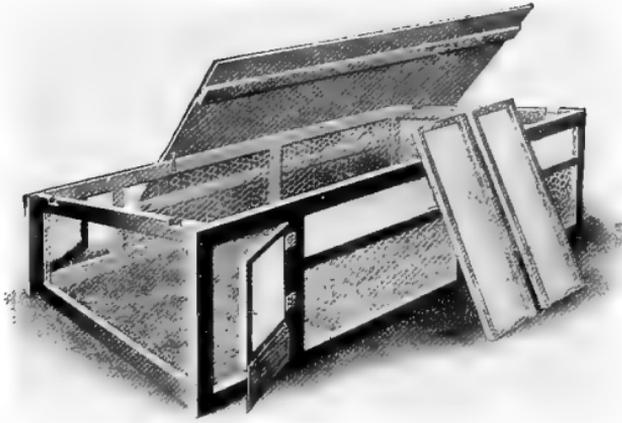
out injury to the garden or crops. In addition to protecting the chicks from the weather, these coops also provide safety from cats, rats, and hawks.

The majority of the outdoor brooders give the best results when operated under cover, where they are more or less protected from the elements. Even the large colony brooders give the best results when the chicks have some protection other than that furnished by the brooder itself. In winter and spring weather it is often too cold for the chicks to be outdoors in the open, and no brooder has enough floor space to comfortably house fifty or more chicks *all* the time for a week or more.

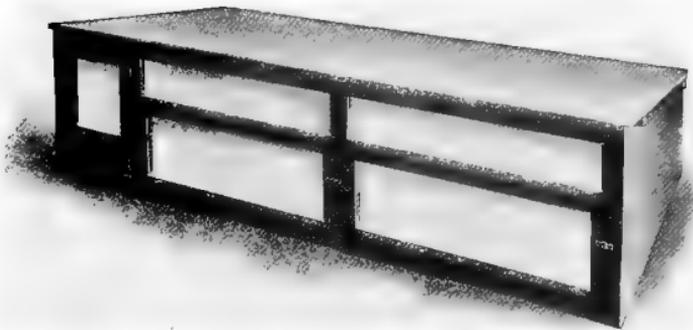
Shelters for Chicks. While it is detrimental to the health and vitality of the chicks to allow them to run in wet grass, or before the dew is off in the morning, it is also detrimental to keep them confined in the brooder for several hours. We have a covered run attached to each brooder, and the chicks make use of this during the early morning hours and during rain storms. By the use of these shelters the chicks have an outdoor run where they are protected from sun and storm and also from marauding animals that so often reduce the flocks, especially where chicks are reared on town and city lots. The run is made by covering a wooden frame with one-inch mesh wire netting. We have three different styles in use on the Buff Rock Farm, and

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illustrations of them appear herewith. The ones with the slope in the roof all one way are two feet high in front and fifteen inches high in the rear. The other one is fifteen inches high at the sides and twenty-five inches high in the middle. Both styles are 3 x 6 feet in size on our plant, but may be made any dimensions desired.



Chick shelter No. 3, with storm screens and roof removed to show construction of shelter



Chick shelter No. 3, with muslin storm screens in place

REARING CHICKS AFTER BROODING
AGE

CHAPTER XI

REARING CHICKS AFTER BROODING AGE

THE best time to wean the chicks from the mother hen depends a great deal more upon the hen than upon the chicks; some hens will leave their chicks and commence laying again before the chicks can safely be left to look out for themselves, while others will stay with the chicks for weeks—sometimes until after they have returned to laying.

As a general thing it is a good plan to allow the chicks to have as much of the time and attention of the old hen as she is willing to give them, unless she is exceptionally persistent in remaining with them for a long time, preventing them from getting hardened off properly.

With brooder chicks, the proper time for changing them from the brooders to the more independent colony life depends largely upon the breed, the weather, the location, and the shelter and care that will be provided for them. The little ones should be sufficiently well feathered to insure protection from sudden climatic changes and

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any other conditions that are liable to surround them. By "colonizing" is meant the removal of the chicks to small colony houses or to brood coops, similar to those described in Chapter Five, where each one must look out for himself and depend upon the warmth from his own body and the protection of his feathers. At this age chicks will stand cool weather much better than dampness, which is very hard on them. The Mediterranean chicks feather out the most rapidly of all, and can usually be safely colonized when they are eight weeks old. The American varieties are somewhat slower in clothing themselves, but may usually be colonized at the age of ten weeks. The Asiatic breeds are the slowest of all and often require twelve weeks, or even longer, before they become well feathered out.

Small portable houses should be used where any considerable number of chicks are to be carried through the summer, for with these **Housing the Chicks** the birds may always have a dry, comfortable protection, and it is easier to look after a few colony houses than two or three times that number of brood coops. Where portable houses are used, one hundred chicks may safely be housed together until they get pretty well matured. Where mere brood coops are used, the number of chicks in each had best be limited to twenty-five or thirty, and the chicks should be got-

REARING CHICKS AFTER BROODING AGE

ten into roomier quarters as soon as possible in the fall. A greater number than what I have mentioned sleeping together is not desirable, but this is about as few as economy of time and labor in their care will permit. The chicks in each lot should be as uniform in size and age as possible; this not only tends to safety and prevents loss, but also results in uniformity of appearance and consequent attractiveness of the flocks.

Cleanliness and health go hand and hand in the poultry business, and nowhere is this more noticeable than in the growing of little chickens. The coops must be cleaned out frequently; fresh, cool water must be frequently supplied in hot weather; lice and mites must be fought unrelentingly. If the chicks have not much yard room, plow or spade up the runs quite frequently; a hard, baked surface in the yards tends to bring the chicks to a standstill in growth, besides making a very unattractive and unpleasant place for them to range. Fresh soil, green grass, fresh air, plenty of good feed and exercise, moderate sunshine, welcome shade, comfort and activity all along the line—all these things play their part in the growth and profit of the chicks.

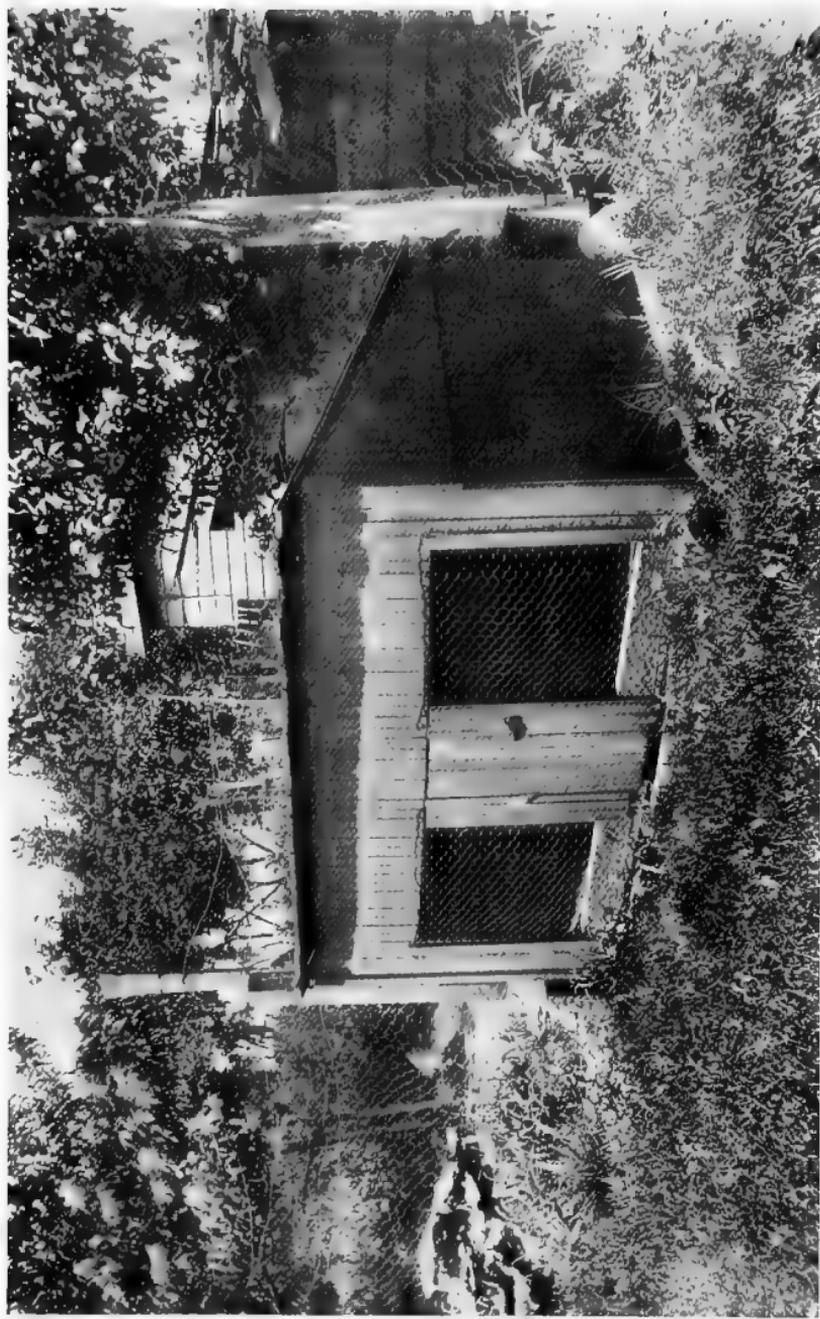
Separating the Sexes. The sexes should be separated as soon as the cockerels begin to crow and assert masculine traits, as otherwise the growth and development of the pullets will be greatly

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retarded and much loss may result. The cockerels themselves will fare better when away from the females, for then they will not hesitate to eat all they need and will have no chance to waste their energies.

Teaching Chicks to Roost. The chicks should be taught to roost as soon as they are removed from the brooders or weaned from the mother hen; they get more good pure air when roosting than when huddled together in a pile on the floor, and the general conditions of cleanliness and health are better. There will be no danger of causing "crooked breast bones," providing the perches are made wide enough. Four or five inches makes a nice width until the chicks are large enough that the shape of their bones has become fixed. These perches should be placed only a few inches from the floor at first, as then there will be less difficulty experienced in getting the chicks to use them; they should be gradually raised as the chicks get older, in order to get them further removed from the droppings under the perches and the resulting foul air near the floor. The chicks will need a little watching the first night or two, to see that they do not huddle in a corner instead of going on the roost, but after that they will prefer to perch.

By the time they are moved to the colony coops the chicks ought to be able to eat whole oats and corn that has been very coarsely cracked. Birds



A roosting coop for chicks after weaning

REARING CHICKS AFTER BROODING AGE

intended for breeding purposes should be fed those foods which will induce a normal, healthy growth without any of the evils of forcing. Whole wheat is probably better than any other one grain, but a variety is more than desirable—it is essential. Cracked corn is the most fattening, and considerable should be fed, as growing chicks always have a decided natural tendency toward “lean-ness.” Wheat middlings are also very good, and chicks greatly relish them; in fact, I find that of the numerous feeds kept before our growing stock in self-feeding hoppers, more middlings are usually required than of any other one feed. Of course, it is placed in the hoppers dry, the same as any grain would be. The best feeds to be kept before the growing stock are wheat, oats, cracked corn, middlings, a prepared commercial mixture of various grain feeds for large chicks, beef scraps, grit, and charcoal. See that the chicks get all they will eat of these feeds, because ordinarily the more they eat the more rapidly they will develop.

How to Feed Broilers. Chicks to be marketed as broilers should be hurried along more rapidly than chicks intended for breeders, so that they can be marketed at the earliest moment possible and the profits will be greater. After the chicks have been given a good start in life by the dry-feed system, the breeder may hasten their growth during

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the remaining few weeks of their lives by feeding extra large amounts of animal food and by forcing them with rich mashes, patent poultry condiments and anything else of a stimulating nature. Three mashes a day may safely be fed, and see that the chicks get all they will eat up clean at each meal.

The three great broiler feeds are ground oats, ground corn, and middlings; the first for bone and muscle, and the latter two for fat and flesh. Make the mashes about equal parts of these three grain feeds and add twenty per cent. of ground beef scraps, or give a liberal feed of green cut bone each evening. In addition, keep a hopper of the beef scraps constantly before them, and also see that they get all the green food they will eat. Only remember that too much meat and other stimulating feeds have a tendency to produce looseness of the bowels among fowls of all ages. Much range is not desirable for broilers, as they are likely to take too much exercise and "run off," as it were, a great part of their development.

Capons are male birds which have been castrated, that is, their generative sexual organs have been removed. The advantages resulting from the operation are a sweeter and finer flavor of the flesh, an increased price in the fowl when it has matured, and a higher price in the market than could be secured for an uncaponized cockerel. Birds that are caponized

REARING CHICKS AFTER BROODING AGE

when they weigh from two to four pounds make larger birds than they otherwise would, and the growth of delicate, tender chicken flesh is continued, instead of the bird growing into hard, stringy, muscle-flesh. The birds lose their fighting qualities, become very quiet, and even have been known to successfully brood little chicks. By an expert, the operation can be quickly performed and with scarcely any pain to the bird. A little practice will enable anyone who has the necessary "grit" to become proficient at the work. A set of instruments can be purchased at a cost of only a few dollars, and full directions for use accompany each outfit.

THE MATURING PULLETS

After the trials, troubles, and perhaps losses, of early chickenhood are over, there is nothing gives the poultry keeper more true delight or keener pleasure than to watch the young pullets grow and develop in symmetry and beauty and begin to exhibit motherly ways. After the birds have replaced their chicken feathers with attractive new plumage and begin to show a reddening of the combs and wattles, the poultryman who knows begins to realize that they have powers and possibilities all their own and his own.

The best of care and attention is necessary at

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this time, for in addition to developing her own bodily characteristics of bones, muscles, feathers, etc., the pullet has also to turn a large part of her energies toward the proper development of the internal reproductive organs, the ovaries. Sometimes poultry keepers become anxious to have their pullets to commence laying at once, and dope them with stimulating foods and mashes. These often hasten the development of the reproductive organs, but the development is not a healthy or a natural one, and is therefore unwise. The secret of genuine success is to keep the pullets developing steadily in a natural, healthy way that shall insure perfect bones, muscles, blood vessels, nerves, lungs, digestive system, and last but by no means least, reproductive organs.

It is at this time that the germs of the eggs are being formed,* and it is very important that each of these shall contain all the force, stamina, hereditary quality and life powers necessary for the production of a new chick which shall have the ability to thrive and grow and mature, and in turn reproduce its kind. This is not a machine process. It is life development; it is Nature's work, deliberately done with a definite purpose: the perpetuation of the species.

The Use of Condiments. Do not, under any

* Heredity determines the number of eggs a hen shall produce in her lifetime; feed and care determine the number of them we can force out of her in a given period.



Practical small roosting coop in use



The same coop with hood thrown back

REARING CHICKS AFTER BROODING AGE

circumstances, make continuous and frequent use of condiments like red pepper, mustard, or patent tonics of any kind in order to force egg laying, among either pullets or adult birds, unless you want to get all the eggs possible out of the female in one season and then discard her. These foods used in small quantities once a week or every two weeks do no particular harm and may do good, but if used recklessly they inflame and excite the digestive tract and the organs of reproduction, and, although they will temporarily produce the desired results, a reaction is bound to come which in course of time will leave the birds in a debilitated, run-down condition, and they are liable to succumb to attacks of disease germs in the tissues, which in health and vigor they would resist and reject.

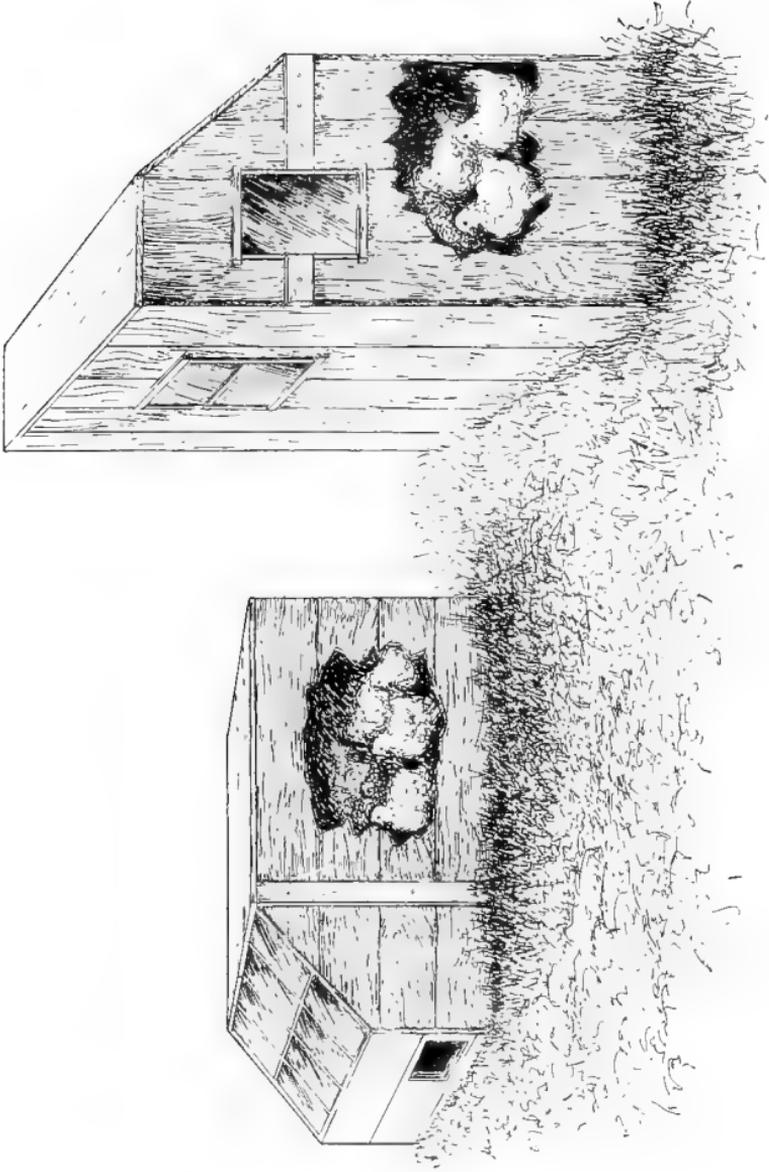
See that the pullets have plenty of room; remember they are no longer little chicks and cannot get along on the same amount of room now that they could a few months ago. Good ventilation is imperative for sound constitutions. Damp or foul air, raw, rough winds, unpalatable food and filthy water, all tend to delay, interrupt and prevent egg production. Plenty of animal food, green food and exercise are essential to the best normal development.

So far as feed is concerned, I strongly believe in letting the birds use their own judgment, letting them eat what they want, when they want, and the

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quantity they want, from self-feeding hoppers. As many different kinds of grain and other foods as possible should be kept before them, and they will select the ones they need the most. Wheat, oats, and cracked corn are the three indispensable grain feeds.

The pullets should be removed to their winter homes in ample time to allow them to become thoroughly familiar with their new surroundings before cold weather sets in, and then the egg yield will not be interrupted or delayed. Leghorns and some of the other Mediterranean breeds often commence laying at the early age of four or five months. The American breeds usually require a month or two longer, and the Asiatics still longer. The first few eggs from a pullet are always undersized and sometimes the shell is imperfectly constructed, but ordinarily a little time will correct all that. If it does not, dispose of the fowl.



Practical small roosting coops made of single piano boxes

THE "FANCY"



THE "FANCY"

dred or more varieties has its own special points of beauty and merit. Not only are these fowls beautiful in form and color, but they are valued at what seem like ridiculously long prices to one who has never paid attention to the matter. At America's great shows, where the best of each variety is placed on exhibition, one hundred to one thousand dollars frequently are asked for the first-prize birds in the popular classes. One hundred to three hundred dollars each have repeatedly been paid for choice specimens, especially for male birds.

These high prices mean something. Men are not going to pay such large amounts for five to ten pounds of chicken meat, bone and feathers, unless there is a good reason for it. The extremely high prices are not, however, founded so much upon the utility or practical value of the birds as upon their "fancy" excellence, that is, beauty of form and feather. But while this is true, it is also true that no other class of poultrymen has done so much for commercial poultry as has the fancier. He has greatly improved and developed not only the fancy side of the business, but also the practical side as well. The Plymouth Rocks and Wyandottes, the most popular market varieties, are strictly the production of the fancier, and all other practical breeds and varieties, as well as the ornamental breeds, have been greatly benefited by his work.

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The Genesis of the Fowl. It is claimed that in the beginning there existed only one kind of chicken, a black and red jungle fowl of uncertain origin, and from this one species man has produced, through selection and persistent matings, the one hundred or more distinct varieties of poultry now in existence. There is no doubt but that this is substantially true, for more than half the varieties 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 years fifteen or twenty of our popular varieties have come into existence.

Inasmuch as it has taken years to create and produce the different varieties of standard-bred poultry, building them up to such an extent that they will reproduce the desirable distinct qualities and characteristics, it follows that the one best way to preserve and augment these traits is to buy into an established strain and then stick to that strain, concentrating all energy upon developing to the utmost the special characteristics and qualities which it possesses. Different breeds have different strains (or families), all alike in general, but varying in the fine points, depending upon which ones the breeder has specialized the most strongly. A common mistake made by beginners with standard-

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bred poultry is to secure their stock from two or three different sources and their eggs from still another, thus mixing and crossing the blood of different strains, regardless of the loss of the breeding lines upon which these different strains have been developed.

The beginner, in starting, should consider quality rather than quantity. It is often cheaper to buy five birds or five settings of eggs for fifty dollars than to buy twenty-five for the same amount of money. Anyone can breed quantity, but it is the work of years to produce quality. It is cheaper to start with quality and pay the price than to start with quantity and spend years of time breeding for quality. As it takes a breeder several years to breed a flock up to quality that is recognized, the beginner can afford to pay him for his years of experience and skill.

Instead of having to sell his eggs at twenty-five cents a dozen and his fowls at from twenty-five to **The Profits** seventy-five cents apiece, the fancier **in the Fancy** can get from one to five dollars per setting for his eggs and from one to five dollars each for nearly half of his birds, while a few exceptional specimens may bring several times this amount each.

At the same time there is not such a radical difference in the profits from the market and fancy sides of the business as one would imagine on first

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thought. The fancier must pay as much money for one breeding male, or for a good hen with which to retrench his blood lines, as he could reasonably expect to receive for half a dozen of his own birds. The breeder with the big reputation can ask prices for his stock and eggs, and get them, that the beginner would not dare to think of asking for his own goods; and this is reasonable and proper, too. Then, again, from twenty-five to sixty per cent. of the chicks from every ordinary mating will prove to be culls which will honestly bring no more than market prices. Half of those left after culling will be worth only a dollar or two a head, and it is from the remainder that the profit will have to be made, and it will be made if the matings which produced them were of good quality.

Then, too, the beginner in the fancy will find that, while he will experience no difficulty in disposing of all his eggs and surplus stock from a small flock of fowls if he does not ask exorbitant prices for same, as soon as he becomes overly ambitious and enlarges the scope of his operations the supply will have exceeded the natural demand, and he must secure new quarters for his wares by advertising; and this is a great drain on the profits the first year or two, or until one gets his name and business well established. But the man who can weather the storms of early experience will find

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that he will have comparatively smooth sailing after that. And that is true of every branch of the poultry business, market or fancy.

On the result of his matings depends the success or failure of every fancier. I do not mean, in **Mating** this sense, the correct mating to pro-
to Produce duce eggs that will hatch (which is
Prize-winners very necessary), but instead, the mat-
ing of the different individuals so that their vari-
ous characteristics and peculiarities will "nick
in" (blend) just right and the resulting progeny
will be as good or better than their ancestors.
The man who can afford to buy a pen of breed-
ing birds to make his start has the advantage
in this respect, because the breeder from whom he
purchases them will use his experience and skill
in selecting and properly mating them before ship-
ping. The beginner should secure some one to
do the work for him who is thoroughly acquainted
with the breed and the breed characteristics, or else
he should thoroughly post himself upon the sub-
ject as best he can and experiment and observe
results. One of the best means of becoming famil-
iar with the good and bad points of a breed is by
a careful study of the Standard requirements.

American Standard of Perfection. This is a
cloth-bound book of 300 pages, published and
copyrighted by the American Poultry Association.
In this Standard will be found, listed in classes,

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breeds and varieties, every kind of chickens, turkeys, ducks, and geese known as standard. All the popular varieties are illustrated with full-page drawings, and each and every variety is fully described, section by section, from beak to toe-nail. It gives the standard weights of all varieties that have special weights, minutely describes the color and markings of the feathers, and describes and illustrates the correct type and the proper shape of body. This book is often referred to as "the national guide of poultrymen." They use it in their yards in mating their breeders and selecting birds for exhibition, while in the showroom it is the judges' guide and authority in scoring the fowls and awarding the prizes. It should be in the library of every breeder of good poultry.

The national organization for all classes of poultry keepers is known as the American Poultry Clubs and Organizations for Poultrymen Association. Nearly all influential poultrymen are members of it. Annual memberships have been discontinued, and ten dollars now makes one a member for life.

There are many local organizations of poultry keepers, while nearly every variety has its specialty club designed to promote interest in the variety whose cause it espouses. Every breeder of standard-bred poultry should belong to his variety's club, as it will keep him posted on the development of

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his breed and the doings of the breeders, besides giving him added prestige on account of being a member. Most specialty clubs have one dollar for their membership fee and the same amount for annual dues.

When selecting fowls to be exhibited, first of all subject each one to a careful scrutiny, and make sure **Hints on Exhibiting Fowls** that it is free from disqualification. Remember, that if the "Standard" says white in the ear-lobes or face shall disqualify, a spot the size of a grain of wheat is all that is necessary to throw your bird out of the race in close competition; or, if the "Standard" says white or gray or any other foreign color in any part of the plumage is a disqualification, it means just what it says, and a part of a feather off in color will disqualify your bird just as surely as a whole feather.

Preparation means a great deal toward success in the show room. Train your birds so that they will not object to being handled, and teach them to pose at command so that they will show to the best advantage. White-plumaged birds should be given a bath a few hours before being cooped to send to the show, or long enough that they may dry and arrange their feathers before being removed. All kinds of fowls should have their combs, lobes, wattles and legs thoroughly cleaned, using a soft sponge, warm water and soap.

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At the show it usually is best for the beginner, or some one interested in his exhibit, to personally look after his birds. The management will attend to the fowls as well as they can, and usually satisfactorily, but they have many to care for and necessarily have to do the work hurriedly and do not understand individual methods of feeding and caring for the birds as their owner does. Keep the coops, as well as the birds themselves, as clean as possible during the show, and give the birds meat and green food every day in addition to their grain.

Which Are the Best Fowls? The best fowl is, of course, the one that most nearly fulfills the "Standard" description, valued at one hundred points. The bird that is perfect in every respect has never been grown. Ninety to ninety-four points are the most common scores among exhibition stock. Fowls scoring more than ninety-five honest points are rare and valuable.

Judging. There are two leading methods of judging poultry, viz., the "comparison" and the "score-card." By the former the judge selects the winner by comparison, and no scores are given out because none are made, the birds being judged solely by their relative merits. The score-card system gives the most satisfaction to the beginner, because he can learn much by studying the score cards of his fowls, seeing just where they are weak

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and where they are strong, and, if he was defeated, why. Most small shows use the score-card and most large shows use the comparison system because it requires less time.

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CHAPTER XIII

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NO matter for what purpose kept, the condition of the adult fowls lies at the very foundation of the success or ultimate failure of a poultry plant. If the hens are kept merely to produce a large number of eggs, they must be forced with this idea in view in order to yield maximum profits, and no fowl will stand forcing unless in a condition of maximum thrift and vitality. If the fowls are kept for breeding purposes, that is, to furnish eggs for hatching, it is even more important that their physical condition be of the best, because here the laws of heredity play an important part.

In selecting breeding stock, the most important point to be looked after is to see that the fowls are all perfectly sound and healthy; it is not only essential that the fowls themselves be healthy, but they must have been bred with a well-established habit of health. To paraphrase a famous saying of Oliver Wendell Holmes, it may be said that "the physical training of a chicken should begin with its great-grandparents"; that is, if we are to pro-

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duce sound, thoroughly healthy stock—stock that has the ability to resist and reject disease—we must breed through several generations for health and vitality, the same as we would breed for other points of practical value, and so establish and perpetuate the habit of reproducing healthy specimens in future generations. It is probably true that a very large per cent. of the failures of beginners to get good hatches from their eggs, or to successfully rear a large percentage of their chicks, is due to the neglect of these cardinal principles.

Fowls with constitutional taint or which are otherwise debilitated, never did and never can, in the very nature of things, produce eggs that will hatch healthy, vigorous chicks. Fowls that show any symptoms of disease at all should never be bred from, and the same thing is true of birds that have at any time in the past been seriously ill, for, while they may have apparently recovered, there are nine chances to one there is yet and always will be a weak spot there somewhere, and the disease is always liable to crop out again in the progeny at any time. Eggs from hens that have been forced for great egg production during the winter months are always more or less weak-germed in the spring, and give correspondingly poor hatches and weak chicks. The same kind of results usually come from eggs laid by late-hatched pullets which are not fully developed and matured.

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The experienced poultryman watches up the records and the good and bad points of his fowls throughout the entire winter, and then **Mating up the Breeding Pen** when spring arrives he is well qualified to intelligently and systematically mate his birds. The fowls should be mated up at least two weeks before their eggs will be needed for hatching purposes, in order to insure good fertility.

On the author's plant, culling is about the most important work at mating time. We discard every bird that is not in vigorous, rugged health, so far as can be determined by a careful examination. This is done with absolutely no regard to the score or the egg record of the individual. The remaining healthy, vigorous stock are again culled—this time with a view to Standard requirements. Every hen showing an improbability to throw chicks as good or better than the average of the flock is promptly removed.

The Benefits of Culling. Most persons, especially beginners, are prone to add doubtful birds to their breeding yards in order to increase the number of laying stock. It is quality and not quantity that counts, however, and the man who gets to the "top" the quickest is the one who hatches a comparatively small number of chicks from his few best birds, rather than a large number from over-large pens of doubtful quality. A little flock well culled,

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like "a little farm well tilled," is a greater source of satisfaction and profit than larger operations run on the "hit or miss" plan, without constant culling and careful attention to details.

The Best Age for Breeders. It is usual to mate cockerels to hens, and cocks to pullets. Pullets and cockerels should not be mated together, unless very early-hatched and well matured, but young stock of the one sex should be balanced by seasoned maturity in the opposite sex. This insures stronger fertility in the eggs. Of course there is no objection to mating fowls of the same age together, providing both sexes are well matured, that is, at least one year old.

A perfectly sound male at the head of the breeding pen is very essential; if possible, have the male of a even little better quality than the females. The statement is often made that "the male bird is half the flock," and in a breeding sense it is absolutely true, for the male bird influences every chick hatched from his pens and in that respect his power equals, approximately, that of all the females to whom he is mated.

Number of Females to One Male. The best results are usually secured when one male is mated with not more than eight to twelve females of the Asiatic and American classes, and twelve to eighteen of the Mediterranean class. Sometimes good results are secured where one male looks after a

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greater number of hens than this, but not usually. A great deal depends upon the individual disposition of the male, and whether or not his attentions are well distributed. If he is a spry, vigorous fellow, the male is apt to worry the hens if there are only a few of them, and in that case it is well to introduce as many more females as are necessary in order to keep the male peaceable.

Sometimes it becomes necessary to keep more hens together in one flock than one male bird can properly look after. Then various expedients are resorted to in order to prevent the males from exhausting their powers and interfering with each other. Where two males are necessary for one pen, the common practice is to put them with the hens on alternate days. This doubtless is the best plan, but the most satisfactory way is to have the houses and yards so arranged that no flock contains more females than can be well looked after by one male. If two or more males are allowed to run together, they are sure to interfere with each other, and often the one is kept in total subjection and is as good as useless, for fear of the other.

How Long to Retain Male Breeders. More depends upon the vigor and activity of the male bird than upon his age in deciding how long he may satisfactorily be used as a breeder. Several times I have used exceptionally good cock birds for breeding purposes until they were in their

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fifth season, and I could not see that the fertility was any poorer or the chicks any the less vigorous, although the cocks could not look after quite so many females as they could when younger. Replacing male birds every year or two gets expensive when they are of exhibition quality, and that is the only reason that prompted me to retain the fowls so long. When he can be replaced for a few dollars, better not keep any male bird after he has gone through his third season. After that time most males become clumsy and awkward and their sexual powers begin to wane.

Inbreeding. So far as inbreeding is concerned, there is little to fear if the instructions given at the beginning of this chapter on selecting the breeding stock are observed, and only sound, thoroughly healthy stock are used. There is danger in breeding from debilitated birds, whether they are related or not. Of course, inbreeding can be carried too far, especially by the inexperienced, and if practiced closely and continuously, year after year, can result in nothing other than impaired stock; but if you have an extra good male and a few females you would like to mate together, go ahead and do it, even though they are slightly related. But be sure you know when to stop, and don't keep it up closely year after year.

At what age a hen ceases to be profitable is another of the many poultry problems on which

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it is difficult to state general rules with any degree of accuracy. All females lay more eggs during their first and second seasons than they will any year after that time, but some hens lay enough eggs after their second year to make their further retention profitable. Few hens pay a profit above expenses after their third season, and the exceptions to this rule are so scarce that it is always best for the beginner to keep his flock under three years of age. This is true, of course, only where the hens are kept for the eggs they produce alone; an exhibition hen that has proven her worth as a show bird and breeder may often be profitably retained as long as she will lay at all, as a dozen of her eggs are often worth several dollars. Generally speaking, however, it is best to keep the flock young and vigorous. Young fowls are almost always more active, more thrifty, more hardy, and more attractive than old ones.

The egg production of different flocks varies greatly. The most common egg yield is probably the one which averages from five to ten dozen eggs per year from each hen, although the ordinary American farm flock, or the flock in the hands of a beginner or a careless attendant, often does even poorer work than that mentioned. A very excellent egg yield is from ten to fourteen dozen eggs per year

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per hen. Anything above fourteen dozen eggs per year from each hen may well be classed as extraordinary.

There is a small flock to be found here and there over America which has averaged two hundred or more eggs per year from each hen, and there are a few hens with individual records of as high as two hundred and fifty to two hundred and sixty eggs per year; but these records were made in the hands of skilled poultrymen who not only knew exactly how to feed and manage, but these flocks were the result of years of careful selection and breeding from only the best layers by means of trap-nest records. The poultry keeper whose flock averages more than one hundred eggs per head per annum is engaged in profitable work, and the man whose egg record shows an average of more than one hundred and forty eggs per hen in twelve months has cause to be well pleased with both his fowls and himself as attendant.

Leg bands are inexpensive aluminium or brass bands which go around the leg of a fowl much the same as a ring on the human finger. They are indispensable to the fancier and a valuable aid to every poultry raiser. The bands contain numbers or initials and enable the poultry raiser to keep a valuable record of the age and breeding or laying performance of every fowl on the place. Thus, old and unprofitable specimens can be weeded out.

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Eggs intended for incubation should be gathered several times a day during freezing weather, as otherwise the germs will become chilled and will not hatch. After the eggs have been gathered they should be kept in a room where the temperature ranges between forty-five and sixty-five degrees. The sooner they are set after being laid, the better; but strong germs may be held for three weeks and give a satisfactory hatch. However, the author finds that it pays never to set eggs that are more than ten days or two weeks of age; fewer chicks die in the shell and there is more vitality among the chicks that hatch. Turning the eggs while saving them for hatching is unnecessary, unless they are held for more than a week or ten days; in the latter event it may be found beneficial to turn them half over several times a week. Wash all dirty eggs before setting. Discard all ill-shaped and all very large or very small eggs; also those having chalky shells, as they are too porous and not properly finished.

If you have to buy eggs for hatching, be sure they are carefully selected and perfectly fresh and fertile. Eggs secured at the grocery or picked up promiscuously over the country seldom give satisfactory results. Secure your eggs of a reputable poultry breeder, or produce them yourself if possible, and then you will be sure of what you are getting.

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Testing out the infertile eggs is necessary in artificial incubation and often very desirable where
Testing hens are doing the hatching. Hens
the Eggs that steal their nests sometimes have too many eggs under them for best results, and if the infertile eggs are tested out as soon as possible the good eggs will be more certain to hatch well; or, when several hens are set at one time, if the infertile eggs are tested out one or more of the hens may be reset with fresh eggs.

The egg-tester illustrated (or one similar to it) takes the place of the chimney on a lamp in a dark room. By holding the eggs up to the opening in the tester, those that are infertile can readily be distinguished, as they will be perfectly clear. The living germs will appear as a small spider-like body if the testing is done between the fifth and tenth days. The inexperienced should not attempt to test eggs before the seventh or eighth day, or he may throw out a few good eggs along with the others. Don't hold eggs before the strong light any longer than necessary.

If a second test is made at the end of the second week, those germs that have started and died may also be removed. The live germs will now appear very different from the first test, the lower portion of them being almost wholly dark and opaque, while at the large end of the egg an air space covering nearly one-fourth the total surface may be

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seen. Those eggs showing a fair-sized air space with the remainder of the egg perfectly dark, without any streakiness or watery appearance, contain live chicks. The eggs that contain dead germs will not show the complete development the others do, but will appear streaky and watery and some may give off a foul odor. Any eggs which you are doubtful about may be left in the machine with the live germs, but all those you are positive are dead should be thrown out at once. Good egg-testers can be secured of any of the incubator companies for twenty-five to fifty cents.

Chicks may be "marked" by means of the Poultry Punch, a small and inexpensive instrument by means of which one may
Marking punch or cut a small hole in the
Chicks web of the chick's foot. The fancier often has occasion to use one of these markers so that he may keep tab on the results from his different matings, or distinguish chicks hatched from purchased eggs from those of his own strain. The marking should be done as soon as the chicks are removed from the nest or the incubator, as at this time the wound will not hurt nor bleed, as it may if the marking be deferred until later. As chicks have two webs in each of their two feet, it is possible to make quite a number of different combinations if necessary.

The most level-headed, practical poultrymen insist upon eight or ten square feet of house room per

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fowl. With small flocks of ten to fifteen birds this is more essential than where fifty head or more are kept together in one flock.

How Much House Room Per Fowl Also, breeding fowls need more house room for fertile eggs than hens that are kept merely to produce a large number of eggs regardless of the hatching quality. More fowls can profitably be accommodated in a house of a certain size during the summer time than during the winter. For all-the-year-around work, a house 10x10 feet should contain no more than nine or ten breeding hens and a rooster. Hens kept for eggs alone, and with no male birds in the flock, can safely be housed in flocks of forty or more at the rate of five square feet of floor space to each fowl.

How often a house should be cleaned out depends very largely upon the number of fowls in the house; a house that is crowded certainly needs cleaning more frequently than a house in which the fowls have plenty of room. Also, in damp weather the droppings have a very strong odor and should not be allowed to accumulate. On the best-managed poultry plants, and where the birds have all the house room desirable, the droppings are removed every day. Use droppings boards under the perches, keep them sprinkled with fine dry dirt, sand, sawdust, leaves or other litter, and it is not

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a difficult or irksome task to sweep off the droppings every morning or every other morning.

When a hen is compelled to sleep above the accumulated droppings of many nights, breathing foul, impure air, laden with the rank ammoniacal gases arising from the droppings, her breathing apparatus is bound to get out of order and her constitutional strength undermined and weakened. In the wild state fowls perch on trees, fences or other high objects, far above the lodging place of the droppings, and sleep in air that is always pure and fresh.

How often the scratching litter should be removed from the floor and replaced with fresh depends very largely upon the number of fowls, the season of the year and the kind of weather. Once a week is often enough in all ordinary cases, and sometimes the same litter may be used continuously for two or three weeks. A good rule to go by is to remove the old material as soon as the birds have it scratched and picked pretty well to pieces, and as soon as it begins to get dusty and broken in such small pieces that it settles together and is hard for the hens to scratch apart, or it becomes filthy from the droppings or soiled by the fowls running over it with muddy, unclean feet. Loose litter will allow the grains to become buried deeper and better than heavy stuff, the hens prefer it to work in, and it is more desirable in every way.

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Gentleness pays in handling fowls. Tame fowls are more pleasurable than wild ones, and are also more productive. Five minutes' time a day, for a few weeks or months, will make any flock of chickens tame and easily handled. Learn them to feed out of your hands. Even Leghorns and other "wild" breeds of poultry will become tame if paid a little careful attention. Large plants often have to restrict the number of visitors allowed on the place, because their presence in the houses and yards, and the attending noises, have a disastrous effect upon the egg production of the hens. Sudden, jerky movements, loud tones in the voice, loud, flaming colors in the clothing, dogs or strangers running through the houses or yards, all have a bad effect upon egg production.

Where only a small plot of grass can be had, if left unprotected it will soon be destroyed by the hungry fowls. To overcome this difficulty, I often covered the grass with wire netting when I was keeping poultry on a town lot. By raising the netting on boards or cleats to the height of two or three inches above the ground the fowls can pick the grass off as it grows out above the netting, but cannot scratch it out or destroy the roots. The best netting for this use is the one-half-inch mesh.

One of the quickest ways to make a hen forget

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her desire to incubate is to place her in a coop with **Breaking up** a slat floor which is raised a foot or **Broody Hens** more from the ground. She will not persist in sitting on the slats as she would the floor of an ordinary coop, but will be so busy keeping her feet on the slats that she will forget her desire to sit in a few days.

Another very successful method is to place the female in a pen with a vigorous male bird, who will soon get the sitting fever worked out of her. Don't starve hens while trying to break them up. That will have no effect upon their incubating fever, but is the means of delaying their return to laying condition. However, feed them foods that are not fattening, because corpulent hens are more inclined to broodiness than those that are only in fair flesh. Hens that receive good care and are fed rich egg-forming foods while they are broody will usually return to laying in a comparatively short time.

Practical poultrymen no longer believe in "cod-dling" fowls, or in the efficacy of "hot-house" **Heating the** fowls for any purpose whatever. As **Poultry House** a natural result no artificially heated houses for mature fowls are to be seen on the practical poultry plants of to-day. As long as the temperature of a poultry house does not fall much below the freezing point the inmates will fare all right; this, however, is about the minimum temperature for best results. We make our fowls scratch

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and hunt for all the food they get, and this keeps their blood in good circulation and their bodies at a comfortable temperature, as well as furnishing them with necessary exercise.

Much trouble is often attributed to the house being too cold, when it really is caused by drafts or currents of air striking the fowls, especially when they are on the roost at night. See that the walls are perfectly tight and that there are no cracks, crevices, or knotholes through which the elements may blow. Drafts mean trouble, every time.

A good start means a great deal toward success in any enterprise, and the poultry business is no exception. By starting with good stock, good houses and good equipment, the beginner is taking advantage of the teachings of the successes and failures of others, and is enabled to start at a place which earlier poultrymen had to attain by continued effort and often costly experiments; thus he saves time as well as money. Saving money by buying cheap goods is false economy of the highest type, and if continued will lead anywhere rather than to success. Many a beginner in poultry keeping who has started out on the "cheap-skate" plan, finding himself on the wrong track, has had to back out and start over in order to avoid total and permanent failure.

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Poultry keeping is peculiar in that it is made up largely of details. While they may seem small and insignificant, each plays an important part, and the man who thinks otherwise can often thus account for his failure. One neglect or slip somewhere may easily counteract a dozen carefully observed requirements in the poultry business. For instance, a sick fowl left with the flock twelve hours after the first symptoms are noticed may be the means of causing an epidemic among the entire flock; foul, stagnant drinking water often causes disease as well as being a most excellent medium for its spread and dissemination; injudicious, improper feeding, non-attention to lice and mites, and numerous other such "little" things usually account for most of the troubles, disappointments and losses in poultry keeping. Remember that "it is the little things that count."

By all means keep an accurate account of your poultry receipts and expenditures. It is a little tedious sometimes, but possesses much the same advantages and future pleasures as a diary of your own life. By keeping a record of past experiences one may profit by his mistakes and successes in future operations, as well as tell "where he is at" financially. Nothing elaborate is needed in the way of a poultry account book; any ordinary memorandum book,

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properly lined and head-lined by the keeper, will serve the purpose quite well; but regular poultry account books, properly printed and well bound, can be secured at a nominal cost, usually twenty-five cents. The items that should always be included are, number of birds on hand at stated times, cost of feed and other expenses, receipts for eggs or fowls, daily egg yield, result of hatches, and number of chicks raised.

THE SEASONS AS AFFECTING
POULTRY KEEPING

CHAPTER XIV

THE SEASONS AS AFFECTING POULTRY KEEPING

THE duties of a poultry keeper vary with the seasons—aye, with the months—and the wide-awake, successful breeder is the one who keeps abreast of the times in the matter of caring for his poultry, and who not only supplies the present daily needs of his flock, but also anticipates their future requirements and is ever on the alert to take advantage of every opportunity for supplying them.

Hot weather makes most people feel like giving themselves over to a general relaxation, foregoing **Summer** the more serious and strenuous things **Management** of life and “take things easy” for a while. So it is a common occurrence at this season for many poultry keepers to come to the conclusion that work in the poultry yard is an intolerable bore, and they compel their fowls to endure many hardships and neglects at a time when they should be receiving special care and attention. The more experience one has with poultry the more he

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realizes the importance of intelligent, systematic care and management during the summer and autumn months.

The market man cannot expect to secure many eggs from his fowls next winter, when eggs are selling at something like an half-dollar a dozen, unless he has his pullets well developed before cold weather sets in and unless he gets his old hens through the molt early and keeps them in the best of shape all the time, both in and out of season. With the fancier it is of paramount importance that he look carefully after the welfare of his birds during the summer and fall months, else he cannot win any of the creamy prizes at the poultry shows this winter; for good size in the young birds means a great deal toward successful competition, while hot weather and lack of shade and protection, to say nothing of other neglects all along the line, especially during the molting period, will ruin the plumage and color of the best show bird ever bred.

As soon as the breeding season is over the males and females should be separated, and kept separated until eggs are again wanted for hatching. Hens lay as well without males as with them, and infertile eggs keep longer than the other kind during hot weather. Aside from the undesirability of having the hens constantly nagged by a cock bird, both sexes deserve a rest after having been mated together during the breeding season, and if

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they get it the result will be better fertility in the spring. The reason why so many aged cock birds fail to properly fertilize the eggs is because they have been "bred out," as it were, by being kept constantly with females, wasting their reproductive and sexual powers unnecessarily for half of each year.

Another thing that should be done as soon as the breeding season is completed is the disposal of all hens that are getting too old to be profitable and all that are not of the best quality from either the utility or fancy standpoint. Also dispose of all male birds which you are not going to breed from another year; feeding useless roosters does not pay, and the quicker they are gotten rid of the better.

The drinking water supply is important. Do not, under any circumstances, compel or allow your fowls or chicks to partake of impure water. Water soon becomes stagnant and unfit for drinking purposes in hot weather, and should be changed often for the poultry. By all means keep the vessels in a shady location which is never reached by the sun. Rinse out the vessels each time fresh water is supplied, and scald and disinfect them every week or two.

The best foods for summer use for old fowls are those that are the least heating and fattening. Oats and wheat are the two most common good

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warm-weather grains. Very little, if any, corn should be fed. The greatest abuse of corn and the cause of much of its adverse criticism lies in the failure of those who satisfactorily feed large quantities of it during the winter to reduce the amount fed during warm weather. More or less green food is essential, and if available may well compose a large part of the fowl's ration during warm weather, thus materially lessening feeding expenses.

Shade of some kind must be provided for both fowls and chicks, so that during the warm hours of midday they can find protection from the hot sun, exposure to which is debilitating and harmful to the health, comfort, plumage and color of the bird. While shade is exceedingly pleasing to fowls, it cannot be entirely considered in the light of a luxury, but is an absolute necessity. Of course natural shade from trees or bushes is the best, but if this is lacking it is an easy matter to provide artificial shade by making a framework and covering with old boards or old oilcloth or carpet, or any other such material. This can be set up on posts several feet above the ground and left open on all four sides to permit a free circulation of air. It should be substantially constructed, so that it may be moved every few days, for if left long at one place the ground underneath it will become foul and unhealthy. The atmosphere inside the coop may be made cool and fresh on hot days by sprink-

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ling the ground with water. A patch of sunflowers growing in the yard make good shade, and the seed will ripen at a time when especially valuable to feed to molting fowls. Shrubs or bushes in the yards also make good shade, while vines may be trained along the fences or on frames in the yards.

Cleanliness always is a very important factor in successful poultry culture, and needs special attention during hot weather. Not only the fixtures, but also the houses and yards must be kept free from filth and in a perfectly sanitary condition. The droppings had best be removed each morning, as they are smeary and make more foul odor in the house during warm weather than at any other time. The roosting quarters must be well ventilated; fowls will thrive better and be more healthful in warm weather sleeping out in the open, on trees or fences, than in a stuffy, ill-ventilated and foul-smelling poultry house; therefore, keep the doors and windows open as much as possible.

In the yards, animal and vegetable matter will decompose rapidly, and should not be allowed to accumulate. Have a general clean-up of the premises once a week, and burn or deeply bury all the decaying material; don't rake it up in a pile in a corner of the yard and leave it to decay and rot, a breeding place for disease and vermin. All old litter, nesting material, etc., should also be burned as soon as removed from the house or coops. Most

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of the "mysterious" diseases that attack poultry during the summer can be traced to filth and neglect. Spade or plow up the runs several times during the course of the summer; hard, dry, baked ground is not the most desirable kind for poultry to range over. In cases of disease, sprinkle the ground with air-slaked lime or a diluted disinfectant before turning under.

August and September mark the beginning of the molting season—the time when all mature fowls throw off their old, faded, wornout plumage and take on new. Usually from seventy-five to one hundred days elapse between the beginning and the completion of the molt. Most hens lay very irregularly and infrequently during the molt, for it is drain enough upon their vitality to produce new feathers without producing many eggs. The early molting hens, therefore, make the best winter layers, because they will not only have entirely completed the process, but will also have regained their normal and full strength and vitality before cold weather sets in. Hens that commence molting in August ought to be in laying shape again by November or December, and, if conditions are favorable, should continue laying until spring. Hens that do not commence to molt until late, say October, not only will not recuperate in time to lay many eggs during the season of highest prices, but may also suffer

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from the cold weather, which will still further retard the molt.

Fowls can often be forced to commence to molt and the process hastened by feeding very light for a week or ten days, and then feeding heavily on nutritious food. This should be done during the latter part of July or in August. Where eggs for hatching are the specialty, it is not desirable to have the hens lay heavily through the winter, and late-molting hens are not particularly undesirable in this connection, but all hens should be fully feathered out by the time the weather turns cold, for they will need a full coat of feathers for protection.

While I cannot agree with some writers that the process of molting is a serious and critical drain upon the vitality and physical powers of the fowl, still I do believe that it may easily become such under any other than the most proper and natural conditions. Molting is a process of Nature, and not a disease, and so no drugs, stimulating condiments or tonics are either necessary or desirable. Let Nature have her own way and time, doing your own part faithfully and well in providing the correct and natural conditions that you should, and you will have no trouble with sickness or death among your fowls on account of the molt.

Feed and care for molting fowls the same as at any other time, only remembering that the weather

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is warm, and therefore the instructions and suggestions given above on warm-weather management will apply during the greater part of the molting period. An occasional feed of linseed meal will be found beneficial to molting birds, while animal food or meat in some form is essential for furnishing feather-forming materials. A few handfuls of sunflower seeds every day or two will help to loosen up the old feathers and cause the new ones to come in smooth and oily. This is the only feed or system that the author uses to hasten the molt, as I believe in letting Nature pursue her own course.

The fall is the time to prepare for winter. There is much to do. Broken window lights, cracks or **Fall** knotholes in the walls or roof of the **Management** poultry house did not make so much difference in the summer time, but all these, together with any similar defects, must now be remedied at once. Colds and roup are the results of drafts and dampness during cool weather. The poultry house should always be thoroughly renovated and cleaned out just before cold weather sets in. Remove all the old litter, and also three or four inches of the top of an earth floor, and replace this with fresh, untainted material. This is very desirable in keeping the house fresh and sanitary and prevents disease germs from lurking around from year to year. Burn all the old nesting material as well as the litter. Take the roosts and nests to the

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outside of the building and give them a good scalding and scrubbing with boiling hot water to which has been added some carbolic acid. This will not only cleanse them from dirt and filth, but will also kill vermin and disease germs. If the house is to be whitewashed, now is the time to do it. Winter quarters that are light and cheery are very desirable, and nothing is better for producing this effect than giving the interior walls of the house a good coat of whitewash. It also has a sanitary and antiseptic effect.

The brooders and roosting coops that were used during the past summer should now be thoroughly cleaned and disinfected and stored away indoors for use again next season. If left to stand out in the storms of winter they will warp and crack and lose much of their value.

The trees are now shedding their foliage, and the practical poultry keeper will find good use for the clean, crisp leaves, and will store away as many as he can use during the winter. They make excellent bedding for the poultry house floor during the winter, providing litter for the fowls to scratch in, and also preventing cold currents of air from passing along the floor.

Lay in a supply of dirt also before cold weather sets in. This can be used to make dust baths during the winter, and may also be used under the perches. Dirt is an excellent absorbent and deo-

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dorizer, and when sprinkled over the droppings boards prevents the droppings from sticking fast, and they may easily be swept off.

Take good care of the early hatched pullets now and they will take good care of your egg yield this winter, when eggs are bringing high prices. Sell the cockerels, but hold on to the pullets and keep them for winter and spring laying. Don't let a paltry fifty cents cause you to part with a well-developed, likely-looking pullet, for she will produce a dollar's worth of eggs for you this winter. Push the young roosters for broilers; more money in them that way than any other way. Don't keep them too long; let them go when they weigh two pounds; a bunch of useless males will rapidly eat up the profits, and their development is usually less rapid after they are three or four months old. Dispose of all stock, both young and old, that have any defect or are not of the most desirable quality from either the utility or fancy standpoint. When cold weather sets in house room will be at a premium, and a small flock of high quality will pay greater profits than a crowded flock of mixed quality.

Cold weather always means more work with the
Cold poultry. The chill should be taken
Weather off everything to be partaken of by
Management the fowls. Chilling a fowl by allow-
ing it to partake of cold food is just as harmful, and

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has the same effect as cold quarters. The water with which the mash is mixed up should be sufficiently hot to thoroughly warm the food. Care should be taken, however, to not have it too hot, or injury to the birds' crops will result, and that would be worse than cold food. Lukewarm is about right. All grain should be thoroughly warmed before feeding. This is especially true of corn, which gets as cold as ice during cold weather. Put your hand in a panful of shelled corn, and then imagine the effect that this painfully-cold stuff would have on the bodily warmth of the bird that consumed it. All the drinking water should be warmed. To be sure, with ordinary drinking vessels it is impossible to keep the water warm for more than an hour or two, but by using stoneware fountains (which retain the heat longer than any other kind) and supplying fresh warm water two or three times a day one can get along quite well.

One should not imagine, however, that because he warms their food and water he can house his fowls in any old place and still have good results. Neither can one dose up his fowls with cayenne pepper, hot mashes, etc., and have this superabundance of inward heat make up for a lack of outward comfort.

Variety in feeding is more than desirable at any time, and in the winter time it is positively necessary if maximum results are to be secured, for at this

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time the fowls can get absolutely no food, for weeks at a time, except that which is supplied by the attendant. Mix all the table scraps in with the mash or feed them separately in troughs; nothing better could be served by way of variety. Apple parings and potato parings are also good and usually available every day or two. Cooked turnips and beets are good, and so are pumpkins and squashes; in fact, almost anything that the birds will relish. I have all egg shells crushed and fed to our hens, as they will supply the material with which to make more shells, but we are careful to see that they are broken into very fine bits, so that their use will not teach the fowls the egg-eating habit.

It is the busy hen that lays the greatest number of eggs. I find that one of the best and most practical ways to give chickens interesting work while confined to the house in winter is to supply them with some unthreshed grain in the sheaves. Oats, wheat, buckwheat, and millet are excellent, but any small grain that the fowls like will do quite as well. In the fall I always see that we get stored away enough unthreshed grain to enable us to supply one or two bundles to every twenty or thirty of our hens each day that the weather is such that the fowls are kept confined to the house.

What to do when it snows or rains is a perplexing problem to many beginners in poultry culture.

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There is no objection whatever to letting fowls out when there is snow on the ground; if the day is pleasant the invigorating oxygen the fowls will take into their lungs will do them a great deal of good, and, though they may get their feet a trifle damp or chilly, this does them no harm if they are afterwards allowed to dry and warm themselves by scratching in clean litter. No harm can come from the fowls eating snow, but they should always have pure water to drink, even though at times they seem to prefer snow when they can get it.

Fowls usually exhibit a marked desire to be outdoors during, or shortly after, a rain; this is because at this time they can pick up many worms and other such delicacies to fowl life which have been washed out by the rain. As soon as the shower is over let the fowls out, but while it is in progress it is best to keep them confined to the house, as they often become so interested in ranging that they will stay out during quite a heavy rainfall, and if they get their feathers and bodies thoroughly water-soaked it creates a damp, unhealthful condition when they go on the roost, and colds, or roup, and rheumatism may develop.

During windstorms, or hail and sleet, the fowls seldom venture out, as instinct teaches them that they are safer indoors; however, at such times the fowl exits may well be closed, not so much to keep

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the fowls confined as to prevent the elements from blowing into the house. Except under the conditions stated above, there is, ordinarily, no necessity for keeping the fowls confined to the house on account of the weather; let them be outdoors as much as possible, and they will be all the better for it.

I never force our breeding hens for heavy egg production during the winter. Hens must have a **Winter** rest occasionally, the same as all other **Management** beings, and we allow our breeders to take theirs when they prefer it, which is during the cold weather of winter time. Then in the spring, when we want eggs for hatching purposes, the hens are shelling them out at a lively rate, and with their stored-up strength and vitality the eggs are bound to be strongly fertile and hatch good, livable chicks. What we want in the breeding pen is not only eggs, but also good, strong chicks from the eggs. Where the object is eggs for market, of course we want all the eggs we can get in the winter, as they bring in the market two or three times as much at this time as in the spring or summer.

Chickens are usually early risers, and to keep them occupied between the time when they come off the roost and when the attendant can get around with their breakfast, it often is a good plan to throw a few handfuls of small grains in the litter in the evening after the fowls have gone to roost. Immediately upon arising they will commence dig-

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ging around in the straw, and this starts up the circulation of the blood and keeps them from moping around and becoming chilled.

When the night is going to be extremely cold, corn makes an elegant evening feed for the fowls. When it is thoroughly warmed, the fowls relish it more than any other grain that could be fed, and a crop full of warm corn is a comfortable thing for a hen to go to bed with on a cold night, as the grain by nature is heating and will help the hen to maintain her bodily warmth during the night. Once a week put some shelled corn in a pan and char it in the oven, and let this compose a large part of your fowls' supper; it helps in varying the diet, and the charring produces a tonic effect.

Mangel wurzels are one of the best, or quite the best, vegetable food that can be given to fowls during the winter. Cabbage is excellent, but fowls relish it somewhat less than mangolds, and, besides, a continued diet of cabbage or onions will invariably impart a disagreeable flavor to the eggs laid by the fowls to which they were fed, while mangel wurzels never have this effect. They are easily kept in any root house or cellar where there is no danger of freezing. When fed, suspend them in the air so that the birds will have to jump a few inches to reach them. This may be accomplished by sticking them on nails in the walls of the house.

Any seedsman can supply you with mangel wur-

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zel seed, and they are easily grown. Also try growing a little rape or some Swiss chard for your poultry if you have the room.

With the approach of spring, give the fowls the advantage of all the sunshine and fresh air possible. A few balmy spring days have a wonderful tonic effect upon a flock of hens that have been persistently living "the simple life" and producing few eggs during the winter; their faces and combs will begin to redden, they will begin to cackle and "sing," and if they are given a little judicious care and management at this time you will soon be enjoying "the lay of the hen." Remember that fowls that are laying well require more food than those that are forming no product. In the spring, a hen will often "lay herself poor," as it were, on a ration that would be ample were she not laying regularly.

The man who is not well fixed for the business should attempt neither very early nor very late-hatched chicks. Early chicks fetch the high prices, but are hard to raise during bad weather. Late chicks are weakened by the hot summer's sun, and lice are most bothersome in the summer; besides, the market is flooded with both old and young stock at this time, and prices are decidedly unprofitable. My advice to the unprofessional poultry keeper would be to hatch no more chicks after the middle of

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June than he wants for his own table. Chicks hatched the latter part of August or in September often are better property than July hatched chicks. However, in case of an early winter they require extra care and even then their development is slow.

April and May are the two most favorable months for hatching in America, and at this time the eggs usually hatch better and the chicks thrive better than at any other time, either earlier or later. Pullets hatched during April make the best winter layers of the medium-sized or large breeds, while the smaller breeds (such as the Leghorns) may be hatched during May and still be sufficiently matured to commence laying in November or December. The idea should be to get out your pullets in plenty of time so they will be pretty well matured and ready to commence laying when winter arrives, for, if they are still undeveloped at this time, cold weather usually causes a postponement of laying activities until the season of highest prices is past.

Hatching for Broilers. Earliness is one of the most important factors in producing broilers with profit. The January and February hatched chicks are the ones that bring the big prices as broilers. For the greatest profit, commence hatching as early in the New Year as possible, if you are prepared to handle the chicks, no matter how cold or disagreeable the weather may be.

PARASITES AND DISEASES OF
POULTRY

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CHAPTER XV

PARASITES AND DISEASES OF POULTRY

MANY poor egg records and unthrifty and unprofitable flocks in the hands of beginners can be explained by the presence of lice and mites on the fowls. Fowls are scarcely ever wholly free from vermin, and while in small numbers they do little damage, they are rapid multipliers, and unless their multiplication is periodically checked they will become so numerous that in a short time they are liable to get the poultry keeper into serious straits.

The Parasites of Poultry

A man may start in the poultry business with everything new and clean, but it is only a short time until the pests are there. Much needless trouble is often caused to beginners by vermin, because they cannot find any lice, or at least not enough to lead them to believe there is anything important at stake. The beginner should remember that every adult fowl is more or less lousy, and should not flatter himself that *his* fowls are free from them. It is a good rule to treat every fowl

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with suspicion and examine it carefully for lice, as they are almost certain to be present in force when least suspected.

When the beginner finds his houses or fowls so badly infested with vermin that the trouble is easily apparent, he will find he has more of them on his hands than he can well realize until he finds how hard they are to exterminate. The fowls themselves and the roosts and nests are the leading habitations of the pests, and these should come in for first attention. In bad cases the vermin spread to the walls, ceiling and other parts and fixtures of the house. During the summer time is when lice are the most troublesome, because warm weather is more favorable for their rapid increase.

While there are quite a number of different kinds of lice and mites which prey on domestic fowls, they may, with chickens, for all practical and elementary purposes, be divided into two main classes—(1) body lice, which stay on the fowl nearly or quite all the time, and may be detected traveling around over the skin, especially on the neck or under the wings, or nestling among the fluffy feathers around the vent; and (2) the red mites or lice which infest the poultry house fixtures, hiding in cracks and crannies during the day and coming forth after night to seek their prey.

I am a strong believer in the efficacy of the dust bath as a means of ridding the fowl's body of

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vermin. The hens wallow and fluff their feathers in the dust, and the pores in the louse's body, through which it breathes, are closed thereby, and death takes place from suffocation. The dust bath also is valuable for cleansing the fowl's body from dirt and impurities; it provides much healthful exercise for the fowls, and they get a great deal of enjoyment and pleasure out of the bath in addition to the practical benefits. The finer the dust the better. Road dust is excellent, but no better than any other kind of dust or dirt that has been made very fine and free from clods and pebbles. In the summer, each flock should have access to several places in the yards, each two or three feet square, which have been spaded up and made quite fine. In the winter, boxes should be provided in the house. Observe this requirement, as it is important.

While dust baths, used constantly and continuously, will often prevent lice from getting a start, yet once the pests become numerous, a quicker and more effective way of fighting them must be adopted. There are many brands of louse powder on the market; most of them are all right, but some are not. Use nothing but a well-advertised and approved brand, and even then closely watch the results, to make sure that the powder is doing the work. Where a large number of fowls are to be treated, it is a tedious, unpleasant task to dust

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each one separately, but this is the most certain way of exterminating the pests, and so it is always good policy. Dipping the fowls in a solution of "sheep dip" to kill the lice is a method quite satisfactory on warm, sunny days when the fowls' plumage will quickly dry, but it should not be attempted under other conditions of the weather or the fowls will catch colds.

To dust a fowl thoroughly, hold it by the legs with the head downward in an empty barrel or narrow box. This causes the feathers to separate and open out so that they will readily receive the louse powder, which should be dusted in among them from a dredging box or tin can having one end perforated with small holes. After being applied to the feathers from the can, the powder should be thoroughly worked in among them and down to the skin with the hands; it is at the base of the feathers where the pests are, and not out close to the surface. Pay special attention to the rear parts and under the vent, where the fowl is covered with fluffy feathers, and under the wings and thighs and about the neck and head.

Little chicks are often bothered with the large head lice. These may be killed by greasing the head and throat with lard or sweet oil. If the chicks are lousy at other parts of their bodies, use a reliable brand of louse powder. In young chickens lice cause dumpishness, drooping wings, indiffer-

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ence to food, and, if present in large numbers, may stunt or kill the chick, owing to the loss of life-blood caused by the sucking parasites. Artificially hatched and raised chicks do not require so much attention for lice and mites as chicks hatched and raised by a hen, because the latter will contract the lice from their mother; but even brooder chicks are seldom free from lice, especially after the first few weeks, and so they, too, require attention.

Sitting hens are especially liable to be excessively lousy, because the conditions of heat and quiet in the nest are exceedingly favorable to the breeding and increase of the pests. If sitting hens hatched as many chicks as they do lice and mites there would be little use for incubators. Individual dusting with insect powder is necessary here.

The tiny, blood-sucking mites are white or grayish in color, except when filled with blood, when they vary from red to black. These
Mites pests are terrible stayers and cause more damage and are harder to exterminate than the body louse. Especially watch for them around cracks or crevices in the roosts, nests and droppings boards. While the mites themselves can usually be seen, a plain indication of their presence is their excrement—little grayish patches, like fly specks, on the roosts and adjacent parts which they traverse. When you see these specks you may know with certainty that the mites are there. Liberal

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applications of common kerosene oil will kill them, painting or spraying this material on every spot where the vermin could possibly find lodgment. This is the commonest and cheapest method and it is efficient, although the patent liquid lice-killing preparations offer probably the safest and surest method of extermination, as the fumes from these preparations are fatal, as well as the liquid itself. But it is a question as to whether the difference in results is equivalent to the difference in cost. Chloro-naphtholeum and sulpho-naphthol in water are both very excellent liquid exterminators, and are not expensive. Where liquids are used they may be applied with a small spray pump, or painted with a brush or with a broom, as is most convenient. Whitewash will kill all lice with which it comes in contact.

If treatment is begun immediately upon the discovery of lice and mites, they may be practically exterminated with a few treatments. Promptness is important, as much on account of the loss of vitality to the fowls and profit to the owner as because of the greater difficulty in getting rid of the pests when their numbers have greatly increased. With prompt and thorough treatment whenever signs of vermin are observed, there is no need for regular weekly, or even monthly, applications to prevent their increase. Several months may be allowed between each fight of extermina-

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tion, although greater energy will be required during warm weather than in the winter. When fowls are dusted or fixtures are treated, it is always well to repeat the operation in a short time, as many of the parasites will be so well concealed and secreted that they will not be reached by the first treatment, and also there will more have been hatched out in a few days. The interval for dusting with powder may be a week or ten days, and for liquid applications three to five days. Two thorough treatments close together as suggested ought to, ordinarily, last at least two months in the summer time and longer in the winter.

COMBATING POULTRY DISEASES

The author has not much faith in poultry doctoring. Fowls are naturally healthy, and disease is nearly always the result of neglect or carelessness and unsanitary conditions. Fowls that are well-housed, get plenty of exercise in pure air and sunshine, good wholesome food and pure water, rarely need doctoring. It may seem like a heartless thing to say and do, yet the fact remains that it usually is better to kill a sick chicken and put an end to its misery than to try to effect a cure, unless the bird is a very valuable one or the disease is only some local disorder or is not of a serious nature. In the latter event, where it is not deemed wise to lose the fowl

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without an effort, it should be quickly removed to a considerable distance from the main flock and steps immediately taken to bring about its recovery. Always have an isolated hospital for sick birds, whether this be a separate pen or a dry goods box. Never leave an ailing fowl with the flock a minute after the symptoms of disease are discovered.

If a sick bird is killed by cutting the head off, do it where the other fowls cannot get at the blood, or the disease will surely spread; it is better to kill the fowl by wringing its neck. Birds that are killed should always be burned; if merely buried in the ground the disease germs may be carried back into the flock by earth worms or other parasites. All excrement from the ailing bird should also be burned or deeply buried in the ground.

Whether fowls are killed or isolated, a general cleaning up of the premises should immediately follow the outbreak of a germ disease or contagious disease. Burn the litter and disinfect everything around the house and yard. Spray the interior of the house and the runs with a fifty per cent. solution of crude carbolic acid or some other good disinfectant, put a few drops of the same preparation in the drinking water, dust air-slaked lime over and under the perches, in the nest boxes and over the floor. Then watch the remainder of the flock, and if any of them show the slightest

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symptoms of disease remove at once to some isolated place, feed very lightly on mostly green food, administer a remedy, and be guided further by the persistency of the attack. Medicines and drugs prepared for human beings can often be used to advantage for fowls, as the effect is much the same, but the dose should, of course, be lessened for fowls.

Roup is one of the most contagious and destructive diseases among fowls, and is especially prevalent in the fall and winter months. It is a contagious catarrhal disease, characterized by running at the eyes and nostrils, puffed eyes, and swollen head; later, mouth and throat become filled with foul-smelling mucous, or sometimes cheesy matter. The disease is caused by its own special germ, but the predisposing causes are usually dampness or drafts, while crowding, filth, and almost any neglect or mismanagement may also be a factor. Colds and catarrhal disorders often develop into roup if neglected. Diphtheria or diphtheritic roup is similar to ordinary roup, but perhaps a little worse.

Roup is a very difficult disease to cure, and perhaps the easiest and most reliable way is to use one of the advertised roup cures. With this disease, in addition to isolating all afflicted birds, establish a quarantine for all suspects. If a patent roup cure is administered, use peroxide of hydrogen once a

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day; if nothing else is used, give two treatments with the hydrogen peroxide daily, forcing it well back in the throat with a small syringe, medicine dropper, or swab. Wash the mouth and nostrils once or twice a day with a solution of boric acid, fifteen grains to an ounce of water. If the eyes are closed or smeared with a sticky fluid, bathe them with salt water, a half teaspoonful of salt in a pint of water. Another good head lotion is composed of one part spirits of turpentine to six parts glycerine. Apply with a bit of absorbent cotton twisted about the end of a toothpick, or use the end of a stiff feather.

Roup is often accompanied by a form of canker in the mouth and throat, although this trouble may and often does appear on a bird that has not the roup. The disease comes in the form of small whitish or yellowish ulcers, or a larger cheesy growth on the roof of the mouth, the side of the tongue, or the angles of the jaw, and sometimes at the opening of the windpipe. Burnt alum applied to the canker will often effect a cure. or a little aristol may be applied to each sore place. Spray the throat well each day with peroxide of hydrogen. A bad form of the disease is usually fatal, but if taken in time a cure may be effected without serious difficulty.

During cold, stormy winter weather, even fowls having the best of care and management some-

PARASITES AND DISEASES OF POULTRY

times contract simple colds. The symptoms are sneezing, bubbles in the corners of the eyes, water

Common running out of the nostrils and eyes,
Colds and accompanied by more or less cough-
Bronchitis ing and sneezing. There is no odor to the discharge or in the throat and mouth, as in roup. If there is an odor, the disease is roup, and not a mere cold. Common causes are undue exposure to stormy weather, overcrowded sleeping quarters, drafts, improperly ventilated and damp quarters, and houses which have been closed too tightly early in the season making the fowls tender during very cold weather.

A common cold often develops into bronchitis, which is merely a bad cold accompanied by rattling in the throat, or it may be caused by dusty or filthy houses, in which the fowls are compelled to breathe irritating vapors or dust.

These diseases should receive prompt attention, or they will develop into some more serious disease, such as roup. They are not difficult to control if taken early. Remove the cause if possible, air the house daily, and do not allow the birds to be exposed to cold winds or rains. A good remedy for colds is twenty drops of spirits of camphor dropped on sugar and then dissolved in a pint of drinking water, no other drink being allowed the fowls. For bronchitis, give the bird three drops of syrup of ipecac twice a day, and force it to

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inhale the steam from boiling water in which has been placed a teaspoonful of carbolic acid to a quart of water.

Genuine fowl cholera is comparatively rare; simple indigestion and bowel disorders are often termed cholera. With true cholera, and Cholera diarrhœa is always present and is one of the main symptoms. Improper food, filthy quarters and general mismanagement are always at the bottom of an attack of cholera and of all other bowel disorders. In general, among beginners, derangements of the fowls' digestive organs are more common where mash is fed than where the dry-feed system is employed. The free use of a good disinfectant is very essential in cases of these diseases. There are on the market many poultry remedies especially for cholera and bowel disorders. One of the best home remedies is one dram of hydrochloric acid in a quart of water, keeping all other water away from the fowls. The fowls in the flock that are apparently well should be fed liberal quantities of charcoal as a corrector, or may be given sulphocarbonate of zinc in the drinking water, one-eighth of an ounce of the drug to a quart of water.

For mild diarrhœa, charcoal will often be as efficient as anything required, giving boiled milk to drink and *dry* food. Constipation is usually caused by lack of exercise and of green food. Cor-

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rect conditions, and give castor oil, castoria, or any other convenient laxative.

The disease known as "bumble-foot" comes in the form of an abcess or a little growth resembling a corn on the bottom of the **Bumble-foot** fowl's foot, and is usually caused by jars and bruises to the foot in jumping from high perches or other objects and alighting on some hard substance. Occasional causes are constant confinement upon hard floors or runs and extremely narrow perches. If taken early, a few applications of tincture of iodine twice a week will generally effect a cure, keeping the foot bandaged during treatment. If the growth is well developed or the bird shows signs of lameness, open the growth by making an X-shaped incision with a sharp knife; wash out all matter with warm water containing a little carbolic acid or any good disinfectant; bathe the wound daily with hydrogen peroxide, and apply some healing lotion, such as carbolic salve. Bandage the wound with cotton, and keep the fowl confined until the wound heals.

This disease is caused by a minute parasite which burrows beneath the scales of the leg, forcing them **Scaly Leg** out and giving the shanks a rough, crusty appearance. One of the best ways to cure the disease is to make a saturate solution of naphthalene flakes in kerosene (coal oil), and dip the fowl's legs in this solution several

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times, at intervals of one or two days, until the crusts are all easily removed. Rub the liquid well in among the crusts and scales by means of a hard bristle brush. Four to six applications will cure an ordinary case, but some take longer than others. The treatment suggested never fails if performed faithfully.

“Gapes” is a parasitic disease caused by the presence of worms in the windpipes of young chickens. Where these worms come from and get their original start among a flock of chicks, has never been definitely settled, although several theories have been advanced. The most popular theory is that the primary cause of gapes is often the eating of angle (earth) worms, or other such organisms, of which the gape-worm, so called, is a parasite; although in many localities these worms do not affect the chicks. Letting the chicks out in the damp or wet, or before the dew is off the grass in the morning, is known to help maintain the disease if not to produce it.

After the gape-worm is introduced into a flock, infection is easy and rapid, as well chicks often eat the worms coughed up by the afflicted ones, or may get the eggs or the worms themselves in the food or drinking water. The symptoms of gapes are frequent gaping, sneezing, and later a whistling cough with discharge of mucus and worms, dumpyishness, weakness and drooping wings.

PARASITES AND DISEASES OF POULTRY

Isolate all afflicted birds; give the coops a thorough application of hot whitewash, sprinkle the runs well with air slaked lime and plow under; this is a good preventive measure to take in the chick yards every spring, as one can never be quite sure that gapes will not attack his chicks sooner or later. Scald all drinking vessels frequently, burn all chicks which die with the disease, and whenever you find gape-worms or extract them from sick chickens be sure to burn the worms.

There are many different treatments advised, and none is thoroughly dependable in every case. A safe course for the beginner to pursue is to use one of the prepared gape cures on the market, which come in powder form and may be used in the soft food or drinking water. Extracting the worms from the windpipe with a horse hair or special gape-worm extractor often gives quick temporary relief, but it is a tedious and more or less uncertain task. A small quantity of spirits of camphor in the drinking water is often beneficial. A common method is that of dipping a feather in turpentine and insert it in the windpipe of the chick and twist it around a few times; this causes the chick to cough and sneeze, and some of the worms are expelled. In cases of long standing it is often impossible to effect a cure. People who are bothered with gapes among their chickens year after year, should give their ground a rest from

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chickens for a year or two, frequently treating the soil with applications of slaked lime and a strong solution of salt water.

Diarrhœa among chicks, or as it is often termed, "pasting up behind," may result from many causes.

Diarrhoea Sometimes it is due to breeding from
Among debilitated stock. At other times
Chicks errors in incubation, on account of which the chicks are not hatched properly, are the cause of the trouble. After the chicks are hatched the disorder may be brought on by chilling, improper brooder temperature, or by improper feeding and general mismanagement. Find the cause of the trouble and remove it if possible. Mild attacks may often be cured by withholding water and giving boiled milk to drink to which some grated cinnamon has been added. Feed charcoal freely. If the trouble is very bad and prevalent, medicine is necessary to correct it. Use some reliable bowel regulator for either fowls or humans.

Tuberculosis, consumption, and "going light" are used synonymously with regard to the poultry
Miscellaneous disease which afflicts both old and
Diseases young fowls and causes loss of flesh, listlessness and rapid emaciation generally. The comb becomes pale or even yellowish in color. The only effective treatment is preventive.

Break Down Behind. If simply due to over-

fatness, this disorder may be remedied by putting the hen on a light diet, composed mainly of green stuff. If the disorder is due to some derangement of the oviduct, it is generally incurable.

Liver Diseases usually commence on account of overfeeding or insufficient exercise. Congestion of the liver is the first stage, and this may usually be cured by using some good liver pill. Inflammation of the liver is the next and final stage, as it seldom yields to treatment. The symptoms are loss of appetite, yellow diarrhœa, extreme thirstiness, slow and labored breathing, and general listlessness.

Leg Weakness is a common ailment among the young chicks of novices. It comes from overfeeding, too much forcing, insufficient exercise, too close confinement, or lack of bone-forming material in the food. The bird's gait is unsteady, the hocks appear weak and wobbly, and the bird desires to sit a great part of the time. Feed less heating or forcing food, discontinue wet mashes and instead feed dry grains scattered in litter, making the chicks scratch for all they get.

Soft-shelled Eggs are nearly always caused by overfatness among the hens, or by a ration deficient in lime and shell-forming materials. Correct conditions, supplying crushed oyster shells and feeding freely of bran and clover, both of which are rich in lime. Occasionally a hen will lay a soft-

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shelled egg or drop several eggs at one time (in different stages of development) because she is unable to retain the egg until it is fully developed. A hen in general good condition recovers quickly from such a mishap (miscarriage) if placed by herself for a few days and fed lightly and mostly on green stuff. .

Double eggs may be laid by an overfat hen, or they may be due to the occasional outcropping of an hereditary tendency to produce twins.

Egg-eating is a bad habit, which is the result of overcrowding, lack of exercise, lack of animal food in the ration, or the use of nests open to the light. This habit is difficult to cure after it has been well learned, and often the hatchet is the safest and best remedy. Otherwise, correct the conditions mentioned above and allow the hens to partake of a few eggs well treated with cayenne pepper.

Feather Pulling is another bad habit, which results from overcrowding and insufficient exercise, or a ration deficient in meat or animal matter. Kill the hens that are the most persistent at it. Feed large quantities of meat and green food and give a little salt each day.

Frosted Comb or Wattles. Frost bite is determined by stiffness and purple color of the frozen parts, which later change to black color and finally may drop off. Thaw them out gradually with snow or cold water, and apply several times a day

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an ointment composed of vaseline five parts, glycerine two parts, spirits of turpentine one part.

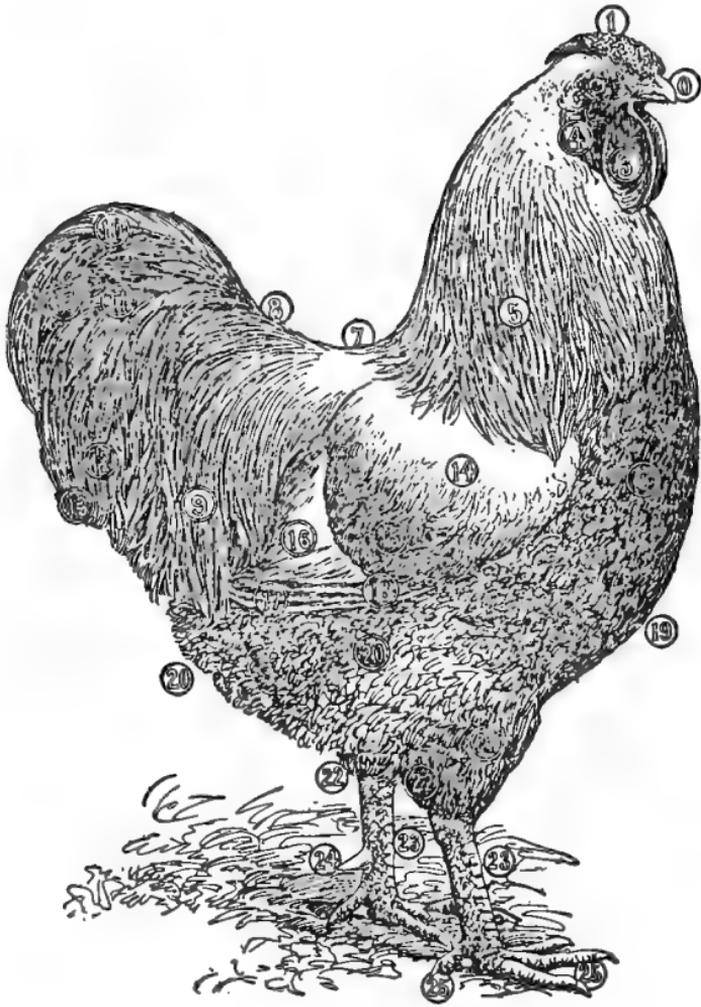
Broken Bone. Unless extremely valuable, a fowl having a broken leg or wing may best be used on the table. Sometimes, however, the bone may be adjusted and held in place by splints made of a shingle or other thin board, keeping the fowl confined until the bones knit together.

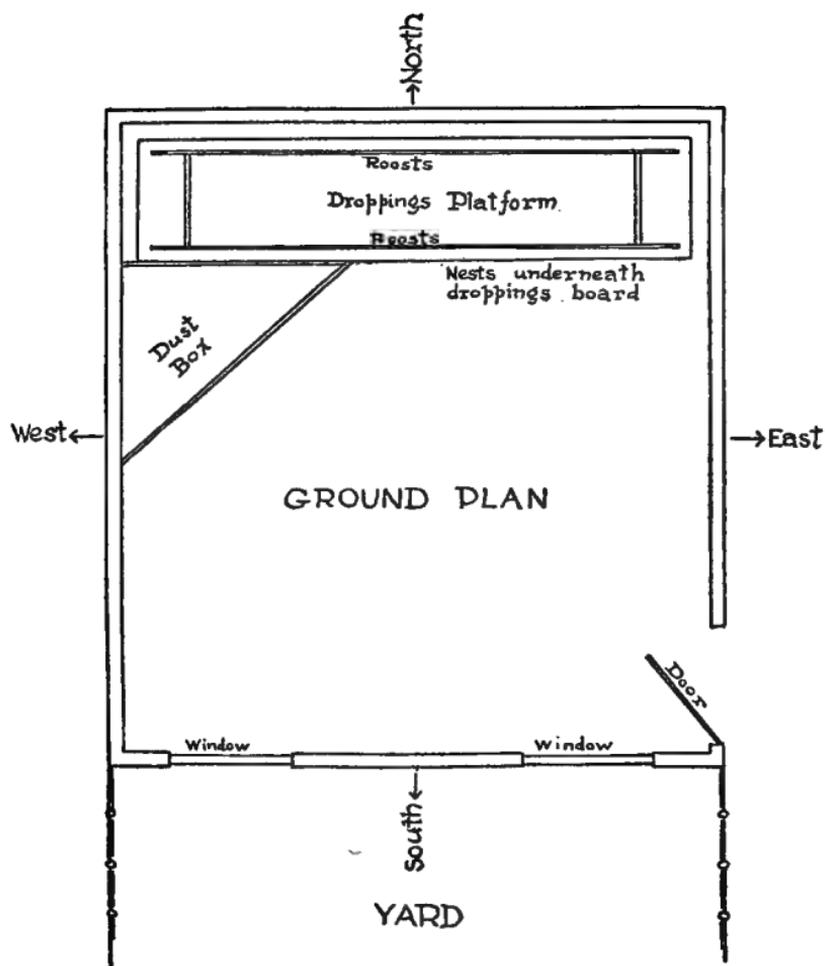
General Remedies. For general lack of thrift or partial loss of appetite, tincture of iron in the drinking water often has a desirable tonic effect.

For all germ diseases, permanganate of potash is excellent. When the fowl waters at the eyes or nostrils, bathe its head freely with warm water colored a deep red with the permanganate. In case of any germ disorder of the throat or bowels, color the drinking water a light red with the permanganate. If the fowl refuses to drink, pour a few drops of a comparatively strong solution down its throat.

Nomenclature Diagram of Fowl

▣ Beak	14 Wing-bow
1 Comb	15 Wing-coverts, forming wing bar
2 Face	16 Secondary wing feathers
3 Wattles	17 Primaries, or flight feathers
4 Ear-lobe	18 Flight-coverts
5 Hackle	19 Point of breast bone
6 Breast	19 20 20, Body and fluff
7 Back	20 20, Fluff
8 Saddle	21 Thigh
9 Saddle feathers	22 22, Knee-joints
10 Sickles	23 23, Shanks
11 Lesser Sickles	24 Spur
12 Tail-coverts	25 25, Toes, or claws
13 13, Main tail feathers	





PLAN FOR CONTINUOUS POULTRY HOUSE

WEIGHTS

Disqualifying Weight Limit	Cock	Ckl.	Hen	Pullet
Light Brahma.....	9	7½	7½	6
Dark "	9	7½	7	5½
All Cochins	9	7	7	6
Langshans.....	9	7	6	5
Standard Weights	Cock	Ckl.	Hen	Pullet
Light Brahma	12	10	9½	8
Dark Brahma and Cochins Except *	11	9	8½	7
Langhans.....	10	8	7	6
Javas and all P Rocks.....	9½	8	7½	6½
All Wyandottes ..	8½	7½	6½	5½
American Dominique	8	7	6	5
Rhode Island Reds	8½	7½	6½	5
Huckeyes	9	8	6	5
White Dorkings	7½	6½	6	5
S. G. "	8	7	6½	5½
Colored "	9	8	7	6
Minorcas S. C. Blk	9	7½	7½	6½
" S. C. White and R. C. { Blk. and W. F. Blk Spanish }	9	6½	6½	5½
Andalusians	6	5	5	4
Red Caps.....	7½	6	6	5
All Orpingtons	10	8½	8	7
Houdans	7	6	6	5
Crevecoeur.....	8	7	7	6
Cornish and Whl. I. Games.....	9	7½	6½	5½
B. B. R. Malays	9	7	7	5
LaFleche	8½	7½	7½	6½
Disqualifying Weight Limit, Bantams	Cock	Ckl.	Hen	Pullet
Brahma and Cochin Bantams	34 oz.	30 oz.	30 oz.	28 oz.
Other Bantams except Game	30 oz.	26 oz.	26 oz.	24 oz.
Standard Weight Bantams	Cock	Ckl.	Hen	Pullet
Brahma and Cochin Bantams.....	30 oz.	26 oz.	26 oz.	24 oz.
All others except Game	26 oz.	22 oz.	22 oz.	20 oz.

*Black Cochin Cock 10½ pounds.

Reverse side of ticket shown on the other
side of this sheet

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Set up, Electrotyped and Printed at
THE OUTING PRESS
DEPOSIT, NEW YORK

