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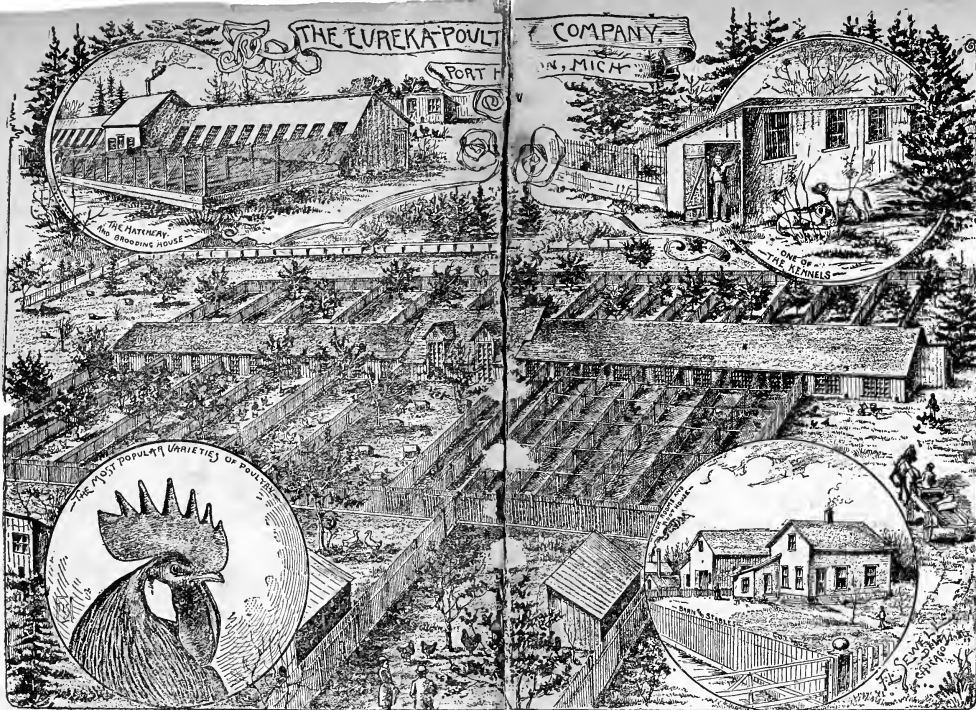
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M. K. BOYER.

DEPUY'S POPULAR POULTRY BOOKS.

No. 1.

MASSACHUSETTS
AGRICULTURAL
COLLEGE
1891

ALL ABOUT BROILERS

AND MARKET POULTRY GENERALLY.

BY M. K. BOYER.

SYRACUSE, N. Y.:
CLARENCE C. DEPUY,
PUBLISHER.
1891.

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PREFACE.

In undertaking the task of writing a treatise on broilers and market poultry, it shall be the aim of the writer to overdraw nothing, but to present things in their true light. It is with the object of teaching the novice, and avoiding mistakes so often made by those who take their maiden step into the business, that this book is written.

No theories are used, every line is but the record of the experience of one who has spent considerable time and money in gaining the knowledge; and in the hope that all who read may be benefitted, we beg leave to remain,

THE AUTHOR.

Hammonton, N. J.



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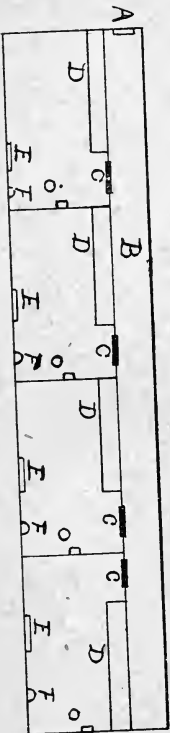
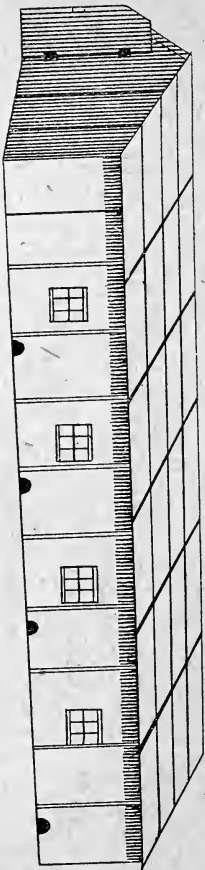
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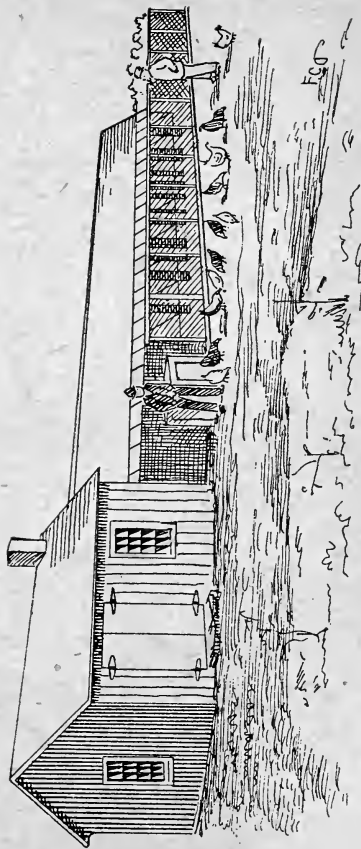
SIZE OF BREEDING PEN. A VIRGINIAN'S EGG SECRET. FRENCH
LICE REMEDY. "SOUR KROUT" FOR FOWLS. E. C. HOWE'S
BROILER FOOD. PETERSON'S FEED FOR LAYING HENS.
PETERSON'S FEED FOR YOUNG CHICKS. POULTRY AT THE
EXPERIMENT STATIONS.



HEN HOUSE OF M. K. BOYER.
 30 feet long, 12 feet wide, 9 feet high to eaves. Covered with Neponset lining paper, Manufactured by F. W.
 BIRD & SON, East Walpole, Mass.

GROUND PLAN.

A—Door to entry. B—Entry. C—Door from entry into pen. D—Roosts, two feet high with platform under to catch droppings. E—Windows. F—Small doors for fowls to get out into yards. Size of pens, $7\frac{1}{2}$ x 9 feet, width of entry, three feet. Nests are arranged under the dropping boards, with door opening into entry, making it convenient to gather eggs. Drinking fountains and oyster shell boxes on the right of each pen, as shown in diagram.



DR. EDW. NORTH'S FARM. (Less than one-twentieth acre.)

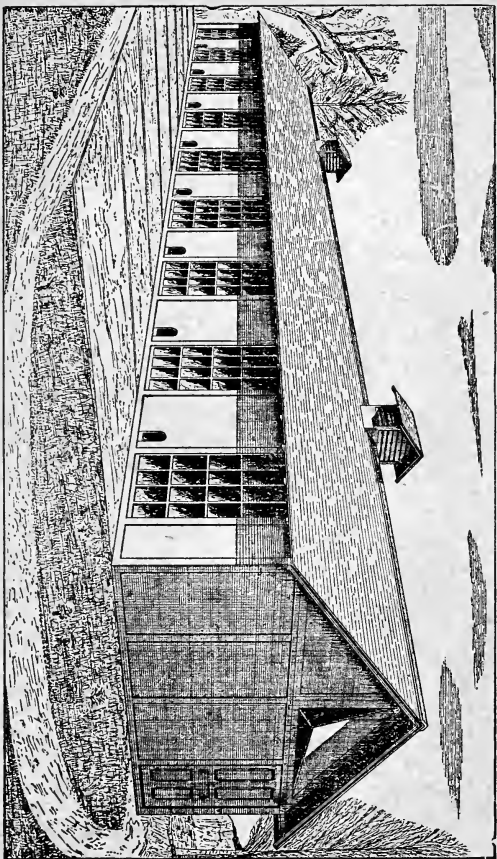


FIG. 1.—PERMANENT POULTRY HOUSE.

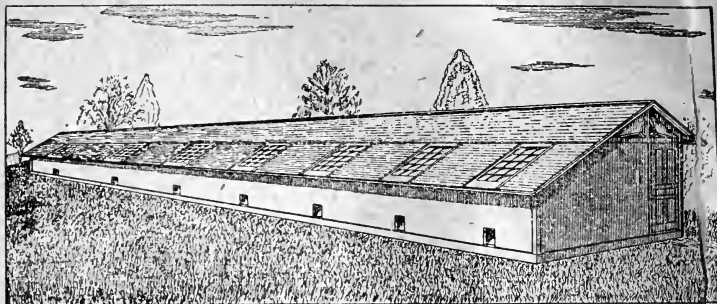
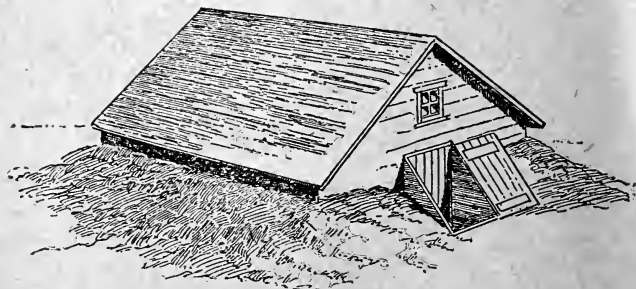


FIG. 2—PERMANENT POULTRY HOUSE.



AN OUT DOOR INCUBATOR CELLAR.

CHAPTER I.

IS BROILER RAISING A FAILURE? HOW MUCH CAPITAL IS REQUIRED? HOW MUCH LAND, AND HOW MUCH TIME IS NECESSARY? WHAT ARE THE PROFITS?

These are questions put to us almost every day. They are not the easiest to answer, by any means. So much depends upon the man and the conditions. "Is broiler raising a failure?" No. Many have failed at it, 'tis true, so have hundreds of merchants, farmers, and other tradesmen. Because the man has failed in the dry goods business is no reason to suppose that the dry goods trade is a failure. Because farmers are annually sold out by the sheriff does not prove that there is no money in growing crops. Because manufacturers have been closed by the sheriff does not go to say that their goods are of no value. Then neither can the broiler business be called a failure because so many have been compelled to blow out the lights. Most of the failures in all business come from some cause in the main chargeable to the operator.

This is not the business for a novice, unless the novice is willing to pay a reasonable sum for his experience. The successful broiler raisers of to-day are men that have generally paid pretty dearly for the whistle! If there were no failures, if every Tom, Dick and Harry could step right into it and make money, it would not be long before prices would drop, caused by a glutted market

This may not be pleasant to the ambitious novice. He had supposed that to raise chickens for market was as easy as rolling off a log. On the other hand it is hard work, "eternal vigilance." The successful broiler raiser is a man of pluck, energy, perseverance. He has good business principles, and he puts them to play. He is up and doing: You will always find him at his post. From October to July he fairly resides in the brooder house. God pity the poor "invalid," the delicate woman, the "child" that undertake the task without knowing what is before them.

We have seen men start up the farm, get good incubators, erect substantial houses, put in a number one brooding system, start out with good hatches, fill up a number of pens with fine chicks—and then greet us with mouth and eyes wide open, saying: "I didn't know there was such hard work connected with the raising of chicks." It is not so much the muscular work, in fact there is very little of that, but the staying up late at night watching the incubators, the getting up early in the morning for to care for those hatched, the continual vigilance for signs of sickness, the lookout for enemies of all kinds, and the myriads of little things that take up so much care, and that dare not be neglected.

A neglect of these little things is what has caused more failures than anything else. Business principles must be applied to poultry affairs as well as anything else, only all people do not think so. They find out, later on, however, to their sorrow.

"How much capital must I have?" It is a stunner. It depends upon many things. Some men in some places can start in a small way with three hundred dollars. We have known others to invest two thousand dollars in the start. But the best plan is to begin small. Commence at the bottom of the ladder and climb up. There are a great many things to be considered.

First,—There must be the incubator house and incubators.

Second,—The brooding house and the brooders.

Third,—The eggs for hatching.

Fourth,—Fuel, feed, your board, and general running expenses for five or six months.

All these need capital, even after the chicks are hatched it will take four months to grow them to the marketable size. Up until the first shipment is made, there is no chance for a penny of income, but all outgo.

The best and safest plan is to put up a brooding house to accomodate several hundred chicks at a time, get two small incubators (say two hundred capacity each), and thus begin. Of course this will only do when run in with other work. The other work must give you your living, and when you have fairly educated yourself then will be the best time to enlarge your plant, and devote your entire time. If those who have failed could have started in just that way, there would have been less disaster.

A small plant, like the one just described, would be profitable for the farmer. He could install his son, daughter or wife into the general care of it, and it would become a valuable adjunct. Of course the drudgery work, like carrying water, cleaning up, etc., should not fall to the lot of the woman—it's man's work; but the madam will run the incubators and brooders, nine times out of ten, better than the man.

In Henry Phillips's immense brooding establishment in Hammonton, one of the largest in this country, Mr. Phillips's mother attends to the incubators, and she does remarkable work, keeping that mammoth brooder filled up right along. So Mrs. Bradbury, wife of W. H. H. Bradbury, of the Valley Avenue Egg Farm, Hammonton, successfully runs the incubators. And the Misses Pressey, daughters of G. W. Pressey, manufacturer of the Hammonton incubators, have made many sales for their father's machines by producing plump and extra fine broilers. We might mention more, but these show that the patience, perseverance and grit of the women count wonderfully in the work.

"How much land?" Well, you cannot run a broiler establishment on a town lot. We would want five acres. The space taken up by the brooder will not be much, but to guarantee success, there must be plenty of room left for old fowls, to supply the eggs. The wise broiler raiser, and the one that makes the most out of it, raises his own eggs. Last year, those that bought up their eggs, averaged a hatch of about 35 per cent. Such costs cut deep into the profits.

"How much time?" All the time possible. Those that raise large numbers are always at their post. Incubators must be watched, brooders must be watched; and between cleaning the brooders, preparing the feed, watering the stock, testing the eggs, and all the other necessary work, time goes very fast, and the day is spent before one is well aware of it. The more time you spent at the work, the better results you will have.

Now, "what are the profits?" Profits vary. The average cost of an egg in winter can be safely put down at two cents. Two hundred eggs would cost four dollars. To run a lamp machine (supposing you are using that), will average a cent a day—twenty-one days would bring it twenty-one cents. Say that you have a good test when you examine your eggs about the seventh day, and that you find seventy-five per cent of them fertile. That would reduce the number of eggs down to one hundred and fifty, making their value, say two and a half cents each. The hatch comes off, you get one hundred chicks (50 per cent. is a good average—incubator manufacturers claim to the contrary, notwithstanding), and each chick costs four cents each, or, in other words, the one hundred chickens cost when one day old, four dollars and twenty-one cents, counting in the cost of the oil.

But they won't all live. Twenty-five are most apt to die. Then the seventy-five will be worth to you about five and a half cents. To take a chick, and raise it up to a pound and a half or two pounds weight (broiler size) will cost, including brooding, and not counting labor at all, about fifteen cents a pound—two

pounds, thirty cents, original value of chick five and a half cents, total, thirty-five and a half cents.

The market price for broilers is from thirty cents per pound upwards. The early birds capture the best prices. Thirty cents is a good average, making sixty cents for a two pound chick, leaving, after subtracting the cost given, a margin of twenty-four and a half cents on each bird. But then it costs five cents each to have a bird stabbed and dry picked, and this leaves about nineteen and a half cents profit, out of which must yet come your labor.

Now this estimate is given after interviewing nearly all the broiler men in this section. But even that profit amounts to considerable where several thousand birds are annually raised. It is a hard matter to get down to the cost and profits of a business that varies as does this, but our figures are impartially drawn, with no intention of misleading.

CHAPTER II.

INCUBATORS, AND HOW TO RUN THEM. BROODERS, AND HOW TO
MANAGE THEM. FEED, AND HOW TO GIVE IT.

Which is the best incubator? Who can tell? It depends upon the person in charge. It is so with all kinds of machinery. Simply because Jones don't know how to run a certain machine is no criterion that the machine is no good. We have run machines that have been condemned by others, and yet our success has been good; on the other hand with a certain incubator we could not do any hatching at all, and we gave it to a lady who succeeded wonderfully.

During our experience with incubators we have tried many different makes, but we have failed to secure as good hatches and strong birds from hot air machines as from those in which hot water is used. The reason for this, to our mind, is that the hot water gives more of a moist air and even temperature than hot air. If it is not this, what else can be the cause, as the construction of the machines are alike?

The French are skilled poultrymen. They make money in the business. Read the description of their hatcheries and brooders, and you will find that hot water is the agent clean through. Here in Hammonton, however, hot air is chiefly used in hatching, yet we fail to find the vigorous chicks, on an average, that we can daily see in the broods that have been brought into this world by means of hot water.

The Pineland Incubator Company, of Jamesburg, N. J., have built a machine partly from the patterns used in France. It is yet on trial, but the hatches so far have been remarkably good. When this machine is perfected there will be a revolution in hot water. Nearly all the new makes are on the hot water plan, it having become a pretty well settled fact that it is the only true method that can be employed.

So much for our opinion; others may prefer hot air. We use both at present, but our success is very closely attaching us to the old system.

But as we have hinted at before, it is not so much the make of the machine that gives us success or failure, as the manner in which it is handled.

In the first place the operator must strictly follow the manufacturer's directions. Where novices generally fail is in the attempt to teach the manufacturer. Their ability increases too rapidly.

Here are a few rules which are imperative for success:

There must be an *even temperature in the machine*. That is, the thermometer must register the same in all parts. To secure that, the incubator must stand perfectly level.

The outside temperature of the room must be even. We have yet to hear of a machine that is not affected by a variation in temperature on the outside. For that reason we recommend a dry cellar. The engraving shown in this book (which we reproduce from the *American Agriculturist*) of an out-door cellar, is by far the best arrangement that can be had. The illustration is a likeness of the cellar on Frank Hopping's broiler farm, in Hammonton: Mr. Hopping tried it last year, and it has worked to perfection. The temperature of the chamber was even, and there was less trouble with his incubators than formerly. It can be made any size wanted.

Regulators on machines need regulating. A regulator should be set at 100 degrees, so that when 103 degrees are reached it opens sufficiently to let off the surplus heat. Anything from

100 to 105 will bring good results. A fall of temperature to 90 degrees will not kill the hatch, but prolong it, while 110 degrees, if allowed to continue so for more than an hour will end the experiment. Therefore, the regulator needs proper regulating.

Moisture is very necessary. It is nature's provision. Hens set in a cool place, on the ground, have the best hatches. The hen that goes off to the woods, lays a clutch of eggs and then incubates, returns with a big percentage, notwithstanding that she has exposed herself and the eggs, to the inclemency of the weather. We favor moisture, and plenty of it after the eighteenth day.

Turning the eggs is also imperative. "The hen don't turn her eggs," said a gentleman to us one day. But she does. Watch her when she returns to her nest after you have fed her. See how she twists herself about—she is then turning her eggs. We turn them in the incubator morning and evening, about twelve hours apart. But we stop turning them after the chicks begin to pip the shell.

Eggs must be tested. We test on the seventh and fourteenth day. White eggs can be tested on the fourth day, but dark eggs can never be satisfactory examined until about the seventh day, and we have made that the time of our first test. We take out all the clear ones, which have no germ in them. They can be used in cooking. We replace all doubtful ones. On the fourteenth day we retain only the strong ones, and the cloudy or weak germed eggs we break up into the soft feed for our laying hens.

The hatch must not be tampered with. After the hatch is started, keep the machine closed. Start turning the eggs about the fourth day. When you take the tray out of the machine, close the door or drawer and after you have turned every egg, replace the trays. There will be a fall of temperature. Stay by the machine until the heat goes up again, and see that everything is all right before you leave it. Do not open the door or drawer to show inquisitive people how the eggs look. There is

nothing for them to see, and you are running a great risk. The hen sits very closely, not even coming off for her feed, for the first few days. The second week she is off more than at any other time. Towards the close of the hatch she again resumes her close work.

— *Leave the chicks alone.* When the chicks are coming out the shell is when there is the most danger. Leave them kick about all they want to. Don't try to help them. They need no help. Those that are too weak to come out will be too weak to live even if you help them out. Do not remove a chick from the incubator for twenty-four hours. For every time you do so, you lower the temperature, and imperil the hatch. Do not let your curiosity get the best of you.

There are more suggestions that could be given, but the manufacturer's circulars will explain the balance to your satisfaction.

Having hatched the chicks, we must have a good brooding system. In Hammonton the Pressey, Packard, Smyrna, Pineland, and nurseries are used.

The Pressey brooder is run by an oil stove, a stove being required to each brooder. They have given the best of satisfaction, the only drawback being that they require more care than any of the other three systems named.

The Packard system is the original plan used for large houses. The heat is given by a large stove, sent by hot water through the pipes laid *under* the brooders, giving a bottom heat.

The Smyrna and Pineland systems are worked upon the same plan, giving top heat, and those using these claim they do better work than the bottom heat plan. We always favored top heat, as it is more after the hen fashion. She gives the warmth from her body *over* the eggs. In all our operations in artificial incubation we must pattern after the hen.

Nurseries are valuable for chicks until they are a week or ten days old. We keep them in there until they have become strong, and accustomed to feeding, when we remove them to

the regular brooding house. By the use of nurseries, the mortality among the chicks can be greatly reduced.

A few hints on the management of brooders will not come amiss:

In the first place *do not have brooders too warm*. The heat in the nurseries should be kept up to about 90 degrees for the first week. But when the chicks are removed to the brooding house, they should be gradually accustomed to a temperature of about 80 degrees. We raise better chicks at this temperature than at a higher one. Too much heat does more harm than good. Before we leave our brooder at night we take a look at the chicks. If they are squatting about the brooder they are comfortable, and the heat all right. But if they are crowding, the temperature has fallen, and you will need more heat.

There must be perfect cleanliness. A departure from this rule will bring about sickness. Clean up every day. It is but a little work at a time, and it pays. On bright days, when the chicks are running out in their yards, open up the windows, and thus thoroughly ventilate the house.

Have sand in the brooder run. It gives the chicks a dust bath, which is not only relished by them, but very beneficial in many ways.

Avoid dampness. Nothing will kill off chicks so rapidly as this. Set the house about a foot above ground, have a board floor upon which put about six inches of sand. This makes it proof against damp floors, and as we line the outside with the best quality of Neponset Rope Roofing Fabric, we have a warm, dry building throughout the whole year. Under our floor we have quarter inch wire netting, which keeps rats from getting into the brooders. Rats are dead enemies of chicks.

The style of brooding house can be according to the wishes of the builder. Those in Hammonton are built with slant roof, glass sash on top, as per diagram herewith given. We, however, do not favor too much glass, and prefer a house on the same plan as the hen house which we illustrated elsewhere. Instead of full sash, only half sash is used. All glass windows should

be covered at night by curtains, which will keep out a great deal of cold. Mr. Pressey uses no glass at all. Instead of the sash he has oiled muslin blinds. On nice days he removes them, and lets both the sun and air come in with full force.

In feeding chicks, we must give them such food as will grow them rapidly. Our plan is to put rolled oats before them from the start, with boiled milk as a drink. After several days we give a mash made up of two parts bran, one part corn-meal, and a handful of meat scraps to a pail of the mixture. This is scalded several hours before feeding, and fed warm—not hot nor sloppy. Cracked wheat, and cracked corn is added after about two weeks of age. Gravel, or grit of most any kind, is constantly before them. About twice a week we add bone-meal to the mixture. We never feed hard boiled eggs, nor do we use any condition powders. The finest chickens we ever grew was on this meal and bran diet.

We keep forcing them right along, feeding every two or three hours for the first two weeks, after that about three times a day. By way of variety we roast potatoes, and then cutting them into halves, we place them about the brooder. It does not take long before they know all about it, and the potato is highly relished.

The broiler men in Hammonton vary the diet. There is no fixed rule. Corn-meal and bran, however, go into the composition of all. Some bake regular Johnny Cakes, Corn Bread, etc., all of which are very good.

Chopped up cabbage leaves, onion tops, and any greens available, are beneficial. There must be green food of some kind supplied.

After the chicks are about a month old, we change the feed somewhat, by giving equal parts of ground corn and oats, and bran; to which meat scraps are added. But at the same time, cracked corn is before them most of the time. If we have chicks from good crosses, or suitable purebreds, our experience has been that this bill of fare will make marketable birds quicker than any other mode of feeding.

CHAPTER III.

MISTAKES IN BROILER RAISING. PURE-BREDS FOR BROILERS.
GOOD CROSSES FOR BROILERS. HOW BROILERS ARE PRE-
PARED FOR MARKET.

To take up the "Mistakes in Broiler Raising," we know we tread upon delicate grounds, what may be our opinions may not be accepted by others. We do not desire to open up a subject for debate, but instead wish to note a few errors in the business and which has proven of no little consequence among the broiler men of Hammonton and elsewhere.

In the first place we do not like the present style of brooding houses. There is entirely too much glass about it; while the glass will let in considerable sun during the day, it likewise becomes a conductor of cold at night. In the present style, nearly the entire front of the roof is composed of glass—hot bed sash. It has become necessary to cover the glass on the inside with a curtain, at night, to keep out the cold. One-half the sash used would give better results. There is room for improvement in this.

Then, it is a great mistake to crowd the pens. Without exception, the capacity of brooders is over-estimated. In 100 capacity brooders we never put more than fifty chicks, and not that when we can help it. It is an undisputed fact, that small flocks in chicks, as well as fowls, do best. Overcrowding causes more deaths than anything else, and when broiler men realize this, there will be better success.

Then, we consider it a mistake, to run a broiler establishment without an egg farm attached. If every raiser would keep just enough old fowls to supply the eggs needed, there would be more chicks hatched. Buying up eggs here and there, and everywhere, does not only put a heavy expense upon the concern, but insures more unsatisfactory results.

Then, we consider it a mistake to raise chicks on a high temperature of heat. Brooding at 100 degrees is not conducive to health or success. Begin at 90°, and gradually reduce as the bird ages. A great many ills are caused by too much heat.

Then, we think there is too much soft feed; bran and corn-meal with cracked grain at noon and night, we have found will grow chicks better than a mess of soft stuff the whole day through.

Then, we think using eggs from dunghills is wrong. We look upon it as unprofitable, and believe the day is nearing when the thorough-breds, either in their purity, or in the first results of good crossing, will be used entirely. While it is true that a thorough-bred cock mated to dunghill hens will make a better class of birds, we know that they will not do as well as the first mating of pure-breds.

During the past year we have experimented with thorough-breds—Wyandottes, Plymouth Rocks, and Langshans. We have been enabled to grow plump birds in less time than those have who have used eggs from common fowls. Besides, later in the season, when broiler prices were down, we could pick out the best marked birds to be used, or disposed of, as breeders, and at good prices. The prejudice that white skinned birds would not sell in the markets, is fast dying out. Large lots of them are annually shipped from Hammonton, and the returns are the same as from the yellow skinned ones. The Plymouth Rocks and Wyandottes are excellent broiler fowls, especially the latter. The American Dominique makes a capital bird for this purpose. The Leghorn is likewise much used, although we like it better crossed upon some other breed, than in its purity. Why more Houdans are not used by broiler men we

cannot understand. They are a quick growing fowl, plump, and affording an excellent flavored meat. Besides, the Houdan eggs are remarkably fertile.

The subject of pure-breds for market poultry is yet in its infancy, but the time is not far off when the common fowl will be entirely wiped out.

Last year we made quite a number of experiments in crossing fowls, and met with remarkably good success. Among the many tests we made, were Houdan crossed upon Cochin, Brahma and Wyandottes, and Plymouth Rock upon Leghorn. In the Houdan crosses we secured more than we expected, especially in our Houdan-Cochin mating. We had a chick from the start plump, hardy and quick growing. At twelve weeks of age it was ready for market. Although the idea was entirely original to us, we afterwards heard, that W. Cook, the English poultry authority, made the same kind of experiment, and produced such meritorious birds that he has placed them upon his list of fowls for market purposes. Houdan crossed upon any breed is profitable.

Our Plymouth Rock-Leghorn mating, while it also proved to be good, did not reach the mark attained by the aforesaid crossings. Yet we secured plump and quick growing carcasses.

We have found, and so has every practical poultryman, that in the endeavor to get the exactness of feather, the thorough-breds have been crippled in health. Expose a pen of thorough-breds, and a pen of birds from crossing, to contagion, and the former will catch the disease quicker than the later. This is no theory; we have experienced it. The infusion of new blood attained by crossing improves the constitution of the offspring, and where one aims for market poultry exclusively, we advise a mixing of two breeds.

Of course, there must be good common sense used in the matter. The male must be of a quick growing breed, and the female of a solid body, broad breast variety. Then we get the meaty broilers. But if we cross birds of like merits, we get nothing better than what each of the class used affords.

Speaking of crosses, recalls to us a query, and one which may interest our readers; "what makes the dunghill fowl, are not crosses dunghills?" When we mate two thorough-breds we have a cross. The young from this cross gives us the idea we are working for. Then we must stop. If we mate up the birds from one cross, by themselves, we are losing the benefits, and each succeeding cross lessens the value. Likewise if we promiscuously yard all breeds, and allow them to mix up haphazard, we are breeding dunghills, for we gain only to lose again.

In fancy poultry breeding, crossing is still more of a hard problem. There considerable inbreeding is resorted to in order to retain certain points and add others. It is this inbreeding that produces the weakened constitutions we have referred to.

So, then, we must in broiler raising, either use the fowl in its purity or else the results of the first cross of pure-breds. In no other way can we successfully conduct the business.

The preparing of broilers for market is generally done by experts. The legs are tied to a rope suspended from the ceiling, and the operator then takes the bird under his left arm, and with killing knife in right hand stabs the bird in the roof of the mouth. No sooner is the bird stabbed, when the operator begins pulling the feathers, and before the chick is through struggling it is perfectly bare. Women generally do the pin feathering. All birds are dry picked.

CHAPTER IV.

AN EGG FARM. HOW TO BUILD HOUSES. HOW TO FEED LAYING HENS. HOW TO GET FERTILE EGGS. HOW TO MARKET.

We herewith give a few extracts from articles we have written for the several journals with which we are connected, and which fully cover the ground:

To successfully run an egg farm—the eggs for table use only—pullets are the best to start with. We have always argued, and proven by our own experiments, that hens or pullets will lay more eggs when not receiving the attention of males, than with them. Some writers disagree with us on that score. English authorities like to use one male with twenty-five or thirty females. We always looked upon the matter in this light: When a cock or cockerel is used, the hens or pullets much sooner show signs of wanting to hatch. When they get broody they stop laying, and idle away their time. This is a loss to the owner. Our plan is to exclude the males from the yards of laying hens, but keep several small houses or yards, domiciled by young, vigorous cockerels. As soon as a hen becomes broody, we put her in one of the yards, and, in nine cases out of ten, she will change her mind and will again start to lay. Then she is returned to the flock. In this way much time is saved. So many make a grave mistake to build one long poultry house. We know of some hen-houses five hundred feet long, divided up into departments ten feet each. The size of the departments

is correct, for not more than ten fowls; but the danger in having the houses all in one is the liability of the spread of contagion. Better have houses forty feet long, four apartments in a house, and the houses separated some distance apart. This will give less chance for the spread of sickness. One other great mistake is to start in with a large flock. It is all well enough if all other conditions are equal, but in the majority of cases they are not.—*Iowa Homestead*, Des Moines.

That there is money in supplying eggs for table use there is no doubt. We believe that more money can be realized in this than in the sale of eggs for fancy. If farmers and poultrymen generally would create retail markets—sell direct to the consumer—they would not only secure good prices, but would give more general satisfaction. The home market is crying for “fresh eggs.” Do they get them? We venture to say that there are more stale eggs, over one week old, palmed off to hotels, stores and families, than fresh ones. How many eggs are broken open that do not show a red streak in the yolk? How many are used that do not have a stale flavor? Hotels are getting sick of it; merchants are afraid of it; families are indignant about it, and no wonder.

Here is a farmer that lets his hens run at large. They lay wherever they please. In his search for eggs he picks one up here and one there. Perhaps a week afterwards he discovers a whole nest of them; they may have been laid by different hens the same day, or they may have been the accumulation of one hen in so many days. It is the later, more likely, but off to market they go anyhow; go as fresh eggs.

Here is a man running an incubator. At the end of the fourth or fifth day he makes his test of eggs; those perfectly clear are infertile; if the germ has started and died it can hardly be seen in so short a time. Off they go to market. The consumer never knows any better. They are perfectly safe to use, but they have a stale flavor nevertheless. They may have been laid two or three weeks before they were put into the incubator.

Four days under the heat of 103 degrees is equal to one week with no heat. But the consumer buys "fresh eggs" all the same. —*Iowa Homestead*, Des Moines.

It is necessary to have comfortable quarters. We give an illustration of one of our hen houses, which is complete in every way. It is a big mistake to have too large a house, as in the case of contagion, the entire flock are placed in danger.

We like board floors in hen houses, and on this about six inches of sand or dry earth. They prevent dampness, and are more readily cleaned.

In feeding laying hens, care must be taken that they are not given too fattening food. Wheat is the best grain for laying hens, and oats comes next. A morning feed of bran and ground oats and wheat, with a pint of meat scraps to a bucket of the mixture, slightly moistened; with a scattering of wheat or oats among leaves or other litter to keep the fowls exercising, and an evening feed of wheat or oats, we find the best egg food. We suspend cabbages in the hen houses, just high enough so the fowl must jump up to pick off a piece. Gravel is strewn all over the yards, and boxes of oyster shells within access.

We give all the food they will eat up clean, but no more, and as a rule we never are troubled with overfat.

During the winter months we give a little corn at night.

The subject of fertile eggs is one that is commanding considerable attention. Some writers advocate a few hens to a cock, others a large number. The best results in our yards have come from flocks of eight hens and a cock with the lighter breeds, and six hens and a cock with the Asiatics. It is a good plan to change males several times during the season. A good range, and plenty of green food are great helps. Two males in one yard never do well. One will be master, and the other cowed down.

One of the shrewdest poultrymen we know of, is continually catering to the demands of the market. He ships broilers when broilers are high; he rushes his roasters to the stalls when the demand is great; all stock goes in an attractive style.

CHAPTER V.

HOW TO FATTEN. CAPONIZING. PURE-BREDS THE BEST. MONEY
IN DUCKS. HOW LARGE A FARM. DISEASES AND REMEDIES.

There is nothing to beat corn and cornmeal for fattening, and these articles, along with boiled potatoes and meat scraps, will do better work than anything else that can be given. Our plan is to give scalded cornmeal and boiled potatoes in the morning, to which is added a pint of meat scraps to a bucket of the feed. At noon give whatever green food is on hand. For evening feed, all the whole corn they will eat. Besides, a box of grit, and a box of broken charcoal must be constantly within reach.

It must be borne in mind, that the less exercise the fowls have, the quicker they will fatten. Confine them to small yards. George W. Pressey, of Hammonton, N. J., has a fattening house with slat flooring. The fowls are continually roosting and eating. In about a week or ten days he is enabled to send heavy weights to market. He uses the house principally for fattening his broiler stock. He grows body first, and then fattens them in this house about a week prior to shipment.

Caponizing is drawing the attention of poultrymen all over the country. It improves the quality and increases the quantity of flesh. The best prices for Capons are obtained in February

and March. The Plymouth Rock makes an excellent capon. Dow recommends a Dorking cock crossed on Brahma or Cochin hens, and then re-crossed with Plymouth Rocks. We have not the space in this work to go into details, but would recommend Dow's book on "Capon and Caponizing" which can either be secured of C. C. DePuy, Syracuse, N. Y., or the author of this book, for fifty cents.

Purebreds are the best for the market poultryman. It is a mistake to suppose that the common scrub hen is just as good. In an article in the *Delaware Farm and Home*, the author of this manual gives these pointers:

In breeding purebreds each season there are a lot of culls. The best marked birds should be picked out, and some of the rest could be yarded and the offspring sold as broilers. Cockrels could be fattened up and sold as roasters. In this way two objects can be accomplished, and the income increased. In fact, whether we are raising fancy poultry or not, it is always best to study various methods by which little financial extras can be secured. They add considerably to the amounts necessary to reduce the expense column. And let us likewise assure our farmer friends, that whether they use or sell the poultry droppings, it is an item to gather them each day. They pay for the labor.

If a man goes into poultry farming to win, and is persevering, he cannot do otherwise than succeed. He can have his purebred stock, his broilers, his roasters, his eggs, his ducks, his geese, his turkeys and even his squab pigeons. All come under the one head, and one helps the other along admirably.

Ducks are valuable acquisitions to a poultry farm. They are always worth their money. Duck culture is becoming a very important industry. A great many farmers are taking up this branch, and the public is rapidly being converted toward it. The Pekins, Cayuga, Rouen and Aylesbury varieties are the market birds. They need no bathing water, and are valuable fowls. Ducklings are very easily raised. About the only pre-

caution necessary is to keep them from getting their backs wet before they have assumed their feathers. The best duck feed is bran, to which should be added one-third scalded cornmeal, and a little meat scraps. Middlings makes a good change with the cornmeal.

Ducks can be bred for six or seven years. A duck at seven years of age is not as old, and is more useful, than a land fowl at half that. Change drakes about every three years. Too much inbreeding gives dwarfs, and, in our experience, makes the birds susceptible to cramps. Too much whole grain is also apt to bring on cramps, and a damp house at night is almost always sure to.

Ducks thrive in all kinds of weather during the day, but at night they want warm, dry quarters. Cover the house floor with leaves or chaff.

The feed for ducks is about the same as for ducklings. Less cornmeal must be given during laying season, and ground oats used instead.

How large a farm should a man starting in the business have? The author, in an article in the *Western Farm Journal*, answers as follows:

“What do you call a large poultry farm?” “How many fowls can a man manage well?” These are every-day questions. They can be briefly answered, and they can be spun out to fill columns. The size of a poultry farm is measured by the results obtained. A man may have a thousand hens and yet only enough to do credit to a hundred good layers, therefore it is necessary to start small. Erect your house; build it warm and strong. Have every convenience. Have it in a dry situation. Put in a board floor, and on top of this several inches of dry earth. Attach to this house a large yard. Then put in your stock and begin. Watch all their movements. Study their habits. Cater to their wants. After this has been successfully accomplished, put up another house, being equally careful to make it as good as the first. Building up in this way, success

can best be obtained, as the operator has a better chance of learning the details, and will know just exactly how to treat each pen. It is not unusual to find fowls, even of the same breed, that vary in appetite and general characteristics. By thus giving individual attention, three hundred hens can be made to pay a better profit than a thousand. Too large a flock requires so much labor that the work is apt to be neglected, and the many small affairs are overlooked. These small matters very often count tremendously in failure or success. One thousand would necessitate the employment of extra labor, and it is not every day we can get help that is of any value. Seven hundred extra hens will also cost \$700 more a year. They must be good hens, and you must have the best of help, if you want three times the income from one thousand fowls that three hundred can give. Hence three hundred hens make a big farm.

"How many fowls can a man manage?" He knows that best after he has tried the work. Some men can easily handle five hundred fowls. It would take others the same amount of time to take care of three hundred. The best way is to begin with one hundred—then keep on growing, but the moment you find that the work is becoming too bulky, stop. Don't go any further. Make it a rule from the beginning that each pen is to receive all the attention they need, and just as soon as you cannot do that stop growing. If people starting into this business would use such a system, there would be more paying enterprises.

The diseases of fowls are not so extensive as some writers would make us believe. Take roup and cholera and we have two-thirds of them implied. Both are contagious, and the sooner the victim is put to death, the quicker will the trouble be arrested. It is a mistake to fool away time and money on a sick hen, only to spread the disease still further. We believe in preventatives, and treatment in mild cases, but when the disease is rooted, the best economy is decapitation.

The best preventative of disease is good housing, pure water and good feed. We must keep our fowls from catching cold.

We must see that they are comfortably quartered, that they are regularly supplied with pure, fresh water, and that only good, sound grain is given them.

We believe in tonics, as for instance tincture of iron in the drinking water. But our opinion of condition powders is that a little of it goes a great ways. We never use any of the patent egg foods, as sad experience has taught us that over stimulation produces many of the ills in the fowl family. An occasional evening feed of onions, chopped up, breaks a cold better than the best of condition powder. Cayenne pepper once a week in the soft feed is the best of egg producers. Linseed meal, a pint to a bucket of feed, once a week, will brace up the fowls. Tincture of iron, fifteen drops in a gallon of drinking water is the best of stimulants.

Fumigation is a good thing in the hen house. Remove the fowls, close the doors and windows and burn a pound or so of sulphur. Place in an iron vessel, and ignite by a piece of burning paper. It is needless to add, get out of the house as soon as the sulphur is on fire. Keep the house closed for several hours; and the smoke will reach every crack and crevice, killing lice and destroying the germs of disease. Whitewash the interior. Put an ounce of carbolic acid to a pail of the wash. Put it on thick. Kerosene the roosts and nests. Keep the floors clean. Remove the droppings daily. Cover the floors with chaff or leaves, and scatter the grain among them. Exercise prevents idleness—idleness breeds disease.

Don't crowd fowls nor chicks. A house ten foot square is not a bit too large for ten birds. It is a mistake to put more in. Crowded quarters increase the louse family. Lice are the cause of numerous ailments.

The moment a fowl gets sluggish, the amateur poulturer is apt to dose it. Ten chances to one the bird has lice. Remove them, and the trouble generally ceases.

Good common sense is a necessary article on a poultry farm, but we are sorry to say it is a remedy often neglected.

CHAPTER VI.

SIZE OF BREEDING PEN. A VIRGINIAN'S EGG SECRET. FRENCH LICE REMEDY. "SOUR KROUT" FOR FOWLS. E. C. HOWE'S BROILER FOOD. PETERSON'S FEED FOR LAYING HENS. PETERSON'S FEED FOR YOUNG CHICKS. POULTRY AT THE EXPERIMENT STATIONS.

Opinions in the number of hens that should be yarded with a cock or cockerel differ. Our rule is, with Asiatics, six females to one male. With the American class, eight females to one male. And with the Mediteranean class, twelve females to one male. Crowded yards are never profitable. There should always be an extra cock on hand, so that a change can be made twice in the season. This will insure more fertile eggs in winter.

There are really no secrets in the care of fowls or the raising of chicks, but still there are a few things not generally known, and they might be profitable to the reader.

While we resided in Virginia, a neighbor of ours owned a large flock of fowls that seemed to be nearly laying their heads off. And this, too, while eggs were very scarce. One day while inspecting his birds we asked him what secret he possessed that made him so successful.

"Well," he replied, I take oats and boil them; after they have boiled a few minutes I fry them in lard. It requires some work, but the results pay for it.

Lice, as we have said before, are the cause of a great many ills in the fowl kingdom, and we venture to say slay more birds than roup or cholera. Some years ago we received the French secret, which, although we have never personally tried it, is said to be excellent. It was furnished us by W. W. Blakslee, Jr., Weatherly, Pa. Mr. Blakslee says:

“A reliable means of ridding the hen roost and pigeon loft of vermin. is a preparation of sulphur and carbon, technically known as sulphuret carbon. In France it has been thoroughly tested, and it works like a charm. It is sure death to the insects which prey upon pigeons and fowls, without injuring the birds. A bottle containing the solution will last several days, and the cost of it is small. Put two ounces of the sulphuret carbon in a bottle, open at the mouth, and hang it by a string in the hen house. At the end of eight days the bottle should be refilled. The remedy is infallible, and should be known to every farmer’s wife and poultry raiser in the country.”

The Germans, as is well known, are great “sour kroust” eaters. They grow fat upon it; and while they are making it, they do not forget the fowls. The outside leaves of the cabbage, which do not go into the composition of the regular “kroust” and which are generally thrown away, are put in a barrel, in layers, with common rock salt. They stamp this as solid as possible, and then allowed to ferment. In this condition it will keep all winter. It is cooked and fed in a luke warm condition.

E. C. Howe was perhaps the most successful broiler raiser in Hammonton, N. J. He is out of business now. While Mr. Howe never pretended to have any “secrets,” he, nevertheless had his own way of running his establishment.

Following is the recipe for the first feed for chicks, as given the writer by Mr. Howe himself:

One pint of cornmeal, one teacupful of bran, one tablespoonful of ground meat. Mix thoroughly.

Then take one raw egg, half teaspoonful of baking soda, and one teacup of cold water. Mix together in a separate dish

and add to meal, bran and meat. Also put in three tablespoonfuls of ground bone. Bake in deep pan for two hours. When cool crumble up for them.

After the chicks are ten days old, gradually wean them over to ground wheat, oats and corn. Always keep ground oyster shell, charcoal and bone meal before them in separate dishes.

Jacob J. Peterson, of Vineland, N. J., has had considerable success with his laying hens, and has kindly furnished us the following:

"Our feed is very simple, and not expensive. During fall, winter, and spring we feed clover hay, cut fine as we can in a hay cutter." To this we add ground oats, bran, cornmeal, wheat middlings, equal parts, adding a little salt, such as is used for cattle.

"After it is thoroughly mixed we pour boiling water on it and cover, and let it stand covered until it has thoroughly steamed. Then we feed it hot. It is surprising how they will devour it. Also during cold weather we give our hens warm water to drink morning, noon and night.

"Our proportions of feed—say for fifty hens—is one peck of clover hay, and four quarts of ground grain. We feed this every morning, and at night we feed wheat and cracked corn, very little corn, one-third corn, and two-thirds wheat. This we throw in a lot of chaff or leaves, making them work for their supper.

"Our ground grain proportion is as follows: oats, one bushel; cornmeal, twenty-five pounds; bran, twenty-five pounds; wheat middlings, twenty-five pounds. Ground fine, and mixed with the clover hay. It has every element of growth, and especially of egg production.

"During the breeding season we add to the hay feed, three times a week, about one quart of desiccated fish or ground meat. We also always keep before our hens a liberal supply of coarsely ground grit, ground bone, and charcoal.

"We feed also to hasten moulting with our hens, which we like to have over by early fall. For this we add to clover hay feed, every other day, about one pint of linseed meal, alternating with desiccated fish or ground meat, until the hens are done moulting, then we discontinue the linseed meal.

"With this clover diet in summer, and clover hay diet in winter, you will save one-fourth of the food, and your hens are not liable to get overfat, and will keep in better health, the eggs hatch well, and chicks grow fast. For any bowel trouble, and also as a stimulant, we give ground ginger to our laying hens."

Mr. Peterson also gives this plan for feeding young chicks:

"For the first twenty-four hours give no feed at all.

"First day's feed—Stale bread crumbs, moistened with milk, alternating with stale bread crumbs, every two hours. Continue this feed for the first ten days, after which gradually withdraw the bread and milk, and substitute grain food (one-third corn and two-thirds wheat, ground finer than cracked corn) morning, noon and night.

"Give no water to drink for the first ten days, but all the skimmed milk they want.

"Twice a week give boiled potatoes or chopped onions, for variety's sake.

"It is also a good plan to give bread and milk twice a week until fully grown, to which can occasionally be added condition powder to strengthen and invigorate them, and ward off disease.

"Always keep a good supply of ground grits, and ground charcoal before them.

"Continue this feed for the first four or six weeks, which to our mind is the most important period of a chick's life, and from careful study and experimenting, we find this food to contain every element necessary for the growth and development of chicks.

"After a course of feeding, such as we have described, for six weeks, we have no trouble in raising chickens for either profit or pleasure. In fact, our loss of chickens hatched does not reach ten per cent. a week.

"If you have no faith in condition powders we would suggest a very simple remedy for any bowel troubles, acting also as a stimulant: add to your soft feed a tablespoonful of ginger to a quart of food. Give once or twice a day until bowels change.

"In fact, I have learned in several year's experience and experimenting, that the only proper way to raise chickens either large or small, the droppings are to be watched, examined carefully noted. This is the best test of the health of chickens. When I see the droppings are of a good brownish color, capped with white, I know my chickens are doing well."

The author of this book has always advocated the fact, that, more interest should be taken in poultry at our experiment stations. It would be furthering the interests of market fowls. J. H. Drevenstedt, the well known writer and judge, not only hits our ideas upon the subject, but gives some valuable pointers in the following article contributed by him to the *Rural New Yorker*. It is worthy a perusal:

It seems that our experiment stations do not think sufficient interest is attached to poultry culture to even consider the advisability of determining whether to give it any attention or not. Yet there is nothing of greater importance than this very question of raising poultry for profit. The following questions are often asked:

1. What are the best breeds for egg production?
2. The best breeds for the general farmer?

To determine the first question without bias or favor is just what is needed. Poultrymen, as a rule, have their own notions and, notwithstanding all absence of reliable data, rush to conclusions just as their eyes are saturated with the apparent qualities of their favorites. Leghorn breeders claim that the Leghorn is the best, Minorca breeders think the Minorcas unexcelled. Hamburgs are by many considered the best egg-producers. Houdans, Creve Cœurs, Black Spanish, Red Caps, all come in for the lead; yet no reliable competitive test has ever been made. I myself have made but few tests, and those with Brahmas,

Wyandottes, Leghorns and Andalusians. In order to make a test accurate and reliable the following plan should be pursued: About March 15 hatch at the same time Brahmas, Cochins, Plymouth Rocks, Wyandottes and Langshans. About May 15 hatch Leghorns, Minorcas, Hamburgs, Red Caps, French and Spanish breeds, *i. e.*, non-sitters kept for eggs only. These breeds mature earlier than Asiatics and Americans as a rule, and if hatched too early would not do as well and would lay too early and perhaps fall into a moult in winter, which is not desirable. Beginning with November 1st, these breeds should all be in laying condition—some should have already laid. The birds should be penned up in one building; the pens should be of exactly the same size, as should be the runs. Place ten of each breed in a pen. They should be carefully weighed every month from the date of hatching to the time of penning up in the fall. If possible, it would be desirable to keep each variety separate from the time of hatching to the beginning of the test, and to feed each all they will eat of bran, oats and wheat; but not too much corn. If they have a grass run they will need no other food, except a good supply of fresh water, which must always be within easy reach. Chicks require water, notwithstanding all reports to the contrary. When ready for the test, the feed should be carefully prepared and as our stations have each a Professor of Chemistry, it will be desirable to have him determine the rations to be used. This is of vital importance, as much mystery is still connected with profitable feeding for eggs and meat. I would suggest a trial as follows: Soft feed in the morning, consisting of bran, ground oats, meal, mixed with either cut hay, cut clover or mashed potatoes and whole corn; wheat or buckwheat fed at night. These to be varied every two weeks in all the pens except one, the birds in which are to be fed uniformly as follows: Boiled oats in the morning, vegetables, such as cabbage or turnips, at noon, whole wheat, corn or buckwheat at night—the grain to be placed before them continuously so they can help themselves. The birds are also to have a liberal supply of fresh

beef bones to pick at. Gravel should be on the floors of all the pens. There being serious dissensions regarding the value of oyster shells and the use of sulphur, it will be desirable to subdivide the pens and to give one lot oyster shells and the other not. Analysis should be made of the manure to ascertain the amount of carbonate of lime, also the weight of oyster shells should be taken, as well as the amount of carbonate of lime in the egg-shells. Sulphur will increase the fertility of the egg—so many claim. I doubt this, and do not understand the reason why sulphur should influence the fertility in any way, except to reduce the hen's condition, of fat, thereby making her more active. All these points I consider valuable for experiment. The test will readily determine the best fowl for the farmer's use, as a hen must be both a good layer and table-fowl to be of any profit to a farmer. It is claimed that the Wyandottes, Plymouth Rocks, Light Brahmas, Dorkings, Langshans and Indian Games are superior for this purpose and the truth of the claim should be ascertained:

1. Which lay the largest eggs?
2. Which lay the most eggs?
3. Which lay the best colored eggs?
4. Which have the best colored and flavored meat?
5. Which have the most meat and the least offal?
6. Which mature the quickest?
7. Which makes the best broilers at ten weeks?
8. Which makes the best roasters at six months?
9. Which sell best in the market?
10. Which consume the least feed?

All these sections should be scored by a score-card, giving each section 10 points—a total of 100. For example, the breed laying the largest eggs gets 10 points. This is the standard; the eggs to be weighed by the dozen. For every ounce deficiency from the highest score for a dozen in the weight of a dozen eggs, deduct half a point. The other sections can be scored by percentages and comparison. The profit per hen should be esti-

mated by the cost of the production of the eggs. The cost of raising and feeding the chickens should be deducted from the price received for the carcass when marketed, which determines the profit or loss. These are but crude suggestions; but they are of sufficient importance to all interested in poultry, and especially to farmers, to induce our experiment stations to give a little attention to such an important subject. Although the greatest product of the land, poultry and eggs are not receiving the study and research they deserve.

HOW TO MAKE A POULTRY FARM PAY.

Before we are so ready to say that poultry don't pay, let us make a calculation something like this. Put down the amount of the cost of buildings, land, and stock. Count six per cent. interest on the amount for one year. Say, for instance, that you invest \$500. Six per cent. of that would make \$30. Say that the land occupied costs \$100; buildings, \$200; supplies necessary, \$50. One hundred and fifty hens at \$1 each to make up the \$500. Now for a calculation: Interest on \$500 is \$30; feed per annum for fowls, \$150, total \$180. Now 150 hens should lay 15,000 eggs, that is, counting 100 eggs for each hen. An average of $1\frac{1}{2}$ cents per egg is not high by any means, especially when near a city market. That would yield \$225 for eggs. The manure from 150 fowls should amount to at least 200 bushels, we gather very closely, and get an average of 250 bushels. Count 200 bushels of manure at 50 cents a bushel and we have \$100. Now for another calculation: 15,000 eggs \$225, manure from flock \$100, total \$325. Receipts \$325, expenses \$180, profit \$145. That is not much profit you say. Certainly not. But it is an investment that has paid you 6 per cent. with a profit of one-fourth the investment. Show us the business, if you can, that will net a larger dividend than that on an investment of only \$500. The great trouble is the manure goes to waste, and the eggs and poultry consumed are never taken into account, and the profits are only measured by the actual sales after the full expense is counted. We have seen men invest

more money in feeding hogs than they could buy the meat at retail—yet the hogs are great things to them. They never look at the cost of swine, but poultry has all the blunt to bear. Now in our calculation, take notice, we merely call for eggs. It is an egg product we are figuring upon. Add sufficient male birds to the flocks and raise broilers and roasters—lessen your egg product, and add the income from several hundred broilers, and a hundred or more roasters, and it will readily be seen that the farm is yielding 25 per cent. and the investment will soon be refunded.—Germantown, Pa., *Telegraph*.

All good poultrymen keep themselves thoroughly posted in the markets. They have their stock in readiness, and ship whenever the prices are good. It is a mistake to hold over too many birds expecting a jump in prices, as the extra cost to keep the stock over is often greater than the difference in price.

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