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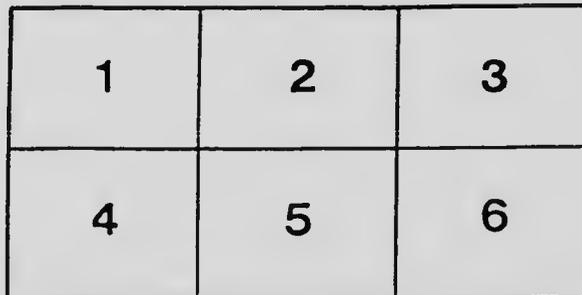
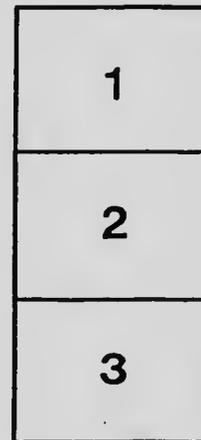
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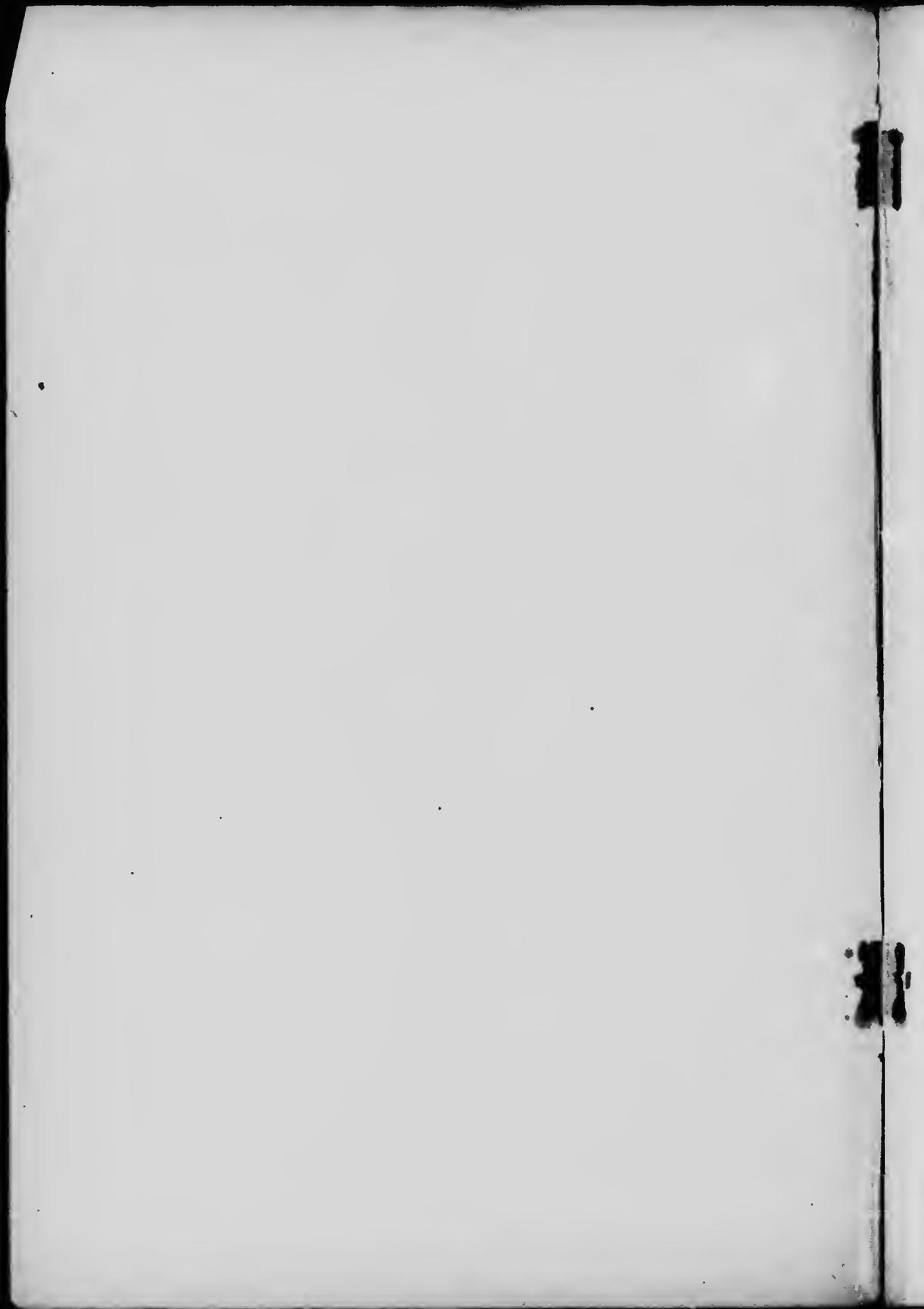
DEPARTMENT OF AGRICULTURE

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POULTRY-RAISING IN BRITISH COLUMBIA.

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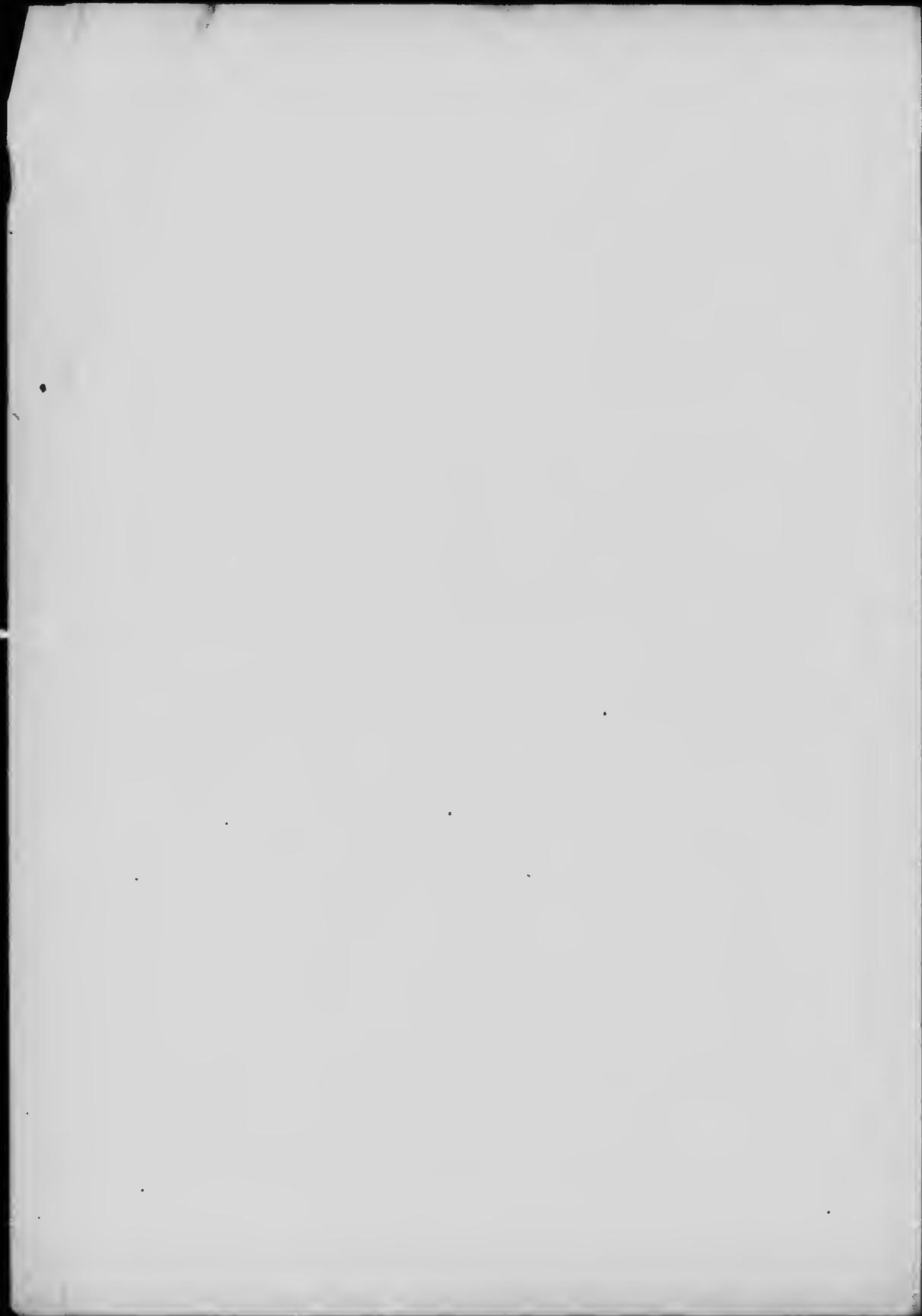
*The Hon. R. G. Tatlow,
Minister of Agriculture,
Victoria, B. C.*

Sir.—I have the honour of presenting the following Bulletin on "Poultry-raising in British Columbia," prepared by the Rev. W. E. Dunham.

A considerable quantity of the material contained in Bulletin No. 15, by H. P. Johnson, has been embodied in the present Bulletin and extensive additions made, adding greatly to its value.

J. R. ANDERSON,
Deputy Minister of Agriculture.

*Department of Agriculture of British Columbia,
July 19, 1910.*



POULTRY-RAISING IN BRITISH COLUMBIA.

—:—

BY THE REV. W. E. DUNHAM.

The climate of British Columbia is, for the most part, better suited to the successful carrying on of this industry than almost any part of the United States or Canada, the Lower Mainland and Vancouver Island offering exceptional advantages.

The Upper Mainland, or Dry Belt, as it is often designated, is subject to longer and more severe winters, but not at any time as bad as in the Eastern Provinces and some of the Eastern States, where the poultry-raising industry is successfully and profitably carried on. Assuming the importance of the climatic influences on this matter, we find that the whole of this Province is on the average better adapted to this industry than the localities where it has grown to the largest proportions. The mild winters of the Lower Mainland and Vancouver Island, the continuous supply of green food out of doors all the year round, place these sections at a great advantage when compared with that famous poultry country, California, for they have all its advantages and have not the dry, intense heat to contend with that is prevalent in the summer in that country.

It is then established that British Columbia is, in so far as the climate is concerned, a suitable and desirable country for poultry-raising. Never have the prospects been brighter for the poultry industry than at present. The high prices will no doubt continue, and the man who uses common sense in taking care of his stock will have a good investment on his hens. I believe that the poultry industry is one of the best fields for a young man to enter who is not afraid to work, and who is willing to learn the business from the bottom up; but for the one who wishes to start from the top I can see nothing but failure. The man who starts from a small beginning, with one breed, and works his way to the top, is the man who is bound to succeed.

The poultry industry has passed the point of being looked down upon, and is now regarded with favour by even the wealthier class, who have taken up the industry as a hobby. We need never fear that the market for poultry will be glutted, but, on the contrary, I do not believe that the present generation will see the supply meet the demand.

We are often asked by those unacquainted with poultry-raising, or by the ambitious beginner, whether or not there is money in poultry. To such our experience gives a direct yes, but attaches one essential condition, namely, that poultry-raising be managed with the same care and knowledge that is needed to make a success of any other legitimate business.

The following reasons are given by Mr. Gilbert, of the Poultry Department at Ottawa, why poultry should be taken up by farmers:—

" 1st. Because the farmer ought, by their means, to convert a great deal of the waste of his farm into money in the shape of eggs and chickens for market.

"2nd. Because, with intelligent management, they ought to be all-year revenue producers, with the exception of perhaps two months during the moulting season.

"3rd. Because poultry will yield him a quicker return for the capital invested than any of the other departments of agriculture.

"4th. Because the manure from the poultry house will make a valuable compost for use in either vegetable garden or orchard. The birds themselves, if allowed to run in plum or apple orchards, will destroy all injurious insect life.

"5th. Because, while cereals and fruit can only be successfully grown in certain sections, poultry can be raised for table use or layers of eggs in all parts of the country.

"6th. Because poultry-raising is an employment in which the farmer's wife and daughters can engage, and leave him free to attend to other departments.

"7th. Because it will bring him the best results in the shape of new-laid eggs during the winter season, when the farmer has the most time on his hands.

"8th. Because to start poultry-raising on the farm requires little or no capital. By good management poultry can be made with little cost a valuable adjunct to the farm."

A little careful study on the part of farmers will enable them to make poultry pay, but it must be gone at in the right manner. Without wishing to in any way offend the farmers, for whose benefit this bulletin is mainly intended, I would ask, what is the state of affairs in the poultry yards on most farms? One finds male birds, all shapes, colours and sizes, running with a lot of hens of the same style. Probably no hen-house, and if there is one it has not been cleaned out for possibly years. The writer has even seen a sow and litter and hen and brood of chicks all in the same filthy coop. It is little wonder that we are told by such people that "poultry does not pay." No farmer would leave his horses or cows in the same condition and expect them to be profitable; but it is the opinion of so many that the hens should care for themselves, take what they can get to eat and still be money-makers. Try the new methods for a time and you will find the poultry just as good a success as any other farm industry.

But to have success with poultry it is necessary to have a basis upon which to build that success. Many persons affirm that common barn-yard fowl are more prolific and have greater vitality than pure-bred stock. On the face of it this is a stupid statement, and yet there is some reason for such a claim. Let us look into the cause of such a measure of success in barn-yard stock as compared with pure-bred poultry. In the first place, the great majority of persons buy eggs for hatching from the man who wins the greatest number of prizes in the show-room. Catering to this demand for show-room standing, you will find that the greater number of breeders advertise their windbags in certain shows. This method of obtaining a standing is legitimate in every sense of the word, but it is abused. If the prizes given were awarded for utility, and this can be fairly judged by the shape of a bird, then it would be not only a fair but a desirable method of obtaining a standing, and a

splendid source for the beginner to obtain a basis. But the prizes in these cases out of ten are awarded from the fancier's standpoint, and utility is in the greater number of cases sacrificed to colour or some minor point. The Barred Rock is a striking example of this. This class of fowl is one of the best general-purpose birds that has ever been produced; its universal reputation bears out this statement, without argument, and yet this fine standing has been sacrificed until out of a dozen scattered specimens you will not find two birds of the same shape. The Barred Rock has been perhaps the greatest sufferer in this respect, owing to the great competition in obtaining the correct barring and the proper colour of skin. Notwithstanding the long establishment of this universal favorite, there is to-day greater competition in the Barred Rock class than in that of any other class or breed. The reason for it is as stated above.

The reader will at once see, then, the disadvantage which sometimes attends, and I will venture to say, generally attends, the purchase of eggs or stock from the poultry-keeper who aims to please the judge's eye or who aims to reach the fancier's ideal.

There are, however, successful winners who are successful breeders of utility stock, but the beginner must learn to discriminate between the two classes of breeders.

Now, to produce a basis from stock such as above referred to, *i. e.*, stock in which utility has been sacrificed to reach the fancier's ideal, is to weaken, each year of production, that basis; hence dissatisfaction and the reason for the claim that barn-yard stock is superior to pure-bred birds. The mongrel is never hindered in natural production by aiming for a colour standard or some other technical point.

And, again, it is the ambition of the beginner to obtain eggs for selling purposes during the closed or winter season; this is a right objective, and it can be obtained, but only in the right way. The beginner invariably endeavours to obtain eggs for hatching from stock which have laid all winter, and which oftentimes have been forced to lay, yet he does not want the eggs for hatching until March or April. Now, a little common sense should be a good guide here. Is it not, from every point of reason, absurd to expect that the greatest vitality will be obtained from stock when the laying season for them has been long continued? Whether the male bird has been kept from the females all winter or not, the fact remains that the vitality from the female side is weakened by prolonged laying prior to hatching. So, then, the beginner should not expect a good vitality from birds which have been laying for six or eight months before he obtains eggs from them, to hatch and obtain his basis.

If eggs are obtained from strong, vigorous birds, which have begun to lay, say, in January or February, and if these eggs are hatched prior to May 1st, there should be no difficulty in obtaining winter layers. The breeder who purposes producing eggs for the winter trade and for setting purposes also, should have two lots of stock, *viz.*, "winter layers" and "breeders"—the first to commence laying about November, the second to commence laying about February. This is another reason why the barn-yard fowl produces vigorous chicks; the hens usually rest all winter and the egg material is strong, natural and vigorous.

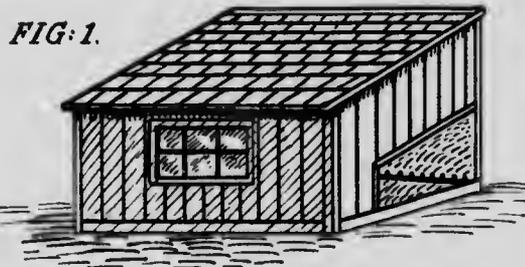
A disadvantage attending the handling of common barn-yard fowl is that you can never tell what the birds will produce, and strong, vigorous stock will frequently "throw back" and produce progeny incompatible with good results. For this reason, the beginner should have pure-bred stock to begin with, treat them fairly and naturally, and good results cannot but be obtained.

HOUSES AND FITTINGS.

A great many beginners obtain their stock and then build houses for them. In this way, very frequently, diseases obtain lodgment in the flock, and no amount of care or comfortable quarters will obliterate the trouble or the results of it. The aspect should, as far as possible, be south or southwest, and if on a hillside sloping in that direction, you have then the ideal spot for such a building as you may settle upon. There must be no opening on the north or east sides, and if the situation is dry, an earth floor is the best that can be used, and should be raised six inches or a foot above the surrounding ground.

The best material to cover the house and roof with is one of the well-known and tested brands of roofing material, which comes done up in rolls with cement to fasten it. This is easily applied by any one and can be put on over rough board siding, and is absolute protection against draughts, which must be avoided, as much of the sickness and roup in poultry is directly traced to some small knot-hole or crack. Of course, at a little more cost, shingle will make a better finish to the siding and shingles a more lasting roof; but I cannot too strongly emphasise the necessity of covering the sides of the building with this paper to protect against the small holes and cracks. Provide proper ventilation in the proper place, but remember that a cold draught is the surest starter of roup, which has ended the career of what, with a little care, might have been a fine flock of money-making birds.

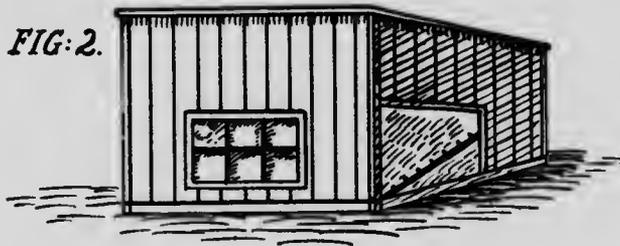
A house which has proven in every way to be adaptable to this climate is the double-deck house, a sectional plan of which is given below:—



Back and end elevation of single house.

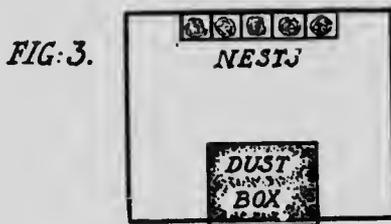
The double-deck house should be built in pairs, thereby being easy to accommodate to orchard runs. This is a very profitable way to utilise the orchard, as the fowls keep down a great number of insects and fertilise the soil to a marked degree. Care, however, should be taken to protect the

roots of the trees; the birds are liable to expose the roots by scratching around them. A few large stones placed around the trunks of the trees will prevent this, and if these be white-washed, a very attractive, tidy appearance is presented.

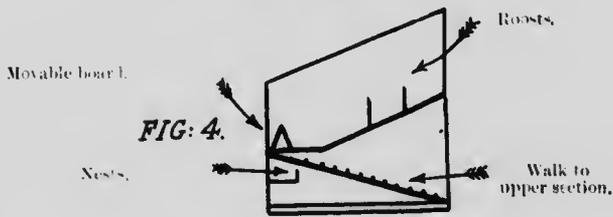


Front and elevation.

The double-deck house plan utilises every available foot of space, which cannot be said of any other plan. The great majority of poultry houses are built with walks and high ceilings, causing needless expense. To accommodate about twelve of the American or English class of birds (*i. e.*, Rocks, Wyandottes, Orplingtons, etc.), the following dimensions will be sufficient for a single house:—Length, 10 ft.; width 6 ft.; height, front, 8 ft.; back, 5 ft. If a single house is built, only one end should be open.



Ground floor.



Cross section.

It will be seen that this is a comparatively small house, but in this climate a walk is a luxury, and it is, in fact, unnecessary to build a house large enough to admit of a person standing upright inside. There is no

reason whatever for the poultry man to enter his poultry house. All of the spraying, cleaning of roosts, changing of litter, etc., can be done from the outside. This is a decided advantage, and to make this possible the building is built narrow, so that a hoe will reach every section of the droppings board or floor quite conveniently. The floor of the upper deck is built on a slope, thus facilitating the cleaning of the droppings. (See Fig. 4.)

FIG. 5.



Uprights for roosts.

and immediately beneath the rear window, places them in a convenient position to gather the eggs, the board being raised only when gathering the eggs. The trap or opening in the floor through which the fowls enter to go to roost can be at one end of the nests. The trap should be closed during the day and the window of the roosting pen should be kept open all day, no matter what the weather is like. If the keeper is careful to clean the droppings every day, sprinkling road dust lightly upon the damp places to absorb the moisture, the roosting pen will be kept sweet and clean. The open space at one end of the scratching section of the house is low, being but four feet high at the highest end. This compels the birds to be in the fresh air all day long; the window in the front of the building and opening into the scratching section makes of it bright cosy quarters. (See Fig. 2.)

The ground floor of the scratching shed should be of dirt and about six inches higher than the ground outside; if the sills of the building are put on blocks (there is no need of posts) about six or eight inches from the ground, and this space, from the sills to the ground, filled with coarse sand, baked before being placed inside, the floor will always be dry and comfortable; then litter of some kind should be spread over the floor and the grain always fed therein, winter and summer.

A 2 x 3 scantling, with the edges slightly rounded, makes the best roost. Place the wide side up, and notch, as in Fig. 5. The roosts should never be the full length of the roosting pen, no unnecessary cleats of any kind should be nailed to the walls, as these make admirable places for vermin to secrete themselves.

For a house the size of the one above advised, have the roosts about seven feet long, placing two, about eighteen inches apart, about the middle of the slope of the floor of the roosting pen. Be careful to have the roosts the same height, else the birds will all strive to obtain a place on the highest roost. Do not nail the roosts, simply fit them into the notches of the uprights.

A decided advantage, too, in having the roosts in the high part of the house is that the natural heat of the fowls does not escape to some high corner and leave the birds roosting in a low, draughty place. When birds are damp they need comparatively close quarters in which to roost, *i. e.*, a low ceiling, so that the animal heat will be retained, thus readily drying them. If the plan given above is carefully followed, there will be no danger of over-crowding or of the fowls being compelled to breathe impure air.

The board over the nests should be left loose (*i. e.*, the first board of the floor from the back window—Fig. 4). The nests being built a foot from the ground

This will permit of the roosts being easily removed and a strong smelling liquid poured thereon, *e. g.*, coal oil, carbolic acid, creolin, or any tar extract. This will keep the mites and lice in check.

A house such as the one above recommended is cheaper and will give better satisfaction than any of the standard plans so often mooted by experts and would-be poultry advisers.

A word of caution here *re* the open shed plan will not be out of place. The open shed plan, *i. e.*, the wire-fronted house with a canvas screen, is more practicable in Ontario than it is on the British Columbia coast. The reason can be given briefly. This plan exposes the fowls when roosting to an atmosphere, in the wet season, surcharged with water vapour; this is not healthful and will keep the fowls in an uncomfortable state all night long. This will affect the egg production, and such exposure frequently results in disease.

The dampness during the winter months is practically the only climatic problem which the British Columbia poultry-man is called upon to solve, and the open-fronted house has done much to militate against the success which many have tried, but failed to obtain. No matter what success may have been achieved with the open-fronted house, I do not hesitate to say that better success could be had under more favourable conditions in this climate. The double-deck house answers every purpose, is cheap, takes up little space, and is thoroughly practical.

CLASSIFICATION OF BREEDS.

It is absolutely necessary, before the beginner invests in stock of any kind, that he know just what section of the poultry business he is aiming to follow. When this is decided upon, he is then in a position to choose the class of bird which will be the most profitable to him, and from that class choose the particular breed which he believes will suit his purposes best.

Just here let me say that there is not very much in a name or breed. I would not advise anyone to obtain a certain breed because someone else has had success with it. But the beginner will do well to weigh carefully the merits and demerits of each particular breed of the class he chooses before making his final selection. As an aid to this end, the several standard breeds will be divided below into three classes, *viz.*, the Asiatic, Mediterranean and American. The English class will be included in the American.

<i>American.</i>	<i>Mediterranean.</i>	<i>Asiatic.</i>
Brahmas.	Leghorns.	Plymouth Rocks.
Cochins.	Minorcas.	Wyandottes.
Langshans.	Andalusians.	Orpingtons.
		Rhode Island Reds.

These are the standard breeds of each class; there are others, but they are inferior to those mentioned above.

The Asiatic Class.

This class is essentially a fancier's bird. Some maintain that they make a splendid table bird. This is quite true if size be the only requisite, but, unfortunately for such claimants, size is not the only thing. To obtain a

good table bird, the bird must be the proper shape in the first place; people do not wish a great heap of bones, and customers soon grow weary of paying something for nothing. There are meat types of fowls, and notwithstanding all that may be said in favour of the Aslatie class, they do not belong to the meat type. The food that should be reproduced in meat is in them reproduced, in a very large measure, in bone, and this is expensive, as bones are thrown away, not eaten. True, the Aslatie grows quickly, and at a tender age is a large chick, but that is all that can be said of it. In this type there is too much food wasted in legs and neck. The Aslatie class is not at all the type which the market demands. Aside from this, they are indifferent layers, and are not suited to the climate. Their clumsiness is proverbial, hence they are poor brooders. In fact, from a utility standpoint, as compared with the other classes, "they are not in it." The above remarks, of course, are given in a general sense, and do not apply to particular cases.

Mediterranean Class.

Leghorns.—The Leghorn has been well called the "egg machine," and perhaps of all breeds of this class, or of any class, this breed will lay, on the whole, more eggs in the year than any other breed. But that does not make of it the best egg-producer from the profitable standpoint. The Leghorns, as is the case with all of the Mediterranean class, are summer layers. As the name of the class indicates, they come from a warm, mild climate, and the sudden climate changes experienced on the British Columbia coast in the winter months are detrimental to their egg production. And another fault of this type is their nervousness. They exercise very freely, which is good, but they are also very easily frightened, which frequently acts as disastrously with the female bird as a scare will to any female during the period of reproduction. Shocks frequently occur among this type and end disastrously. This nervousness may, however, be removed to a very great extent by choosing only the larger, coarser birds for breeding purposes. But the tendency is quite the reverse of this; fineness of comb, fineness of shape, and fineness of feather are most desirable for show purposes, hence an increase of nervousness. To choose from the larger birds for breeding purposes will improve not only the Leghorn but all of the breeds of the Mediterranean class.

Minorcas.—Splendid layers, and if improved in size and coarseness will prove quite as good as anything for winter egg production. However, eggs are always a good price, and winter eggs are not always the most desirable. This bird has been sacrificed much to colour and comb.

The Minorca lays the largest eggs of any breed in any class. A beginner will not be far astray in handling this breed, if care be taken to handle them quietly and carefully, and if eggs are the main object aimed at.

Andalusians.—Rather hard to raise; great competition in colour; hence a great sacrifice of utility qualities; a splendid summer layer.

The Mediterranean class is essentially an egg-producing class; this class is of very little value for market purposes.

American Class.

This class contains what are known as the great general-purpose breeds, combining, as they do, excellent laying qualities and the ideal market type. The breeds of this class are not nervous, neither are they indolent; on the contrary, they are vigorous workers and put all of their food to good advantage. None is wasted in energy spent in useless fluttering.

The American class are particularly hardy; they have a coarse feather and plenty of them; they will stand great exposure to dampness or cold, and in every way are admirably adapted to the British Columbia climate.

Plymouth Rocks.—There are three kinds of this breed, viz., Barred, White and Buff. The Barred Rock, as has been stated previously, has been the best general-purpose bird the poultry world has known. But owing to the great competition still existing, and bound to continue to exist, in the obtaining of correct berrings, and the proper colour of same, the type varies with every strain produced. In consequence, from a market standpoint, the good qualities have been superseded by an irregular shape, which all too often is manifested in too much bone, prominence of breast bone and length of leg and neck. These are positive objections in market birds. The laying qualities are also jeopardized by the fancier's notions as to what will win in the show. Nevertheless, the breed is a good one, and if care be taken to improve the utility qualities, even though it be at the expense of minor technicalities, this breed will prove profitable.

Buff and White Rocks.—The Buff Rock has suffered some from colour, but promises to take the place of the Rock as a general-purpose bird. The legs and neck are, however, somewhat long for a good market type.

The White Rock is too coarse and bony for market, and is usually a weaker layer than either the Barred or Buff. The White Rock is, however, very hardy, and with improvement along the lines mentioned will make a very profitable bird.

Wyandottes.—The Wyandotte is almost an ideal table bird, short limb and neck, plump full breast, with meat in the required place. The Wyandotte is not of a bony, rakish build like the Rock, but is blocky, plump and shapely, with sufficiently heavy bone to give a strong vigorous frame. There are four principal classes of Wyandottes—White, Buff, Silver and Golden-faced and Pencilled. In preference, they run in the order named. The White Wyandotte is the easiest type in which to obtain perfection of any class or breed of fowl known. There is, therefore, less competition and less sacrifice for fancy points; for this reason the White Wyandotte ranks practically first as a utility fowl. The Wyandottes are excellent layers, and the white of this breed is well to the front in the contests for laying held under varied circumstances and in various parts of the world. The Northern States and Canada are, however, peculiarly the home of the Wyandotte. There is little required which this bird does not possess.

Orpington.—This breed, as compared with the others named, is a new one. It was originated to supply a crying need for an ideal utility bird, and as a general-purpose fowl it is "par excellence." In shape it is ideal for market purposes, save length of limb and neck, but this can very easily be bred out. The Orpington is to be had in three kinds, viz.:—Buff, White

and Black. The Buff is the favorite, and is a pronounced success. There is, however, a difficulty in securing vigour in this breed. The reason is very easy to explain. There has been a great cry for the Buff Orpington, and hence every holder of the breed has pushed the egg production to the detriment of the progeny. Hence weak, indifferent chicks, if indeed they hatch at all. In a few years time, however, this breed will be among the best in any class or type. It is well to the front thus early in its existence as a standard fowl.

Rhode Island Reds.—This breed are good general-purpose birds; they have not been sacrificed to any great extent in colour, because they have not been favourites; there has been no run on this breed as in most of the other leaders. The Rhode Island Red is, however, an indifferent layer, and until this objection is removed it can never be a general favourite nor a "top notcher" as a money earner.

STANDARD WEIGHTS OF DIFFERENT BREEDS.

Plymouth Rocks, all varieties:—

Cock, 9½ lbs.; cockerel, 8 lbs.; hen, 7½ lbs.; pullet, 6½ lbs.

Wyandottes, all varieties:—

Cocks, 8½ lbs.; cockerel, 7½ lbs.; hen, 6½ lbs.; pullet, 5½ lbs.

Light Brahams:—

Cock, 12 lbs.; cockerel, 10 lbs.; hen, 9½ lbs.; pullet, 8 lbs.

Dark Brahams:—

Cock, 11 lbs.; cockerel, 10 lbs.; hen, 8½ lbs.; pullet, 7 lbs.

Langshans:—

Cock, 10 lbs.; cockerel, 8 lbs.; hen, 7 lbs.; pullet, 6 lbs.

Leghorns:—No standard weight adopted.

Andalusians:—

Cock, 6½ lbs.; cockerel, 5½ lbs.; hen, 5½ lbs.; pullet, 4½ lbs.

Mineotas:—

Cock, 8 lbs.; cockerel, 6½ lbs.; hen, 6½ lbs.; pullet, 5½ lbs.

Black Spanish:—

Cock, 8 lbs.; cockerel, 6½ lbs.; hen, 6½ lbs.; pullet, 5½ lbs.

Houdans:—

Cock, 7 lbs.; cockerel, 6 lbs.; hen, 6 lbs.; pullet, 5 lbs.

Silver-grey Dorkings:—

Cock, 8 lbs.; cockerel, 7 lbs.; hen, 6½ lbs.; pullet, 5½ lbs.

Buff Orpingtons:—

Cock, 10 lbs.; cockerel, 9 lbs.; hen, 8½ lbs.; pullet, 7 lbs.

Rhode Island Reds:—

Cock, 8½ lbs.; cockerel, 7½ lbs.; hen, 7 lbs.; pullet, 5½ lbs.

Bronze Turkeys:—

Adult cock, 36 lbs.; yearling cock, 33 lbs.; cockerel, 25 lbs.; hen, 20 lbs.; pullet, 16 lbs.

Pekin Ducks:—

Adult drake, 8 lbs.; adult duck, 7 lbs.

Indian Runner Ducks:—

Drake, 4½ lbs.; duck, 4 lbs.

Toulouse Geese:—

Adult gander, 20 lbs.; young gander, 18 lbs.; adult goose, 18 lbs.;
young goose, 15 lbs.

Emden Geese:—

Adult gander, 20 lbs.; young gander, 18 lbs.; adult goose, 18 lbs.;
young goose, 16 lbs.

This practically covers the weights of all the popular breeds in use to-day. Of course, there are still a great many fancy fowls that we have not dealt with, and in a bulletin of this kind it is not intended to supply detailed information on such breeds. It is solely for the purpose of giving farmers and others the useful side of poultry, and to assist and encourage this industry from a financial point.

INCUBATION.

There are two methods of incubation, viz.:—

1. The natural method.
2. The artificial method.

The proper mode of procedure for a beginner is the natural method.

It is not much of a task to obtain a successful hatch, even in the case of a novice, by the artificial method, but it does require skill to care for chicks after they are hatched; it will, therefore, be surer ground for the beginner to start in a small way, let the old hen do the incubating, and when the chicks are hatched take them from the hen and learn by experience the wants of the chicks. The beginner will find these not a few. Of this I will deal later.

The Natural Method.

A great many persons think that when a hen takes to the nest and refuses to leave it, ruffling up her feathers and accompanying the same with no uncertain tone of displeasure, upon the approach of any one, that she is clucking. This is not always so. Very often the hen is sick, and, like most humans in that state, not very agreeable. Before a hen is set upon eggs her condition should be looked into. If the breast is plump and the body excessively hot, it may be taken for granted that the hen is broody; but if, on the other hand, she is in poor condition, she should not be set even if she be broody. Most every farmer's wife can tell you of the devotedness of certain mother hens, which in their maternal care for the eggs refused to leave the nest long enough to eat, and finally died; whereas, the truth of the case is that the hen went to the nest to die. It is seldom that a sick hen, unless she have a fever, will have the vitality to bring the eggs to a temperature which will start incubation.

When a hen is known to be "clucking" and it is decided to "set" her, she should be carefully dusted with insect powder, after dark, care being taken to rub the powder freely around the vent and under the wings. To do this the bird should be lifted quietly, held in the left hand by the legs, body suspended, the feathers will thus stand out from the body and catch the powder as applied by the right hand.

A nest should next be prepared of sufficient size, there should be no crwding; dust the box well with powder, also the clean straw. The nest

should never be in such a receptacle as shall demand the hen jumping down into the nest, she is likely to break the eggs.

A good plan is to set two hens at once, then about the end of the seventh or the eighth day "test" the eggs by holding them before a lamp light, encircling the egg with the hand. If a black mark is seen return the egg to the nest; if there is no dark spot the egg is infertile and should be removed. When the testing is over there will possibly only be enough eggs to set under one hen; give them to the one in the best condition and the one showing the greatest gentleness. Break the other up. This may be done by confining her in a coop with a vigorous young male bird. Never dip her in water.

In the selection of eggs be careful to have the eggs of a uniform size and of a uniform colour. The reason a hen usually has such success when she hides her nest is that she obtains this uniformity; the eggs are her own and all the same. The colour is an important item; brown eggs are thicker shelled than white eggs, hence are slower in hatching, or rather in evaporation, so that white eggs just brought to the proper condition will leave brown eggs with an excess of moisture which will likely drown the chick.

Do not give a hen more than 15 eggs; it is risky to give more. Let the old hen have perfect freedom and ready access to food and water, also to a little strip of green grass where she may obtain moisture for the eggs if required. She will require no further attention save a good dusting about the sixteenth day, when the corners of the nest should be well dusted also. When hens eat the eggs during incubation take the remainder from them. This is usually a sign that the bird is sick and not broody at all.

Artificial Incubation.

Any standard incubator will give satisfactory results. Chicks hatched by the artificial method can be brought around in just as good condition as by following the natural method. The advantage of the incubator is that it is always ready and will give a quantity at once, whereas the hen has to take the notion and is limited to number.

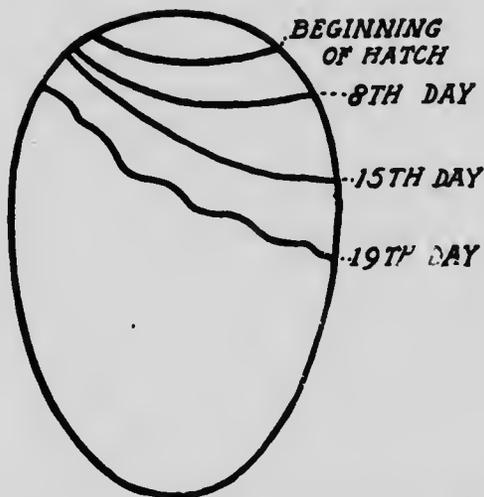
This brings me to an important point on this subject. Do not buy an incubator because it is cheap or because you get it on easy terms; rather buy the machine that costs a little more and that carries the maker's guarantee with it, and one that you know is in satisfactory use by the leading poultry-raisers of the day. The market is so full of cheap, trashy machines that are really nothing but toys, and so many are deluded into buying them every year and throwing them away in disgust, and so giving the poultry industry a black eye, that I am compelled to impress this upon the buyer: Whatever you do, get a good standard machine, if you have to pay more for it, as it is cheaper in the end and will be in business long after the other has fallen to pieces. The same remarks will apply to the brooder, for whereas anything will hatch a certain percentage of chicks, it is only the properly constructed, scientifically ventilated brooder that will raise those chicks after they are hatched. There is also the great danger from fire with these cheaply-constructed machines, while, on the other hand, you never hear of accidents with the more expensive and, consequently, better makes: or if such accidents do occur, they are directly traceable to negligence of the operator.

There are, from my experience, a few golden rules that must be observed by those who would have success in the operating of incubators, and they are as follows: Run the machine strictly in accordance with the maker's printed instructions; for it is a reasonable supposition that he has made every experiment and investigation necessary to the success of his machine, and he is as much interested in the thing doing the work properly as you are, and more so, as it means increased sales for his machine; therefore, I say, follow his directions to the letter. Air your eggs at a regular time every day and also have a set time for filling and trimming your lamp, and do it then, so that you will not have the misfortune to find your machine cold and the hatch ruined. Do not be in a hurry to open the machine at the end of the hatch; your chicks will not die of starvation; nature has provided for all their requirements for at least forty-eight hours after exclusion, and more chicks are killed by opening the machine, perhaps with a view to saving some chick which it is thought cannot get out by itself, than by any other means. The chick that has to be assisted out of the shell is never any good, and in saving, or trying to save, the one you may kill fifty others. Let me then make a strong point of this; Do not allow anyone, by any excuse whatever, to open your machine during the hatching or until it is all over and you are ready then to remove the chicks to the brooder. This is also a critical time, as they must be quickly removed to the brooder without a chance of a chill, which is almost sure to be fatal, and if not so will give them a great set-back, and they never will quite recover from it.

A most important point to be observed is the keeping of an equal temperature and the proper supply of pure, fresh air. In the matter of temperature it is a good plan to err on the side of too much than too little. What I mean is, that if your machine is such that it cannot be regulated to a fine point, it is better to be on the high side than to have a machine at 102 deg. 103 deg. is conceded to be the correct incubating temperature, and the nearer the temperature is kept at that the more satisfactory the result. All good makes of incubators are now provided with reliable automatic regulators, so that if the maker's directions are followed there will be no variations of temperature. In fact, I have run a machine for eighteen days and the regulator was never moved or altered by anyone, and the temperature did not vary half a degree in that time. Follow the directions and keep heat as regular as possible, providing plenty of fresh air by proper airing of the eggs daily. Do not be afraid to give the eggs plenty of air, as this is essential above all things to the proper and timely exclusion of the chick and to the natural drying out of the egg. But do not get the eggs where they will be chilled, or you will err on the other side. What is wanted is fresh, not cold, air. Most beginners are too timid about airing the eggs; especially during the last week, and more chicks are lost from this cause than any other; they are practically smothered in the shell. Did you ever notice the way a hen will leave her eggs, often for half an hour each day, and even an hour if the weather is warm, and then hatch every one. More air should be the motto of the incubator operators and there would be more chicks. These same remarks apply also to the brooders and brooder houses. Fresh air is the life of the chick, both before and after hatching.

The beginner is at some disadvantage in commencing artificial incubation in British Columbia, because a great number of the standard machines are tested out to conditions prevalent in the Central, Southern or Eastern States of the Union. Eggs in British Columbia require more ventilation than they do in the above-named places. There is a greater amount of water-vapour here than in the East. For this reason some operators have not had the success they anticipated; in most cases the chicks have been found to drown in the shell. The only way to overcome this is to learn to judge the amount of evaporation required. The accompanying diagram will give some idea of the evaporation required during the different stages of the hatch.

The air cell may not be so pronounced at the beginning as I have given it in the figure, but be careful to have the cell showing just about the evaporation indicated in the diagram at the end of the proper time. If there is difficulty in obtaining this, expose the eggs a longer period, but have the room warm. Otherwise follow the directions given with the machine minutely.



Be careful to have uniform eggs, for the same reason as given in the advice *re* the natural method of incubation.

Some advise the opening of the machine when the shells are pipping and turning the pips up as rapidly as possible. There is a chance here, of course, of doing more harm than good. It is a well-known fact that if eggs pip in the air-cell they are safe; if below it the chicks are liable to drown. Now, to avoid this in a large measure, care should be taken, when the eggs are cooled for the last time, that the large cell end of each egg is slightly tipped upward. This will give the chick a better chance. The safest way is not to meddle with the machine after it is shut up, until you become an expert, then use your common sense.

If the evaporation is too rapid, reduce the ventilation and exposure; and if it still continues, towards the last add moisture by placing a warm, damp cloth over the eggs, cloth to be about temperature of the eggs; leave for half an hour, then remove—do not have it so wet that it will drip.

CARE OF CHICKS.

The care given to young chicks should be practically the same, whether they are raised by the natural method or by the artificial. When an operator has obtained control of his brooder or brooders, the care which the brood demands from him will not be more than a much smaller brood requires when mothered by a hen. When a beginner undertakes to operate a brooder, he will do well to pay strict attention to the most minute detail of direction given by the manufacturer of the brooder.

A few essential points to be especially remembered are:—

1. Sufficient heat to give comfort.
2. Sufficient fresh air, which should be warmed before reaching the chicks.
3. Be careful not to have an excess of bottom heat. This will cause leg weakness and general debility.
4. Chicks should be taught to scratch in the litter.
5. Powdered charcoal and fine grit should always be before the chicks in receptacles.
6. Fresh water should be kept in the brooder from the second day of the hatch. The water, however, should not be cold. A handleless cup filled with water and inverted into a saucer, with a piece of a match or a small nail placed under the edge of the cup, makes an excellent drinking fountain for chicks.
7. The lamp of the brooder must be carefully watched. Follow instructions relative to lamp very carefully.

SOME DIFFICULTIES MET WITH IN RAISING CHICKS.

Leg Weakness.—This is caused by excess of heat, excess of meat food, too much food, or general weakness. If the bottom heat has been excessive, reduce it gradually, take out the affected chicks, placing them in a box near a stove until they recover. If too much meat food has been given or if the chicks have overeaten, reduce their food accordingly. Always take out the affected birds. If there is a general weakness, the best of care will seldom make them strong and vigorous.

Gummed up behind.—This is an indication of an advanced bowel trouble. Wash the affected part in warm water as soon as noticed; do not neglect a chick so affected; isolate the chick until dry and feed dry food. This trouble is due to sloppy foods, some kinds of rich foods, chills, colds, over-heating, etc. Give chicks affected warm—not hot—quarters, and boiled milk to drink.

Roup, colds and kindred ailments are due to dampness, exposure, filthy quarters, over-crowding. These wrong conditions should be corrected and the affected chicks isolated, and if badly developed, killed. The floor of the brooder should be kept clean, cover the floor with fine sand, and do not permit it to become caked; frequently filthy brooders are the cause of failure and are always a positive menace to success.

Cramps are often nothing more than the death struggles of chicks that have been illing for some time. The cramps which kill healthy chicks in a short time are mostly caused by drinking too heartily of very cold water, by choking, or by extreme heat of the sun when the chicks are not hardened to it. Prevention in such cases is the only cure.

Drooping Wings.—This is frequently met with and is due to general debility, which may result from any one or from several of a great variety of causes. Prevention must begin in the condition of the parents and continue in the management of the chicks. Chicks which have been going about long with drooping wings are not worth trying to cure or rear. The main thing required in raising chicks is to keep them growing from the shell to maturity. The slightest check is a loss that cannot be made good. But regular feeding of a proper food will be a splendid asset in this direction.

Growing chicks should be fed five times a day, and each feeding should be regular. It will not suffice to keep food continually before the chicks; they are most likely to over-eat and "go back" on their food. The chicks should be hungry and ready for their food each time they are fed. Only sufficient food to satisfy should be given at one time.

Care should be taken as to the kind of food fed and this depends upon what the chicks are being raised for. If for market purposes and rapid growth is required, independent of vitality, then soft foods may be fed, rich in quality, *e. g.*, bread soaked in milk. But if the chicks are required for layers, or for breeding purposes, then the dry food is better. Pearl oatmeal (not rolled oats) is a splendid food to start with. Johnny-cake is also an excellent food. Two parts bread crumbs, one part hard-boiled egg, one part chopped onions, is also a splendid ration. Cracked wheat and cracked rice are good.

Just here I should give a word of caution in the use of advertised "chick foods." A great many of these mixtures are nothing more or less than screenings of grain and are usually the seed of weeds which have been threshed with the different grains. Some of these seeds are good for chicks, others are injurious. At best the merchant who markets this so-called "chick food" is in the dark as to the quality of the same. He knows nothing about what the food is composed of, and very frequently knows nothing of the requirements of chicks. The weed seeds and sweepings are with him a "by product"; to him it looks good for chicks, and to advertise it thus makes it marketable. Some of these "chick foods" are specially prepared for chicks, and it is profitable to use such, but there are others which are unsafe and dangerous.

Chicks should never be allowed loose with older birds until fully grown. Many breeders and many beginners act very nonsensically in this respect. In warm weather most hens will rear their chicks when from 6 to 8 weeks old. But in cold weather they sometimes require mothering until 10 and 12 weeks old. This is a safe gauge for artificial methods.

When chicks are taken from the brooder they should be placed in small bottomless coops for a few weeks; these coops should be moved daily to a fresh plot of green grass during fine weather. A small yard of convenient size can be made of a few yards of narrow poultry netting, each end fastened

to the coop, and a couple of stakes driven in the ground on the inside of the wire; this will make a handy runway. The whole can be covered with old fishing nets, thus making the runway hawk and cat proof. The chicks, as soon as feathered, should be taught to roost. They should be supplied with a large portable coop in which wide roosts are placed a few inches from the ground. The chicks will instinctively use the roosts at night. The front of the coops should be slatted or wired.

FOODS AND FEEDING.

"This is a section of the poultry business which requires great attention. And a larger percentage of common sense and practical knowledge is required than scientific or theoretical information. However, where common knowledge fails, scientific knowledge is able to assert itself with value. In acquiring common knowledge, only the elements or values of the foods used become of use, whereas it may be profitable and necessary to introduce new foods, and, not knowing the value of the new foods, the poultry-man who simply uses common knowledge is at a disadvantage. An elementary knowledge of the science of feeding is, therefore, desirable. As an aid to this end, I will give a brief synopsis of the function of foods, and a table giving the analyses of the foodstuffs usually obtainable in British Columbia.

The food which a fowl eats has three functions—

1. To develop and maintain its organic structure.
2. To keep it warm; to keep up heat in the body.
3. To furnish the strength.

Added to this is the egg production of the female.

The divisions of the animal body are fat, flesh and ash, and these are all obtained from plant food.

Flesh is formed from the protoids (or protein) of the plant. This is the albuminous or nitrogenous matter. Protein then is the nourishing matter, supplying material for bone, muscle, blood, feathers, eggs.

Fat in the plant will form fat in the body, and fat produces heat or motive energy. Fat is about two and a half times as strong as protoids. The fats store up a reserve of heat and energy in the body of the fowl, and furnish the material for elementary growth cells which are developed by the protein. Fat also enters largely into the composition of the egg, forming nearly one-half of its solids.

Carbohydrates are the starches and form the bulk of the dry matter of nearly all foods. These are the principal sources of heat and energy. There are also two subordinate elements in grain, viz.:—

1. Ash, lime and other mineral matter; partly digestible.
2. Fiber, husks, or waste matter, mostly indigestible.

These principal properties are all to be found in grains, but sometimes there is not a sufficient quantity to be found in vegetable food for the sustaining of the fowls during laying period. And as these properties are also to be found in meat foods, and as they are more easily assimilated than vegetables, it is sometimes necessary to feed animal food with the vegetable. The principal food elements, though having each its special function, are not wholly independent. At times, they may be said to do each other's work.

Carbohydrates are the cheap fuels for ordinary use. Fats are expensive fuels for emergency use. If there is a deficiency of carbohydrates or fat in a ration fed to fowls, the protein will be diverted from its proper use to supply the deficiency. Therefore, if there be a sufficient quantity of carbonaceous matter in a ration, the entire consumption of protein is available for growth and maintenance. But on the other hand, a deficiency of protein is not made up from the other elements. An excess of carbonaceous matter is detrimental, *e. g.*, meat if fed in excess will cause scouring, and protein will have just as detrimental an effect if fed in excess as will fats.

In view, then, of the foregoing, it will be readily seen that some scientific knowledge of foods is desirable.

Remembering, then, that fat is about two and a half times as strong as protein or carbohydrates as a fuel value, and knowing what he requires in his bird, the beginner will be able to figure out from the following analysis what proportion of each element his birds require:—

Digestible Nutrients of Feed Stuffs per One Hundred Pounds Concentrates.

	Dry Matter.	Ash.	Protein.	Carbohydrates.	Fat.	Nutritive Ratio.
Wheat	89.5	1.8	10.2	69.2	1.7	1:7.1
Barley	89.1	2.4	8.7	65.6	1.6	1:7.9
Rye	88.4	1.9	9.9	67.6	1.1	1:7.0
Corn	89.1	1.5	7.9	66.7	4.3	1:9.8
Peas	89.5	2.6	16.8	51.8	0.7	1:3.1
Oats	89.0	3.0	9.2	47.3	4.2	1:6.2
Buckwheat	87.4	2.0	7.7	49.2	1.8	1:6.7
Field Beans	85.5	3.1	23.0	50.2	1.4	1:2.5
Flax Seed	90.8	4.3	20.6	17.1	29.0	1:4.2
Sunflower	92.5	2.6	12.1	29.8	29.0	1:7.4
Wheat Bran	88.1	3.8	12.2	39.2	2.7	1:3.7
Wheat Shorts	82.2	4.6	12.2	50.0	3.8	1:4.8
Linseed Meal, O.P.	90.8	5.7	29.3	32.7	7.0	1:1.6
Cottonseed Meal ..	91.8	3.5	37.2	16.9	12.2	1:1.2
<i>Roots.</i>						
Sugar Beets, feeding	13.5	.9	1.1	10.2	.1	1:9.4
Mangels	9.1	1.1	1.1	5.4	.1	1:5.1
Turnips, Swedes ..	11.4	1.2	1.0	8.1	.2	1:8.5
Carrots	11.4	1.0	.8	7.8	.2	1:10.3
Parsnips	11.7	.7	1.6	11.2	.2	1:7.3
Potatoes	21.1	1.0	.9	16.3	.1	1:18.3
Rape	14.0	2.0	1.5	8.1	.2	1:5.7
Field Pumpkins ..	19.1	.5	1.0	5.8	.3	1:9.5
<i>Milk and Its By Products.</i>						
Milk, new	12.8	.7	3.6	4.9	3.7	1:3.8
Milk, Separator ...	9.4	.7	2.9	5.2	.3	1:2.0
Buttermilk	9.9	.7	3.9	4.9	1.1	1:3.7
Whey	6.6	.4	.8	4.7	.3	1:3.8

The first column represents the dry matter that the food contains, the balance being water. All food-stuffs contain water. The amount varies from eight to fifteen pounds per hundred pounds in such dry material as hay, straw and grain, and from sixty to ninety pounds in green grasses and roots. The animal makes use of the water to form a portion of the organs and fluids of the body, to aid in dissolving solid food and to carry it by means of the blood to the various parts of the body.

Chemical analysis of an egg:—Water, 66 per cent.; protein, 13.1 per cent.; fat, 9.5 per cent.; ash, 9 per cent.; refuse, 10.5 per cent. Refuse is shell and shell membrane; mineral matter will produce these properties, lime, etc.

One cannot always judge from the chemical analysis of foods just what is best to feed, for some foods are palatable and others are not. Corn is a

splendid food, but rather strong in fats. Oats is a good food, but the hull makes it unpalatable and hard to digest. Wheat is the best balanced one grain for fowls that there is. Barley is also an excellent grain.

COST OF KEEPING FOWLS IN BRITISH COLUMBIA.

I have proven, after many personal experiments, the outside cost for one hen per week when food is highest, and during the most productive and energy-demanding period, to be $2\frac{3}{4}$ cents per week of seven days. Supposing, then, a bird to only lay three eggs per week for the year, which is a very low average, and supposing the average market price to be 35 cents per dozen, which is also a low average. There is a clear minimum profit of, say, 6 cents on each bird per week. Many have estimated that there is good money in chickens if each bird would return a profit of \$2 per annum. According to the above estimate, and I again affirm it to be a most moderate one, over \$3 per annum would be realised from each hen.

FATTENING POULTRY FOR MARKET.

Chickens.

There are many methods for fattening chickens for market. All methods may be said to be under one of the three following heads:—

1. Fattening in crates.
2. Fattening, running loose.
3. Fattening in pens.

1. *Fattening in Crates.*—Under this heading we might mention two methods of feeding—(a) Crumming ; (b) in troughs.

The crumming machine is not a paying proposition, as compared with other methods in Canada. It takes time, and time costs money, particularly where labour is as dear as it is in British Columbia. The trough method is effective, but I object to the system after giving it a systematic trial, for several reasons. There is always a percentage of chickens which, though given the best possible food and attention, will fret in crates, and refuse to put on flesh, and this percentage takes away much of the cream of the profits.

Another objection I have to this system is the cost of crates, and to my mind this is an unnecessary cost. And a further objection to the crating method is the amount of room they take up under cover, which, of course, means a special building put up for the purpose, or the utilisation of one already up, which may be needed for other purposes. And from the standpoint of results I positively do not recommend the crating system.

2. *Fattening Chickens running loose.*—There is no doubt in my mind whatever but that fowls can be fattened and put in good market condition by letting them run loose. But there are objections to this method too, *e. g.*, the bird running loose will take considerable exercise; this has a detrimental effect in two ways—(a) It will tend to toughen the flesh. (b) It costs money to permit a fowl to exercise, *i. e.*, more money than it should; hence the bird running loose is not as profitable as it might be.

Now, the reader will at once see, by what has been said above, that the crating system runs to the extreme of non-exercise and causes fretting; whereas the fowl running loose goes to the other extreme and takes too much

exercise, which is not profitable. The most natural thing to do, then, is to strike a happy medium between these two, and this is exactly what I have succeeded in doing by—

3. *Fattening in pens.*—Special houses may be built for this purpose, but this is not necessary where there is a "brooder house," or other poultry houses used only part of the year. Most any kind of a place will be suitable, the idea simply being to give the fowls shelter sufficient to roost in and a small yard. Let the yard be very small.

When the birds are first put in these small pens (and by small I mean yards where they will not have room to roam about and exercise, but at the same time large enough to permit of them dusting in the sunshine), let them get real hungry before feeding, then for the first two days feed sparingly; for the next week feed all they will eat readily, twice a day; and the remaining days feed all they will eat three times a day; let them gorge themselves the last few days.

In this way chickens will not fret; neither will they exercise; they will simply put on flesh. Do not feed shorts to fowls you are fattening, but a little bran will not be amiss. Never feed whole or cracked grain to birds you wish to fatten, but give them a rich mash, not too wet, neither should it be too dry.

Always feed rich food, and as soon as you see a fowl becoming indifferent to its food, if in good condition, kill at once; if not yet fleshy enough, turn them loose. Fowls kept in crates frequently "go off their feed" early in the fattening process, but it seldom happens with fowls fattened in pens. Fowls fattened in pens will be in splendid condition in from 12 to 20 days. The following foods will make splendid fattening rations:—Oat dust, or oat meal, or oats rolled with skimmed milk, fed once a day (Morning). Corn meal with skimmed milk (Night). Buckwheat meal with skimmed milk (Noon). A mixture may be made with any of the above to good advantage. Feed in troughs. Give the birds drinking water immediately after feeding. Never feed sour food, nor let the troughs become sour.

Keep the roosting pens clean and have the place smelling strongly of some tar extract, such as crude carbolic, or cresolin, to keep down vermin.

Fattening Ducks.—Keep ducks in small pens; do not permit them to swim; feed them a good food in a sloppy condition; have plenty of drinking water at hand; for a duck will take all of the food it can and then clear the passage to the crop by drinking freely, when it will again return to the food and continue to eat until it can eat no more. Food should not be left before ducks continually, but should be fed regularly. If the above instructions are followed, ducks will be in prime condition in ten days, or less.

Fattening Geese.—Geese will not stand confinement, but if placed in a limited run and not being permitted to swim, in fact given practically the same conditions as ducks, they will show like results.

Fattening Turkeys.—The best way to keep turkeys from roaming is to give them a small, rich range, such as a clover field, and to feed a rich food, all they will eat, morning and night.

A good plan to make food particularly palatable, in feeding to fatten any kind of fowl, is to add to the mash sufficient tallow or dripping to make it tasty.

DUCKS.

The duck business is different from the chicken business, in that ducks are raised almost exclusively, from a practical standpoint, for market purposes. Very few duck eggs find their way to market, and there is little demand for them. Hence the duck business is practically divided into three sections, viz. :—

1. Exhibition purposes;
2. Breeding purposes;
3. Market purposes.

The first we cannot here consider at all. This treatment of the subject is a consideration of utility, not fancy stock. I strongly advise the beginner to refrain from purchasing exhibition birds for breeding; they are usually poor layers and indifferent breeders.

Ducks are by no means the general farmer's fowl; here they are different to either turkeys or geese. The duck is a fowl for the specialist; it is peculiarly suited to intensive keeping. Ducks are remarkably free from disease or vermin. Many persons claim that ducks are entirely free from vermin, but this is not so. However, if given proper conditions, the vermin never become a menace to success, as is the case in chickens. Ducks grow just twice as fast as chickens and turkeys, and of all fowls they are the most easily managed in close quarters.

There is only one way in which either chickens, ducks, geese or turkeys can be dressed to be presentable at market, and that is by "dry plucking." This phase of the subject will be dealt with separately.

There are five standard breeds of ducks suitable for raising for practical purposes in British Columbia, viz. :—The White Pekin, White Aylesbury, Coloured Ronen, Black Cayuga and Indian Runner.

The White Pekin.—This breed must not be confused with the Common White Duck, nor must a cross of the Pekin and the Common White Duck be considered as suitable as the pure-bred Pekin. The Common White is a slow grower, and hence an expensive duck as compared with the Pekin, which we will now describe. The Pekin has no rival as a market duck, it stands positively alone. They are hardy, quick growers, prolific layers of large white eggs, and thrive in close confinement. The Pekin duck has a distinct type of its own, and differs from all others in the shape and carriage of its body. Some have said that the end of the body resembles the bow of a birch-bark canoe; there is a heavy fluff of feathers at the base of the body which resembles the keel of a canoe, while the graceful "turn up" of the tail clearly resembles the prow. The body of the Pekin is very long and deep, well rounded and full, both in breast and in the rear. The flesh is very delicate and free from grossness. In fact, they are an ideal table fowl. They mature the earliest of any duck, and it might safely be said, of any fowl. It matters little to us where the Pekin comes from, or whether it has a little dark green on the bill or not. These are exhibition points, and with these we have nothing to do. I do not hesitate to recommend the Pekin to the duck-raisers of British Columbia as being superior as a utility bird to any other breed known.

The *Aylesbury Ducks* resembles the Pekin in a general way. The body is a little different in shape, being more oval than that of the Pekin. There are some minor exhibition points of difference which have no material value. The flesh of the Aylesbury is white and fine, the skin being very fine; the feathers are harder if the term may so be used, than is the plumage of the Pekin. This may not at first appear to be of much importance, but this makes all the difference between the Pekin and the Aylesbury. The tenderness of the skin and the hardness of the feather make it almost impossible to dress an Aylesbury satisfactorily for the market. The Aylesbury is, too, a little inferior in size and rapidness of growth to the Pekin. To retain the good points of the Aylesbury, some have advocated a cross with the Pekin. There, however, can be no advantage in this, for the Pekin has every quality of advantage possessed by the Aylesbury, hence there is no need for a cross or the introduction of the Aylesbury blood at all. In fact, such a cross, to my mind, weakens the Pekin in the matter of dressing. I would only advise a cross of these breeds when a raiser has an Aylesbury flock and does not wish to sacrifice a year's work. Under such circumstances the Pekin will improve the Aylesbury, but *vice versa*, never!

The Aylesbury is a great favourite in England and in some parts of Australia, but the Pekin is fast displacing it, even in districts peculiarly held by the Aylesbury.

Coloured Rouen Ducks.—The standard weights of the Rouen Ducks are given as being the same as the Aylesbury; this, however, is somewhat misleading. In practical experience I have ever found the Pekin to be the largest of all ducks, the Aylesbury next, and the Rouen next. And this experience has not been gleaned from the handling of a few pens of each, but is the result of handling many large shipments of ducks through successive seasons.

The Rouen is deservedly a favourite, and is a very profitable bird to keep. It is a fine market bird, splendid shape, and is a profitable feeder. It, however, has some drawbacks, which are of vital importance. In the first place, the Rouen is slower in maturing than is either the Pekin or Aylesbury. And another disadvantage is the dark-coloured plumage, which gives the dressed bird a coarse, swarthy appearance. On the other hand, the feathers are fine and pluck readily, and if this bird is marketed at the right time the latter objection could be largely eliminated.

Black Cayuga.—The Cayuga is not so general a favourite as are any of the three breeds already considered. Some claim that they rival the Pekin in rapidity of growth. The Cayuga are quiet, docile, and thrive on a restricted range, there being no inclination to stray from home. They are not so good in egg production as are the Pekins.

The Cayuga fattens very readily, and is a good duck for the average farmer to keep. It, however, has the same objectionable feature as the Rouen in colour of plumage. This is beyond doubt a decided disadvantage where a large number are kept for market, but where the flock is small, with a little additional care in preparation for market, this objection may be materially removed.

Indian Runner Ducks are the smallest of any of the foregoing types. They are active, hence require more food in proportion to size than the other breeds, but they are also very prolific. Recently considerable attention has been given to the Indian Runner. They make a good table fowl, and being small, very often a convenient size. It, however, costs more to feed them in proportion to results than is the case with the other standard breeds mentioned above, and in no way can it be considered a rival utility bird to the Pekin.

THE DUCK BUSINESS.

British Columbia offers special advantages to the duck-raiser. There is a constant demand in all of the markets, to say nothing of the undeveloped demand which might very easily be developed. The beginner will do well to heed the remarks already made on buying stock in the discussion on chickens. Every word therein stated may be applied to ducks. I may say, however, that ducks fret considerably when crated, and hence, if shipped long distances will seldom do well the first season. For this reason it is advisable to start with a purchase of eggs from some reliable breeder.

Selection of Breeding Stock.—In mating ducks to produce market stock, deep keeled, meaty specimens, strong, not coarse in bone, should be selected. They should be hatched in April or May; very early or very late hatched ducks are not desirable breeders.

Whatever characteristic is desirable in the offspring should be manifest in the parent bird, but care should be taken that essential qualities are not sacrificed for minor points, *e. g.*, do not strive to obtain rapid growth at the expense of table qualities. It is certainly desirable to have a bird grow fast, but not so fast that the appearance will make it less marketable. If early birds are required, the best results will be obtained from young ducks, as they will begin to lay a month or two earlier than the yearlings or older ducks. On the other hand, however, only eggs from the older birds, *i. e.*, the fully matured stock, should be used for hatching ducklings for breeding stock.

The question of water is a much debated one in duck-raising centres. Success has been obtained on large plants where ducks have had access to water, and equal success has been had where the ducks only had sufficient water to drink and bathe their heads. The best plan to follow is to allow your breeding duck to have access to a swimming pond of some kind. But when ducks are being raised for market they should never be permitted to swim from the time of hatching to the end of their career. In the case of the breeding duck, they *can* do without a water range, but they are better with it, and the contrary applies to market stock.

The reason for my advocacy of water runs for breeding ducks is that I believe the exercise the birds thus obtain keeps them in a very healthful state, and their progeny will be strong and vigorous, and eggs will be more fertile. I also believe that ducks will breed better in water than out of it. On the other hand, ducks raised for market purposes are expected to give the best possible results in the shortest possible time. Now, it stands to reason that if they are permitted to exercise in water it will take a greater

amount of food to keep them up, and hence a greater expense in the achievement of the same end. My reason, too, for stating that market ducks should be kept from water from the beginning to the end of their lifetime is that never having exercised in water they will never fret for it. It is a waste of money to have fowls of any kind fretting. Cleanliness is a very important factor in keeping ducks. Feed troughs and drinking vessels should be kept clean. The floors of the houses should be littered with cheap hay or straw; this will enable the ducks to keep their feet warm, and it also absorbs moisture and keeps the pen sweet. This litter should be frequently cleaned out and the pen swept; then the litter having been shaken about in the sun and thoroughly dried, can be returned to the pen. The yards should be swept and refuse of any kind should not be permitted to accumulate.

Be careful to have the drinking troughs sufficiently deep to allow the duck to submerge the bill to above the nostril; otherwise the duck will smother, or when the nostril becomes partially clogged disease sets in, which will become contagious in advanced stages. Particular care must be taken in this respect with ducklings. Water should also be near at hand when the ducks are feeding; they depend upon water, not saliva, to help in swallowing their food.

Houses for Ducks.

Houses for ducks are simple affairs; they have no furnishings whatever, and are built plain and comfortable. The houses need not be warmly built; they may be constructed after the long continuous plan, or the houses may be single. The pens for ducks are larger than those for chickens, and may be of most any size that will accommodate the number of ducks in the pen. About forty ducks are usually placed in one pen, eight of which should be drakes, although a smaller number of males have been found quite serviceable when the ducks have an exercising pond. For forty ducks the pen should be 15 ft. by 20 ft. The house need not necessarily take that shape, but there should be 300 square feet of floor space to every forty ducks, and each duck should have 40 square feet of yard space. If, however, the ducks have access to a swimming pond, the yard space required would be very small, say 15 square feet per bird.

In a succession of pens or yards a partition of boards 30 inches high will be found sufficient.

The nests should be fastened to the wall and resting on the floor; an earth bottom with some clean straw placed thereon is most natural. The nest should be so constructed as to be broadside out; this enables the cock to go on her nest easily without turning around. A succession of nests can be built together, making them about 16 inches long, 14 inches wide and 12 inches high, with a 3-inch strip running along the front.

The floor of the duck house should be of sand, and at least 6 inches higher than the ground outside. It is a mistake to build houses for poultry of any kind high. There is no necessity for it, and it costs money. If the pitch roof is used for ducks, the houses need not be more than a couple of feet high on either side; if the shanty roof is used, the low sides need not be higher than two or three feet.

Referring to the profits in duck-raising, I would quote one of the very foremost duck-raisers, Mr. Jas. Rankin, who says: "Our ducks are all hatched and raised artificially and we put them upon the market at a cost not exceeding five cents per pound." I do not say that this can be done in this country, or even in small quantities, but it is the open confession of a man who has raised thousands annually.

The hatching and raising of ducks is comparatively easy. Almost every fertile egg placed in a good incubator will hatch; in fact, a higher percentage of fertile ducks' eggs will hatch than of hens. In the brooder, ducklings are easy to raise; they require plenty of heat at first, but as they grow rapidly this is soon lessened, and they can often do without any at four weeks. This, of course, depends upon the time of year and individual surroundings.

No food at all should be given till they are twenty-four hours old, and then a mash of mashed potatoes, ground gralus, corn meal and middlings. Meat, raw or cooked, may be mixed with the mash when they are a few days old, and grass, cabbage, vegetable tops, etc., may be given. The secret of profit in duck-raising is rapid growth, and they must be pushed right along.

Impress is fatal to young ducks. They require a dry, clean house at night with a board floor. Cold drinking water is also liable to cause trouble and give them cramps; just take the chill off it.

The manner in which they have been bred of late years, as previously stated, has taken the desire for a pond and swimming from them, and in some cases the young have been known to require driving into a pond to get them to swim, and while they require plenty of good clean water at all times, for drinking purposes, they will do better if it is kept in troughs in such a manner that they cannot get at it to slop it round and make mud holes.

The following formulae are given by Mr. Jas. Rankin for feeding different sizes of ducks:—

For Breeding Birds (old and young) during the fall.—Feed three parts wheat bran, one part Quaker oat food, one part cornmeal, five per cent. beef scraps (soaked to before, five per cent. grit, and all the green food they will eat in the shape of corn fodder cut fine, clover or oat fodder. Feed the mixture twice a day all they will eat.

For Laying Birds.—Equal parts of wheat bran and cornmeal, twenty per cent. of Quaker oat food, ten per cent. of boiled turnips or potatoes, fifteen per cent. of clover rowen, green rye or refuse cabbage, chopped fine, five per cent. of grit. Fed twice a day all they will eat, with a lump of corn and oats at noon. Keep grit and oyster shells constantly by them.

For Feeding at different stages of Growth.—The first four days feed equal parts of rolled oats and cracker or bread crumbs, ten per cent. of hard-boiled eggs chopped fine, five per cent. coarse sand. Feed four times a day, what they will eat clean. Brooder heat, 90 degrees.

"When four days to three weeks old, feed equal parts of rolled oats and wheat bran, ten per cent. cornmeal, five per cent. coarse sand, five per cent. of fine-ground beef scraps, soaked, finely-cut clover, timothy, rye or cabbage. Feed four times a day. Brooder heat from 85 to 75 degrees.

"When from three to six weeks old, feed equal parts of cornmeal, two parts wheat bran and Quaker oat food, five per cent. of fine grit, five per cent. of beef scraps. Mix in green food. Feed four times a day.

"When from six to eight weeks old, feed three parts of cornmeal, two parts wheat bran, one part Quaker oat food, ten per cent. of beef scraps, five per cent. of grit. Feed three times a day.

"When from eight to ten weeks old, feed two-thirds cornmeal, one-third equal parts of wheat bran and oat food, ten per cent. of beef scraps, five per cent. of grit, oyster shells and less green food. Feed three times a day. They should now be ready for market.

"We never cook the food for our ducks after they are a week old, but mix it with cold water.

"I wish to emphasise several points again. Do not forget the grit; it is absolutely essential. Never feed more than a little bird will eat clean. Keep them a little hungry. See that pens and yards are sweet and clean, for though ducklings may stand more neglect than chicks, remember that they will not thrive in filth. If anyone falls in this business, it must be through his own incompetency and neglect."

GEESE.

The Goose, like the Turkey, is a fowl for those who can give it room, and is generally made profitable only where it can pick the most of its living. Geese, however, do not require as much range as turkeys; they are contented on a comparatively small range and easily kept within the bounds allotted them. They must have access to grass, for grass and weeds, when they can be had, form the greater part of their food. They must have a dry place in which to sleep, but otherwise they thrive on low, marshy ground. There is always a good market for geese, but it is not advisable for anyone to go into the raising of geese on a large scale, unless the ground at the disposal of the raiser be of such a nature as to warrant that the income from the geese, whatever it may be, is nearly all profit. There are some admirable places along the banks of the Fraser River, and, in fact, along the lower reaches of most any river in the Province, for the successful raising of geese. This is the natural home of the wild goose, and coupling this advantage with careful breeding, and the benefits which attend domestication, should make the raising of geese a most profitable by-product of the farms in these sections. Every year there are large importations of geese from the East, which having been frozen, or at all events closely packed, in large quantities for an undesirable length of time, present anything but an inviting spectacle when presented for sale. The local product would (because of local conditions being superior to those in the East), under any circumstances, be superior to that of imported stock; and adding to this better appearance, there is no reason whatever why the farmers who have sections of land most suitable for the raising of geese should not have the income paid by his fellow citizens for this product, but which now finds its way eastward. This money should be kept here, and geese should be a product for export rather than import.

Kinds of Geese.

There are a number of kinds of geese, but here we will only consider in detail the merits of four of the standard breeds, viz.: Toulouse, Embden, African and Chinese. The common goose known to us in Canada is presumably the descendant of early importations brought from Europe by settlers. They are usually rather small and are not so profitable as are the larger geese. But I desire to draw the attention here of the reader to my experience in the marketing of many thousands of every kind of fowl. I have ever found the average-sized bird of any class to be the best seller. Nine to thirteen-pound geese or turkeys invariably had the first demand, and it is only natural that this should be so. These are usually the young birds, or, at any rate, the female birds, and there is not the coarseness of flesh nor strength of flavour in the smaller birds. This is an item that will be appreciated in a market where the demand is light—and in the best of markets occasionally the supply will exceed the demand. But the poultry business in its every department must very materially increase before this state of affairs will ever become a matter of experience in British Columbia.

"*Toulouse Geese* attain the greatest size, after exceeding the standard weights, which are:—Adult gander, 20 lbs.; young gander, 18 lbs.; adult goose, 18 lbs.; young goose, 15 lbs. In colour they are grey, upper surfaces dark grey, shading to lighter grey on the breast, body and thighs, with white on the belly. Bill and legs are a reddish orange. They are good layers, young ones laying 18 to 24 eggs in the season, and old ones 30 to 36 or 40. This breed is by far the most popular, though for market it is considered inferior to some others. They are quiet, and the best suited to range without water."—*Poultry Craft*.

Toulouse is a late maturer and is about ready for market at Christmas time.

White Embden Geese are almost as large as the Toulouse Geese. They are, as the name indicates, white in colour, with yellow bill and legs. The Embden is not so great a favourite as is the Toulouse, they are a less hardy bird than the Toulouse, and are a little indifferent as layers. They are, however, by far the best table goose of any of the breeds. They fatten readily, dress well, and are profitable once they are carried over the first three weeks after hatching.

African Geese are about the same size as the Embden Geese. They are grey in colour, upper surfaces dark grey, under surfaces lighter, neck light grey, with a long, dark stripe on the back; bill black, with a large knob at the base of the upper mandible; prominent dewlap under the throat, although in some specimens this is inconspicuous; legs dark orange. The African Geese have many good qualities and at the same time many bad ones. They are considered to be very profitable birds and practically occupy the same place in the Geese world as the Pekin Ducks do in duckdom. They grow very rapidly and when about ten weeks old will weigh from 8 to 10 lbs. They are much better layers than the Embden, but not so good as the Toulouse. For table purposes they are very popular, their flesh being fine and of good flavour. They are, however, very difficult to dress. This is so in all

geese, but particularly so in the Africain: and having dark pin-feathers and down and a dark skin, they do not present as attractive a carcass as the white breeds.

Chinese Geese.—In shape the Chinese resemble the Africain, and is the only other breed having the knob at the base of the bill. The Chinese Geese are smaller than the three other breeds named. The adult gander weighs 14 lbs., the adult goose 12 lbs., the young birds being 4 lbs. lighter, respectively. There are two varieties of Chinese Geese:—

Brown Chinese Geese.—These resemble the Africains in colour as well as in other points mentioned. They are splendid layers, being the most prolific of all breeds, but they are the hardest to pluck and present a very undesirable appearance when dressed, as do all dark geese.

White Chinese Geese.—These are the same as the Brown, save in colour. They are prolific layers, splendid table birds, comparatively easy to dress, and are rivals of the Embdens. They have, however, one very undesirable characteristic and that is a large percentage of infertility in the eggs.

Mating and Breeding Geese.

It is advisable to mate geese in the fall of the year, else the birds, if mated late in the winter, will not mate satisfactorily. The female must become accustomed to her surroundings before she will commence to lay. Old birds are more desirable for breeding purposes than young ones, and the productiveness of the female is said to extend to ten years, while that of the male about six years.

In mating it is advisable to eliminate some of the weak points in a breed by introducing the strong points of another breed, *e. g.*, I said above that the Africain Geese were objectionable because of the difficulty in plucking them; on the other hand, the Embdens and White Chinese are comparatively easy pluckers. Combine either of these breeds with the Africains and you are very likely to retain the strong points of both and eliminate the objectionable features. Other combinations, worked out on the same practical lines, have produced like good results.

"The natural tendency of young geese is to pair off. Young ganders will often mate only with one goose; older birds will generally mate with more. Generally geese are mated in trios, two geese and one gander. Where birds have a common range they may be mated four geese to one gander, with a few old ganders put into the flock extra. The matings should be put into separate yards until well satisfied with each other, then they can be turned into the common pasture.

"During the breeding season care should be taken not to let the geese get too fat; no grain should be fed as long as grass is available. Green rye, clover or peas makes splendid pasture. Feed corn during cold or very raw weather.

"When geese are used to hatch eggs they may be given about fifteen each. Usually they must be set where they have been laying. They will bear little interference when incubating."—*Poultry Craft.*

The great trouble with the hatching of geese has been the tough skin that is found on the eggs, and many goslings are unable to extricate them-

selves without assistance. This trouble is found both with incubators and also when the old goose does the hatching. But there is less danger in helping them from the shell than any other chick. Large numbers of fully matured goslings die in the shell, being unable even to pip the shell. This state of affairs can be discovered by the noise made by the efforts of the bird to break through, and if you cannot tell just where to open the shell, lay the egg in a pan of warm water and open it in the centre of the part that floats up.

The young goslings must be kept dry and warm and given the first feed thirty-six hours after hatching, and the same food as would be given young ducks. They may also then have water to drink, but none to swim in. When three days old give them all the green food they will eat, green clover and onion tops being excellent. There is no bird that will grow as rapidly as a gosling after it is three weeks old. After they are fully feathered they should have water to swim and wash in, running water being preferred. Geese are, as a rule, very hardy, but they cannot be kept in runs, and when fully feathered they need only a shed for shelter. After a goose has once laid her egg in a particular nest she is not likely to leave it, but will keep going to the same place. Geese and ducks should have access to water deep enough to cover the nostrils, otherwise they cannot keep nostrils clean and will smother.

TURKEYS.

The general impression appears to be that turkeys are very hard to raise, and it is caused for the most part by the improper methods that are followed. In the first place, they will not stand close confinement, but if given proper range they are easily raised. Though they are tender while young, they are very hardy after six weeks old. Their eggs hatch even stronger and better than hens' eggs in an incubator, and it is during the first two or three days of their lives that the greatest care is necessary. They must be taught to eat, and the easiest way to do this is to make little pills of some mash such as is fed young chicks, and put one in the mouth of each bird that will not take it of its own accord. They will most likely take the second themselves. Keep them housed in dry, comfortable quarters, and do not allow them out till the dew is off the grass. Dampness is almost sure to check the growth, and probably cause death at any time before they are six weeks old.

Many persons have found it almost impossible to raise turkeys in British Columbia; and when we remember where these experiments have been made, and also bear in mind the nature of the turkey, the resultant failure is not so startling. Let me say most emphatically that the Coast Districts of British Columbia are in no sense of the term suited for raising turkeys. If the turkey were allowed free range, and in the winter months to seek its natural shelter, there is no reason whatever why the turkey should not thrive wherever the pheasant will live; but being exposed to the open fields during the rainy months makes the domestication of the turkey almost an impossibility throughout the Coast Districts.

In the upper Coast localities there are, however, sections where the turkey thrives, *e. g.*, Comox Valley or Alberni, providing there is not too much mineral in the drinking water.

Turkey-raising in either East or West Kootenay, or in some sections of Cariboo, should prove profitable. In East Kootenay, Creston should prove a splendid section for turkeys, *i. e.*, in the upper or higher lands, while the lower lands along the Kootenay are par excellence for geese.

Kamloops should also prove an admirable place for turkeys. In fact, anywhere where there is snow in the winter instead of rain, where there is a good opportunity for range and where the drinking water is not surcharged with mineral.

Do not, however, try to keep your turkeys on a place so small that your birds must live on your neighbour's farm. This is hardly honest.

For full instructions *re* raising turkeys, I would suggest the taking of one of the good poultry papers, in which will be found lengthy articles on the subject by the best men of the day, and space forbids the details being given here that the subject merits.

MARKETING POULTRY.

It is a very common practice in British Columbia to send poultry to market alive. This is positive mistake, unless the stock is so thin that it would not stand exposure; in such cases it should not be marketed.

All poultry should be killed and dressed before marketing, for two reasons:

1. Live stock shipped any distance where crating will be necessary will shrink ten per cent. in weight, though they may only be a few hours in transit. It matters not whether they be conveyed by train, boat or cart, they will fret just the same. This loss is not borne by the purchaser, but is a direct loss to the raiser.

2. A better price can be obtained for dressed than undressed fowls.

In marketing poultry of any kind, it is advisable to sell same by the pound. The poultry business in British Columbia is still in its infancy, and it is in the power of the poultryman to now educate his market before fixed habits and methods become too set. In selling by the pound, it is fairer to the raiser and to the purchaser, because the value placed upon a fowl is then not approximate but true.

HOW TO DRESS POULTRY FOR MARKET.

Methods of Killing.

1. The old, and certainly very effective, method of killing fowl of any kind for market is to chop off its head. I do not wonder that those who have had experience with this method will sometimes gladly forego the small additional profit obtained for dressed fowl, and ship their stock alive rather than put up with the unsightly mess caused by this method of killing. It is disgusting to the operator, and almost an impossible task for a woman. One would naturally think that a fowl with its head chopped off would bleed freely, but this is not usually the case. All who have seen a fowl killed in this way have observed the neck turned upward into a crook. This for

a moment stops the flow of blood, and the blood already exposed coagulates or clots; in this concrete form it prevents a further flow of blood, or, at least, to any excess. Hence, on account of this coagulation, the fowl does not bleed well. I, therefore, condemn this method, because of its messiness, and because it curtails the bleeding.

2. A second method is to sever the artery behind the ear. This method is effective, but has the same objection as in the former case, to say nothing of the cruelty of bleeding a fowl to death. I condemn this method as ineffective in small fowls, if satisfactory results be required. But in the case of geese it is advisable to adopt this method, because dislocation of the neck, as will later be recommended, is almost an impossibility in the case of geese. This method can be made effective by tying the goose by the feet to a suspended cord at a convenient height, lock the wings by turning one behind the other, then grasping the head with the left hand expose the artery on the side of the neck and sever with a sharp knife just behind the ear. Still hold the bill in the left hand, preventing the turning of the neck so as to close the severed artery. Hold thus for a few moments until the struggles of the goose subside, then take down and pluck. This method is also advisable in the case of large gobblers, the operation being performed in the same way. Some knock the bird unconscious by striking it a sharp blow on the head. When birds are killed in this way their heads should be washed, then carefully wrapped in paper before marketing.

3. A third method is to sever the artery by slitting open the roof of the mouth. This is practically the same as method No. 2. It is advocated because of cleanliness, the blood being washed out of the mouth as soon as the fowl is dressed. There is no merit in this, however, as I do not think the fowl bleeds freely enough.

4. A fourth method is dislocation of the neck. Now, by dislocation I do not mean simply the breaking of the neck. A Chinaman, for instance, will catch a bird by the head, give it a couple of twists in the air and has succeeded in dislocating the neck; but such a method is nothing more than strangulation. The bird is not fit for food, not having bled.

To properly dislocate the neck of a fowl of any kind, catch either the legs or wings in the left hand, and, either sitting or standing, rest the bird on the right knee, catching the head of the bird between the first and second fingers of the right hand, palm of the hand toward the beak, then holding the body firmly with the left hand, tip the head of the fowl slightly backward with the right and stretch the neck by a steady pull downwards. The neck will readily separate where the head joins the neck; but this is not all, the neck must be stretched until the artery or jugular vein severs. By this method the fowl is unconscious instantly; the neck is stretched two or three inches, into which cavity every drop of the blood of the fowl flows, and not being exposed it does not coagulate. And, further, the mess caused by other methods is avoided. This method I most heartily recommend as being the most practical.

How to Pluck a Fowl.

An old and very effective method of plucking is to dip the killed bird into scalding water, when the feathers readily rub off. But what is the

result? In every case the appearance of the bird is practically destroyed, for the skin is scalded and rubs off in places when the feathers are being stripped. And a scalded bird will not stand exposure so long, but looks old within ten hours of killing. For family use this method is all right, but not for market purposes. The dry method is the only method, and to effectively pluck a bird dry the feathers must all be off before the bird becomes cold; the feathers come out readily when the flesh is warm. So it becomes practically impossible to pluck dry and kill by any other method than dislocation of the neck, because by any other method the operator must wait until the bird has bled, and even then the value of the feathers depreciates, because of the blood mixing with them. As soon as the bird is killed pull out the long flight feathers of the wings, also tail feathers, then strip off the back feathers by pulling the feathers with thumb and forefinger slightly against the grain. Catch as many feathers as you can at once, but be careful not to pull too much against the grain, or the flesh will tear. Plucking the back first gives one the confidence for the rest, unless the operator is well in practice. The back plucked, turn to the breast and pluck this as soon as possible. Then turn to the fluff around the vent, the feathers of the legs and wings, and the bird is done.

Leave a band of feathers about 2½ inches wide on the neck below the head. This covers the cavity in which the blood has collected, and that much of the neck is always chopped off when the fowl is being prepared for the table. Leave just a garter of feathers also to cover the knuckle of the leg. The last two small flight feathers, as well as all of the small feathers found on the tip of the wings, should be left on, and the wings folded by turning the tips behind the shoulder.

Do not singe a bird you are going to expose on the market; leave this for the housekeeper. To singe draws out the oil and spoils the appearance. All down and hair should be carefully removed and the fowl made as presentable as possible.

In packing for market, line a box with clean unprinted paper and lay the birds on their sides, necks and legs extended, and the bodies so arranged as to interlock. Do not throw the birds around or handle them roughly; careful handling will be found to increase their value. In the case of ducks and geese, the feet may be folded back on the body, the same as the wings.

I do not advocate the shaping board, nor any other scheme to "make" a bird appear better than it is. I prefer the bird to be in good condition, and it will in such a case show to best advantage when suspended.

POULTRY IN RELATION TO THE ORCHARD.

British Columbia fruit is now coming so much to the front that it is attracting the attention of the whole world, and the thanks of the farming community are due to the Government and their representative for the way they have encouraged this industry. The combination of poultry and small fruits—in fact, any fruits—is one that should also call for the same care and encouragement, as the two go hand in hand, the one assisting the other.

Poultry in the apple, pear or peach orchard are of the greatest benefit to the trees, as they destroy noxious insects and weeds; and in addition to keeping the weeds under, they scratch and loosen the surface of the soil in a

manner that is most beneficial. The droppings are also less valued than they should be, as they are a very rich fertiliser; in fact, apple-growers state that their crops have been doubled since the poultry have been allowed the run of the orchard, and that the crops are of a much better quality, owing to destruction of insects. One authority says: "There is no need of there being any off-year with apple trees, as the grower has ever year and a bigger crop if the poultry is given a chance to assist them."

Blackberries, raspberries, currants and gooseberries are excellent for chicken runs. The young chicks turned loose amongst these plants will not injure the fruit; in fact, it is very rarely they will touch even the ripe fruit. No two branches of farm industry go so well together as poultry and fruits; they can be worked on the same ground with decided advantage to each other.

DISEASES OF POULTRY.

Prevention is better than cure, and the breeder who keeps the houses clean, warm and properly ventilated, and has the water and feed vessels always clean, need have little to fear from diseases.

Roup.

This is the most to be dreaded of any of the troubles that the poultryman will have to encounter, as if it once gets a start the whole flock may go with it. This affection, if taken at the start, is easily checked, and the bird that shows any signs must be immediately isolated from the rest of the flock. The symptoms are:—Eyes watering, nostrils closed, breathing deep and frequently swelling round the eyes.

As soon as it is detected, take the bird and after dissolving a teaspoonful of boracic acid in a small tin cup of warm water, plunge the bird's head under and hold it there till it seems to choke, which action will draw the solution into the cavities of the nose and throat, and I have found it a most effective remedy. Do not use any tins or cups that are wanted for any other purpose, as the disease is very infectious. Put the bird in a dry, warm place and repeat the treatment in a few hours. Zinc ointment or carbolated vaseline is also good to apply to the swelling round the eyes.

Cholera.

The fowl affected with cholera is dejected, sleepy and droopy, is very thirsty, has a slow, stalling gait, and gapes often. They often stagger and fall from weakness. The wattles turn pale or sometimes dark and they have diarrhoea. At once remove all affected birds to a warm, light place with plenty of clean straw. Give no water except with "Douglas Mixture" in same formula for which is given herewith. The droppings should be drenched with a solution of carbolic acid, to prevent the spread of the disease. Nothing but cooked food should be fed. Prevention is the only sure cure for this disease, but if anything will do any good the above treatment is most likely to be effective.

Crop Bound.

This complaint is liable to affect birds in confinement more than those on a large range. It is caused mostly by over-feeding, and unless relieved promptly death is sure to follow. Relief may be quickly given by opening

the crop on the side with a sharp knife, cutting a slit sufficiently long to remove the contents. Clean the crop with warm water and sew up again, taking care not to sew the skin of the bird to the sack of the crop. Close the crop with white linen thread first, having the knot on the inside, then put a few stitches in the skin. Put in a warm place and give no water for twenty-four hours and only soft food, and it will soon recover.

Gapes.

Causes.—Foul water, exposure to wet, damp places, particularly at night, want of nourishing food, etc.

Symptoms.—The general symptoms, as the name implies, consists in constant gaping, coughing and sneezing, together with inactivity and loss of appetite.

Treatment.—Give the bird daily, until it recovers, a small piece of camphor about as large as a grain of wheat, and add a few drops of camphor or turpentine to the drinking water, or mix with the food, about ten drops to the pint.

Ley Weakness.

Cause.—It often arises from the inbreeding of the same strain of fowls for too long a period, but is usually caused by too high feeding, which increases the weight of the body out of proportion to the muscular strength of the legs; It more generally occurs in the large breeds, such as Cochins and Brahmas, particularly in the cockerels.

Symptoms.—Squatting around on their hocks, after standing for a short time, as if tired; In bad cases they are unable to stand on their feet at all.

Treatment.—In an early stage give the following pill twice or three times a day: One grain of sulphate of iron, five grains of phosphate of lime and half a grain of quinine.

Douglas Mixture.

"Douglas Mixture" is made thus:—Take of sulphate of iron (common copperas) 8 ounces; sulphuric acid, $\frac{1}{2}$ fluid ounce. Put into a bottle or jug one gallon of water, into this put the sulphate of iron. As soon as the iron is dissolved add the acid, and when it is clear the "mixture" is ready for use.

In hot weather, or when the flock is small, less may be prepared at once, but the above proportion should be observed. This "mixture" or tonic should be given in the drinking water every other day—a gill for every twenty-five head is not too much—and where there is infection it must be used every day, but where there is no disease, not so often, or in small quantities if used every day.

This preparation, simple as it is, is one of the best tonics for poultry known. It is alternative as well as tonic, and possesses, besides, antiseptic properties which make it a *remedy* as well as a *tonic*.

There are many other diseases that poultry are liable to, but the above are most prevalent and most likely to be met with.

VERMIN PESTS OF FOWLS.

To keep fowls in good healthy condition it is absolutely necessary to keep down the vermin. This particularly applies to chickens; turkeys are

also troubled, but to a less degree, while ducks and geese are worried little if at all.

In British Columbia the vermin pest is even greater, though this is needless, than it is in any other part of Canada. But it can be controlled with comparative ease if proper methods be adopted.

So great has been found this plague to fowls that certain concerns have found an eager market for all kinds of patent mixtures for the positive prevention of the vermin pest. I term such mixtures luxuries and stamp them as non-essential. But it will be necessary for us to know something of the kinds of vermin which infest poultry houses and the fowls themselves, as well as something of the nature of the same, before we can intelligently discuss their prevention as pests.

Vermin pests are of two kinds, viz., lice and mites.

The lice stay on the fowl and are mostly the large grey louse.

Kinds of Lice on Fowl.

1. *Lesser Lice*.—These are a small louse similar to the large grey louse.
2. *Large hen louse*.—Very common and very prolific; it trails a tangle behind it, making a very irritating sensation; lives chiefly on feathers. Hence it is a parasite and stays on the bird all of the time.
3. *Burnett's hen louse* is similar, though not so large as the large hen louse.
4. *Chicken louse*.—This louse is usually found upon young birds, is very small and very prolific.
5. *Long chicken louse* is similar to above but different in shape, as its name denotes.
6. *Common hen louse* is a medium size, with habits similar to all of the above.

In fact, all of the six kinds of chicken lice above mentioned are similar in their habits as they are in appearance, though differing much in size. Some are so small that they can scarcely be seen with the naked eye; others so secretive in habits as to be scarcely discernible among the feathers. The lice usually seen on the bodies of birds are the "large" and the "common" lice. When lice are plainly seen, even though it be only one here and there, it is a sure sign of great numbers of the pests.

Among the varieties of lice there is also:—

- The common duck louse.
- Squallid duck louse.
- Clear duck louse.
- Clear goose louse.
- Blithing louse of turkey.

Mites.

These are of two kinds, viz.:—

1. *Chicken mite* (4 legs), sometimes white and grey, but blood-red when full.
2. *Itch mite*.—About 1-80 of an inch in length, thus being so small as to be not discernible to the naked eye. It affects the legs and comb.

The chicken mite bites the fowl and sucks the blood, and when a poultry house becomes infested with this worst of all pests, such a thing as a good healthy fowl soon becomes impossible. The chicken mite leaves the body of the hen before the fowl leaves the roost; as soon as the fowl begins to move it makes off. It lives during the day in crevices and under the roosts; cleats, loose boards, cracks, knot-holes, etc., make admirable hiding places. At dusk they come forth in search of the fowls. They are very prolific.

The itch mite produces scales on the legs and, as mentioned above, it also attacks the comb. The first appearance on the comb is little white points or scales, and the comb skin is not pure red but brown. The disease sometimes seems to stand still for perhaps a month, but all of this time the mite is at work. The base of the comb becomes swelled and is full of little burrows. The feathers of the head stand straight out and die, then curling up they imbed themselves in the flesh and result in the swelling called the itch. On the feet and legs this mite is also very active. The scales drop off or form in knots; a crust forms beneath the scales and the feet and claws smell badly. "Scaly leg" is nothing more nor less than an excessive state of the work of the "itch mite."

Remedies.

Isolate the affected birds. Then treat by using a solution of 5 per cent. creolin and bathe the affected parts, applying it about every two weeks.

CLEANLINESS OF HEN HOUSES.

I emphasise this point, and the individual who aims for success must insist upon it. A good system is to wash the hen houses with boiling water about three times a year—spring, midsummer and fall. Then whitewash with hot lime and 5 per cent. carbolic acid. Dry the house by fumigating well with sulphur. Put coal oil in the cracks and on the roosts. Lee's Insect Killer is good, as is also Persian Insect Powder.

To kill the vermin it is necessary to smother them. They breathe through tubes in their sides. Dust or a strong odour will close these tubes and hence effect their death. So, then, it will be understood that the fowls must always have access to a dust-bath, and the place in which they roost should smell strongly of some tar extract.

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