THE POULTRY KEEPER SERIES.

No. 1.

POULTRY FOR PROFIT

—BY—

P. H. JACOBS,

EDITOR OF

THE "POULTRY KEEPER" AND "FARMER'S MAGAZINE."

PUBLISHED BY

THE POULTRY KEEPER COMPANY,

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PARKESBURG, PENNA.

1886.

TO THE READER.

In presenting the POULTRY KEEPER SERIES the author has considered it proper to arrange the subjects under appropriate titles, thereby believing the readers will be better enabled to select those portions which directly interest them. It is much better to present different subjects in separate works, at a small cost for each, than to refer to a larger volume containing much that may be foreign to the reader's requirements. As the author has devoted many years to the study of poultry, and also interested himself in breeding nearly all the varieties, as well as conducted numerous experiments, he sincerely trusts that the readers will reap many times the cost of this work, and that each and all may be successful.

Respectfully,

THE AUTHOR.

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POULTRY AS A BUSINESS.

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The principal desire on the part of those who are interested in poultry, is to so conduct the business as to render it profitable. It is admitted that poultry return as large profits for the capital invested as any other stock; but can poultry raising be made sufficiently remunerative to allow one to embark in such an enterprise without assistance from other sources? That is at present the great problem which all poultrymen are anxious to solve. In considering the matter let us compare such a venture with other enterprises. In the first place, laying the object in view—raising poultry—aside, let us inquire what amount of capital the party who is to engage in business is willing to invest? Many persons of limited means may place the figures at $1000, while others may name ten times that amount, but we have found the latter class not very numerous. The interest on $1000 is only $60 per annum, at six per cent, while it is $600 on $10,000. In most enterprises, a dividend of ten per cent, after paying interest on capital, is considered a large and remunerative one; and this cannot be estimated until all expenses are deducted. Adding the interest and dividend, we must derive a profit (no matter what the business engaged in may be) of sixteen per cent, basing our estimate on six per cent interest and ten per cent dividend, which allows us, clear of expenses, $160 per each $1000 invested. The figures speak plainly, and show for themselves what may be expected, and yet there are but few persons who are willing to engage in the poultry business with only the prospect of securing $160 from an investment of $1000, though the sum obtained is really a large one, as compared with many other ventures.

Let us consider the subject in a still more liberal manner, and allow as profit, including interest and dividend, the large sum of fifty per cent, and we have an income of $500, but we make no mistake in affirming that there is no branch of industry that returns fifty per cent on capital invested, nor even one-half that amount; there may be exceptions, but not as a general average. Why, then, should

the poultry business be expected to return a larger profit than other pursuits, and why is it not remunerative if it returns a fair profit, as compared with other investments? We have often received inquiries from widows, infirm gentlemen, and others, who were anxious to secure a means of livelihood by raising poultry, and they were always anxious to be advised as to the practicability of earning a profit from a few hundred dollars sufficient to maintain themselves and families; an expectation that few would apply in any other direction. We maintain, however, that in *proportion to capital invested* and *labor bestowed*, as large profits can be secured by raising poultry for market as from any other investment; yet, like other pursuits, the party who engages in it must thoroughly understand what he undertakes.

We do not propose here to place a book in your hands filled with glittering impossibilities, and containing descriptions of impracticable methods, but wish, rather, that we may reason together and consider all the advantages and disadvantages. What we wish to do is to show what is possible, and what *may* be done, the execution of the work, however, depending not only upon a knowledge of what is required, but also upon the executive ability of the poultry keeper, and the first suggestion, therefore, is not to expect too much.

What Can be Derived From a Single Hen.

We have realized as much as $5 from a single hen, and as the hen was valued at only fifty cents, the gross sum derived was equal to one thousand per cent. An enthusiast may claim, according to the figures, that as fifty cents returned a gross profit of $5, or at the rate of $10 for every dollar invested, that $100 should return $1000. And we have also known of flocks that gave a net profit of $7 each, the flocks ranging in numbers from ten to twenty hens. But the conditions were favorable. The hens were fed regularly; they were supplied with all that they required; they were carefully sheltered and kept warm, dry, and comfortable, had *unrestricted range*, and consequently, were contented and happy, secured plenty of exercise, and were capable of assisting themselves whenever the proper conditions of food were overlooked by the owners. And it *seems*, also, an easy matter to secure $5 from one hen. We hatched ten chicks with her, which sold, when only two pounds in weight, at twenty cents a pound, or forty cents for each chick, making $4, while the eggs laid by her numbered 108, or exactly nine dozen. Some of the eggs were served upon the table, but enough were sold to realize a little more than $1. Thus it appears that any hen may raise ten chicks and lay 108 eggs (nine dozen) at twenty cents a

dozen. We did not estimate the cost of the food, however, which would have reduced the profits, but we can safely estimate that for each pound of flesh produced in the shape of chicks, the cost will not exceed five cents, and, deducting this from the $4, a profit of $3 was derived from the chicks, while the eggs used on the table more than repaid for the board of the hen. But every hen will not raise ten chicks, and 108 eggs is fully up to what may be expected from each hen in a large flock. Individual hens receive great care. The hen mentioned above received the scraps from the table, and she and her chicks were favorites, and were closely watched, fed, and attended to. The chicks were never allowed out while the grass was wet, and at night they were nicely tucked away under the hen, on a clean, warm nest. In fact, every condition was observed in order to prevent loss, and to ensure success from the hen and her brood.

If a small flock may be made profitable a number of flocks should be made equally so, and they can. This is done every day. A flock in one location has a range to itself, while that of a neighbor has the same privileges, and thus the number may be multiplied as often as we wish; but fowls are no respectors of persons, and it matters nothing to them whether they be divided into separate fields, and owned by different individuals, or whether they are under the care and ownership of one person. A thousand hens may be kept as profitably as a dozen, provided the keeper is willing to invest sufficient *capital* in the business to ensure success. The first idea that usually strikes a beginner is that of massing the hens under a single roof, and of economizing as much as possible in room and shelter. They cannot discern why a hundred hens may not thrive and prosper together as well as a dozen; yet, fowls, like humans, are subject to certain laws and conditions that govern them naturally. In our domestic relations we may be happy with a family of twelve persons, as peace and good feeling can exist, but we would not prosper so well with our cousins and relatives living in the same house (or the same room) to the number of one hundred. Everything may be amicably arranged, yet there would be obstacles in the way which are at once apparent to all. We would much prefer that our cousins be separated and domiciled on neighboring locations, thereby leaving us more room and greater freedom of action. We do not believe that a large number of fowls, therefore, can be made as profitable when kept together, as they would be if they were divided into families, or flocks. In order to divide them, then, to the best advantage, capital is required to so arrange the buildings and grounds as to secure the most favorable conditions,

and even then there will arise so many obstacles which cannot be anticipated that the profit will be proportionately lessened. Take, for example, the hen with her brood. She has a whole field to herself. Then change the illustration, and imagine 100 hens with broods, and at once it is seen that the conditions are not as favorable for the 100 hens as for the individual hen. Should a chick accidentally stray to another brood it becomes a victim to the dislike of the strange hen, and should two hens with broods meet a struggle often occurs, which usually results in the loss of some of the little pets, but where a hundred hens are on a hundred farms no such difficulties arise, and no competition for existence ensues.

With the foregoing as a preface, we will attempt to assist the reader in overcoming many of the difficulties that stand in the way of making poultry, when kept in large numbers, profitable. Our reason for proceeding as we have is to induce the reader to personally look over the field of operations himself while following us, and by so doing he will partially solve for himself the problem which seems to stand in the way, while the ideas we may give may be improved upon, the consummation of which will be as satisfactory as though our thoughts and experiences had alone been the guide.

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PREPARATIONS FOR BUSINESS.

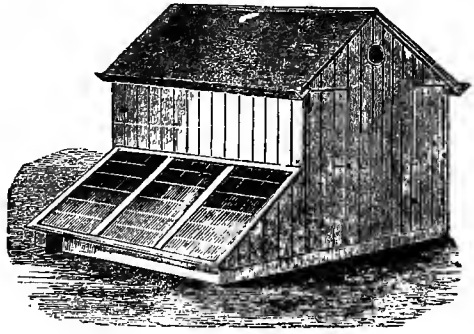


FIGURE 1.

As we stated, everything depends upon the accommodations and management. While expensive buildings may be put up, arranged with every contrivance for the accommodation of poultry, yet it is not everyone who can afford to engage in the business as

they would desire, and hence let us confine ourselves to those essentials for operation which are rather within the province of persons of limited capital. We must make every dollar go as far as possible, and while constructing cheap buildings, they must be *dry*, *warm* and *light*. The first consideration is how to get the greatest surface space for the least outlay. We present, therefore, Fig. 1, which, while it may not be exactly according to the most approved style, has some advantages that are very important, and conveys some very good ideas. The house is 10x10, with three greenhouse sashes facing the south. Each sash is three feet wide and six feet long, and they cost, usually, about three dollars each. Now, while we have ten feet each way, in the house proper, making 100 square feet, we also have the room under the sashes, which is 4x10, or 40 square feet, the entire surface being 140 square feet, or equivalent to a house 10x14 feet, while the roof is built over a surface of 10x10 feet only, the glass serving in the capacity of a roof to the extended portion, and is also so inclined as to allow the heat and light of the sun to pass in to a distance under the main section, as well as *directly down* upon the four feet extending forward. The cost of the glass is partly saved by the shingles that would be necessary for covering a roof 10x14 feet instead of 10x10 feet, as it may be observed glass would be necessary, also, for a house 10x14 feet. Before building the house, or fixing upon the size, first determine how the fowls are to be kept. We would suggest that instead of adopting the above size, we would build a house 8x16 feet, so as to best utilize 16-feet boards, with two sections to the house, making each section 8x8 feet, and with a cock and ten hens to a section, which is two cocks and twenty hens to a house 8x16 feet. Instead of three sashes, there need be only two, one to each section, which gives the room on the floor, however, for each section 8x12 feet (instead of 8x8 feet). The reason for so doing is that in the winter, when the weather may be severe at times, the hens may be kept in doors, and have plenty of room, as that portion under the sash will be as serviceable as that under the main portion. In Fig. 2 we show how a single sash may be arranged, and also how a still cheaper house may be constructed. Fig. 1, alluded to, is five feet from the eaves to the ground, the peak being eight feet from the ground. Fig. 2 should be made 10x10 feet, the peak being seven feet from the ground. At the bottom is a board one foot high, though it may be two feet if preferred. The door is at the right, and ample room may be had inside for those who may have to enter to collect eggs or clean the house. In front, near the right corner, is a place of ingress and egress for the fowls, and the house

may be roofed with narrow tongue and grooved boards, shingles or tarred paper. Our object here is simply to give design of the house.

Before the house can be considered finished it should be made very warm, and should be lathed and plastered, no matter how constructed, as an ordinary board house, although supposed by many to be sufficient, will be found a very cold place when the thermometer is near zero. Do not become alarmed, however, at the idea of plastering it, which is expensive, but let us endeavor to adopt a substitute. No poultry house will be free from lice, or draughts of air, unless it is plastered, or closed in some manner. So we will

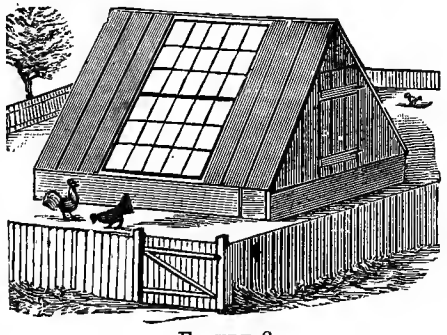


FIGURE 2.

paper it inside, and do so in a cheap and inexpensive way. We will give several methods, the reader selecting that which suits his inclination.

Before stating our preference we will say that lice will not remain in the presence of tarred paper. Get a lot of old newspapers, or a ream of brown paper, and make some paste by stirring flour in boiling water, first adding a little glue and alum to the water. Now put plenty of paste on both the paper and the wall; lay on the paper, and put on a covering of paste over it. When this is done put on another layer of paper, taking care to cover all cracks and broken parts of the first layer. Let the first course dry before putting on the second. Paper under the roof as well as on the sides. You may now put on the tarred paper, by nailing it with tin heads and small nails, and strips of lath may be nailed over the tarred paper to assist in holding it in position. If the tarred paper is too expensive, and you wish to harden the paper, make a paste of skim milk and lime, adding a little dissolved glue and enough flour to make it stick. Before applying it put in a pint of coal tar, or

boil a piece of tarred paper in the paste. Brush this over the paper on the wall, and it will soon become as hard as a board, while the odor of the coal tar will keep off lice. Once a month make a whitewash, adding a quart of milk, a little glue, flour, and coal tar to the whitewash, and with the mixture whitewash the interior, say three or four times a year. It is also an excellent outside coating. You now have a building which is warm and comfortable. The only objection to the coal tar is that it darkens the interior, while the hens love plenty of light. This may be remedied by passing a little whitewash over it. Always endeavor to have the odor of coal tar present, as it is an excellent disinfectant, prevents lice, and assists in warding of disease.

The best floor is boards, but they are expensive, and also allow rats to get under them. Make the floor of concrete. Get some lime

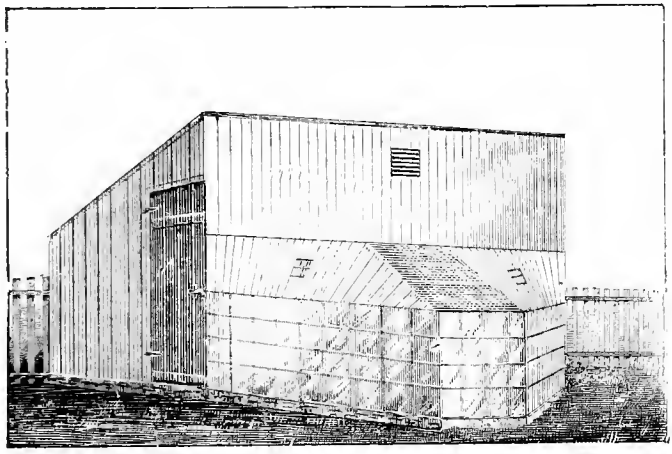


FIGURE 3.

and slake it with plenty of warm water. To every bushel of lime add one peck of calcined plaster, cement, or skimmed milk. Put in, also, a gallon of coal tar. Now mix the mortar of lime, plaster and coal tar, with sand and gravel, making it of such a consistency as to easily run out of a bucket, and spread. Level down the floor of the house (which should be higher than the ground outside) and trample it firmly. Now pour on the concrete, but mix it only as required, as it may set if allowed to stand too long. When finished take a trowel and level it down. After it is dry, make some concrete

of lime, tar, plaster and sand (no gravel) and spread it evenly, about half an inch in thickness, over the first layer, so as to stop up any cracks or openings, and in a day or two you will have a hard, solid, dry floor, under which no rats or weasels can enter, and which may be cleaned off by sweeping with a broom, sprinkling with either sand, dry earth, sawdust or land plaster, after each sweeping.

We give Fig. 3, an illustration of a poultry house with the windows so arranged that the light and warmth enters as soon as the sun rises, and so remains until sunset. A window may be on the roof or not, as preferred. Observe that, although the house may appear expensive, such is not the fact, as it should be considered that the *space on the floor* is equal to that of a house covering the ground occupied by both the main portion and the window. With

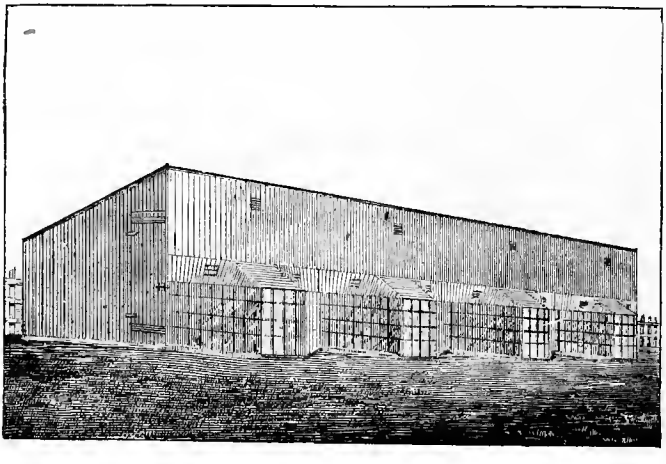


FIGURE 4.

light and warmth the hens will remain inside on cold days, and if they are *kept at work* will lay in winter, hence we will again remind the reader that when feeding the hens in the morning, give a *small* quantity of *soft* food, and throw grain into leaves, cut straw, chaff, or even sawdust, and make them scratch for it. *Keep the hens at work* during the day, but feed them well before they go on the roost at night. Never feed a *full* meal in the *morning* unless the fowls can secure it by *scratching*. Make them *work* for all they get.

We also show a building (Fig. 4) composed of a row of partitions, each section being 15 feet; the yards, of course, being the

same width. Our motive in the illustrations is to show the economy of combining light, heat and *floor space*, hoping the reader may improve upon our plans.

How to Make a Cheap Fence.

We are showing how to make a cheap and comfortable house, and not how to build an elaborate one. The next desideratum is a cheap fence. A fence should be at least six feet high for the small breeds, though four feet is high enough for heavy fowls. The cheapest material is lath, but a fence made of lath will not answer unless it is constructed in such a manner as to be strong. Fig. 5 will give an idea of how a durable, strong and effective lath fence may be made. The illustration represents a fence with the lower ends of the lath in the ground, using only two strips from post to post. To make a fence six feet high, take three strips of 2x3 scant-

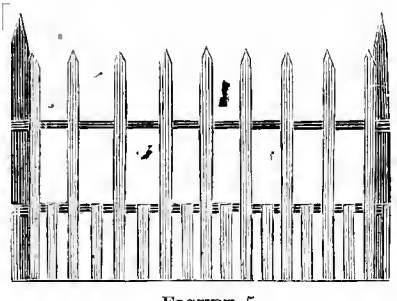


FIGURE 5.

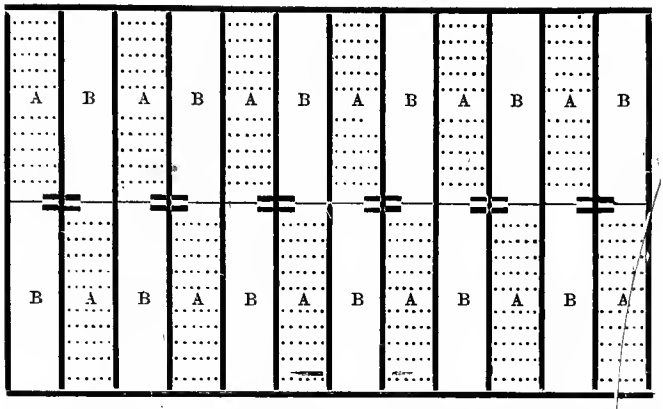
ling, or shingling lath, and nail the strips with the wide part lying flat, the narrow part fitting against the post. This enables it to stand greater pressure. Place the first strip six inches from the ground, the second fifteen inches above the first, the top of which will be two feet from the ground. Now cut whole laths in half, and nail the pieces to the strips, the top of each lath being an inch and a half from the top of the second strip, or rail. Allow one inch space between each lath. Now nail on a third strip, three feet above the second, and nail whole laths, fastening the bottoms of the lath to the inch and a half space on the second strip, which was left above the top of the half lath, and nail the upper portion to the third strip, which will leave one foot of each lath projecting above the third strip, though the third strip may be nailed three feet and a half above the second strip, instead of three feet, if preferred. The whole laths may be placed two inches apart. The advantages of

this fence are that the strongest part will be near the bottom, and more capable of resisting pressure from dogs, or even fowls. The cost of the lath will be about two cents per running foot, six feet high, and it will be close enough at the bottom to enclose young chicks. It would be a good plan, also, to nail laths lengthwise across the ends of those nailed to the strips, in order to more securely hold them in place.

Changeable Yards.

It may be supposed by the reader that we are making our calculations with the expectation that the poultryman desired only to keep one or two flocks, but we mean something more. We are discussing the best methods for keeping poultry in large numbers, and before going into further details in regard to the construction of the houses and fences, let us consider how best to manage them. As we stated before, fowls having a whole farm to themselves always give satisfactory results, while every attempt to keep a large number of fowls massed together has been met with reverses. The reason is that the poultrymen have attempted changes that were entirely too radical. They do not consider that poultry, like other stock, demand attention and labor, as the poultrymen are usually desirous of engaging in the business with as little labor and outlay as possible. Nine out of every ten are anxious to take a barn, or other large building, and divide it up into rooms, in which they propose to place a large number, ranging from twenty to fifty fowls for each room. Others propose to build a long poultry house, dividing it into sections, with a passage way the whole length of the building. We admit that either plan will do if you wish to keep poultry or young chicks, but *will not do for laying hens*, unless the houses are roomy. The square building will have only one south side, and some of the rooms will consequently receive no heat from the sun in winter. The other plan gives only long, narrow yards, unless the divisions are large. The poultryman must bear in mind that the more room that can be allowed in the yards for foraging the better, and in winter the inside of the poultry house should be roomy, especially on the floors. There are several objections in the way of confining fowls in small yards, among them being that the yards will become foul and dirty, no matter how well they may be cleaned; that closely confined fowls become too fat, for want of exercise, and will not lay; that if not allowed to forage they become addicted to the vice of feather pulling, which also prevents laying. How, then, are we to get over the difficulty? Simply by allowing plenty of room, keeping the hens

always *busily at work* scratching for their food, and while so doing endeavor to grow the green food. The following plan will give the reader an idea upon which he may improve:



To describe it we will state that A A A and B B B are yards, but the yards marked A are separated by those marked B. The dark squares represent houses, each being divided into two partitions, a cock and ten hens being in each. Our object is to allow the fowls to have the liberty of the yards marked B, while those marked A are regaining a new growth of vegetation. By changing the fowls back into the yards marked A, those marked B may be spaded or plowed (thereby turning under the filth and enriching the land) and also re-seeded for vegetation. A space of at least twenty-six feet is between every flock, no matter whether they are turned into A or B, which prevents the cocks fighting through the fence, and separates them completely, although the houses are always facing the south. The reason why a cock and ten hens are suggested is that a larger number of hens would require two cocks, and they would naturally become jealous and quarrel, and peace is very desirable. The eggs will also hatch better the fewer the number of hens with a single cock. Two cocks in the same yard are almost useless, as one will not only make a coward of the other, but will be prevented from paying attention to the hens. If the eggs are not desired for hatching no cocks at all are required, as the hens will lay as well without them as with them, and the eggs will keep better.

As to how many hens should be kept on an acre, we can easily

tell by a calculation. An acre is about 209 feet square. We can, therefore, get four lots 52½ feet front 209 feet deep, eight lots 52½ feet front and 104½ feet deep, and 16 lots 52½ feet front and 52½ feet deep. Or, we can get 16 lots 26½ feet front and 104½ feet deep. But, as each flock will require two yards (if we adopt the size of 26½x104½) we will have eight flocks to the acre, or four houses, divided into two departments each. Of course the yards may be made smaller, and a larger number kept, but the results will not be so satisfactory, for under this plan the yards are deep, the flocks are completely separated by a wide yard, they can be at any time changed from a filthy yard to a fresh one, they can always have green food, and the land will produce a greater amount of vegetation every year from being enriched by the droppings.

An Estimate for One Acre.

If we can keep eighty hens on an acre (and we may keep 100 if the eggs are not desired for hatching purposes) in proportion to cost of labor, they will give a greater return, per acre, than can be realized from any other kind of stock, or from any growing crops. It is not always advisable to "count chickens before they are hatched," for no man can tell what a hen will perform, but it is not out of place to attempt to estimate the possibilities from eighty hens on one acre of ground. We will not say anything at present about the cost of the buildings and fences, nor of incubators, brooders, and small coops, for such belongs to the invested capital, but let us try and arrive at a knowledge of the profits and expenses.

The estimated allowance for a hen is five pecks of corn, or its equivalent, for one year. The equivalent, of course, means less corn when wheat, oats, soft food, meat, or vegetables are given. Should you grow any of the food on the ground occupied for poultry, you gain so much. Five pecks of corn, for convenience, may be estimated at a value of one dollar, which means that it will cost one dollar to keep a hen one year, and we believe the estimate should be high for expenses and low for receipts, as will be less room for disappointment. We wish to know, now, what to expect. Let us again begin a calculation. We have known hens to lay as many as twelve dozen eggs in a year, and even sixteen dozen, but we will try and get within bounds and claim only nine dozen. We would claim only eight dozen, but these hens are expected to give but few eggs when they are high, and a greater number when they are low, and therefore nine dozen eggs from a single hen is not a large estimate, yet we feel satisfied that, under proper conditions,

from ten to twelve dozen may be secured. How shall we fix the price? We will do so by stating that eggs range in price from 15 to 40 cents per dozen, in the neighborhood of good markets, and we will strike a price between the figures—27½ cents. No, let us cut off a figure, and estimate it nine dozen eggs at 20 cents a dozen, in order to make a safe estimate. We have, then, $1.80 as a gross sum from the hen, and the cost of her keep is $1.00, leaving a profit of 80 cents. This does not look like a large sum, but, at 80 cents per hen, from 100 hens, we have the interest of six per cent. and a dividend of ten per cent. on a capital invested of $500. We are not done yet, however. If our hen only lays nine dozen eggs, it will be because she loses time sitting, and if she is a poor layer she will probably sit twice, and hatch two broods. We would not expect two broods if she laid early and up to the period of moulting, for she would give a larger number of eggs, but we will make a calculation for her work as a sitter.

We will give her thirteen eggs for a clutch, as that seems to be a favorite number, but in winter she should not have over ten. She hatches perhaps seven chicks, and loses three, or nearly one-half, leaving four chicks out of thirteen eggs, for sale. Have we made too high an estimate in claiming four chicks as the result of what a hen may raise from a single sitting? We think not, and we must now estimate what they are worth. If they are hatched in March, they will get into market when about five weeks old, weighing three-quarters of a pound each, and will bring anywhere from fifty to seventy-five cents each. If they are hatched later, they must be sold when a pound in weight, and will bring from forty to seventy-five cents each. If hatched still later, they will sell best when about from one and a half to two pounds each, the price ranging from twenty-five to fifty cents per pound, according to size and the season. We will let our four chicks grow to two pounds weight, and sell them at twenty cents a pound, or forty cents for each chick, but it is fair to presume that some hens may sit early and some late, but we will accept the low price of twenty cents a pound, and we have $1.60 for four chicks, estimating that we were not in time for the early ones, and had to let ours grow until they were two pounds in weight, and that our hen only raised four chicks. The expenses for the eggs the hen used when sitting may be placed at high prices, however—forty cents—and the chicks cost five cents a pound to raise, or ten cents each, making eighty cents for eggs and food, leaving us eighty cents profit on chicks, which, with the eighty cents profit on eggs, gives us $1.60 as net profit from the hen. So, we conclude, $1.60 may be expected from one hen. But stop awhile.

Remember our hen was a poor layer. She ought to hatch another brood along in August or September, and she ought to have better luck with her chicks, as she will not have the cold weather to combat. Well, we will again give her thirteen eggs, and she ought to raise five chicks, which we can sell for at least fifteen cents a pound (a low estimate) when they weigh two pounds each. This will allow us thirty cents a chick, or $1.50 for the five. The eggs this time, however, we may place at twenty cents a dozen, and the feed for five chicks at fifty cents, making seventy cents expenses, and we again get eighty cents profit, which raises the profit from the hen to $2.40, and all expenses of her board deducted. We were about to say we were done, but we find that the hen and her two broods of chicks (and remember we let those chicks grow to a fair size) made some manure, and that is worth something, for it sells very readily to gardeners. It ought to be worth at least twenty-five cents,

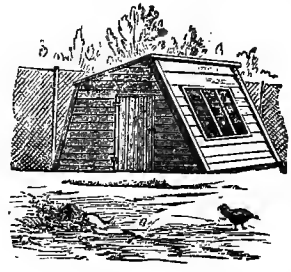


FIGURE 6.

though we are sure fifty cents would not be too much, but we will accept twenty-five cents, and stop at a profit of $2.65 per hen.

A little more figuring enables us to claim $265 for 100 hens on one acre of ground, or $212 for eighty hens on the same area, which is equivalent to six per cent interest and fifteen per cent dividend on $1,000 from the eighty hens, or six per cent interest and twenty per cent dividend from 100 hens on the same amount. It is equal to six per cent interest and about forty per cent dividend from eighty hens on $500, and six per cent interest and fifty per cent dividend from 100 hens. Surely, the investment should be considered a paying one.

If we base our estimate on one acre, and arrive at the figures necessary for business on that much ground, we can afterward calculate for any number of acres, but for fear that we did not make allowance for mistakes in our profit of $2.65 for each hen, let us cut

off the sixty-five cents and call it $2, and we may easily arrive at any estimate in a moment. It will be necessary to keep only enough cocks to fertilize the eggs required for hatching, and one-half the yards, therefore, may dispense with them, especially in summer. We may, then, keep fifteen hens in a house 8x8 with 8x12 ground room, which at a glance shows that 100 hens may be easily kept on an acre, giving a profit of $200 per acre. If the houses are single, and so constructed as to be moved, like Fig. 6, the ground may serve as a floor, provided it is tight and dry. We give the design, however, but it may be altered to suit convenience.

Capital for Beginning.

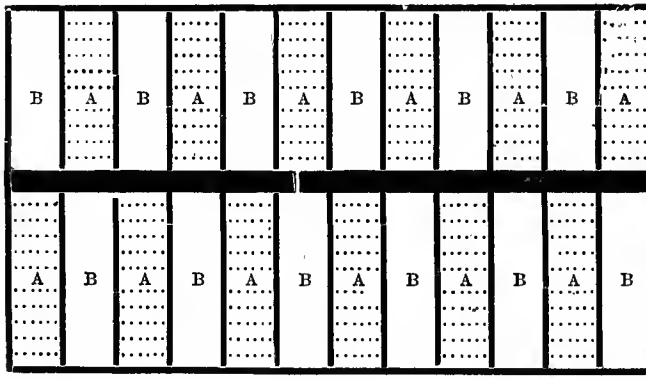
If we wish to arrive at a knowledge of the capital required to begin with, on one acre, let us estimate the price of lumber at $20 per thousand feet, the shingles at $5 per thousand, and the lath at $3 per thousand. A building 8x16 feet, 5 feet high to the eaves and 8 feet to the pitch, with solid inside partition, will require about 500 feet of lumber, which includes the portion covered by the sash of glass, making $10. The shingles will cost about $5, nails and hardware $5, and floor (if of boards) $3, or a total of $25, allowing for extras, such as glass, etc. The fences (permanent) will require 209 feet on the four sides of an acre, and one line across the middle. The four sides will be 836 feet, while the four houses will take away 64 feet from the middle fence, leaving 145 feet, which, added to the 836 feet, will amount to 981 feet. We must now build fourteen partition fences, in order to separate the yards A and B, the partitions to be 104½ feet each, making 1,463 feet, which, added to the 981 feet, gives a total of 2,444 feet for the yards. This will require about 300 posts, at five cents each, $15; about 7,500 feet of railing (shingling lath, at $6 per thousand, will answer), $45, and about 20,000 lath, $60. Thus, four houses will cost $100, the posts $15, the railing $45, the lath $60, and the nails $5, making a total of $225 for material, the labor of building the same being perhaps $100, or, provided one does his own building, $500 may equip two acres, which will accommodate 200 hens. As a matter of course, the cost of material depends upon the location and the prices therein, and, although giving an estimate here, the figures may vary some. Much depends upon the size of the buildings and the kind of fence used, but we have allowed two yards to each flock, each yard being quite large, while the ground floor of the houses is ample. If we were to estimate for contingencies, and place the cost of material for equiping an acre at $300, we would be safe, and estimating $100 with which

to purchase hens (a large estimate), by realizing $200 from an acre, we think the profit from the outlay quite large.

But this $200 is not all *profit*. The *labor* is worth something. It will not be a hard task, however, for a person to manage five acres, or even ten, almost as handily as one acre, and consequently the cost for a single acre should be in proportion, yet we feel assured that all of our readers are willing to let the *profits* pass if they can realize $1,000 on five acres, on a capital of $1,500, by *labor*.

The Single House Plan.

Here is another plan, which is not a bad idea; it is more economical, and is favored by many. If we will make plenty of room inside the house and spade up the yards frequently, no doubt it may answer. Build a house 210 feet long and 10 feet wide, with windows arranged all along the front, the same as in Fig. 1. We then have the floor 210 feet long and 14 feet wide. Divide this building into fifteen sections, with yards front and back. Each section (or room) will be 15x14 feet on the floor, but as we may take up a passage way the whole length, of 2½ feet width, the apartments occupied by the fowls will be 15x11½ feet, or 172½ square feet to each apartment. Dispensing with cocks, each room will easily accommodate fifteen hens, and, as we will have fifteen rooms, we can get 210 hens on a trifle over an acre. We give the arrangement thus:



A and B represent the yards, there being one at the rear and one at the front of each room. The heavy black line represents the building, which is 210 feet long. Each yard is 15 feet front and 10½

feet deep. Let us now compare the cost with the other plan. The house should be 5 feet to the eaves, and, if 210 feet long, each side will require 1,050 feet of lumber, or 2,100 for the front and back; or, making allowance for the glass section in front, with studding and shingling lath, about 5,000 feet for the building, costing $100. The shingles will cost about $75, the nails and hardware about $15, and incidentals $10, or a total of $200. The floor, if of boards, will cost $50 more. We are not familiar with a knowledge of estimating for building, as is done by a carpenter, but believe $300 will amply cover the expense for material required for the building, as, with the exception of two feet of board at the bottom, the partitions inside may be made of lath. The fences will require 840 feet around the outside, while twenty-eight partitions 104½ feet long will amount to 2,926 feet more, or a total of 3,766 feet. No partitions will be required across the center, as the building will answer that purpose. The fencing may therefore be estimated at about $175, or we may fix upon $500 as a safe estimate for the one acre, but we will have 210 hens instead of 80 or 100. Take a tape line and measure the size of the yards, and the space allowed inside the rooms, and you will arrive at some idea of what they will occupy when finished.

We have so far endeavored to lead the reader by the hand, show him the field and talk the matter over confidentially, like friends. We have estimated against the beginner every time. There are no theories presented, but plain possibilities, which the reader may notice himself. We hold out no inducements, but endeavor to make this book so plain that, though small, it may be of value to all. We wish the reader, however, to do his own thinking, and, if we give an idea, that it may take root and become the foundation upon which something better may be established. Having assisted to arrive at the outlay required, let us begin duty and see how we should manage.

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THE BEST BREEDS FOR PROFIT.

Much depends upon the breed. Among live stock we find the Jersey cow adapted for butter, the Holstein for milk, and the Shorthorn for beef. The thoroughbred horse is capable of great speed, the trotter of quick draught, and the Percheron of drawing great weights. Among swine the Berkshire is noted for its hams, the Essex for its flitches, and the Yorkshire for early maturity. The Merino sheep gives us our fine wool, the Cotswold our combing

wool, and the Southdown our marbled mutton. As with cattle, horses, swine and sheep, so with poultry. There are a large number of breeds, but no single breed possesses more than one talent, or dominant quality, nor can the crossing of any two breeds unite all the characteristics of both, though the offspring may combine, to a limited degree, the merits of its parents, and, while not being equal to either parent in some respects, may be superior to them in others.

The choice of breeds depends upon several conditions, among them being the location of the poultry farm, the climate, and the purposes intended by the poultryman. If eggs only are the desideratum, we may name, as the best layers, the Leghorns, Houdans, Hamburgs, Polish and Black Spanish. These breeds are small in size, are non-sitters, lay purely white eggs, and mature earlier than the large breeds, but, as we stated, each has its merits and each may be objected to in certain respects.

The Leghorns, of which there are four varieties—the Black, Brown, White and Dominick—are alike in nearly every particular except color of plumage. They mature very early, often beginning to lay before they are five months old, and probably lay a larger number of eggs in a year, under favorable conditions, than any other breed. The Black variety is but little used, as they have dark legs. The others possess yellow skin and legs, and present an attractive market appearance. The objection to the Leghorns is that they have large combs and wattles, which are liable to freeze in winter, and although we have the single and rose combed breeds, yet the rose-combed varieties are not exempt from the difficulty. They feather very rapidly and are very sensitive to dampness, the loss of chicks being greater on damp days than when the weather is dry and cold. In fact, all of the non-sitters are tender when young, though hardy when nearly grown. Of course the eggs must be hatched under hens of a sitting propensity, or in incubators, if young chicks are desired.

The Hamburgs are also small, have rose combs, and are very handsome in shape and beautiful in plumage. They possess no advantage over the Leghorns, nor are they as hardy.

The Polish are beautiful in plumage, but as there are eight varieties of them a complete description is not necessary. They are ornamented with beautiful crests, and are excellent fowls when matured, but in the hands of a novice there is usually a large loss of chicks, as they are very tender when young.

The Black Spanish lay larger eggs than any other breed, but the fanciers have bred them so closely for the desirable white face

(one of the prominent points) that the breed does not now possess the vigor and strength usual to many others, while the legs are dark and the skin a bluish white.

The Houdan is the largest of the non-sitting breeds, and is a favorite with the poultry breeders of France, it being one of the French breeds. From the fact of its being ornamented with a crest, as well as possessing five toes on each foot, it was no doubt produced by crossing the Polish with the Colored Dorking. The body is long and heavy, and the bird very compact. The hen lays a large white egg, and the chicks are hardier than those of any other breed of non-sitters. Though larger than the Leghorn, we doubt if the chicks weigh heavier up to the time they are two months old, and although the Houdan lays well it does not mature as early as the Leghorn.

Having given a brief description of the five prominent non-sitting breeds, let us now compare them. The Leghorns are early in maturing, but are too large in the comb. The Hamburgs have rose combs, but are not as hardy as the Leghorns. The Polish are large in size, but do not mature early, and are too tender when young. The Black Spanish lay large eggs, but do not grow rapidly, and are not good table fowls. The Houdans are splendid table fowls, but do not mature early, while their crest and fifth toe are objectionable, the crest often becoming watersoaked, thus inducing roup, while the fifth toe is an incumbrance and a nuisance. And, it must not be overlooked, all the non-sitters are excellent flyers, and must be confined with high fences.

If we have puzzled the reader in the endeavor to enlighten him, it is not our fault, for no breed, as we stated before, will fill all the requirements, but as we discuss the subject further we will endeavor to partially solve the difficulty and thereby determine upon the breed which may be most suitable. We again allude to our reminder that the climate must influence you in selecting the breed. In cold, dry climates, the roup (the dreaded winter disease) is not as prevalent as in those sections where the weather is damp, but the winds are very severe on the combs of the cocks. In the Southern States the Leghorns answer admirably, while the Houdans are preferred further north. As the non-sitters are very active, and forage over a large surface, they do not bear confinement well, and the consequence is often a diminished number of eggs, with the acquired vice of feather pulling. These difficulties, however, may be partially avoided by judgment in feeding and caring for the fowls.

The above is intended more for those who believe there is a

greater profit in eggs than in eggs and chicks combined, a matter to which we shall again allude. As to which is the best fowl for eggs, chicks and carcass, let us examine a few more of the principal breeds.

There are more than a hundred breeds, including the sub-varieties, but the most prominent are the Brahmas, Cochins, Plymouth Rocks, Dorkings, Wyandottes, Dominicks, Games, Javas and Langshans. Here we have quite a large number from which to make our selection, but again we will find it a difficult matter to render a decision as to which breed may be denominated the *best*. In order to make poultry profitable, we wish to get as many eggs as possible, to secure good hatches of hardy, quick growing chicks, to produce pullets that begin to lay very early, and to avoid many of the vexations of frozen combs, flying over fences, and diseases.

The Brahmas consist of the Light and the Dark varieties. With the exception of color of plumage, they are very similar, having small triple (or pea-shaped) combs, yellow skin and legs, heavily feathered bodies, and attain a large size. The Cochins, consisting of the Black, Buff, White, Partridge, and Pea-combed Partridge, are large fowls, with single combs, and are, like the Brahmas, heavily feathered, but more compact in shape. The Plymouth Rocks have clear yellow legs and skin, heavy, compact bodies, and single combs. The Wyandottes have yellow legs and skin, compact bodies and very small rose combs. The Dorkings, of which there are several varieties, have single combs (sometimes a rose comb), white or flesh-colored legs, with heavy, long, compact bodies. The Dominick has a rose comb, and otherwise is similar to the Plymouth Rock, though smaller. The Games are very numerous, but the best for market, or for crossing on common fowls, are the pit Games. The Javas consist of the Mottled and Black, and somewhat resemble the Plymouth Rocks in shape and size. Like the Games they also have single combs, but, while many of the Games have yellow legs, those of the Javas are dark or bluish yellow. The Langshans have white skin, dark legs (with pink between the toes), black plumage, and grow to a large size.

A comparison of the breeds will now enable us to judge of their merits more satisfactorily, in order that some particular breed may be determined upon for the purpose of securing the greatest profit. Here we may point out the merits and defects of each by stating that the Brahmas make good winter layers (owing to their heavy feathering), are large, but do not mature early, while the chicks are not very attractive. The small pea-comb is secure from the attacks of winter, but the heavy leg feathering is objectiona-

ble, as the feathers become wet in damp weather. The Cochins possess nearly all of the advantages of Brahmas except the comb. They are the most persistent sitters of all breeds, and the most difficult to "break up." The Plymouth Rocks mature a little earlier than the Cochins or Brahmas, and are not troubled with leg feathering. They have rather tall combs, however, which are liable to freeze in winter. Being well feathered, they stand the cold well, and are good table fowls, while the chicks grow compactly and always sell well in market. We should, but for two objections, consider them as perfect fowls, which are that they can fly over a five-foot fence, and have too much comb, while the Brahmas and Cochins can be confined with a very low fence. The latter are also better contented when in confinement, while the Plymouth Rocks prefer to forage. All the large breeds are liable to become too fat when confined, due to lack of exercise. The Wyandottes are a new breed and seem to possess a great many advantages. They are well feathered, and consequently should make good winter layers, while their small combs are greatly in their favor. They are very compact, and their skin and legs are of a golden yellow, while the plumage is beautiful. They have not proved themselves equal to the Brahmas or Plymouth Rocks as layers, and are rather closely inbred, but, no doubt, in a few years they will be more valuable. The Games are hardy when matured, but are more liable to roup when young than are some of the other breeds. The Dorkings are the most compact of all the breeds, but do not thrive as well in this country as they do in England. The Javas are excellent layers, but their dark legs and single combs give them no advantage. The Dominicks are moderate layers, and do not suffer from the frost as much as the Plymouth Rocks, but are rather small when matured. The Langshans have the objectionable tall combs and dark legs, but they begin to lay sooner than any of the large breeds, are hardy, and are destined to be one of the best breeds we have.

If you contemplate raising poultry in a cold climate, the Brahmas, Plymouth Rocks and Wyandottes are equal to any of the breeds, for they will often lay in winter when other breeds find it difficult to exist. The small combs of the Brahmas and Wyandottes do not suffer from frost, and those of the Plymouth Rocks should be dubbed when they are three months old. Having selected the three breeds we deem most worthy, it is next to be considered whether the fowls are to be confined or allowed to roam at will. If confined, the Brahmas will answer best, as they do not require high fences. If they are to forage, the Plymouth

Rocks are best. In winter, however, very little foraging is done by any class of fowls, but early spring is sometimes rendered severe by cold northeast winds, and roup is liable to occur, while the damp ground is not well adapted to feather-legged fowls. Taking all things into consideration, however, the Light Brahma possesses a greater combination of advantages than any other breed, which is demonstrated by the fact that they have been in existence for about thirty years, and are still great favorites. Being contented in confinement, not addicted to rambling, well feathered, hardy, not liable to frosted combs, and easily fatted for market when matured, the Light Brahmas will long hold a high position, but the chicks do not present as attractive an appearance as the chicks from Plymouth Rocks, and in that respect are somewhat inferior, but the Light Brahma chicks are very hardy, as they feather slowly, and grow faster than do those of any other breed. South of the Potomac and Ohio rivers no doubt the Plymouth Rock is a better breed than the Brahma, while south of Cape Fear the Houdan, as a market and egg producing fowl, is superior to either. For early maturity, table qualities, good laying, and rapid growth of chicks, (if the combs are dubbed), the Langshans answer well in nearly all sections, but they do not possess the yellow legs and skin of the Brahmas and Plymouth Rocks. The Cochins are excellent fowls, but we can best use them for crosses, in which respect they cannot be excelled. The reason why the poultryman should avoid too much comb on a hen is that if her comb becomes frosted she will not lay until the injured part has healed, which makes such difficulty a very serious one.

Crossing the Breeds.

We have attempted to familiarize the reader with the characteristics of the pure breeds, but in raising poultry for market a good foundation may be laid by beginning with common hens. The influence of the male is such that the thoroughbred almost obliterates every trace of the common blood, and for that reason only pure-bred cocks should be used, as the chicks will not only be uniform in size and color, but the poultryman may breed his flocks to any desirable characteristic, and with but little expense. By crossing a pure-bred Plymouth Rock cock on common hens nearly all the chicks will apparently be Plymouth Rock, but although the poultryman may select from the crossed fowls a few hens and a cock for breeding, the progeny of such crossed fowls will revert in color, and resemble their grandmothers, the common hens. For this reason we advise

never to use a cock that is a mongrel, or that is not strictly pure in blood, for if this rule is not observed your chicks will be of all colors, shapes, and sizes.

By a judicious use of the pure-bred cocks a single season will make a marked improvement on a common flock. The first consideration is hardiness, then early maturity, and next prolificacy. What is meant by hardiness is capacity to endure a severe winter, for we have found that a fowl that endures the winter thrives well in summer. Breed also for small comb, and early maturity. It is not easy to breed a small comb on an early maturing fowl, as the breeds possessing small combs require a longet period for growth than do those with tall single combs. Among the common fowls, however, will always be found a few large vigorous hens. These may be mated with a Dominick or Wyandotte cock, or, if the climate is not too severe, with a Leghorn cock. A cross of any breed with the Leghorn give early maturity, and also make a good market chick up to the age of two months. As a rule, however, we might suggest the following rotation for crossing on common fowls, which necessitates an entire change of cocks every year. First, begin with a Light Brahma cock, which reduces the comb, and gives size and hardiness. Then use a Dominick cock on the produce, which will not greatly reduce the size, and give greater activity. Now follow with the Leghorn, which though adding more comb, and even reducing the size some, hastens maturity, and the Leghorn blood will last for several generations. In fact, always endeavor to get in a dash of Leghorn blood. Now breed to the Plymouth Rock, to get back the size, and follow with a Houdan. The Langshan will be found serviceable next, and then the Wyandotte, when the Light Brahma may again be resorted to. Here, it may be noticed, there is a continual change of blood, and during the experiments the poultryman will hit upon some particular cross that suits best, according to the section in which he lives, and he may stop at any one of the crosses, and produce the hens of that particular cross alone, by breeding for such, instead of continuing with the rotation. We wish to state here that care should be exercised in selecting the best hens as breeders. Always choose the healthiest, most contented, and best layers, and, whenever possible, select a cock bred from a good laying hen. In that manner, as with Jersey cows, quite an improvement may be made.

Among the pure breeds many excellent crosses may be made, the Cochin hens being excellent for that purpose, or hens from a cross of the Cochin on common fowls may be used if preferred, as

such hens will partake more of the characteristics of the sire than of the dam. A Brown Leghorn cock crossed on Partridge Cochin hens, or a White Leghorn cock on White Cochin hens produces hens that possess medium size, beautiful plumage, and heavy bodies. The advantages from such crosses are that the Brown Leghorn and Partridge Cochin are somewhat alike in color, while the same may be said of the White Leghorn and White Cochin. The offspring possess the activity of the Leghorns, the compactness of the Cochins, and do not crush the chicks as do the pure-bred Cochins, while they inherit largely of the laying qualities of the Leghorns. The produce may then be bred to a Game cock with advantage, the next season using the Cochin again. Always try to breed fowls of the same color and structure of comb together, when possible. A Leghorn makes a better cross with a Cochin than with a Brahma, while a Black Spanish or Black Leghorn does well with Langshan hens.

For capons there is nothing equal to a cross of the Colored Dorking on Partridge Cochin or Dark Brahma hens, and a very large fowl may be produced by crossing the Houdan with either the Cochins or Brahmas, and then breeding the offspring to a Plymouth Rock. Crossing the Houdan on a Langshan produces an excellent fowl, and a cross of the Wyandotte on Brahma hens is also a good one. A good cross for laying hens is a Dominick Leghorn on Plymouth Rock hens, the pullets to be kept for laying. If they are mated with a Plymouth Rock or Dominick cock the chicks will be very desirable for market. Here we may make a suggestion in regard to crosses. Mate a Plymouth Rock cock with a Partridge Cochin hen. Then mate the pullets from such cross with a Dominick or Brown Leghorn cock. Keep the hens for layers, but mate them with a Plymouth Rock cock, and you will have good market chicks from good laying hens. Cross a Houdan cock with Cochin or Brahma hens, and mate the offspring with a Langshan cock, and the result will be good layers and fine market chicks. In all crosses let the foundation be large hens, using a non-sitting breed for crossing with them, if compatible, followed by a larger breed, but keep as close to small combs and heavy fluffy feathering as possible.

Always endeavor to use only active, vigorous cocks. Do not be tempted to select the largest and heaviest cocks, unless of the small breeds, for they are usually too clumsy. The rule should be to use the small cocks of the large breeds, and the large cocks of the small breeds. Mate early hatched cockerels with old hens, and two year old cocks with pullets. Use no deformed or weak fowls for breeding

purposes, and do not keep the same cocks more than a single season. As we remarked, trim off the combs of the cocks and hens of the tall combed breeds. Cut them off when they are three months old, with a sharp implement, wash the heads with alum water, place a little tar on the head, and they will not be injured.

How to Manage.

What is most desired is for the hens to lay, and the eggs to hatch strong, healthy chicks. It is important, therefore, that the eggs for hatching be selected from the healthiest and most active hens. Hens in their second year are better for this purpose than pullets. See that the cockerel (which should not be less than ten months old) is heavy boned in the legs, broad across the breast, compact in body, and, above all, *strong, vigorous, and active*, for upon the vigor of the parents will depend the vigor of the chicks.

There is a point in poultry raising which should be carefully noted. It is that if you can manage to get your first pullets hatched in March, or even April, they will mature before winter sets in and begin to lay, but if hatched late, and they are overtaken by an early winter they will postpone laying till spring. If a pullet begins to lay she will keep it up until her clutch is finished, and then begin to sit. Consequently if she is an early pullet her chicks will also be early, but if she does not lay before the cold weather begins, *no matter how well grown she may be*, she will simply kill time by doing nothing, but will begin to lay early in spring, however. Such a pullet will also begin to moult early in the fall, and lose time again when eggs are high. Therefore, endeavor to get your pullets hatched as early as possible, but if you find you cannot do so you may try another plan, which shows the importance of a knowledge of the breeds. Suppose you find April passing over and no hens to sit, your chicks will not be hatched till May. You therefore remove your cockerels, should they be of the large breeds, and put Leghorn cockerels with your hens. As the Leghorns begin to lay when they are about five months old, the offspring from your hens will partake largely of the Leghorn characteristics, and will begin to lay before they are six months old, and such crosses will make excellent layers and good sitters. In fact, the eggs from a yard in which there is a Leghorn cock will in nearly all cases hatch, and it would not be a bad plan to have a yard especially for raising pullets. In that case cross a Brown Leghorn cock with Partridge Cochin hens. Then get a vigorous, strong, yellow-legged Pit Game cock (let him be as large as possible), and cross him upon your

Leghorn-Cochin pullets. It is the cross of the Leghorn-Cochin-Game that makes first-class hens, and the reason why we suggest such is that the hens will possess the early maturity of the Leghorn, the hardiness, feathering, and partly the size of the Cochin, and the courage, fine bone, and good table qualities of the Game, they being one-fourth Leghorn, one-fourth Cochin, and one-half Game. But if the climate is a cold one it will be better to use hens, one-fourth Leghorn, one-fourth Game, and one-half Cochin, as one-fourth Leghorn blood is enough, owing to their small size and large combs. Cross a Leghorn cockerel on Game hens, then, and next cross with a Cochin, which will make the breeding about correct if your Cochins are pea-combs. Breed so as to hatch pullets of such crosses every year, as you can easily do by having so many yards.

Having decided upon your hens, we must not forget that we admired the small combs of the Brahmas, so we may suggest that you may still carry the cross one degree further by breeding your crossed hens to a Brahma cockerel, and use the pullets as your layers, thus making them one-eighth Leghorn, one-eighth Game, one-fourth Cochin and one-half Brahma. The next point is the cock. Your hens will not only be good layers, courageous, hardy, and large, but you desire their eggs to produce good market chicks. We believe a vigorous Plymouth Rock will answer admirably, but sell all the chicks, and do not attempt to keep any hens except the cross decided upon—Leghorn-Game-Cochin-Brahma—as the chicks will be one-half Plymouth Rock. If the Plymouth Rock is clumsy, or inactive, use a Dominick instead.

Remember that the earlier a pullet is hatched, the earlier she will moult, and eggs are sometimes high in the fall. But she will not moult her first fall, and will begin to lay early the next winter, so keep the hens that begin to moult about August. Three months is the time usually required for moulting. If you fail to get your pullets early, then hatch them late, say in August or September, and they will begin to lay in May, and keep it up till the winter of their second year, or they may be sold when they begin to moult, if it is in January.

The quarters must now receive attention. Make the roosts all of one height, and have them so that you can take them outside to be cleaned. A good plan for a roost is to make a bench two feet wide, by using two boards a foot wide each, and six feet long. Put four legs to the board, the legs not to be over one foot long. Now make a roost six inches above the center of the board, fastened to a projection extending above the ends. This roost will, of course, be

fastened to the bench, at the ends. When the hens go to roost they will fly upon the bench, which will be only a foot high, and then upon the roost. The object is cleanliness, for you will then have only to pass along *every morning* and *brush* off the droppings from the board, scattering some dry dirt upon the board after brushing. Whenever you so desire, carry the bench outside, which of course includes the roost, it being fastened to it, and give it a swabbing with coal oil, which will prevent lice. The floor will, as a rule, be always clean, as the board will catch the droppings. Make two benches, which will give your fowls plenty of room on the roosts, or what is better, make your bench a yard wide, and fasten two roosts to it, which will be more convenient. You can then place your roosts anywhere you desire inside the house, as the bench will be movable. Clean out the henhouse (floor) twice a week, and under the roosts every day, always sprinkling dry earth after each sweeping. Once a month give a thorough washing, but do so on a dry day. *Cleanliness* is the *key to success.*

Six nests will be sufficient. They may be made of soap or candle boxes, one end being open, with the top, sides, back end and bottom untouched, with a strip in front to prevent the eggs from falling out. Such nests can be taken out and cleaned, which should be done at least once a week. Cut straw or hay is excellent for nests, and glass eggs should be used as nest eggs, as rotten or stale eggs breed lice should they be broken. The interior is now ready, and the yards must be considered.

The yards are the places from which the diseases come. They should be as dry as possible, and a sandy location is therefore best. If wet, run a tile drain under them. It is impossible to thoroughly clean a yard except by spading or plowing it, and this should be done as often as possible. While your hens are occupying the yards marked A, if it is early in the year, sow the yards marked B with mustard, lettuce and kale seed, mixed, or you may add a little orchard or lawn grass. As soon as it is an inch or two high turn in the hens, and sow seed on those marked A. There are a great many vegetables that may be utilized for their tops, such as radish, kale, mustard, lettuce, and you will find oats and rye good, as such crops are required to grow only two or three inches. Along in the summer try Hungarian grass, which grows very fast, while sorghum is also excellent. Remember, you do not have to mature your crops, which gives you an advantage. The first thing to do is to set out fruit trees, and no better tree can be used than the peach, which will give shade the second year, while it is a tree that thrives well under cultivation, thereby enabling you to secure a crop of

fruit from the same land that you raise poultry upon, while grape vines along the fences will be valuable assistants. Should you wish shade the first year plant squash seed along the fences, which grows quickly and gives excellent shade, especially for chicks.

The feeding should be done intelligently. Find out what you are feeding for, and reason the matter over in your mind while doing so. Let us go out together and feed them. We do not want the hens too fat, for they will not lay, nor do we desire them to be lazy, as they should exercise. We know that it requires certain material to make an egg, and that the hen will not produce anything except from the material that goes down her throat, and that material must be of the proper kind, and unless of the right proportion much of it will be useless. She is an egg machine, and we must provide the material. We use corn, because it is rich in carbon, as carbon is in large quantities in the yolk. We also need nitrogen for the white, and phosphoric acid, as well as lime. All the grains contain carbon, nitrogen, phosphoric acid and lime, but some contain certain elements or minerals in larger proportions than others. We know also that when a fowl has been on the roost all night it comes off in the morning with an empty crop, and should have food that will be quickly digested, while at night something solid is better. Now let us mix up a morning meal. We take one pint of corn meal, one pint of ground oats, one pint of fine bran (shipstuff), and mix it by scalding it, feeding it somewhat warm. If milk is plentiful put some in also, no matter whether it is skim milk or buttermilk. Than we add a handful of ground meat, if possible, and two spoonfuls of fine ground bone. A little ginger, cinnamon, or red pepper, will give it a relish, and we must not forget to add enough salt to make it somewhat seasoned, as fowls as well as stock need salt, but not too much. It would have been better, however, to have begun the preparation of the morning meal the day before, so we use a kettle and put in some water to boil. If the weather is cold we may cook a large quantity, as it will keep. In the water we put turnips, potatoes, finely chopped clover hay, an onion, or anything that answers as cooked food for poultry, and in the morning we take out enough for a meal and thicken it while it is being boiled, or heated, over again, with the mixture of ground grain spoken of. The food, therefore, will be cheaper and will consist of a *variety*. While feeding we do not limit so much feed to a certain number of fowls, but throw down the food as long as they will eat it up clean, but no more, nor do we throw it on the dirty ground, but in a trough, which should be long and shallow, so that every hen will be able to help herself without being

compelled to fight for it, and when they have eaten we clean the trough. We give no more till night, as we wish the hens to get hungry, so as to make them hunt about, or they will get lazy or too fat, and in order to induce them to scratch we throw in some leaves or cut straw, and into this, about noon, we scatter a very small quantity of wheat, oats, or millet seed. Anything that they will hunt for will answer. At night we give them all the corn they will eat, changing to wheat one night, then oats, and then corn.

The water is very important, and should be where they can always get enough, and it should be clean. In winter it will require some care, as it often freezes. In summer it should be in a cool place. There are drinking fountains that hold a gallon, which let out only as much water as is used. We fill the drinking fountain every morning, and add to each gallon of water a tablespoonful of Douglass mixture, which can be made by dissolving a pound of copperas in two gallons of water, and adding to the copperas water a gill of sulphuric acid (oil of vitriol). We may occasionally add a little charcoal to the soft food, as well as a little sulphur, or some condition powder. Once a week a feed of parched corn, oats or wheat will be found excellent, and as lime is required for the shells of the eggs, ground oyster shells, old mortar, or something of that kind, should always be within reach, as well as plenty of sharp gravel. Referring again to the food let us say something about meat. We know that meat is an expensive food, but it can be procured in a dry ground condition, but if that is not possible the liver and lights of a sheep or hog may be boiled with the soft food. Fresh blood from the slaughter house, cooked with the soft food, is excellent, and to show the importance of feeding meat we know of a poultryman who sold eggs at a time when the price was sixty cents a dozen, who stated that at that price he fed fresh beef at twenty cents a pound, and it paid him well.

A head of cabbage, or an onion or two, will materially assist in furnishing new green food in winter, and good tender hay, especially of clover, cut fine, and scalded with boiling water to soften it, answers well. The object in feeding a variety is to prevent bowel disease, and to keep the fowls in good health.

An excellent egg food for hens may be made as follows: Take of buckwheat, eight quarts; Indian corn, well parched, eight quarts; oil cake, eight quarts; oats, well parched, sixteen quarts; Egyptian rice corn, or wheat will do, eight quarts. Get the buckwheat, corn, oats, Egyptian corn or wheat ground together, then mix the oil cake in and add one pint slaked lime, one pint ground bone, five

tablespoonfuls capsicum. Put all the above ingredients together and thoroughly mix. This will make about two bushels of feed after being ground. Cook as much of this feed as your fowls will eat up clean at one time, and feed it in the morning, warm. Do not put in so much water that the feed will be sloppy, but have it dry enough that when thrown down it will break apart. Feed this food three times a week and not oftener.

If you have no milk for your fowls we will give you a substitute, which, though not exactly the same, may be said to be equally as valuable. Boil a quart of beans till thoroughly done to the consistency of a thin soup. Add a little salt, tallow and mashed potatoes while boiling; then thicken a little with a mixture of flour and oat meal. If the fowls do not drink it readily, thicken it to a dough with bran and corn meal, and feed. Milk contains nitrogenous matter, and so does bean soup. It also contains the phosphates, which is also a quality of oat meal. It is not always absolutely necessary to feed particular substances while we are able to procure the needed material in forms that bring them more easily within access.

In feeding, the poultryman has two obstacles to contend with, which are overfeeding and underfeeding, and let us first consider overfeeding. The large breeds, such as the Cochins, Brahmas, Plymouth Rocks and Langshans, grow for quite a long period before reaching maturity. While in the growing condition they do not take on fat very readily, but as soon as they arrive at the stage which is the turning point between the chick and the adult, it is a critical period with the breeder. They will then begin to fatten, and if they become too fat cannot nor will not lay. If they begin to lay before they get very fat, the service of egg production calls for nutrition, and the food is diverted in that direction, consequently the young hen will not fatten so easily after she begins to lay as if she had not commenced, but should she become over fat without laying it is a puzzling matter to the breeder how to reduce her in flesh again without injury. An over fat fowl is a nuisance, for, should it lay at all, the eggs rarely hatch, and if a few chicks come from them they will be weak and hard to raise. The hen herself becomes diseased, soon breaks down, and is an eyesore to the whole flock. The cocks are not exempt. When too fat they are unserviceable, impotent and sterile, and might as well be cooped up for all they are worth. In fact they really do damage by injuring the hens, and in no manner are they profitable except for market.

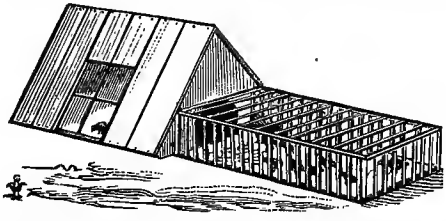
Underfeeding is another evil, not that we mean to infer that the

fowls are usually not supplied with a sufficiency of food, such as it is, but they may be underfed while reveling apparently in the midst of plenty. Exclusively corn is a terrible infliction to a flock, and actual physical suffering is the consequence when certain elements are lacking in the necessary requirements of the system when it is forced to produce a particular article from materials not adapted to the purposes intended. No kind of machinery is capable of weaving silk goods from hemp, nor can steam engines be built of cotton. A hen cannot produce eggs if lime is lacking, nor can she supply the growth of her own body when her product takes possession of that which should support herself. Nature gives her what we call an appetite, which is only an *indication* of that which she requires, and we are all familiar with the habits of most fowls, and notice that when we change the food they accept the new variety readily. Feeding is the art of supplying the *proper* food, not so much in quantity as in *quality*. If we watch the fowls they will easily tell us what they desire. If you are feeding corn throw down a handful of oats. If they greedily take the oats and leave the corn it indicates that they require something else. Try grass, meat, ground bone, pounded oyster shells, cooked vegetables, all of which they will accept or reject according to their requirements. Feed regularly, and never feed more than they will eat up clean. They will walk away from the food as soon as they have enough. Never leave it on the ground. Feed early and late, and let them get hungry, that is, have regular intervals between meals. The practice of keeping feed by them all the time promotes an excess of fat. Allow as much exercise as possible. Throw hay on the floor or in the yard, place in it a few handfuls of some kind of grain that they do not receive often, and let them hunt and scratch for it. Feed growing chicks liberally, avoiding too much corn. Oats ground and fed warm in the morning, is one of the best feeds that can be given. And we repeat, always give whole grains at night. In summer give no corn except once or twice a week. Vegetables and grass is much better for them. Laying hens must have meat or milk. Eggs cannot be produced without nitrogenous material in some shape. Bones are almost absolutely essential. Above all, however, give pure, clean, fresh drinking water.

HATCHING YOUNG CHICKS.

When the hen begins to sit keep her on nest eggs, after removing her to the sitting house, until you are satisfied she will not leave. Then give her the eggs, and always endeavor to have several hens begin at once, so that should but few chicks be hatched they may be given to one hen.

In setting a hen her nest should be warm in winter and cool in summer. Select medium size eggs, not too large nor too small, and the fresher the better. Ten are enough for the hens to cover in winter, and, in fact, at any time, as they will hatch as many chicks from ten eggs, on an average, as they will from thirteen, for they can cover them better. Do not place her in among the laying hens, but select a location for her where she will not be disturbed, and where she can eat and drink whenever she pleases, and provide also a dust bath, which is a very essential requirement of a sitting hen. Do not sprinkle or disturb the eggs, but let the hen attend to all the details herself. Only see that she has a nice clean nest, and she will know what to do. Here is a coop and inclosed yard which



answers well for the hen and her brood. If preferred, and the hen will agree to it, you may make her nest in the coop, placing her food, water, and dust bath in the little yard, but the coop should be under a shed, or protected from rains.

We also show a few designs of smaller coops. In Fig. 1, a frame is made of 2x4 inch light stuff for rafters, spreading two and a half feet at the bottom. The ends and rear are boarded, and the front has a foot-wide board at the top, with slats two and a half feet long covering the lower one and a half foot. The slatted side is turned toward the sun, but from it in very warm or hot weather. We add sketches made from a variety of other forms which we have seen at

various times in different places. Fig. 2 consists of boards two feet wide running a little over two similar boards on the other side to shed rain. The rear is boarded, and the front also about one-third the way down; the rest has lath nailed across at proper distances. A narrow cleat across the bottom and top holds each pair of side boards together. They should fit closely, or be tongued and grooved or battened to shed water. This is preferable to Fig. 1, as rains will drive in less. It is quickly cut and nailed together

FIG. 1. FIG. 2. FIG. 3.

FIG. 4. FIG. 5. FIG. 6.

without any frame. The engravings show different methods of closing and slatting the fronts. Fig. 6 is similar to Fig. 2, but is boarded at the lower front corners, and a hinged cover, shown turned up, is let down during very cold nights and in storms. The hinges may be bits of leather. The size in all these forms will depend upon the breed or size of the hen and room required. When skunks are troublesome, a bottom board will be needed, and strong slats. For ordinary use common lath will answer. An hour's work will make almost any of these forms.

When the chicks come out of the shells, clean the coop, putting in some finely cut straw. They will be safe from cats, hawks, and rats, and the yards may be made of any size desired. If the weather is cold, but dry, they will run in and out without injury, but the yard and coop must be *scrupulously clean*, and you will have no gapes or lice. In damp weather remove the yard, fasten the hen and chicks in the coop, and place the coop in a warm place, or you may take the coop and yard to a shelter. *Dampness is fatal* to young chicks—more so than cold. If you prefer it, you may make your yard still more comfortable, by stretching over the tops and down the sides a piece of bleached muslin, which will protect against winds and yet admit light.

Chicks raised in brooders are thriftier and grow faster than when they are raised by hens, but we will explain the matter some-

what, and show that they may be raised as successfully under hens. In the brooder the chicks are tenderly and carefully watched. They are fed and watered regularly, and they have a warm place to run into whenever they wish, while *dampness* never reaches them. When a hen has a brood she is allowed to go where she pleases, and the hawks, cats and rats have banquets upon the carcasses of the chicks. Then, again, there are always one or two chicks stronger than the others, and the hen will follow them in their active rambles. In the meantime those that are weak perish simply because the hen is too much occupied with the strong chicks to nestle her brood. The consequence is that a hen may hatch eight chicks, which for a day or two, when kept under the eye of the mistress, seem strong and bright, but when the hen begins to carry them about she comes up with a chick missing; then, in a day or two, with another one gone, and so on until the three or four stronger ones, which now have no competition, and can get all the heat, battle through the difficulty and are sent to market. What you should do is not to allow the chicks to range until they have changed the down to feathers, or rather, until they are at least a month old. Do not allow the hen to get out of the coop, but make her stay there so that each chick may get under her whenever it wishes to do so. On damp days they must only be allowed in the little yards or runs long enough to feed. Keep them in, for the damp chilly atmosphere is equal to a rain, and worse than dry cold. Keep each brood separate from the others as much as possible.

One of the difficulties with young chicks is that, though they are fed on a variety of food, and all the conditions are observed, they become constipated or have the diarrhœa. This is because at some time or other they have become chilled. If once a chick becomes in the least degree chilled, even for a few moments, and especially from dampness, the bowels become affected. The vent becomes clogged with adhering matter sometimes, which makes it difficult for them to pass the refuse. Clean them by washing in warm water, wipe the parts very dry, and grease with a drop of lard. Do not grease too much, as grease is injurious to chicks, and once again, remember, the coops and yard must be cleaned *every day*. By so doing there will be little or no loss, and instead of estimating on four chicks from a hen we may probably average seven, which nearly doubles the profit, making a large difference when we calculate for one hundred hens.

The gapes is the worst disease among chicks. It *never appears* when the chicks are fed from little troughs, and their coops and runs are *clean*. Damp and cold days sometimes assist it. The best

cure is to put a tablespoonful of spirts of turpentine in a pint of corn meal, mix with warm water, and feed. If the chick is too sick to eat put a drop on a pinch of meal, mix to a soft consistency and cram it down the throat, or put a drop in a few drops of milk and pour down the throat, but handle the chick gently. One or two doses will generally cure, but if not, then it will be necessary to try a last resort—life or death. Get a little box, such as a pill box, and cut a hole so that the head of the chick may get in the box with the body outside. Now take a sulphur match, stick the end in brimstone, light it, and burn it in the box, closing the top so that the fumes of the sulphur will be breathed by the chick. Keep the head in the fumes, but not too long. Put the chick in fresh air, in a warm place, and it will begin to improve. The same may be done with a mixture of pine tar and turpentine.

Although we have made the statement before, we will repeat here that the earlier chicks, that get into market in January, February, March and April, are known as "broilers," and sell best when not over a pound in weight. The price is then anywhere from sixty cents to $1 per pound. Sometimes even three-quarters of a pound is a better weight than a pound. They seem to remain at that uniform price for the entire chick until grown fowls reach the market. That is, they sell at about seventy-five cents per pound when a pound in weight. Then, afterward, along in May, the preferred weight is one and a half pounds, the price being usually about fifty cents per pound, or seventy-five cents for the chick. As June approaches those of two pounds weight become more saleable, the price being in the neighborhood of thirty-seven and one-half cents per pound, the seventy-five cents per chick still being maintained. And so the figures and weights keep apace, in contrary directions, until late in the fall, when the grown fowl of eight or nine pounds goes to market and brings about seventy-five cents. Of course, we may not be very exact in regard to the figures, as locations, markets and other causes may vary them in either direction, but it requires only a glance to show that the profit is in the *early* chicks. It is safe to state that one hundred chicks, when hatched, will weigh (together) five pounds, and they double in weight every ten days. Thus, at the end of ten days one hundred chicks, weighed together, should weigh ten pounds; at the end of twenty days, twenty pounds; thirty days should make forty pounds, and at the end of forty days, eighty pounds. After forty days they do not double, but grow rapidly, and sometimes weigh two pounds each when ten weeks old. The one hundred chicks will eat as many quarts of cracked corn, or its equivalent, per day, as they are weeks

old. Or, in other words, they will consume one quart daily the first week, two quarts the second, three quarts the third, and so on to the tenth week, when they will have reached ten quarts. Thus, we have about thirty-eight quarts of feed for ten chicks ten weeks or a little more than a bushel, which we may value at $1. The cost of a chick, then, is one cent a week for ten weeks, or ten cents. As the earlier ones are sold before they reach the age of ten weeks, the cost is less.

Chicks come from the shells well fed by nature, as they absorb the yolks a few minutes before coming out. They therefore need no feed for twenty-four hours, and even thirty-six hours. It is best not to feed them until they are about thirty-six hours old, as the rest and warmth will by that time have given them strength and activity. The first meal should be the yolks of hard boiled eggs, and the eggs should not be too stale. Lay the whites of the eggs aside and feed to them for a change the next day. Be sure that the pieces are fine, in order that the chicks may easily pick them up. When the chicks are two days old, change the food to bread crumbs, moistened with milk, and allow coarse oat meal also. Continue this feed until they are a week old, giving a little chopped lettuce or cabbage once a day. If bread crumbs are not convenient, which is often the case when there are large numbers of chicks, make a thick porridge of oat meal and rice, mixed, cook well, and let it become old. Now beat up an egg in milk or buttermilk, or even hot water, and add to the porridge. Thicken the porridge, while being warmed, with corn meal and feed to them. It must be borne in mind that no food is good for young chicks if continued, and hence it should be varied. After they are a week old they should be given screenings, coarse oat meal, cracked corn, millet seed, sorghum seed, broken rice, or any other hard food that they can eat, but the soft food should also be given at least twice a day. Be cautious about feeding too much hard-boiled eggs. Give them plenty of clean water to drink. Twice or three times a week, if convenient, after the first week, feed finely chopped meat of some kind, avoiding salt or pickled meats, but always put a little salt in the food; feed the meat cooked. When green stuff is not procurable, a few onions (with tops), lettuce, cabbage or young rye, chopped fine, will be relished. Once a week parch some wheat, screenings, ground oats, or even corn meal, and feed to them, the meal being moistened. Allow them also some fine sand and gravel. The chicks should always be induced to scratch, by placing fine dirt, coal ashes, or something in which they can work, in the runs for them.

When giving them water, add twenty drops of the Douglass ixture to every gill of water, and also put some bone *meal* (about a aspoonful) to each half pint of food. Ground oyster shells, sand d gravel should also be convenient. As a chick, when growing, s to furnish materials for feathers, which appear rapidly on the dy, a neglect of a single meal is sometimes fatal, therefore feed ur or five times a day, but do not leave food to ferment, as it will eed gapes and bowel disease. Milk, either sweet or sour, is cellent for them, but should be changed at least once a day, and e vessel cleaned. Whitewash the inside and outside of the coops d runs once a week with whitewash, to which has been added rbolic acid, coal tar, or coal oil. Weak legs in chicks is caused by eir rapid growth. It is not dangerous. Warmth, a little meat d bone meal, with milk in the soft food, will soon bring them ound safely.

The best breeds for broilers are the Plymouth Rocks, which are ry compact, the Brahmas, which grow very rapidly, and the chins and Leghorns. All of these breeds, including also the yandottes, have yellow legs, which a large number of buyers efer, but which is only a notion. We find young Brahmas which ve been well fed to weigh three-quarters of a pound at four eks old (one weighed a pound), the Plymouth Rocks averaged an nce less, and the Leghorns an ounce less than the Plymouth cks, but the Leghorns often look nicer than the others, because being so well feathered, and our opinion is that they make as od broilers as any, despite all claims to the contrary, and up to e weight of a pound are but little smaller than larger breeds of e same age, though they may not increase as rapidly as the others er that period. A good plan to hatch early broilers when the ather is favorable is to do so in the fall, and in order to prevent em growing too fast, use Game Bantam cockerels with small com- on hens. The cold weather will also prevent them from growing ich, and they can be placed in market almost at any time. For icks use pure-bred males at all times. Never attempt to raise rket chicks from crossed or scrub cocks. It is a costly and pensive way of breeding. The hens may be common, crossed, ge or small, but use only the purest-blooded Plymouth Rock, ghorn, Wyandotte, Brahma, Dorking, Cochin, Langshan, Game Houdan cocks. Black Hamburgs, Black Spanish and such like e not suitable for broilers.

In regard to early chicks we will state that we priced them in e retail markets of Chicago the latter part of April and first part

pound broilers. This is at the ratio of $1.50 per pound, and the chicks were not over six weeks old. They should have weighed more than half a pound at six weeks of age, but they were *scrubs*, and consequently cost more than would have been the case with more highly bred chicks. We weighed a few chicks hatched in an incubator, and they averaged three-quarters of a pound when twenty-eight days (four weeks) old. As the season advances, however, such small sizes are not saleable, those of one and one and a half pounds being preferred. As we stated, it costs only one cent a week to raise a chick to the age of ten weeks, and as we have known them to weigh two pounds each at ten weeks of age, they return a profit even when hatched in the summer. A good way to get them early is by the doubling up process, which is easily done where there are so large a number as one hundred hens. It is to make the hens sit a week longer in order to get more chicks. When a number of hens are inclined to sit about the same time (for instance, three), put ten eggs under a hen, especially in winter. You will thus have thirty eggs under three hens. At the end of a week or ten days test them, throwing out every egg that will not hatch. You may have, after discarding the bad eggs, say twenty good eggs. Place them under two hens, and start the deprived hen again with two new sitters, repeating the process at the end of another week, care being taken not to deprive the same hen but once. By this plan the majority of the hens will be four weeks instead of three on the nests, and nearly al the eggs will hatch. It is not as cruel as making them stay on the nest six weeks, to hatch two broods, whether the eggs are fertile or not.

To test eggs use an egg tester. Make a square box of wood or pasteboard, with the bottom left off. Cut an oval-shaped hole the size of an egg on one side, and cut a hole in the top so as to allow a lamp chimney to pass through. Put the box over a lamp, the chimney passing through the hole on top, and carry the eggs and lamp into a dark room. Hold each egg to the oval-shaped hole, excluding all light except that passing through the egg. If the egg is perfectly clear it contains no chick. If dark it has a chick within.

The reason why eggs sometimes fail to hatch is because the difficulties are of a character that cannot be discovered, but much depends on the conditions regarding the management of the laying hens. If a hen is very fat, she will lay but few eggs, and the eggs from such a hen will often fail to hatch. When cocks are allowed to range with too many hens, the vitality of the chicks is lessened, and they die in the shell. Fowls that are fed under a forcing process

produce weak offspring, and those that have been bred in-an-in are not to be relied upon to give good hatches or produce healthy chicks. The hen that steals her nest is generally successful, but why this is so has been a puzzle, not only to the farmers but to scientific men as well. One thing we know is that her eggs are never disturbed, and they are surrounded only by the pure and uncontaminated atmosphere. When we place eggs under a hen, we know nothing of them, as a rule, and if they contain fertile germs it is only a matter of guess with us in selecting the best, but the hidden hen's eggs are always impregnated. The nests should be secluded and in a place which will be secure from the approach or intrusion of man or fowl, with the surroundings free from all impurities or odors, and every convenience afforded in the way of dusting, food and water. We handle eggs too freely, approach the nest too often, and disturb the sitting hen when she should be easy and quiet. There are birds that abandon nests after the eggs have been disturbed, and this may partly teach us to place the sitting hen alone by herself, with freedom of action, the eggs being from good, strong hens, of which only a few have been mated with a vigorous cock. Avoid setting hens that are nervous or quarrelsome. Such hens are never careful, and break their eggs, as well as trample the young chicks to death. A medium-sized hen is the best, and, of the different breeds, the Brahmas and Cochins are the most persistent sitters.

One of the curious problems with some breeders is that late-hatched chicks do not thrive. It is because they take advantage of the fine weather and put too much confidence in the hen. We therefore repeat that when the earlier chicks come the weather is cold and they receive more care. Another reason is that in the early spring but little grass is up and the ground is clean, the chicks not getting wet so easily. Cold does not injure young chicks in winter or spring as much as the damp grass in summer. Dampness is fatal to young chicks, even in the month of July. It does not necessarily cause them to appear droopy at first, but about the next day the bowels will show indications of being disordered, and the chick will appear as if having been wet and partially dried, though the true ailment is cold in the bowels. The best remedy is a teaspoonful of castor oil, mixed with one-fourth of a teaspoonful of coal oil, to each dozen chicks, in soft food, if they will eat, and if they refuse, mix with a little milk two or three drops of castor oil, and one of coal oil, for each chick, and pour down the throat.

We will not omit calling attention to the fact that when hens

are kept in large numbers in one apartment they cannot be counted except with difficulty, and the same may be stated in regard to chicks. By dividing into flocks, however, and also keeping each brood of chicks separate from the others, we can arrive not only at a knowledge of the loss, but discover the cause, and we assure you that this advantage alone is a very important one in raising poultry.

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MISCELLANEOUS POULTRY.

Turkeys.

Cross a Bronze gobbler with common hens, and allow six hens with each gobbler as a limit, though fewer are better. Each hen will lay from twenty to forty eggs, according to management. The period of incubation is thirty days. Sixteen eggs constitute a sitting for a hen. Allow the young ones no food for twenty-four hours. Then feed often (but avoid overfeeding), giving food at least every two hours until they feather. The reason of this is that the growth of feathers on young turkeys is very rapid, and demands a constant supply of nutrition, hence a single omission of food for a few hours sometimes proves fatal. The feed at first should be coarse corn meal, which is added to a mixture of milk and eggs. This should be cooked, and an onion chopped up and added to it. After they are three days old, feed mashed potatoes, chopped onions, ground oats and egg, well mixed with milk, and cooked. Milk is always excellent. After they are a week old the egg may be omitted, but a proportion of cooked meat and a little ground bone should be allowed. They may then be allowed grain of all kinds (corn being ground) cooked vegetables and milk. The water should be fresh and clean, one-quarter of a teaspoonful of tincture of iron to be given in every pint of water.

One of the secrets of raising young turkeys is never to allow them to get wet, or chilled. The damp grass is fatal. Keep them in a coop with the hen for three or four days, and then allow them to ramble with her *on dry days only*, keeping them in a roomy place on the approach of damp weather. They cannot be confined like chicks, as it is not their nature, but if carefully watched until they are beyond danger they are very hardy and can take care of themselves. Do not attempt to raise turkeys unless you have ample room for them to forage upon, as they are fond of straying off to long distances, and easily fly over the highest fences. Keep the

male away from the hens while the latter are sitting, or he will eject them from the nests. When on the nest the hen sticks closely, and will nearly starve before she will leave it, consequently her food should not be neglected. Turkeys are subject to the same diseases as chickens, and the remedies in the case of one apply to the other.

There are seven varieties of turkeys—the Wild, Bronze, Narragansett, White, Black, Buff, and Slate, the Bronze and Narragansett being the largest in size, sometimes attaining the weight of forty pounds. All varieties prefer to roost in trees, but may, by being hatched under barnyard hens, be taught to roost in the poultry houses.

Geese.

A goose will lay about twenty eggs, but may be induced to lay as many as thirty if she is removed from the nest, and with good management will hatch two broods. A large goose will cover at least a dozen eggs, and she usually begins to lay about the middle of February or duriug March. The gander is a faithful attendant, sometimes, keeping close to his mate while she is incubating, for the purpose of driving away intruders. The period of incubation is about twenty-nine days. Grass is highly relished by geese, and they may be pastured, but such locatious should be of a character suitable for close cropping, as geese endeavor to eat tops and roots together. They are very voracious, and eat of anything that is fit for food.

They may be plucked for feathers two or three times during the summer, and will yield about a pound of feathers per annum, worth from sixty to seventy-five cents. Geese will pair if the proportion of sexes is equal, but three geese may be permitted with one gander as a limit. They are easily restrained within enclosures by clipping their wings.

There are eight varieties of geese—the Wild, Toulouse, Embden, African, White Chinese, Brown Chinese, Egyptian, and Sebastopol. The Toulouse and Embden are the largest, and sometimes weigh sixty pounds per pair. The latter is entirely white, and also more prolific than some other breeds. A cross of the Toulouse gander with the Embden goose makes the largest bird for market. The other breeds are more ornamental than useful. The management of goslings should be similar to that of young ducks.

Ducks.

The breeds of ducks consist of the Aylesburg, Rouen, Call, Cayuga, Muscovy, Crested, and Pekin, though the Call and Muscovy

are of two colors, divided into White and Colored Muscovy, and Gray and White Call ducks. The largest is the Pekin, which averages about twenty pounds per pair, and the Rouen, which often weighs eighteen pounds per pair. Ducks derive fish and aquatic plants from the water, and worms, seeds and grains on the land, and consequently are not very dainty, grass also being accepted. One drake with three females may be allowed. The period of incubation is four weeks. The Pekins may be kept in yards with no running water, provided a trough be allowed them for bathing purposes. Ducks will average from seventy to one hundred eggs per annum, though instances are known in which they have laid as many as 150. They do not lay as well in confinement, however, as when in freedom.

The ducklings should not be allowed near the water until the down has changed, nor even in the wet grass, as *dampness is injurious to young ducks* If allowed on ponds where turtles exist they will be destroyed. When hatched feed nothing for twenty-four hours. Then give boiled oat meal and corn meal, mixed with milk and eggs. After the second day a piece of meat, boiled to pieces and thickened with oat meal, should be given three times a week, adding to the mess chopped grass, cabbage or onion. Cooked vegetables are excellent, as also bread soaked in milk. Feed on clean places, and give the food and water in shallow dishes. After they are two weeks old give anything that they will eat.

Ducks will lay in the water, while swimming, but in the house usually lay at night. The best cross is the Muscovy drake with large common females, but the offspring will be sterile. The Pekin is the most domesticated, and lays the largest number of eggs, while the Aylesburg is the next in prolificacy. Both breeds are white, the bills of the Pekin being yellow and those of the Aylesburg flesh-colored. The Rouens are the most beautiful. Young ducks grow very fast, and are very saleable. When they have eaten full meals at evening, care must be taken that they do not go into the house until they have been provided with plenty of water. In fact they must never be in any enclosed place without plenty of water being within reach. As they often lay for awhile before showing any inclination to sit, the hens may be used for hatching the early broods. Seven eggs are sufficient for an average-sized hen. Sprinkle the eggs daily during the last two weeks of incubation. Nine eggs are sufficient for a duck when she begins to sit. Set duck eggs in nests on the ground always. Eggs from young ducks do not hatch as well as those from older ones. As ducks do not scratch they do but little damage in a garden, unless they have been

deprived of green food for awhile, when they will then eat the young plants. They may also be plucked for their feathers as with geese.

Guineas.

There are two kinds, the Pearl and White Guinea. The Guinea is a great rambler, and does not desire her nest to be known, which may also be said of the turkey. They do not roost in the fowl-house if they can find trees, and if frightened, or treated unkindly, become very shy. A Guinea hen usually lays about one hundred eggs per annum, and the period of incubation is four weeks. Young Guineas are fed in the same manner as young turkeys, but, as they feather very rapidly, must have their meals often, an omission being sometimes fatal. They cannot be confined, and should have their liberty as soon as possible, but must not be permitted on the damp grass. The eggs are claimed to be very rich in flavor, and if one has plenty of room, they are very profitable. They are monogauous, and mate, but two or more females may be allowed to one cock. They do not scratch, and inflict no damage in gardens. They create an alarm on the approach of intruders at night.

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PRESERVING EGGS.

As many persons would like the recipes for preserving eggs given in a book form, we present them here for a reference. There are a great many methods suggested for this purpose, and we will give not only the plan we pursue, but the experience of others. The best of all preservatives is sulphur, but as sulphur will not dissolve in water we convert it into a gas by combining it with oxygen, forming what is known as sulphurous acid gas (not sulphuric), which is done by simply burning it. In order to test an experiment take one dozen eggs and break one every month, which will enable you to know exactly how long they will keep under any process. We will say this much in the beginning, however, which is that eggs so packed in a box as to permit them to be turned over daily will keep twice as long as those not so treated. By packing them in a box with oats as a filling, and then turning the box upside down, a large number can be turned at once. Another point is that eggs from hens that are confined in yards without the companionship of cocks keep better than under the reverse conditions, or rather, infertile eggs keep better than those that are fertile

Supposing the reader intends to try one dozen eggs as an experiment, one of which is to be broken each month for a year (of course a larger number may be used if preferred), we will give

The Sulphur Process.

Take a common starch box with a sliding lid. Put the eggs in the box, and upon an oyster shell or other suitable substance, place a teaspoonful of sulphur. Set fire to the sulphur, and when the fumes begin to rise briskly, shut up the lid, making the box tight, and do not disturb it for half an hour. Now take out the eggs, pack in oats, and the job is done. If the oats or packing materal be subjected to the same process it will be all the better. If a barrel full is to be preserved place the eggs in a tight barrel two-thirds full, with no packing whatever. Fire a pound of sulphur upon a suitable substance, on top of the eggs in the vacant space over them, shut up tightly, let stand an hour, and then take out the eggs. As the gas is much heavier than the air it will sink to the bottom, or, rather, fill up the barrel with the fumes. In another barrel or box place some oats, and treat in the same way. Now pack the eggs in the oats, head up the barrel, turn the barrel every day to prevent falling of the yolks, using each end alternately, and they will keep a year; or, according to the efficiency of the operation, a shorter or even a longer time. It will be seen by the above that the process is a dry and neat one, and very inexpensive, sulphur being a very cheap article.

Meats, fish, fruits and vegetables may also be preserved with sulphur in the following manner: Take a piece of fresh beef, a fish, or anything that will quickly decay. Place it at one end of a close box and burn a little sulphur at the other end. The beef or fish will absorb the sulphur fumes. Keep the box closed half an hour, then take out the beef or fish, hang it up somewhere (cellar, out of doors, or anywhere) and our word for it that you can let it hang up a year without the slightest odor or signs of decay. The first three days there will be a slight odor of sulphur, which passes away. The meat may dry up gradually, but will not spoil. Placing it in a pot of boiling water at once disengages the sulphur, and it passes off. It is perfectly harmless. In fact it is best to treat all the meats used in the family in that manner, even when wanted for immediate use, as the meat, even if from diseased animals, will be purified from disease germs.

All substances, such as meats, fish, eggs, etc., are preserved with the sulphur without water. If you wish to preserve peaches, tomatoes, or other fruits and vegetables, do it in this way: Take,

say peaches, and put the peaches in one end of a box, and a wide bowl of water at the other end. Burn the sulphur as before. Water absorbs sulphur gas rapidly, and the bacteria are destroyed. In the meanwhile the peaches will also absorb it. Shut up the box, keep it closed fifteen minutes, then repeat the process, allowing the box to remain closed the same length of time. Now place the peaches in a jar, pour the sulphurized water over them, tie a piece of *paper* over the top to keep out the dust (no sealing is necessary) and your peaches will keep till the next crop comes and even longer.

Fruit is not affected by the gas, and with the exception of a partial absorption of water, may be had thereby in the natural condition, though a few highly colored berries (such as blackberries) may be bleached a little. Cider may be kept sweet for years by burning sulphur on a floating piece of wood on the top of it, and dried fruit may be made white, and will keep better from its use. A corpse may be kept a year by the dry process, and the clothes of small-pox, yellow fever, or cholera patients may be worn with impunity after being submitted to the process. All forms of fermentation, germs of disease, bacteria, or invisible organisms yield to its power, and if the water which has been used to absorb sulphur gas be used as a gargle, or drank, it will be found a splendid specific for diphtheria, or other contagious diseases, besides being excellent in cases of roup and cholera in fowls. Its wonderful powers of preservation entitle it to be named the destroyer of diseases, for decay and putrefaction are the same as diseases. Should you have any difficulty burning sulphur, melt it in a small pot or crucible, and then draw a lamp wick through it. When wanted for use cut off a piece of the wick. The reason why sulphur does not burn freely at times is because it melts and smothers the flame.

The Pickle Process.

Take twenty-four gallons of water, put in it twelve pounds of unslaked lime and four pounds salt. Stir it well several times a day, and then let it stand and settle until perfectly clear. Then draw off twenty gallons of the clear lime and salt water. By putting a spigot in the barrel about four inches from the bottom you can draw off the clear water and leave the settlings. Then take five ounces baking soda, five ounces cream of tartar, five ounces salt peter, five ounces borax and one ounce alum; pulverize these, mix and dissolve in a gallon of boiling water, which should be poured into your twenty gallons lime water. This will fill a whisky barrel about half full, and a barrel holds about 150 dozen eggs. Let the water stand one inch above the eggs. Cover with an old cloth, and

put a bucket of the settlings over it. Do not let the cloth hang over the barrel. After being in the liquid thirty days the eggs may be taken out and packed in boxes and shipped. Do not use the same pickle but once. You need not wait to get a barrel full but put in the eggs at any time. As the water evaporates add more, as the eggs must always be covered with the liquid. It does not hurt the eggs to remain in the pickle. It is claimed that this process will keep them a year.

The Scientific American Process.

Having filled a clean keg or barrel with fresh eggs, cover the eggs with cold salicylic water. The eggs must be kept down by a few small boards floating on the water, and the whole covered with cloth to keep out dust. If set in a cool place the eggs so packed will keep fresh for months, but they must be used as soon as taken out of the brine. To make the salicylic solution, dissolve salicylic acid (which costs about $3 a pound) in boiling water, one teaspoonful of acid to the gallon. It is not necessary to boil all the water, as the acid will dissolve in a less quantity, and the rest may be added to the solution cold. The solution or brine should at no time come in contact with any metal. In a clean, airy cellar one brine is sufficient for three months or more, otherwise it should be renewed oftener. For that purpose the kegs, etc., should have a wooden spigot to draw of liquid and replenish the vessel. Butter kneaded in the same solution and packed tight in clean stone jars will keep fresh the whole winter, but must be covered with muslin saturated in the water, renewing it sometimes. Cover the jars with blotting paper saturated with glycerine. Salicylic acid is harmless and yet one of the best and certainly most pleasant disinfectants in existence, with no color nor taste. The water is an excellent tooth wash and the best gargle to prevent diphtheritic contagion.

The Boston Globe Process.

An Illinois correspondent writes: "Last summer I was induced to try packing down eggs for winter use. I had in seasons previous limed them, but a limed egg is not altogether to my taste. Last summer I took sweet, clean kegs, set them in a cool, dry place, with a barrel of powdered dried earth near at hand. In the kegs I placed a layer of this earth, then a layer of eggs, small end down, then a layer of earth, and so on until the kegs are filled. These eggs were quite good six months after packing down. By placing the eggs small end down the yolk is prevented from dropping down on the

end and settling on the shell, while the dry, fine earth keeps them from the air. I suppose that ashes, or bran, or any other fine, dry substance, is as good as the baked earth, but I write only of what I have actually experimented with." Eggs will also keep well if salt, instead of dry earth, be used.

Eggs For Hatching.

To preserve eggs for hatching purposes is a risk, as fresh eggs are always best. They should never be greased or placed in any compound that closes the pores of the shells. Put the eggs small end downward, in layers, no egg touching the other, using a *plentiful supply* of clean, dry wheat for packing. By turning over the box in which they are packed three times a week they will keep better. Each egg may be wrapped in tissue paper with advantage. Keep them in an even temperature.

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DISEASES OF POULTRY.

The two diseases that cause the greatest mortality among fowls are cholera and roup. The former seldom appears where strict cleanliness is observed, and especially if the yards are frequently spaded. The latter comes from dampness. When the fowls seem chilly and cold, especially on damp days, roup will be the result. It is to fowls what heavy colds are to human individuals, and as we may have cold in the head, cold on the bowels, sore throat, and other disturbances from cold, the term "roup" covers them all. Roup in some forms is contagious, while in other shapes it may exist in a flock without affecting any but those of weak constitutions. The first thing to do with the affected fowl is to clean out the nostrils, and every breeder should have on hand a small syringe, or sewing machine oil can, which should be put to use early. Roup, when malignant, makes known its presence by a peculiar, disagreeable odor. The sick fowl looks droopy, and a slight pressure on the nostrils cause a discharge, which is very offensive in smell. Make a strong solution of copperas water, and put a teaspoonful of the solution to a gill of water, and with the syringe or oil can inject some of it into the nostrils, and also down the throat. Another excellent wash which may be used in place of the foregoing, in the same manner, and without fear of injury to the eyes, is the solution of chlorinated soda (Labarraque's solution) diluted with four times its bulk of water. In this and all other diseases, much is gained by

taking the case in hand at the earliest stage. If the bird is no better in a few hours, try a severer remedy, which is the injection of a mixture of coal oil and carbolic acid. Mix ten drops of carbolic acid, a teaspoonful of coal oil and a tablespoonful of lard together. While warm force a small quantity (about a drop) into each nostril. This will cure when all other remedies fail. Night and morning give roup pills (or powder) either in the food or by forcing it down the throat. Add some, also, to the food of those that are well.

To make roup pills take one teaspoonful each of the tinctures of iron and red pepper, and to this add half a spoonful each of ginger, saffron, chlorate of potash, salt and powdered rhubard, with two teaspoonfuls of hyposulphite of soda. Mix together well. Incorporate this with one ounce of asafœtida, working it together until the whole is completely mingled, occasionally softening it, whenever necessary, with castor oil. This may be made into pills, or when dry, into a powder.

Cholera is a bacterial disease, the germs of which enter the system and rapidly multiply, causing blood poison. The liver is the part principally affected, and the disease is highly contagious, for the reason that the bacteria are ejected in the droppings and in other ways, the healthiest and most robust being equally subject to the disease with those that are feeble. It may be brought into the yards, or may arise from filth. The first thing to do when the disease makes its apperance is to disinfect the premises. This may be done by adding an ounce of sulphuric acid (oil of vitriol) to a gallon of water, and sprinkling it freely over the yards, roosts, nests and the floors. Chloride of lime is also excellent and may be used freely. It will affect the fowls slightly, but will be more beneficial than otherwise. A solution of chloride of lime in water may be used in place of the acid if preferred. The sick fowls should be at once removed from the others. They may be known by evincing a nervous, anxious look, drooping spirits, great thirst, and greenish droppings. There have been many remedies, but it is conceded that hyposulphite of soda is the best agent as a cure for cholera, and therefore one of the best remedies for cholera in severe cases is hyposulphite of soda, four parts; boracic acid, two parts; extract logwood, two parts; mandrake root, one part; red pepper, one part; rosin, one part; pulverized rhubarb, one part. The above is a combination of substances that have been tried and found excellent. Give each fowl a teaspoonful, and repeat every hour until relieved. It is a strong purgative, and as soon as the fowl appears better give it a few drops of tincture of iron, with a pinch of

quinine, in a spoonful of warm water. As soon as it begins to eat, feed at first on stale bread and milk, with a small quantity of condition powder. We must not omit to mention that we have known many instances in which a half teaspoonful of coal oil mixed with the same quantity of castor oil proved an excellent remedy.

An excellent condition powder and egg food may be made as follows: Take four pounds ground dry meat, two pounds ground bone, one pound ground oyster shells, one pound fenugreek, one-half pound of salt, one-half pound of ground cinnamon, ginger or black pepper (any kind of spice will answer). Mix the above thoroughly. Now mix in a separate dish one ounce each of sulphur, copperas, bread soda, saltpeter, hyposulphite of soda and red pepper. When these are well mixed add to the above, well mixing the whole. Now parch two pounds of ground oats and two pounds cracked corn, mix and add to the above. You will then have about fifteen pounds of poultry food, at a cost of about fifteen cents. Feed a tablespoonful daily to each fowl.

To rid chicks and fowls of lice provide a good dust bath. If the quarters are kept clean the fowls will keep themselves clean with dust. For dusting on the bodies take flowers of sulphur, five pounds; carbolic acid (liquid), one drachm. Rub the acid in the sulphur thoroughly with a small paddle, and apply through the fluff and feathers of the hen with the hand, and it will effectually remove all kinds of vermin from your fowls. It is thoroughly effectual, and at the same time. a safe application, as it will not interfere with the hatching of eggs nor endanger the life of the chicks. Persian insect powder is also excellent.

Scurvy legs may be cleaned by rubbing the legs two or three times (once a week) with lard and sulphur, to which a few drops of carbolic acid have been added, or with a mixture of lard and coal oil; but do not grease sitting hens in any manner, as it injures the eggs.

A tonic for general debility may be made by dissolving a teaspoonful of tincture of iron in a gill of water, adding a teaspoonful of quinine, and the same each of spirits of camphor, brandy and tincture of red pepper. Shake well and give four or five drops on a small piece of bread to a chick, and half a teaspoonful to an adult. For diarrhœa add a drop of laudanum to the dose for a chick, and three drops to that for adults.

One of the best remedies for all diseases is warmth. Whenever a fowl is sick remove it to a warm place, near a stove, or in a sunny location. There is nothing so invigorating to a sick fowl as heat,

and give rich food, tonic and condition powder to hens that are moulting, keeping them warm especially.

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CONDENSED ITEMS OF INTEREST.

Under this heading we have undertaken to crowd a large amount of valuable information in a small space, intending it as a means of reference, and in so doing we thereby present that which is to be found in large-sized volumes. We do not claim that it is complete, but believe the reader will gain many practical hints and ideas, a single one of which may be worth ten times the value of this little book:—

DON'T crowd too many fowls together. Allow at *least* three square feet of room in the poultry house for each fowl. Thus, ten hens will require thirty feet, or a house 5x6 feet.

TEN hens may be mated with a cock of the small breeds, and eight, or *less*, with the larger breeds.

A YARD sixteen feet front and one hundred feet deep will accommodate a flock of ten.

CLEANLINESS is absolutely essential to success, as disease will thereby be avoided.

TO SECURE strong chicks use a cockerel of medium size, at least one year old, and mate him with six large, healthy, two-year-old hens.

EGGS from pullets do not hatch as well as those from hens.

IF pullets are used mate them with a two-year-old cock.

IN setting the hens let the nests be on the ground, in a cool, moist place in summer, but in winter have it as snug as possible.

TEN eggs under a hen will give better results than a larger number.

SELECT small or medium-sized hens for sitting, as they will not break the eggs so easily as will large hens.

ALWAYS make the nests so that the hens can *walk* in upon them, and never in a barrel, or where they will have to jump down upon the eggs.

THE roosts should be upon a level with each other, and low, and not with those at the rear higher than those in front, or the hens will crowd, as each wishes to get as high as possible.

DO NOT feed hard-boiled eggs to chicks more than two days at any one time, as it will cause diarrhœa.

In selecting the breeding stock, first cull out the inferior fowls, then choose from the remainder. Be guided by small combs, heavy feathering, bright eyes, red combs, clean, strong limbs, activity, and early maturity.

Heavy cocks will sometimes injure the hens, which may be known by observing that the hens gradually droop, refuse food, and finally die without any apparent cause.

When a hen is egg bound, or "baggy" at the rear, the best thing to do is to kill her. If cure is preferred give a dose of castor oil, isolate her from the flock, and anoint the parts with castor oil to which a few drops of carbolic acid have been added.

Keep carbolic acid solution always ready for use. Put a teaspoonful of carbolic acid in a pint of water and bottle it. It is an excellent wash for roup, and a good remedy in the soft food for cholera. For cholera give each fowl half a teaspoonful of the solution once a day. For roup wash the beak and nostrils clean, and pour ten or twelve drops of the solution down the throat.

The safest and one of the best remedies for roup and catarrh is to put a gill of liquid coal tar in a quart bottle and fill the bottle with water. Use it as a wash, and give a teaspoonful to all birds having roup, cholera, or any other violent disease.

A good *clean* yard is better than a grassy lawn, provided the fowls are provided with green food, but it must be frequently spaded, and also should be well drained.

To allow fowls to run where there is tall grass, which is wet at times, will cause roup, but a piece of ground in *short*, tender grass will be an advantage.

Depriving the fowls of green food, and then giving them a large quantity at once, conduces to bowel disease.

Never allow a hen from another yard to be brought among your flock until you are satisfied that the flock from which she came is perfectly healthy. This is very important, as contagious diseases are incurred by not observing such precaution.

Gapes are more prevalent on old farms, where the soil is the result of decayed matter, than on new locations. The disease is in the dirt. Hence always feed young chicks on clean surfaces.

Fresh bullocks' blood, put in a woolen bag and boiled, then mixed with the soft food and fed to fowls, is the best egg producing food known, as it is exceedingly rich in albumen.

Bones are phosphate of lime, or phosphoric acid and lime. They therefore provide lime for the shell and phosphate for the system. Grind or crack them and feed to all classes of poultry.

When fatting a turkey in confinement it will gain in flesh very

rapidly for ten days. After that time it will begin to lose in weight, owing to the restlessness occasioned by the confinement. Fatten them *quickly*, and give them plenty of charcoal while so doing.

WHEN you find a hen, that was apparently healthy, dead under the roost in the morning, you may attribute it to apoplexy, which results from overfeeding. This disease sometimes causes the fowls to spin around in a giddy, crazy manner.

VERY often deformed chicks are hatched in incubators, due to their receiving too much heat. Weak and sickly-looking chicks result from insufficient heat.

AN acre of land may return a profit, if devoted to poultry, of $200 or $2,000. The result depends upon the management.

THE poultry business cannot be monopolized. Every man, woman and child can raise poultry without depending upon large amounts of capital.

EXHIBITION fowls are not always the best for breeding purposes. Show birds are often prepared, and though possessing the points—comb, wattles, color, etc.—may be lacking in vigor. Always sacrifice points for vigor when raising poultry for market.

IN buying "fancy" eggs remember that the dealer cannot tell in advance what the result of the hatch will be. Always endeavor to be charitable with him. He receives quite an amount of abuse although innocent.

IF a hen only lays one egg a week for a year it will pay for her food, and every egg additional is clear profit. If a hen lays three eggs a week she will give double the profit derived from a hen that lays two eggs. The greater the number of eggs the cheaper the cost of production in proportion.

A STRICT account should be kept with the fowls. In no other manner can *business* be transacted. Every item of profit and loss should be known. Charge the family, also, for the eggs and fowls used on the table.

IT is an utter impossibility to overstock the markets with fowls and eggs. If all the farmers in the country doubled their productions of poultry and eggs, the demand would increase proportionately.

REMEMBER when you buy a sitting of "fancy" eggs from a breeder you do not want the *eggs* really, but the *stock*. Therefore, if you are asked to pay $3 a sitting for such do not compare the sum thus expended with the prices current for eggs used for table purposes. The transactions are very different matters.

GRAVEL, ground oyster shells, pure water and a dust bath are as important as regular feeding and warm shelter.

IN building a nen house try and have the sun to send light and warmth into it from the front and at both ends. Let it always face the south.

DURING damp, slushy weather in winter, cut off the feathers from the legs of the Asiatics—from the knees to the ends of the toes —as wet feathers cause disease.

KEEP your hens closed up on stormy days, but give them something to *scratch* in.

IF you *pull* out the feathers of a fowl new ones will grow in place, but if they are *cut* off, however, such will not be the case till next moulting.

A GOOD substitute may at times be used in place of boards. Thick paper, if painted with linseed oil and litharge, will be water-tight. Such paper is usually a yard wide, and sells by weight at the rate of about one-third of a cent a yard. Secure it with lath strips.

HEN manure is very valuable, and should be carefully saved. Mix it with twice its bulk of dry dirt, adding a quart of plaster to a bushel of mixture. Keep it in a dry place.

IF eggs are packed with the small end downward, and in layers without touching each other, with plenty of wheat or corn as a packing material, they will keep for hatching purposes for two months.

NEVER let eggs get chilled that are to be used for hatching purposes. They should be collected during cold weather every time a hen is heard to cackle. The rule is—early and often.

THE hens that lay white eggs are of the following breeds: Hamburgs, Leghorns, Polish, Houdans (all the French breeds) and Black Spanish. The largest eggs are laid by the Black Spanish. Very dark eggs are laid by the Cochins and Brahmas. Medium dark eggs are laid by the Plymouth Rocks, Wyandottes, Langshans, Games, Dominicks, and their crosses. Sometimes there may be exceptions, however.

THE symptoms of cholera are sudden and violent thirst, diarrhœa, greenish droppings, which become thin and whitish, extreme weakness, and a nervous, anxious look about the face. Death ensues in about from twelve to thirty-six hours.

THE symptoms of roup are discharges from the nostrils and a foul odor, sometimes hoarse breathing, dirty face and nostrils, pale or dark comb, and a general appearance of droopiness.

A HEALTHY fowl always possesses a bright scarlet comb and wattles, and any deviation from this color indicates ill health.

WHEN a young pullet is about to lay her comb enlarges and

becomes very red, and this may be noticed for a week or two before she begins.

IF you wish to purchase a number of old hens in the fall see if the plumage is new. If so they have moulted and will soon lay. If the plumage is smoky, or dirt-colored, with straggling feathers that pull out easily, they have not moulted. See that the combs and wattles are red, and the legs clean. Examine the nostrils for roup by pressing gently against them. If a discharge is noticed do not take them. Use your nose for the detection also, as roup emits a foul odor.

A HEN requires about three months for moulting, but you can hasten the process with stimulating food.

IT is not natural for fowls to run together in large numbers. They always divide into flocks of smaller size and select different feeding grounds.

IF two hens are sitting in the same neighborhood it very often happens that both will go upon the same nest, thus permitting the eggs to be exposed too long. Always try to keep a hen alone when she is incubating.

A COOP for shipping a trio of fowls should be two feet long, eighteen inches wide, and twenty inches high. Always provide a cup for water and a box for food, filling the box with wheat and corn. Make the shipping coop with unbleached muslin, and as light and strong as possible.

HENS often pull out their feathers when they are infested with lice. If closely confined they pull feathers from each other. The vice is not easily cured, but instances are known in which smearing them with tar has been effectual, which disgusts the fowls that do the mischief.

FOWLS will not fatten quickly while growing, as the process of growth prevents it. Some chicks grow off to legs at first, but when they have reached their proper height they begin to thicken out, and usually make fine, compact, large birds.

IF you have a number of young cockerels of the same age the one that looks the most like an overgrown chicken will usually be the largest. That is, the ones that develop the comb and tail feathers are nearly matured, and will be but little larger. While the young-looking one will grow until he is much larger before developing.

THE cost of a poultry house is about fifty cents for each hen, but a better and more permanent structure may be put up at a cost of $1 for each fowl.

KEEP the hen on nest eggs until you are assured it is safe to give her those intended for hatching, and do not give a sitting hen much soft food. Corn and wheat, with plenty of water, is sufficient. Once a day will be often enough to feed her.

MUSLIN may be made water-proof in many different ways, and is very useful for covering the runs of the hens and chicks. They are: *No.* 1. Soak the muslin twenty-four hours in a decoction of one pound of oak bark with twelve pounds water. Pass it through running water and let it dry. *No.* 2. Into a pint of linseed oil (unboiled) beat the whites of two eggs. With a clean paint brush give a coating to both sides of the muslin. *No.* 3. Mix bullocks' blood and lime to a consistency for application, and paint the muslin. *No.* 4. Dissolve a pound of glue in hot water and add half a pound of bi-chromate of potash and coat the muslin. *No.* 5. Immerse the muslin in a strong solution of soap and let it dry in the shade. Then immerse it in a strong solution of alum and let it dry as before. *No.* 6. Steep muslin in a strong solution of sugar of lead, and when dry steep in alum water. Any of these processes are good, but the best are Nos. 3 and 5.

A GOOD silo for preserving green food may be made of a strong keg or barrel. Cut into fine pieces cabbage, grass, or any other green matter, and subject it to the sulphur process which we give in the items on preserving eggs. Then pack and *press* it *firmly* and allow it to remain till required.

PROF. GERHARDT, of Germany, states that persons can become infected with diptheria from fowls, as many forms of roup and diptheria are the same.

WHEN poultry run at large they procure insects. In confinement this is not the case. Feed plenty of meat as a substitute.

NEVER let a fowl for market go back in flesh, even for a day. It is necessary to hold on to the first pound of flesh gained while the second is forming. Animal tissue is always changing. A bird is either losing or gaining.

A TURKEY hen is a good incubator. She is accustomed to remaining on her eggs four weeks. Give her twenty-five hen's eggs and she will bring them out in three weeks. Give these to hens, or put them in a brooder, and the turkey hen will hatch and bring off twenty-five more, and only remain on the nest two weeks longer than her usual time.

PLYMOUTH Rock chicks which show a preponderance of white in color of back and body will usually be light-colored, with white in the tail. A dark chick, with a little white on the tips of the wings, is usually a female.

In using poultry in the family the cleanest, best and easiest mode of getting rid of the feathers is by scalding.

In breeding for early market, it is important to have a breed that grows rapidly and fleshes up young; the skin should be yellow, and if the feathers are all white, both the chicks and old fowl will look much better when dressed than those with colored feathers. The color of the skin is important, yet half of the fowls that are sent to market have anything but a yellow skin. Small bone, short legs and a well rounded form are also desirable, and a size, when full grown, not less than five pounds, and not over six before dressed, gives the best early chick for market. None of the qualities are an injury to a laying hen; and if to them are added good layers, hardy and quiet, we have combined the points necessary for both meat and eggs.

To make a fountain take a jar of about four or five gallons capacity, and with the aid of a small point of steel (say a three-cornered file broken off) and a hammer, make a hole about two inches from the top of jar (it should be an earthen one); the hole should be only about as large as a pea. This jar should be filled with water and covered with a pan (I use a wash basin), and the whole by a quick motion turned bottom side up. The hole in the jar or crock should be a little below the top of basin. When the fowls drink out the water the hole is above the water line; in rushes the air through the hole and down drops the water in the jar, raising the water in the basin up to the hole and *no farther*. They cannot fill up this fountain with dirt.

One of the best canker cures is Labarraque's solution of chloride of soda, using one part solution to two of water. Wash the throat thoroughly, allowing the fowl to swallow a portion.

It has been recommended, in order to prevent hens from eating eggs, to put two tablespoonfuls of fine salt and one-half pint of ashes (wood) in one quart of corn meal, or in that ratio, and mix with boiling water; feed once a day until they leave off eating their eggs. But if a little salt were put in food every day, and ashes put where they can have access to them, they would never eat their eggs unless the eggs freeze and the shells crack open. Hens seldom eat their eggs except during the winter months.

Young chicks that are subject to weakness in the legs should receive a small allowance of fine bone meal in their food. Weak legs come from forced growth, high feeding and close confinement, but are not necessarily dangerous.

Like milk, an egg is complete food. If fed on eggs alone young animals are furnished all necessary elements for growing bone,

muscle, and all that goes to make a perfect animal of its kind. A hen may lay 200 eggs per year, but ought certainly to produce 120. Eight eggs will weigh a pound, and 120 will weigh about fifteen pounds, at a cost of about one bushel of corn worth on an average say fifty cents; at this rate the eggs cost, so far as food is concerned, about 3⅓ cents per pound, or 4.16 cents per dozen.

A POUND of meat contains water, 8 oz.; fibrine and albumen, 1 oz. 122 grs.; gelatine, 1 oz. 62 grs.; fat, 4 oz. 340 grs.; mineral, 350 grs. A hen may be calculated to consume one bushel of corn yearly and to lay sometimes twelve dozen, or eighteen pounds, of eggs. This is equivalent to saying that thirty-one pounds of corn will produce, when fed to the hen, one pound of eggs. A pound of pork, on the contrary, requires about 5½ pounds of corn for its production. When eggs are twenty-four cents a dozen and pork ten cents a pound, we have the bushel of corn fed producing $2.88 worth of eggs and but $1.05 worth of pork. Judging from these facts, eggs must be economical in their production and in their eating, and especially fitted for the laboring man in replacing meat.

A BROODY hen should not be allowed to indulge her propensities unless both she and her owner mean business. Sitting is exhaustive of vitality, partly because the hen at this time is so absorbed by her duties that she will not take time from the nest to eat or drink. If allowed to sit even three or four days they lose enough flesh so that they are not quickly got into condition for egg production again. As soon as the first broodiness is noticed, shut the hen up in a room where she has no chance to make a nest; feed liberally with wheat screenings and thickened milk. After two or three days she will begin to lay eggs on the floor, which is a sign that the time has come for setting her at liberty.

AN experienced breeder gives the following information in regard to the fertility of eggs. A single meeting of a gobbler and hen turkey renders all the eggs fertile for the entire season. Eggs from the barnyard hen, unlike the turkey, become fertile on the fifth day after the introduction of the cock, and on the removal of the cock the eggs have proved fertile for two weeks afterward.

THE reason why chicks die in the shell during incubation is that they do not procure sufficient moisture.

A TEASPOONFUL of turpentine in a pint of corn meal, made into a dough with water, is one of the best remedies for gapes.

PERSIAN insect powder dusted into the feathers is the best remedy for lice. Tobacco stems in the nests are also excellent for keeping sitting hens free from them. Coal oil the roosts, and whitewash the buildings, and see that a good dust bath is provided.

FOR scabby leg use a mixture of sulphur and lard, or coal oil and lard twice a week till it disappears.

THE Douglass mixture is one pound copperas, one gill of sulphuric acid, and two gallons of water. The acid may be left out if preferred. Put a teaspoonful in the drinking water whenever it is changed.

A MIXTURE of one part turpentine and one of castor oil is excellent for roup, canker, and chicken-pox. Give each fowl ten drops, and inject the nostrils also.

DO NOT feed *raw* corn meal dough to a sick fowl. Let it be steamed or scalded.

A GOOD tonic for weak, debilitated fowls is three parts ground cinnamon, ten of ginger, one of gentian, one of saffron, and ten of carbonate of iron. Mix well and give a tablespoonful to a pint of food, for as many fowls as will eat it.

THE best preventive of cholera, and something which is harmless, is extract logwood. Put enough in the drinking water to redden it a little, and also put some in the food.

A CHICK that seemingly appears dead, after a hard rain storm, may often be restored by plenty of warmth.

IN attempting to destroy rats about a poultry house never try poison until you have baited them with food for a week. After they have been accustomed to the food put in the poison.

THE smallest breed is the Black African Bantam, and the largest the Light Brahma.

THE best market chicks, of pure breeds, are the Plymouth Rocks, and next the Wyandottes, but crosses of these breeds on large Asiatic hens are better.

IF you cannot hatch your pullets before the first of May defer it till September, as all pullets hatched between May and October will lay in the spring.

THE earliest maturing of the large breeds is the Langshan, which begins to lay when seven months old.

THE fancy Games, such as Black Breasted Reds, Yellow Duckwing, etc., are not intended for the pit but for beauty and ornament.

PIT Games are selected from well known tried and tested strains, and are of no particular color, crossing of strains being the rule. They are not recognized in the Standard of Excellence.

ALL breeds that lay white eggs are good flyers, and require tall fences for confinement.

THE smallest-comb breeds are the Wyandottes and Brahmas, and the tallest-comb breeds the Leghorn and Black Spanish.

THE fowls that possess legs entirely yellow are the Wyandottes, Leghorns, Brahmas, Cochins, Plymouth Rocks and Dominicks.

THE Bantams lay the largest eggs in proportion to their size, and give as large profits compared with the larger breeds, in proportion to cost of quarters and food.

THE *most important* point to be observed, when keeping fowls in confinement, is to keep them *industriously at work.* This is the golden rule of managing poultry in large numbers, and is the key to success.

YOUNG chicks are partial to artificial heat, even in summer, and especially in damp weather.

IN shingling a poultry house, 1,000 shingles, laid four inches to the weather, will cover one hundred square feet. One bushel of lime and two of sand will make sufficient mortar to spread over ten square feet.

GROUND meat (commercial) is the refuse of lard factories ground into powder.

IN using ground bone from factories endeavor to have it as free from odor as possible, as ammonia is disagreeable to poultry.

FOOD to which a flock has not been accustomed, such as sunflower seed, will be refused at first. If so give them nothing else till they learn to eat it.

A TOBACCO cutter is a splendid instrument for cutting young grass into convenient lengths. A strong coffee mill will grind pounded oyster shells to powder for young chicks.

RICE cooked in milk is the best food that can be given fowls and chicks that suffer from bowel diseases.

A FEW drops of laudanum, camphor, or other medicine used in the family, will often be found serviceable when given to sick fowls for disorders requiring such treatment.

HENS, ducks, geese, turkeys and guineas will not thrive if kept together.

COAL oil is one of the most useful remedies for contagious diseases. It has been known to cure cholera and roup when administered with an equal proportion of castor oil.

NEVER handle eggs for hatching with greasy hands, and disturb a sitting hen and her eggs as little as possible.

ALWAYS remove a sitting hen to a new location, when desirable, at night, and place the nest in a somewhat dark and secluded location.

THE young cockerel that is "cowed" by another will, in a majority of cases, grow the faster and make the best bird when matured.

IN building a poultry house always endeavor to get as much room on the *floor* as possible.

THE Light Brahma possesses a greater combination of desirable qualities than any other breed. Then follow the Plymouth Rocks, Langshans, and Wyandottes.

THE Cochins are the most inveterate of all sitters, and next the Brahmas. The Langshan is the nearest approach to a middle line between the sitters and non-sitters.

IF two non-sitters are crossed, such as the Hamburgs and Leghorns, the progeny will be sitters. The tendency to avoid sitting is lost whenever a cross is made. Hence a crossed fowl will *always* sit.

DESPITE all belief to the contrary, Bantams *can* cross with the larger breeds. Never keep Bantams in yards with other fowls.

GUINEA fowls and hens should not be kept together, as crosses have been known to occur from such association.

ALWAYS use dry dirt or sifted coal ashes for a dust bath. Wood ashes are caustic, and sometimes do damage.

NEVER mix wood ashes with your poultry manure, as potash liberates the ammonia, nor should lime be used in any form, except as plaster, for the same reason, but there will be no harm done from the use of coal ashes.

THE drinking water is a source of contagion unless sick fowls are separated from the healthy ones.

THE best table fowl is the Game, and the next is the Houdan and Langshan.

THE most beautiful and ornamental fowls are the Polish, and next the Hamburgs.

WHEN using Leghorns for crossing on Brahmas select the rose-combed varieties.

NEVER keep a fowl for *show* unless you make a business of such. Profit should not compete with beauty.

THE END.

With the close of this number we trust we have given the greatest amount of information possible in a small space, and our future numbers will be published with the same object. This being No. 1, the succeeding issue (No. 2) will be devoted entirely to incubators, brooders and chicks. Other numbers in this series will follow and will be of interest to all.

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