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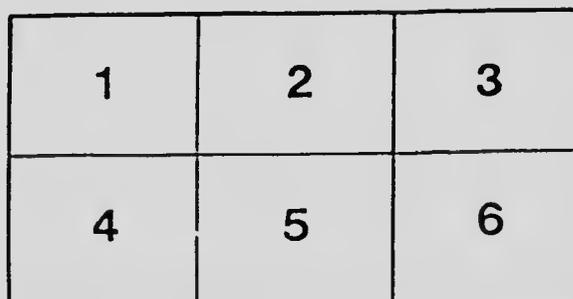
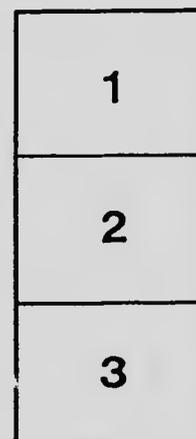
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PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE.

[Bulletin 26]

PRACTICAL POULTRY RAISING

BRITISH COLUMBIA.



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**PROVINCE OF BRITISH COLUMBIA.**

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**DEPARTMENT OF AGRICULTURE.**

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**PRACTICAL POULTRY RAISING**

—IN—

**BRITISH COLUMBIA.**



THE GOVERNMENT OF  
THE PROVINCE OF BRITISH COLUMBIA

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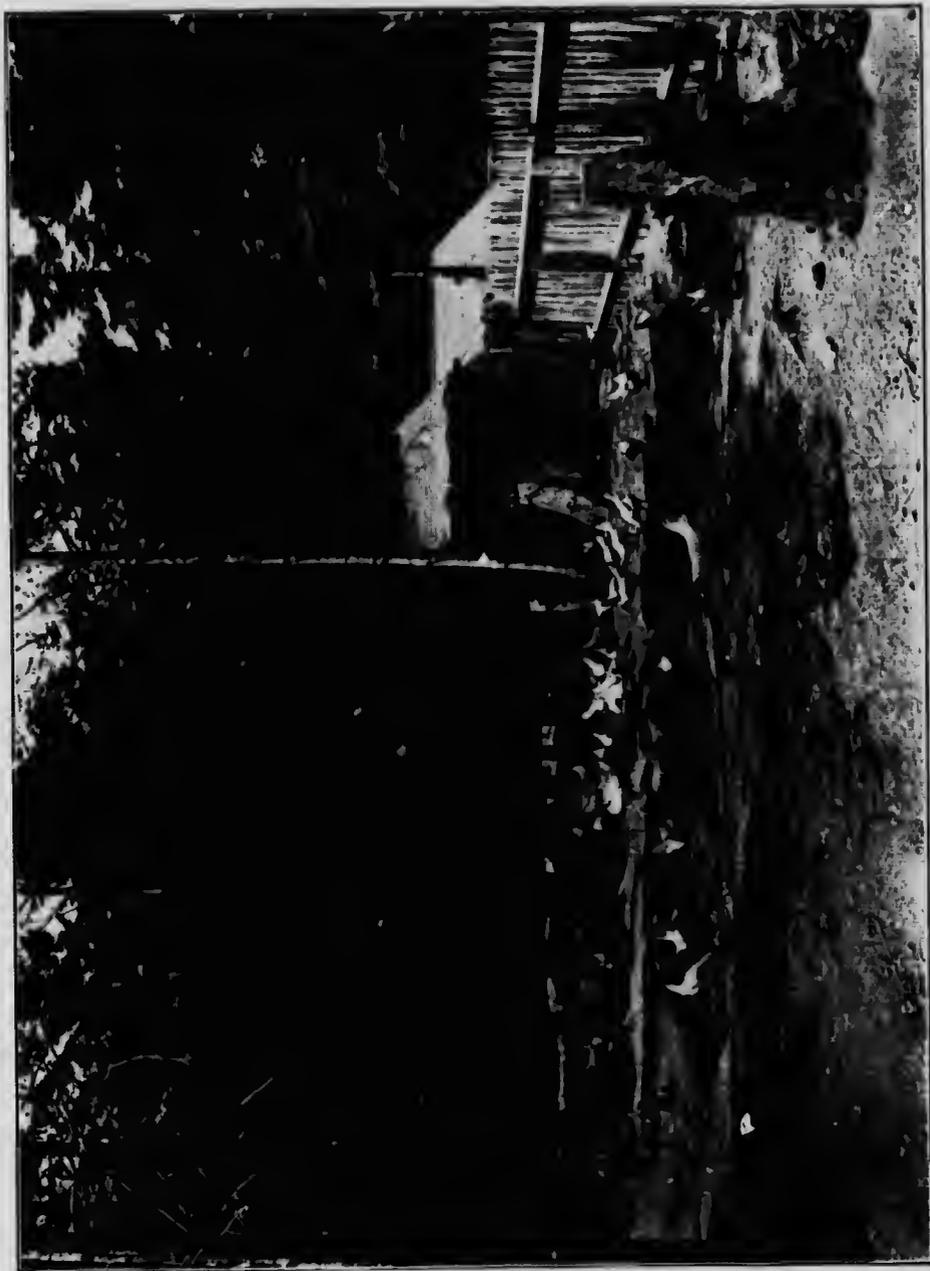
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### ACKNOWLEDGMENT.

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In the preparation of certain sections of this Bulletin I beg to gratefully acknowledge the assistance rendered by Mr. M. A. Jull, Provincial Poultry Expert.

R. W. HODSON.



**A PROFITABLE LOT—A section of a Poultry Farm in the Victoria District.**



## PRACTICAL POULTRY RAISING.

— 10: —

By R. W. HODSON, Live Stock Commissioner.

The demand for knowledge pertaining to the poultry industry in British Columbia is rapidly increasing. The aim of this Bulletin is to give, to some extent at least, that desired information. It is prepared with the object of encouraging the poultry industry throughout the Province. The average farm of this Province is not large, and in many cases only a part of the land is cleared, and perhaps a portion of this cleared area is planted in orchard. While the orchard is growing and the farmer is clearing more land he should have some source of income. Under such conditions poultry-raising proves very profitable. No branch can be carried on with as inexpensive an outlay as can the poultry department. Any farm is improved by a poultry department, and few businesses can be operated in as wide a range of climate and in as varied conditions.

The system of mixed farming as carried on in Canada is ideal for the rearing of poultry. In this Province the returns from the flock should add materially to the income of the fruit-grower or the dairyman, or even the man who is merely in the process of clearing his land. The orchard makes an admirable yard for poultry, especially growing stock, and there is hardly a better place for chickens than the dairyman's paddock or cattle-yard.

The hen to-day may be considered the most profitable condenser of the raw materials on the land into a high-priced product—the egg. In the orchard many insect pests will be destroyed, and by-products of the orchard, which would otherwise go to waste, will be converted into profit. Poultry will also economise a great deal of waste in the dairyman's yard. This policy of economising, together with the income from the eggs produced, should prove highly profitable.

### CLIMATE.

The climate of British Columbia is almost ideal for poultry-raising. It is mild, with no sudden changes of temperature, which tend to cause roup and colds amongst the flock. The days are dry,

bright and sunny during a great part of the year. In winter, as a rule, the temperature is not low, rarely falling to 10 degrees below zero at Upper Country points, and 10 above, or 20 degrees frost on the Coast.

#### MARKETS.

Market conditions in this Province are good, and poultry produce finds a more ready sale on our home markets than elsewhere in Canada. There is, however, great room for improvement in methods of marketing poultry and eggs. There is always a scarcity of properly-fleshed chickens and of fresh eggs on the market, and this, together with the price of eggs and the imports of poultry produce into the Province bears out the statement that our market is good. In this connection I wish to present some figures bearing on market conditions:—

In 1904-5 the average market price paid per dozen for eggs was 30 cents.

In 1905-6, the average price was 34 cents.

In 1906-7,           "           "           37   "

In 1907-8,           "           "           40   "

The reason for this increase in price is accounted for in that eggs have been marketed in a fresher, cleaner condition, that they have been better packed, and also that fewer case eggs have been imported into the Province. The Province uses not only all her available supply of poultry and poultry produce, but during 1907 imported \$750,000 worth of eggs and \$1,500,000 worth of poultry and poultry produce from the Eastern Provinces. Also there was imported about \$75,000 worth of poultry produce from the United States. Instead of sending out of the Province over \$2,000,000 every year, we should be exporting the produce and importing the cash.

#### STARTING IN BUSINESS.

To the man who wishes to make a business of poultry-raising, to raise superior birds from a commercial standpoint, British Columbia offers inducements such as few other provinces in the Dominion. To such persons as wish to enter such a business, it is advisable that they start in a small, inexpensive way, and as success is met with, the business and the plant may be enlarged. There are

a few who have started in the business on an extensive scale and have made a success of it, but there are a greater number who have started in this way and have failed; therefore, it seems only wise to point out this fact to those who may be contemplating the advisability of entering the poultry business.

#### CHOICE OF BIRDS.

We are often asked the question—What is the best breed? There is no best breed of poultry. There are good and poor among all breeds, and there are also good and poor strains of each breed. By strain we mean birds that have been bred especially for some one purpose. Probably the strain of birds is the most important factor in the whole industry. Buy good birds that are pure bred. Choose the breed adapted to your locality and secure the best strains of that breed. Seek to improve your flock by careful selection and breeding. To secure uniformity in colour, shape and size of eggs one must keep pure-bred fowls. This is also true in raising broilers, roasters or any other product. There are many other advantages also in keeping a pure breed. A cheap bird is always a poor one; it will eat as much as a good bird, but will not give the returns for the food consumed.

#### INCUBATION.

(Note.—The reason for so concise a treatment of incubation and incubators is due to the fact that a special bulletin, dealing with this phase of the industry, will be published later.)

As usual, both natural and artificial means are practised the world over. The incubator has not replaced the hen as far as the hatching of eggs is concerned. However, the incubator has become more adaptable in many cases, and here natural incubation has been done away with altogether because of the probable depletion of vigour in the stock from continued use of the incubators, the hen is being reverted to occasionally. The success or failure of artificial incubation depends to some extent upon the machine selected to do the work; therefore, care should be exercised in making the selection. The best machines on the market are none too good. By this I mean that it pays only to select the best the market offers. It will prove a more satisfactory investment in the long run.

## THE EGG, ITS STRUCTURE.

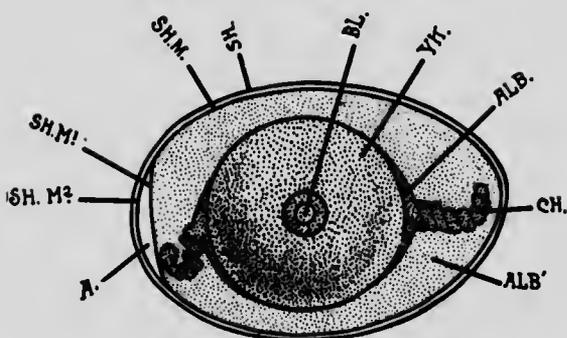


FIG. 2.—A HEN'S EGG.

*a.*, air space; *alb.*, dense layer of albumen; *alb'*, more fluid albumen; *bl.*, blastoderm; *ch.*, chalaza; *sh.*, shell; *sh. m.*, shell membrane; *sh. m'*, *sh. m''*, its two layers separated to enclose air space.

The egg of the chick (Fig. 2) is protected by a more or less hard shell of organic material, impregnated with calcareous salts. Lying close to the inside of the shell is the shell membrane, which is of two layers, sometimes called the inner and the outer shell membranes, closely attached to each other, except at the large end of the egg, where they are separated somewhat to form the air space (Fig. 2a). The shell and the membranes are sufficiently porous to allow gases to pass through them slowly. Filling the space inside the shell membrane is the white or albumen of the egg, in the centre of which, in turn, lies the yolk. At opposite poles seem to be merely more condensed parts of the albumen, that of the yolk, and apparently attached to it, are the chalazae, which are twisted and have been said to serve to hold the yolk in the centre of the egg, though it is difficult to see how they can serve any such purpose, as they are not attached at their outer ends. The yolk is bright yellow in colour, spherical in shape, and about an inch in diameter. It is surrounded and held in shape by the thin elastic vitelline membrane, and exhibits on one side, normally the upper one, no matter how the egg has been opened, a small, whitish circle, the blastoderm or cicatricula.

## DEVELOPMENT OF THE CHICK.

The development of the chick embryo in a fertilised egg starts within the blastoderm. The yolk serves as food for the growing chick, and towards the end of the incubation period the remaining

contents are absorbed within the system of the chick. If this yolk sac has not been properly absorbed, bowel trouble will result, the chick being unable to properly digest its food. The growth of the chick within the egg takes place comparatively rapidly. The many different organs of the chick's system are formed within the first few days of incubation, and in the last few days the growth of the complete system is fulfilled, and generally on the twenty-first day the chick pips the shell.

#### THE INCUBATOR.

There are many different kinds of machines used in hatching eggs. They are nearly all constructed on similar principles and along the same lines. Machines which are giving the best satisfaction are the hot air and the hot water machines. The hot air machines are of the radiant diffusive, and a combination of the radiant and diffusive types. Some of the machines have an up-draft circulation of air, while in others other means of ventilation are employed. Many manufacturers send out moisture pans with their incubators, while others do not advise the use of moisture.

The best place for an incubator is one where there are no draughts of air, and yet where the air of the room is absolutely pure at all times. It is desirable to have an even temperature in the room, although throughout the greater part of the Province such precautions need not be taken as in the East, since the climatic conditions at hatching time are not very changeable. The fact may here be mentioned that success with hatching chicks depends to a large extent upon the method of handling the incubator the first week of incubation.

The incubator should be started for a day or so before the eggs are placed in the egg chamber, so that an even temperature of from  $101\frac{1}{2}$  degrees to 103 degrees may be readily maintained. In different localities and in different seasons of the year a slightly different temperature will be found most desirable. The exact position of the thermometer has a great deal of influence upon the degree of heat in the egg chamber. In some makes of incubators the bulb of the thermometer is placed in an artificial egg, while in other makes a hanging thermometer is provided.

The eggs require to be turned frequently—a few poultrymen claiming that once a day is sufficient, while others claim that twice a day is none too often. It is not known exactly how many times

each day a hen will naturally turn her eggs, but it is known that in artificial incubation the eggs are not turned nearly as frequently. The purpose of turning the eggs is to prevent the embryo in the egg from sticking to the shell, for should the embryo become stuck to the shell growth would be stopped.

In every fertile egg there is life which requires oxygen for its continued existence. Just as with us in everyday life, so with the embryo within the shell, oxygen is absorbed and carbon dioxide is thrown off. This being the case, the circulation of air through the incubating chamber should be rapid enough to supply sufficient oxygen, and also to remove the gases given off from the living embryo. On the other hand, the circulation of air should not be too rapid, as in that case too much moisture might be carried away from the eggs. Egg shells are porous, and they allow the watery contents of the egg to evaporate slowly. If the evaporation of the water is too excessive the hatch will be injured, and to overcome this difficulty many incubators use moisture pans. On the other hand, if the eggs do not lose enough moisture, the hatch is apt to be poor and the chicks may be weak.

At hatching time the temperature should be carefully watched. The heat given off from the body of the chicks will tend to raise the temperature of the egg chamber and the chicks may pant. If they pant, either the lamp should be lowered or more air should be admitted. A sudden lowering of the temperature at hatching time is apt to injure the chicks. It is generally best to allow all the chicks to remain in the incubator for at least twenty-four hours, the temperature being lowered gradually to 95 degrees.

Brooding.—Hatching chicks is but half the battle, and we might add, "Count not your chicks before they are several days old." With judicious treatment, giving the chicks plenty of room, there should be but little difficulty in raising them, provided, of course, they are strong ones. Under natural conditions, if a chick becomes slightly chilled, it goes under the hen to get warmed up. The reason for this is that the chick's lungs, which are along the spinal column and projecting in between the ribs, are very poorly protected anatomically. Thus, when a chick becomes chilled, its lungs are apt to be the first organs affected, and unless they are soon warmed up a cold may be contracted and the lungs may

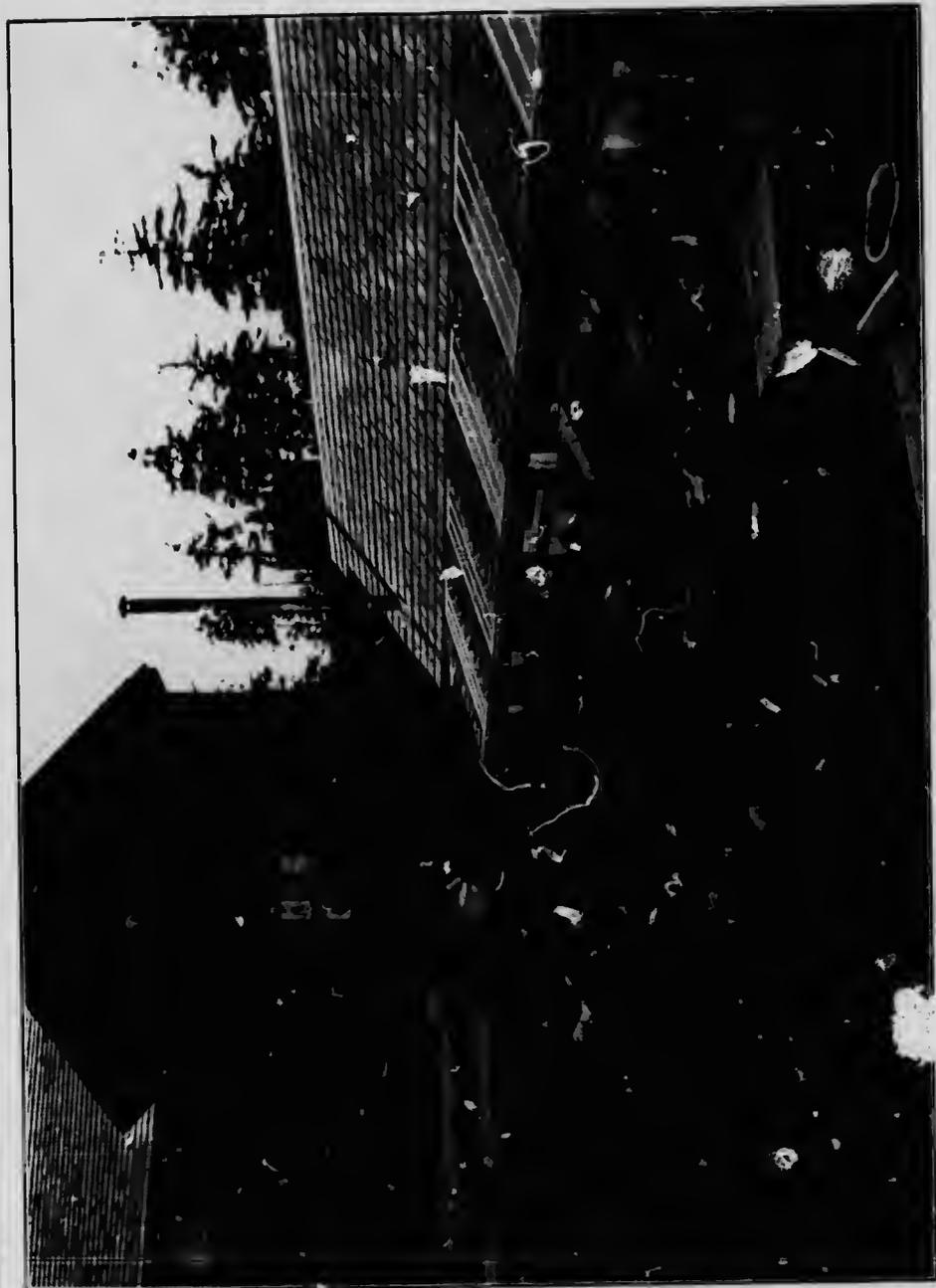


FIG. 3.—EXTERIOR OF A CONTINUOUS BROCCER HOUSE.

become inflamed. Thousands of chicks die annually from inflammation or congestion of the lungs. Hence the brooder should be so constructed that the chicks are warmed as nearly as possible in the natural way; in other words, top heat, with practically no bottom heat, should be supplied.

Many practical poultrymen in this Province employ the continuous brooder house in brooding the chicks. Figure 3 shows a continuous brooder house which gives good satisfaction. One difficulty with this house is to maintain a correct temperature for the chicks of different ages in the same house. Individual brooders are employed on large and small plants, though they require more labour. The "Fireless" brooder has been tried, but it presents some difficulties, and has not been a decided success in this Province; however, it is worthy of attention from poultrymen, especially in some districts of the Province.

#### FEEDING CHICKS.

After the chicks are removed from the incubator it is advisable not to feed them for two or three days, as they have enough nutriment in their bodies to sustain life for that period. It is well, however, to keep plenty of fresh water before them, and also some fine grit.

From the start the little chicks should be taught to work for their feed. The litter should be comparatively deep and fine; in this some good market "chick feed" or finely cracked wheat and corn may be scattered. The chicks will soon learn to scratch this, obtaining exercise, and at the same time becoming vigorous and healthy.

Many poultrymen, in their anxiety to have the chicks grow rapidly, feed them too often and too much. After the chicks have learned to scratch in the litter they may be fed dry mash from a hopper, beside the grain in the litter. A good mash may be composed of wheat, bran, shorts, oatmeal, cornmeal, equal parts by measure and from 5 to 10 per cent. beef scraps. The beef scraps will go towards the formation of bone, which is so essential in the development of the chicken. As soon as possible the chicks should be allowed out on fresh green grass. It is also well to supply them with green food, such as lettuce or rape, of which they are very fond.



FIG. 4.—SHOWING ONE METHOD OF SUPPLYING SHADE FOR CHICKS.

To decrease the amount of labour involved in caring for the growing stock, they may be fed by the hopper system. Both whole grain and mashes may be used for feeding in this way. However, it must be acknowledged that the advantages of the hopper system of feeding the growing stock is questionable. There is no doubt that chickens will do better when fed whole grain from the hand, though it involves more labour. The important factor is that the pullets should be so housed and fed during the growing season that they will be matured sufficiently to be laying eggs in the fall and early winter. When the chickens are three months old the cockerels should be separated from the pullets, and any weak chickens should be kept by themselves or killed.

After they are strong enough to leave the brooder, the best house to put them in is a colony house, such as is shown in Fig. 5. Pull this house into an orchard or field where the chicks may have ample room and pick up much of their living. Not only will they pick up a large portion of their food, but will tend to rid an orchard of many of the injurious insects.

At  $5\frac{1}{2}$  or 6 months old the pullets should be laying. It has been found that pullets hatched in March or April give the best results as winter layers. If they are hatched earlier they may commence to lay late in the summer, may then moult, and will not commence to lay again before spring.

There are no hard and fast rules with regard to the time to feed and the order of feeding grains, mashes, green food and meals. If the flock is to produce maximum results, it should be fed a liberal supply of green food, such as clover, alfalfa, mangels, turnips or some green feed of like nature. Rape is easily grown and is exceptionally good for growing stock. It is also necessary that animal food be given them, such as ground bone, blood meal or beef scraps. Grain is essential and should be fed both ground and whole. In feeding grain, it is advisable to feed so that the fowl will have to work for it. If a little grain is thrown on the floor in the litter early in the morning, so that as soon as the birds come off the roosts they will have to work for their breakfast, it will keep

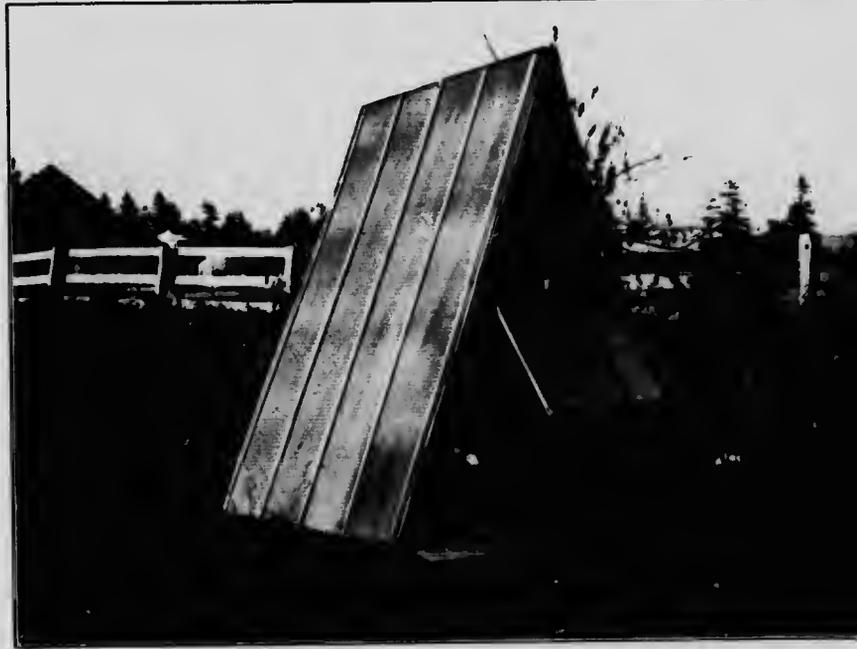


FIG. 5.—AN A-SHAPED COLONY HOUSE, SUITABLE FOR GROWING STOCK.

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STOCK.

them scratching for some time. The exercise thus obtained is especially good during the winter months, as it keeps the birds warm and thrifty. Green food should be kept constantly before the fowls during the winter months. A mangel tied on a string or spiked on a nail to the wall will be relished by the birds. Beef scraps, cooked offal or ground bone should be fed liberally about three times a week, but decayed meat should never be used. Grit should be kept constantly before the birds at all times. Oyster shells or clam shells are also essential. Pure water is an absolute necessity if strictly fresh eggs are desirable.

Wheat is one of the best grains for the poultry plant, though some poultrymen claim it to be an expensive food. However, when the net results are balanced up, poultrymen in British Columbia can readily afford to use this valuable grain. Since it is a staple of human food, the price of good wheat usually rules high as compared with other grains. Wheat of poor quality, broken wheat, frozen wheat, and good wheat screenings are as good as the very finest milling wheats for poultry feeding.

Oats make a good poultry food, but when poor in quality the percentage of hull is sometimes very large and such oats are not very palatable or digestible, hence should not be used. When fed dry or in a mash they are more relished by the birds. Sprouting the oats by soaking them for about twenty-four hours increases their palatability. Oatmeal or rolled oats make a good food for young chicks, and ground oats without the hull is excellent for fattening fowls.

Barley, like oats, has a large percentage of hull, but it is a valuable food.

Ground buckwheat is relished, and, owing to its fattening qualities makes a good winter feed. Buckwheat is largely used in some districts, some poultrymen claiming it to be a great egg-producing food.

Corn is one of the most commonly used of all grains, especially in the great corn belts. Corn is rich in fat and forms an excellent food when used with other grains. Cracked corn is good as a chick food, while cornmeal is a good fattening food, though it tends to produce the undesirable yellow flesh.

**Dry Mash Feeding.**—This system is practised by many of the most successful poultrymen. In this method the mash is kept before the fowls at all times in hoppers, as shown in Figs. 7 and 9.

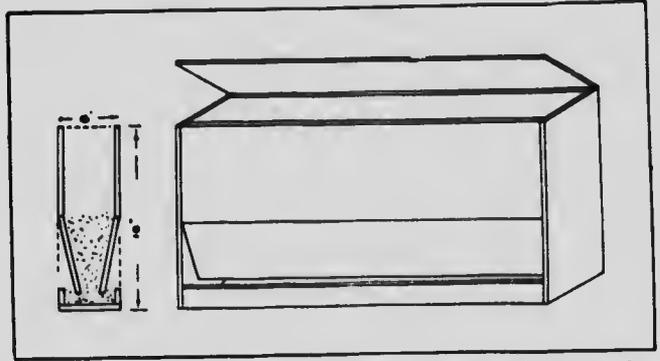


FIG. 7.—A suitable hopper for feeding young stock dry mash.

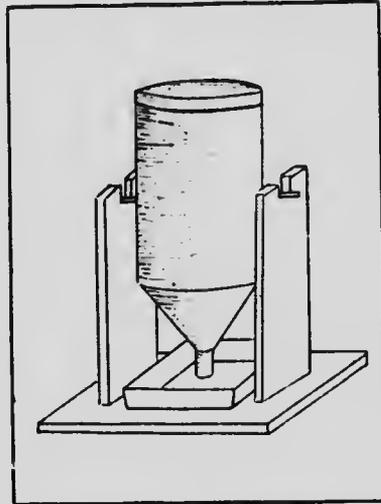


FIG. 8.—An oil-can inverted in a pen makes a good water fountain.

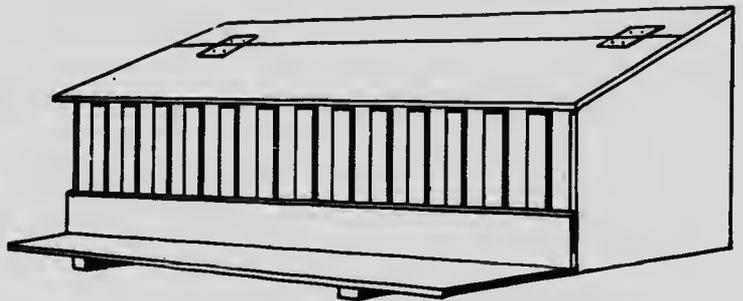


FIG. 9.—An excellent dry mash hopper for laying hens.

Some good mashes which are largely used are as follows:—

1. By measure, 4 parts bran, 2 middlings, 2 ground oats, 1 cornmeal, 1 ground barley,  $\frac{1}{2}$  linseed meal and  $\frac{1}{2}$  beef scraps.
2. By measure, 4 parts bran, 4 ground oats, 2 cornmeal, 1 middlings, 1 cut alfalfa (well cured) and 1 part beef scraps.
3. Equal parts by measure of bran, low-grade flour and barley chop or meal.
4. By weight, 2 of bran, 1 cornmeal, 1 middlings, 1 gluten meal, 1 linseed meal and 1 beef scraps.

By keeping dry mash before the fowls all the time and feeding hard grain, such as wheat, thrown into the litter for the morning feed, a little grain as buckwheat, barley and plenty of green food at noon, and at night a little whole grain such as corn, sprouted barley or oats, a poultryman can take care of a flock of birds, giving less time to the fowl than if he were feeding a wet mash.

**Wet Mash.**—By wet mash feeding we mean that, along with the other rations, we feed a wet mash some time during the day. Many successful poultrymen feed a warm mash the first thing in the morning, as soon as hens come off the roosts. They claim that by morning the hens' crops are empty, and since grain takes longer to digest, a warm mash is fed, which is quickly digested and acts as a stimulant. Against this method we have the argument raised that by feeding a mash in the morning the hens are apt to gorge themselves, and instead of taking proper exercise they may take to the roost or sit around in the sun, and become lazy and get too fat to be profitable layers. I prefer feeding the mash in the late afternoon and then feeding whole grain before the birds go to roost. The reason for feeding the whole grain after the mash is that the mash becomes quickly digested and before morning the birds' crops will be empty. If a little grain is fed after the mash, it will last them till morning, consequently, the hens will be more comfortable and will lay better.

A good mash for winter feeding is made as follows:—Bran, shorts, ground oats, cornmeal, 10 per cent. animal meal or beef scraps, with green food, such as clover or alfalfa. If the mash is to be fed at night, soak the clover in the morning with boiling water, then cover the pail with a heavy cloth. At night the clover will still be warm. Mix the mash with the steamed green food and mix all thoroughly before feeding.



During the summer months the birds will not require so much as during the winter, neither will they require a wet mash, but should be given an abundance of green food and plenty of clean, fresh water.

Poultry kept in fresh-air houses and allowed the run of orchard, field or uncleared land should not require much house-feeding, but should pick up a great deal from the land the year round. The birds will be more healthy and thrifty than if confined. Where birds are kept in close confinement the percentage of hatchable eggs from them is apt to be low. In other words, you will not get as many strong, vigorous chickens from a number of eggs laid by hens kept in close confinement as from the same number of eggs laid by hens which are allowed more freedom, nor will the egg production from hens in confinement be nearly as great as from hens on free range. This is an important matter, since the production of eggs is the most profitable business in the industry.

#### EGG PRODUCTION.

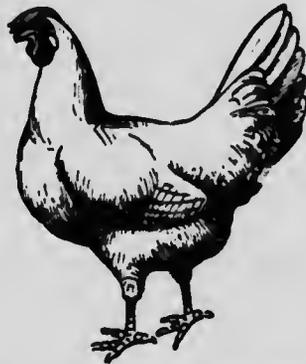


FIG. 10.—Egg type conformation.

At present the average number of eggs per hen is not over eighty; but the average hen in every flock should produce at least one hundred and fifty eggs per year. Two hundred-egg hens should be the rule and not the exception, but these will come only through careful and vigorous selection.

A poor layer is a poor payer. The unprofitable hens should be weeded out, thus saving loss in the amount of feed consumed, and at the same time giving the good layer a better show. Different methods of selection may be employed. Up to the present, trap nesting cannot be recommended for commercial plants.

## TRAP NESTING.

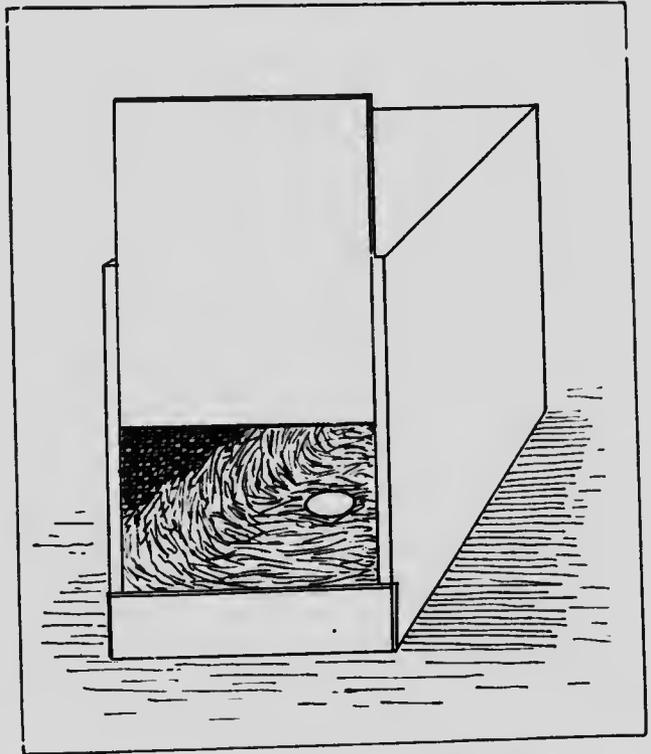


FIG. 11.—A simple and inexpensive trap nest.

In Fig. 11 is shown a simple and inexpensive trap nest. Trap nesting is followed by many poultrymen, and each hen that is being trap-nested wears a leg band which is stamped with her number. A record is kept of the number of eggs she lays, and by this method the unprofitable hen may be weeded out. This system, if followed, will give the exact record of what each hen is doing. It requires considerable time in keeping the record and in releasing the birds from the nest, though it has many distinct advantages. However, if this system of selection is applied, regardless of other considerations, the result cannot fail to be disastrous, as the tendency would be to breed from birds which are good layers, disregarding their stamina, and as the latter is essential to large egg production, and

even though the weaker bird might be prolific, yet her progeny would lose a great deal in this respect. In the hands of those who understand the principles which must be kept in view, this system is an excellent one. It needs to be very carefully applied.

The thing of importance is to breed a heavy egg-laying strain that will reproduce its egg-laying characteristics in the offspring, at the same time maintaining the highest possible degree of vitality. Because of the practical infancy of the poultry industry in this Province, there is a great field of work along lines of breeding.

Finally, as we have seen, the question of egg-production involves many factors. The principal problem is how to maintain the heavy-laying hens in a high state of health. Inherited stamina, fresh air, exercise and food are necessities if constitutional vigour is to be maintained. All of these factors must be considered when endeavouring to improve the qualities of any strain of birds.

Although the egg industry is the most profitable one to the poultryman, excellent returns may be realised from marketing all forms of dressed poultry. Eggs and meat should go hand in hand. In the production of eggs there is always a certain quantity of meat to be disposed of. The increasing demand for dressed poultry direct from the farm should be supplied. The broiler trade in British Columbia is very limited. Roasters are in great demand, also dressed turkeys, ducks and geese. If dressed poultry of good quality is introduced, it will readily find a market. Consumers rarely know what to demand until they know what is being produced.

It is true that growing chickens consume a great deal of feed, but it is also true that money can be realised when broilers weighing from  $1\frac{1}{4}$  to 2 lbs. each can be disposed of from 15 to 20 cents per lb.

For many years past the farmer has seen fit to fatten his cattle, sheep and swine for a short period for market purposes. The more flesh that can be laid on animals in the finishing period the greater are the profits. But it has been proven that the profits of fattening poultry are greater in proportion when compared with the cost of feeding cattle, sheep or swine. Then it can be understood that it is very desirable to fatten the cockerels or culled pullets, even though for a short period.

## MARKET FOWLS.

The first point we should look for is type; to have birds as nearly alike as possible, so that when they are dressed and put on the market they will have a uniform appearance. The birds must have a good constitution in order that they may be fattened early and economically. A good market bird should have much the same characteristics as a choice beef animal. It should be fairly low-set, broad-breasted, and, as a rule, should be rather short in the bill, bright in the eye, and broad in the head.

## PEN vs. CRATE FATTENING.

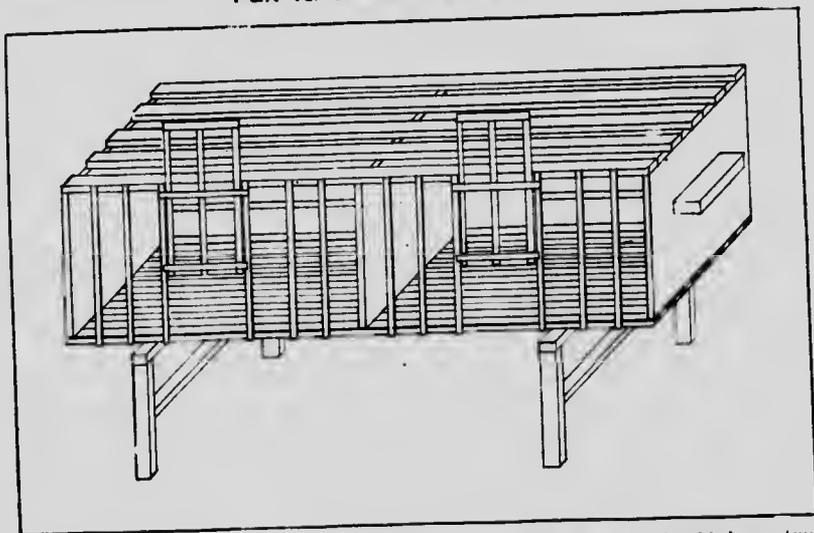


FIG. 12.—A fattening crate of right dimensions, though it should have two partitions instead of one.

**Pen Fattening.**—Poultry will fatten if kept in pens, and given a certain amount of liberty, but require a longer time to put on flesh than when fed in crates, such as is shown in Fig. 12. Birds fattened in crates, if properly fed, will be ready for market about three weeks after being put in the crates.

**Crate Fattening.**—A very easily made and efficient fattening crate can be made of laths and a few light boards which are used for ends and partitions. In Fig. 12 is shown a crate with two sections. Three sections would be much better. The crate should be 6 feet 6 inches long, 20 inches high and 16 inches wide. The top, back and bottom are formed of laths, running lengthwise. The

laths on the top and back should be about  $1\frac{1}{2}$  inches apart. The slats on the front run up and down and are placed about 2 inches apart, so that the birds may eat from a V-shaped trough in front of the crate. The laths on the bottom are usually placed  $\frac{3}{4}$  inches apart. Care should be taken to have the back slat on the bottom at least from  $\frac{3}{4}$  to 1 inch from the back, so that the droppings may pass through and no dirt accumulate.

A V-shaped trough, 2 inches deep and  $2\frac{1}{2}$  inches wide at the top, inside measurements, is placed in front of the crate on brackets, the trough being raised about 2 inches from the level of the bottom of the crate. The crate when finished should stand on legs about  $2\frac{1}{2}$  to 3 feet high.

**Feeding.**—For the first few days after the birds are placed in the fattening crate they should be fed fairly light, but plenty of fresh, clean water given at all times, also grit.

**Note.**—The success of fattening depends to a large extent upon the feeding of the birds for the first few days. They should hardly have full crops at any time for the first five or six days after putting in the fattening crates. If this method is practised it will be found that the birds will eat better up to the end of the fattening period than if fed heavily at first. No more food should be given than the birds will eat up clean. If all food is not eaten up, the troughs should be taken away or the feed removed, and the troughs turned upside down. Do not allow feed to remain before the fowl for any length of time. The troughs should always be kept clean and sweet. With three weeks' feeding the bird should be ready for market.

Some good mashes which may be used for fattening are:—

1. Two parts oat chop, 1 part cornmeal, 1 part barley chop; 1 part low-grade flour; 1 part buckwheat.
2. Equal parts low-grade flour, barley meal and middlings.

These mashes may be mixed with butter-milk or skim-milk. Milk is excellent for fattening chickens, as it tends to develop the tissues and apparently improve the quality of the meat.

#### MARKETING POULTRY PRODUCTS.

A large part of the profits in poultry keeping depends on the marketing of the products. The poultryman must be a good salesman as well as a good raiser of poultry. He must have good markets to begin with, or know how to make them. With high-grade products that somebody wants, and that most people will not

take the trouble to supply, a high-class trade can be built up through skill and tact. The nearer the producer can come to the consumer in selling his products the higher will be the prices realised and the less will be the labour and expense of marketing. The producer should strive to eliminate the middleman. The extra price per dozen which is paid for quality is almost clear gain. There is fair profit, but no more, in producing eggs and other produce at regular market prices. The largest profits must come from superior marketing and from special market advantages in selling eggs and other produce. A special market advantage has been introduced into British Columbia at Duncan, where a co-operative egg station has been established. This is only one instance of the many co-operative establishments which might be advantageously introduced into this Province.

#### MARKETING EGGS.



FIG. 13.—Country eggs as delivered to the grocery store. A dirty egg is a disgrace to the producer. It means hosts of bacteria, which, in turn, mean decomposition and perhaps diseases.

In Fig. 13 is shown shuffled eggs from a leading grocery store. By shuffled we mean that the eggs were in no way selected. Dirty eggs are in evidence.\*

\*Poultrymen should never send dirty eggs to the market. The shells of the eggs are very porous and allow gases and bacteria to enter the egg. If the egg is laid in filthy nests or is packed in unclean cases it soon becomes tainted and unfit for use.

The egg is at its best when just laid, and the longer it takes to place it in the consumer's hands, the less it is worth. Eggs, when prepared for market, should be spotlessly clean. They should be packed in clean cases, of which the thirty-dozen size is preferable. Absolutely clean fillers and cardboards should be used. The quality of the eggs should be unquestionable. It is only in this way that a good trade can be worked up.

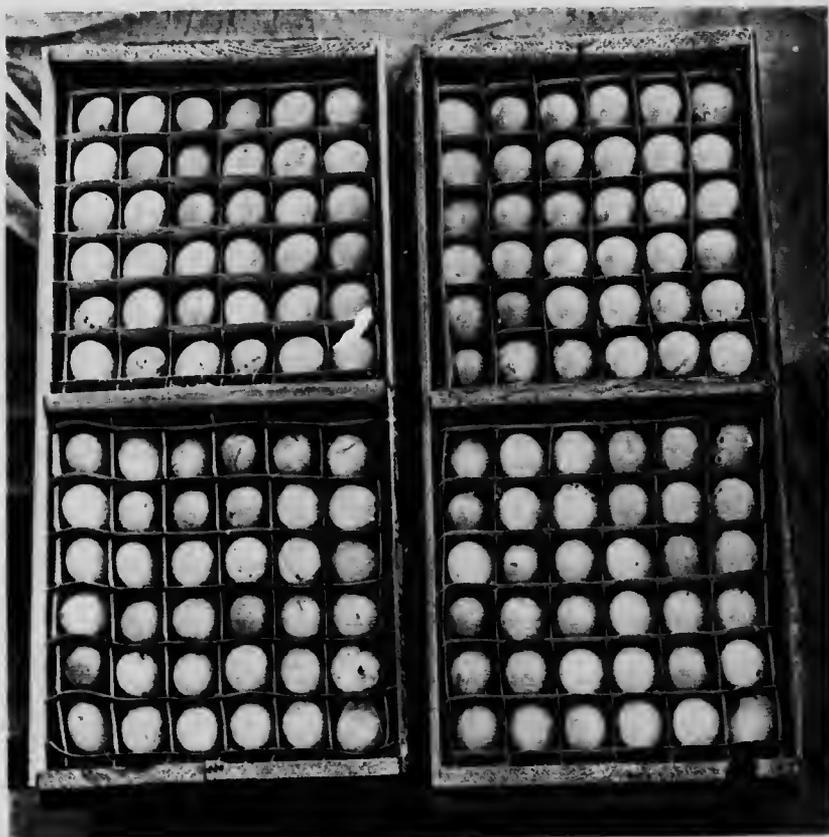


FIG. 14.—Thirty-dozen egg cases used in shipping large lots of eggs.

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FIG. 15.—A new method employed in marketing fresh eggs. This style commands top prices.

The egg industry in Denmark has been enormously improved owing to the application of the principle of co-operation to the collecting, grading, packing and export of the eggs. The great progress of Denmark during the past fifty years may be at once attributed to the wonderful system of education available for its people, and to the extent to which the principle of co-operation has been adopted in every part of the country and in every phase of its natural industry.

There has lately been formed a Poultry Producers' Association in Eastern Canada, based on the co-operative system. They do not hope at first to revolutionise or change the whole poultry industry," but they do, nevertheless, hope to remedy certain existing conditions which are greatly to the disadvantage of the industry as a whole. The Egg Station at Duncan was established with this end in view. The principal object of the station is to eliminate the "middle man" and thus increase the profits of the producer. A good market is sought where the best quality of produce is offered. Quality sells itself.



FIG. 16.—Showing individual dozen cases. Quality sells itself.

At present thousands of dollars are lost annually in British Columbia through bad eggs. The majority of these losses arise through the importation of Eastern eggs; consequently, it is of vital importance that the poultrymen throughout British Columbia produce sufficient quantities to supply the home trade; and, finally, to solve this vital problem, we must have, first, a campaign of education among egg producers, and, second, a system of buying eggs that will guarantee a price according to quality.

#### MARKETING DRESSED POULTRY.

The same principles hold good for dressed poultry as for eggs. A little care and skill in preparing poultry for market will often make a large increase in the selling price. The expense of killing, picking and packing poultry is small in comparison with the first cost of raising. All poultry should be carefully assorted according to size, colour of shanks, age and condition. Each case should be uniform in quality.

#### MARKET REQUIREMENTS.

Fattened chickens, when prepared for the consumer, should conform to the following market requirements:—

The dressed chicken should present a neat, plump appearance. The preferable weight is about 4 lbs. Plump, crate-fed chickens, up to the weight of 5 lbs., are more readily disposed of than heavier ones.

The shape of the breast should be long and broad, to give a well-meated appearance.

The legs should be as short as possible, indicating the low, blocky type.

The colour of the flesh should be white, and the grain fine.

The minimum of bone and offal are two important factors in the best grade of marketable products.

Do not market lean chickens. It is an unprofitable business, both to the producer and the consumer.

#### KILLING, PLUCKING AND PACKING.

Before killing the birds should be fasted at least twenty-four hours, which will prevent food remaining in the crop and the intestines, which would decompose and spoil the flavour of the meat.

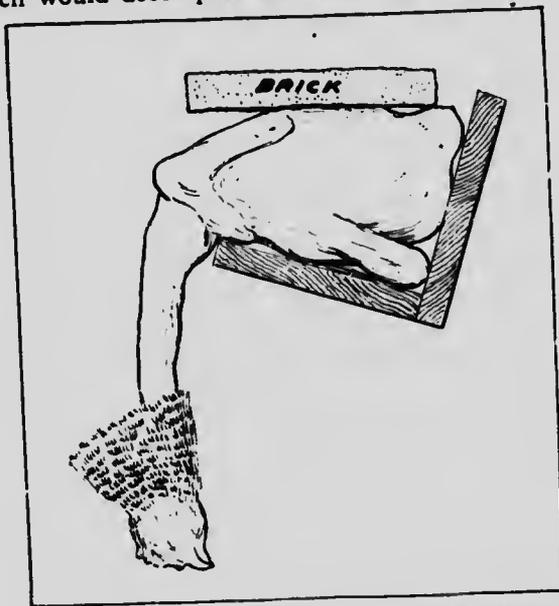


FIG. 17.—Showing shaper and fowl being shaped.

Several hours after the last feed allow the birds all the clean water they want, and then give them a complete fast until killed. The best method of killing is to stick the bird in the mouth, braining it, and at the same time bleeding the bird by cutting the arteries.

Suspend the bird by a cord from the ceiling of the killing room so that it will be as low as the operator's shoulder. To bleed, place the left arm over the bird, grasp the bird by the neck with the thumb on the throat. With the right hand insert the knife and pierce the brain by passing the knife through the roof of the mouth towards the top of the head and give it half a turn. If the fowl squawks when stuck, the operator will know that the operation is successful. To be successfully bled, both arteries must be severed. These arteries are exposed on each side of the mouth, and should be severed after the brain is pierced by drawing the knife down first on one side and then by a quick half-turn down the other side of the mouth.

Plucking should be commenced at once, pulling the body feathers first, then the wing and tail feathers. As soon as the fowl is rough-picked the pin feathering and finishing can be done more quickly in a sitting position.

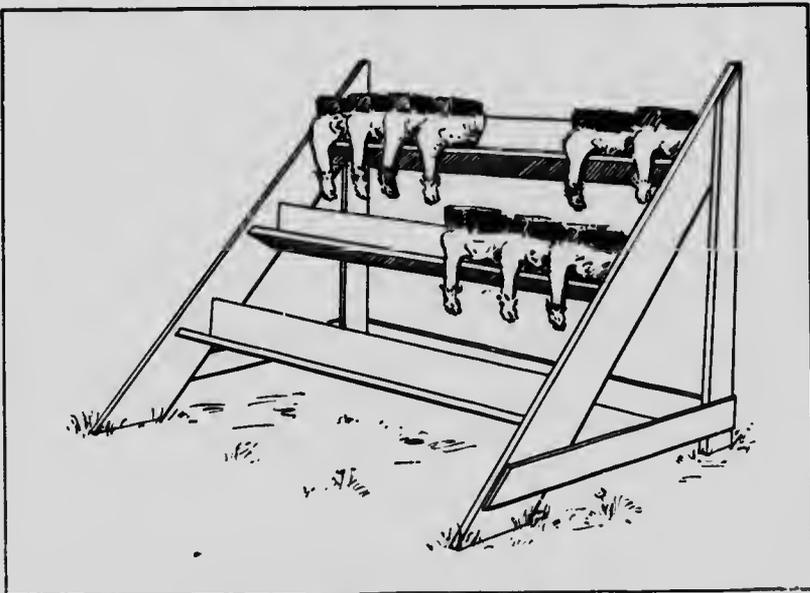


FIG. 18.—Illustration of shaper in frame.



FIG. 10.—Shipping case of proper size. The fowls are neatly packed, though uneven in

Returns are greater when shipped in a compact, plump condition than in a rough, unprepared condition. All birds for market should be properly shaped.

The shaper is shown in Fig. 17, and is made by nailing two  $\frac{3}{8}$  by 6 inch. plain boards together at right angles. The trough should be nailed into a frame and inclined slightly backwards, as shown in Fig. 18.

With legs placed alongside the breast and with the breast downward, force the bird into the angle of the shaper, cover with paper and lay a brick on the back and one against it, to hold it in position. The shaping should be done in as cool a temperature as possible without freezing, and should be continued for about twelve hours. When thoroughly cooled, the birds are placed in shipping cases, as shown in Fig. 19. Cases of basswood or spruce, with corners lock-joined, are most satisfactory. The box should be lined with parchment paper.

There are different methods of packing. The general method employed in shipments into British Columbia from the East is by packing the birds in a single row. Packing the birds in two rows is employed for short shipping distances. The case should be properly stencilled, giving name and address of producer, number and weight of birds, and whether they are chicken or fowl. A chicken is a bird seven months of age or under.

#### POULTRY HOUSES.

It is very difficult to lay down any hard and fast rules as to the construction of poultry houses, as we find poultry thriving and giving good returns in different types of houses. The old system of keeping the poultry house heated in winter never gives satisfaction. The air is apt to become disagreeable and, owing to lack of ventilation, the house may become very damp. Such conditions are favourable to the growth and spread of disease. Under such circumstances poultry cannot give the best results.

Since profit on the money invested in the plant is the object in view, the poultry house should be built as cheaply as possible; the house should be light, with at least one-third of the south side of it open to sunlight, as the rays of the sun have a germicidal effect and also tend to keep the house dry, especially during the winter months.

Location.—In locating the poultry house, it is well to arrange the plant so that extensions may be made as conditions warrant.

FIG. 30.—A Laying House on the Adare Poultry Farm.



**Essential Conditions.**—It is very necessary that the house be built on a dry location, a location where there is ample drainage, and where, if possible, the subsoil is of a gravelly or open nature. The floor of the house should be somewhat elevated above the level of the land, so as to be sure of drainage. The houses should be faced to the south or south-east, with as much as possible of the front open. We do not advise the use of drop curtains in any part of the building, except, possibly, during cold snaps in winter. The house must be free from draughts at all times. Ventilation and abundance of fresh air are two of the most essential conditions in the hen house, if the flock is to be kept in a healthy condition. The old idea that the house must, during cold weather, be shut up close and kept warm, has long since died out, and it has been proven that hens give best results when allowed to run and work in the fresh air during the day, where there is no artificial heat. One essential factor is to have the birds roosting in comfortable quarters at night, although the air should be pure. For this reason, we do not advocate the use of a drop curtain before the roosts, except in districts where the temperature falls to a low degree; but we do maintain that the roosts should be so placed in the house as to avoid all danger from draughts and other detrimental influences.

#### EXPERIMENTS WITH POULTRY HOUSES.

For some years various experiment stations throughout America have been experimenting with different styles of poultry houses, and in the majority of cases the results of these experiments checked very closely. For an example, we cite experiments along this line which have been conducted by Prof. W. R. Graham, manager of the poultry department at the Ontario Agricultural College at Guelph. When the poultry plant was established at the college some twelve years ago, a very warmly-built poultry house was erected, which, during the winter, was artificially heated. This house did not give every satisfaction, and later the heating apparatus was withdrawn, the double windows removed, and gradually the windows and doors were left open daily, so that the fresh air might circulate freely, and were not closed until the winter months, when the water would freeze in the drinking tins. This fresh air treatment gave good results, in that the fowls were vigorous, thrifty, and laid as many eggs as under the hot-house system, if not more, and the eggs were far better for incubation purposes.

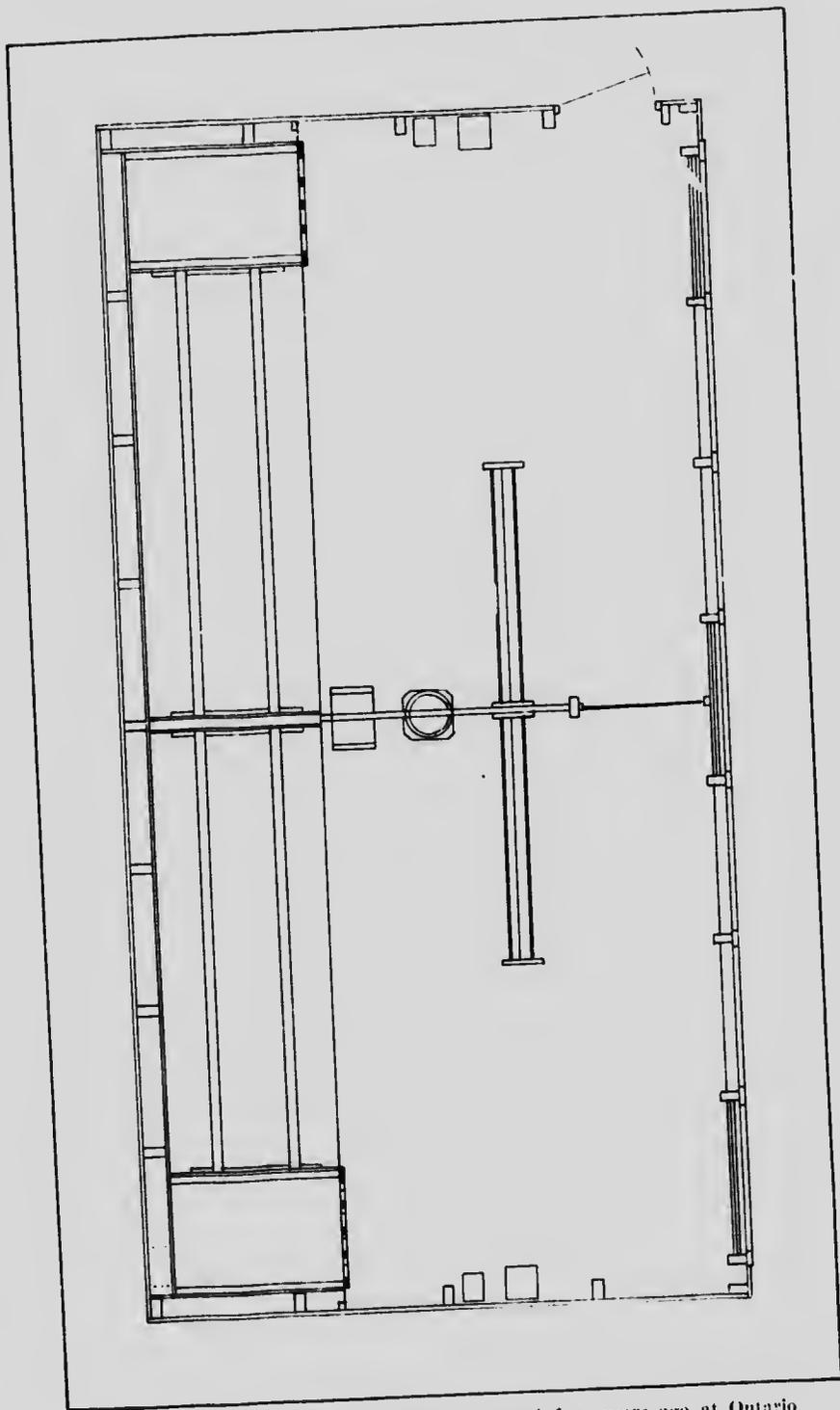


FIG. 21.—Ground plan of houses constructed four years ago at Ontario Agricultural college.

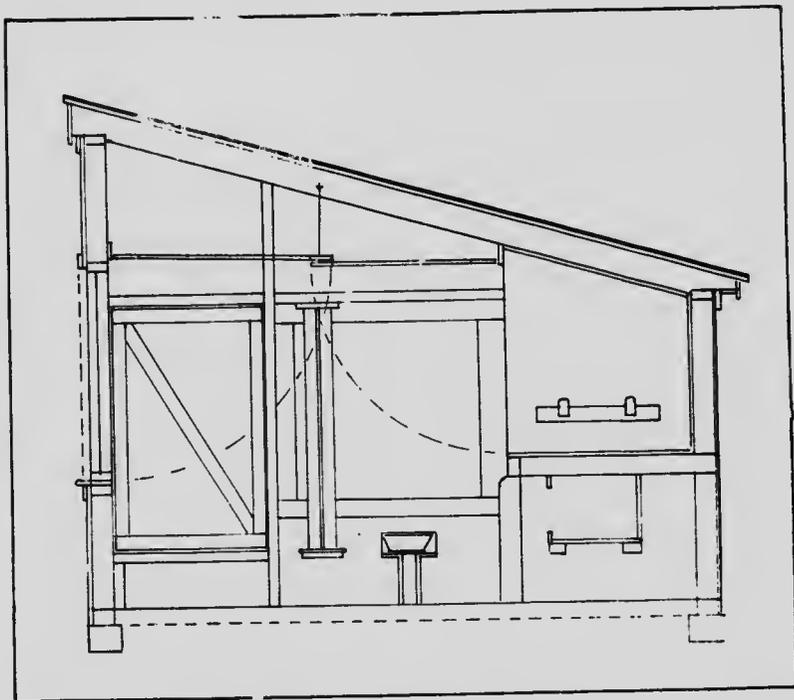


FIG. 22.—End view of one of the same houses.

Four years ago four houses of the same dimensions as regards floor and space, but representing different styles of popular construction, were built. These houses are each 24 feet long and 12 feet wide; each house is divided by a wire partition into two equal-sized floor spaces, with a door between the two. (See Fig. 21 & 22.) The houses would accommodate from 40 to 50 hens, that is, from 20 to 25 in each pen. The houses were stocked, as near as possible, with birds of the same strains of four breeds, the birds being as uniform a lot as it was possible to obtain.

#### DESCRIPTION OF THE HOUSES.

All houses faced the south, with the outside runs to the north, the runs of the various houses being divided by wire fences. House No. 1 is made of matched boards, which are dressed on one side; the ends and the front are of but single ply, the back is sheeted on

the inside, and building paper is used between the boards to prevent draughts. The windows are sliding, so that they may be opened or shut, regulating the ventilation according to the outside conditios.

House No. 2 is an open-fronted house, having only curtains in the front, which may be dropped or raised at will. The ends and the back of the house are made of single-ply matched boards, also in the back sheeting is used on the inside, and a paper lining between the boards. This extra protection on the back gives warmth to the roosting quarters. This type of house is what is known as the "Main State" house. In this house the fowls are allowed to work in the fresh air all day, the curtain being lowered only on rough, stormy days.

Houses 1 and 2 have drop curtains in front of the roost.

House No. 3.—This house is made very warmly of matched lumber, lined with paper and having a dead air space between the walls, and the doors and windows built as snugly as possible. To prevent moisture collecting on the inside walls during cold weather, a loft was built of loose poles on a level with the ceiling. On this straw was placed. The straw absorbs the moisture and keeps the house dry.

House No. 4.—The fourth house is very cheap of construction, as it is built of boards which are dressed on one side only, and the cracks battened. The greater part of the front of the house is open, though there are large doors which may be shut during stormy weather. Needless to say, this house is extremely airy. There is no protection for the roosts, the birds roosting in the same temperature as they were working in during the day, except for the body heat contained in the roosting quarters during the night.

Houses 3 and 4 have no drop curtain in front of the roosts.

#### RESULTS OF THE EXPERIMENTS.

The average results for two years with these houses were, that after a two years' trial, the birds in the cold house, No. 4, gave the best results; that the hens in the warmest house, No. 3, gave the poorest results, neither were they as healthy as the birds in Nos. 1, 2, nor 4. There was a difference of 18 degrees between the lowest temperatures in House No. 4 and House No. 3, their respective temperatures being 7 below zero and 11 above.

House No. 1, with the moveable windows, was about 4 degrees warmer than House No. 4. House No. 2, with curtained front, was about 3 degrees warmer than No. 4. The curtain in front of the roosts is of much value in Ontario during very cold weather, as it keeps the birds from getting their combs frozen.

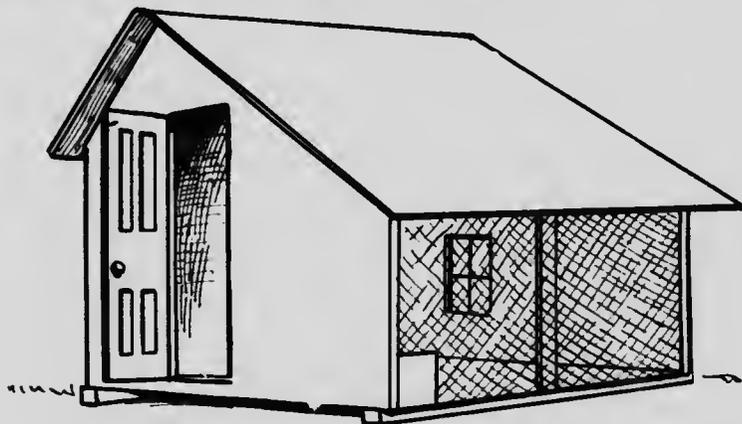


FIG. 23.—"Tolman" fresh air house.

However, in place of the curtain front houses we find the open front houses giving better satisfaction. Considering the climatic conditions of this Province, the open front house is deemed most advisable. The open front house, illustrated in Fig. 23, was first used about three years ago, and is now widely used throughout America. What the curtain front house was to the closed house, so the modern "fresh air" house is to the curtain front house. The advantages of this house over the curtain front house are many. It is less expensive and less labour is required in tending the flocks. A larger supply of pure air is supplied to the fowls at all times, thus keeping the birds in better health, with an increase in the fertility of the eggs and a larger egg yield.

This type of house is what is known as the "Tolman" fresh air house, being introduced by Mr. J. Tolman in Massachusetts. The front of the house is never closed. The house illustrated in Fig. 23 is 16 feet long, 5 feet high in front, 6 feet high behind, and may be any width convenient. It has a pitched roof, with the long slope of the roof to the five-foot side, which is the front, and faces the south. The roosts in the rear of the building being above

the level of the bottom of the front plate insures the fowls against exposure to any winds which may blow in at the open front. The birds are protected at all times from draughts by the tight back, sides and roof. Only one side of the house being open, cold winds do not penetrate the house. The fowls are comfortable all of the time and seem to enjoy the greater abundance of fresh air than is supplied in the old closed house or when the air is diffused through a curtain.

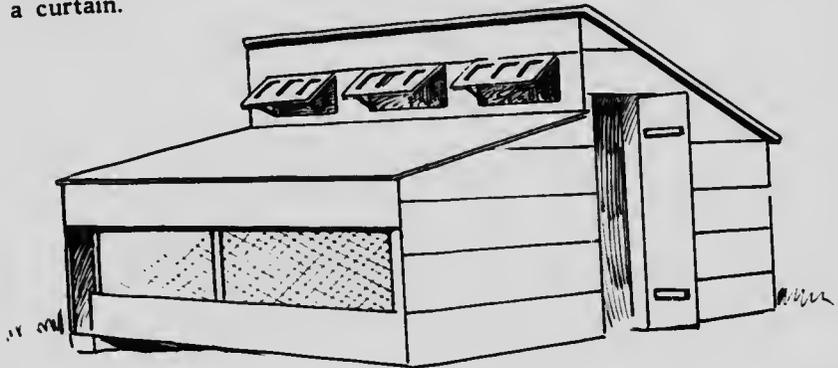


FIG. 24.—" Woods " fresh air house.

Probably a more satisfactory house is found in the " Woods " fresh air house (see Fig. 24), which bears out the principle of the " Tolman " house (see Fig. 23), providing some advantages, especially for poultry breeders, in British Columbia. It is of the semi-Monitor top type, being  $2\frac{1}{2}$  feet in front, which is entirely open, and this runs back about half the depth of the house, while the back part of the house, which contains the roosting quarters, with nest boxes beneath, is six feet high behind, with the roof sloping up to the centre of the house. In the upper front part of this back portion, and above the front section of the house, small windows may be placed. With these open in the day-time, especially in warm weather, a free circulation of air is obtained at all times; also the sunlight may reach the roosts and thus prove very beneficial.

#### CONCLUSION.

In brief, a cheaply-built house with an open front, will give equally as good results as, if not better than, a more expensive and warmer house. Not only will poultry lay more eggs if the house

is supplied with plenty of fresh air, but the hatchability of the eggs from such houses will be greater, and a stronger and more thrifty bunch of chickens will be the result.

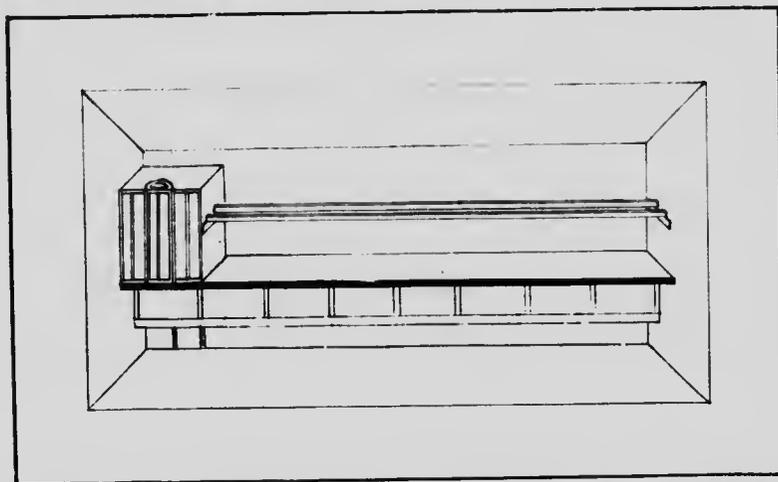


FIG. 25.—Interior of laying house, showing position of roosts and cock pen, with nests under the dropping boards.

There are many plans of houses which receive a wide use, and no one can truthfully say any one plan is the best. The house must suit the local conditions, but it is advisable to get as much sunlight and fresh air into the house as possible. Interior arrangements should be simple and as convenient as possible. The nests should be under the dropping board, so as to give the fowl all the floor space possible. The roosts should not be too high from the floor, or there is danger that the fowl may injure its feet in jumping from the perches to the floor. The dropping board for a single roost should be from about 18 inches to 20 inches wide, and 3 feet



FIG. 26.—Showing nest boxes with curtain front. Curtain raised and lowered. It is usual to have the hens enter the nests from the back, and the curtain provides an easy means in collecting the eggs.

wide for a double roost. Roosts may be made of 2 x 4 scantlings, and the edges may be rounded. For convenience in cleaning the dropping board, it is well to have it fairly low down.

The number as well as the fertility of the eggs depends largely upon the vitality of the flock. The vitality, in turn, largely depends upon the exercise the hens are given. It is only natural for a hen to work for most of her living; the harder she works the greater will be the circulation in her system; consequently, the reproductive system will be better nourished than if the hen were fed large quantities of food only a few times, and induced to take but little exercise. Exercise helps to start egg production. The litter should be quite deep, from about 8 inches to 12 inches. It should be kept in such a condition that the hens may readily scratch down to the

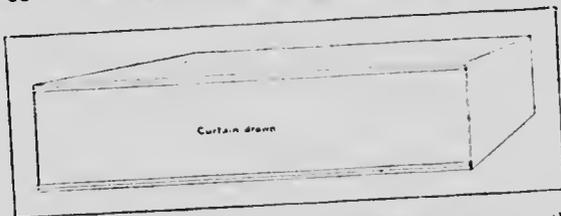


FIG 26a.—The curtain tends to keep the nests dark and prevents the hens from learning to eat eggs.

floor, thus being able to pick up every grain that is in the litter. If the straw used for litter is too coarse, many hens will soon become discouraged after a time and will give up scratching altogether. This will induce laziness among some of the best layers and the egg production will be impaired. The fowls should keep the litter free of grain. If, sometime after feeding, any grain except a few coarse oats are left in the litter, there is something wrong with the method of feeding. The flock should not be fed too heavy in the morning or throughout the day; but at night the fowls should be given all they will pick up clean. Through vigorous exercise the fowls will become hardier, and when cold weather comes on they will be better able to resist the change and will make better breeders and layers.

#### CLEANING THE HOUSE.

Cleanliness is one of the most important factors to be considered in the poultry industry. The house should be cleaned occasionally and the roosts painted with kerosene or some other

disinfectant. The interior of the house should be white-washed frequently and carbolic acid used. The nests must be kept clean, as eggs readily become tainted.

#### MOVABLE HOUSES.

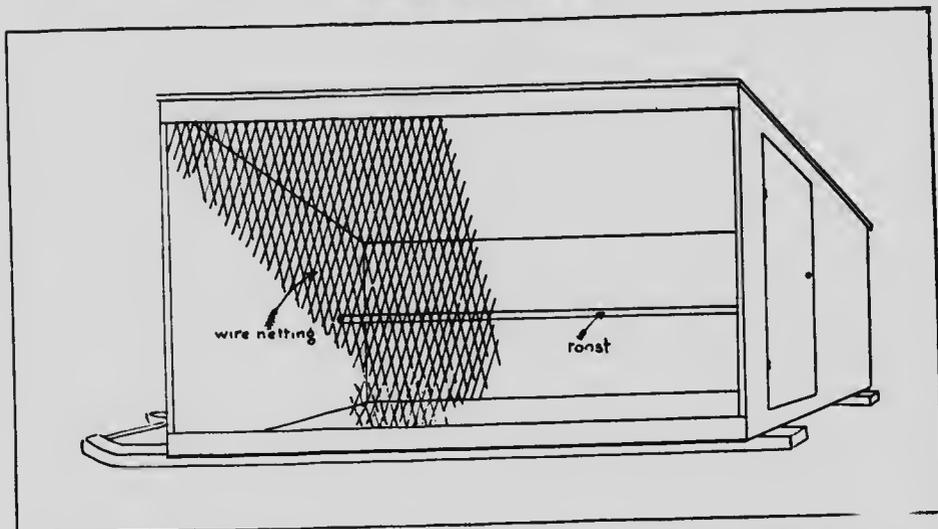


FIG. 27.—A movable colony house admirably adapted for growing stock. This house may be taken into the orchard or out in the pasture field, or even on uncleared land.

The above (Fig. 27) illustrates a popular movable house, and is constructed as follows:—9 feet by 6 feet and  $5\frac{1}{2}$  feet high. The frame is made of 2 inch by 2 inch and covered with single ply lumber, with battens covering the cracks. It is well to have the house placed on runners which are placed 4 or 5 inches from the sides, and having a ring attached on the front of each runner, so that a horse may be hitched on and the location of the house may be easily changed from time to time.

#### POULTRY RUNS.

For success with poultry, they should not be allowed to run year after year on the same land without the soil being turned over and a green crop sown. It cannot be too strongly emphasised that some form of soil cultivation should be linked with the poultry industry. It has been proven that many diseases which break out in the flock are due to contaminated soil. On commercial

plants the whole plant may be divided into two parts by one wire fence running through about the centre of the plant. This will allow of the cultivation of one part and the sowing of some crop, while the fowls have the range of the other part. The land should be top-dressed with lime frequently and a solution of sulphuric acid may be used. Keeping the soil free from contamination has a great deal to do with the success of the industry.

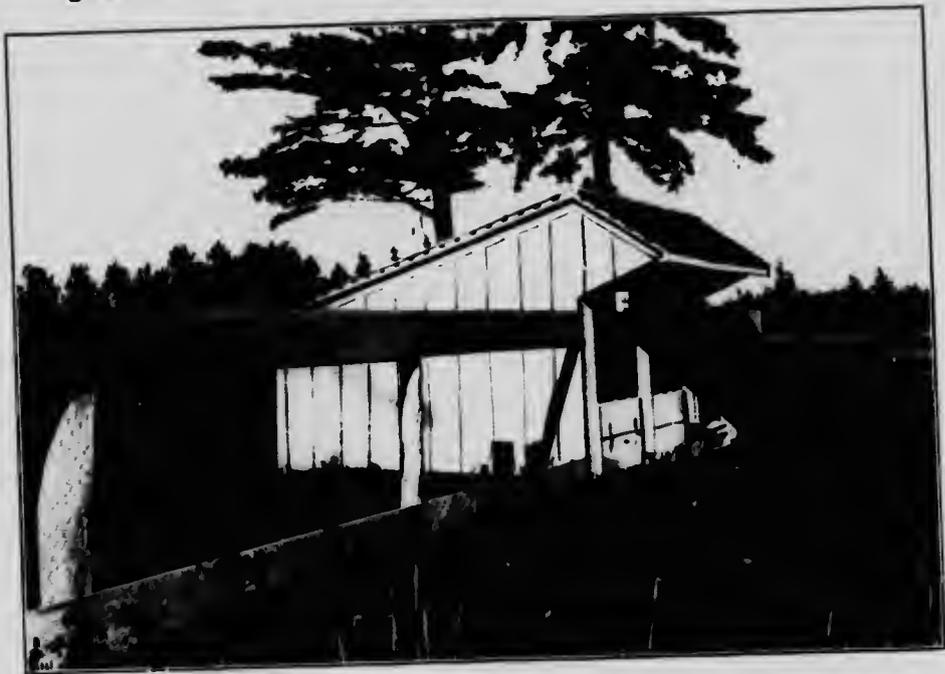


FIG. 28.—Another type of colony house. The hood at the top tends to keep out the driving rains of winter.

#### DISEASES.

This Province is fortunate in having but very little disease; however, the poultryman must be always on " alert, ready to combat any of the many diseases which work havoc with many flocks. "Prevention of disease" should be the motto for the poultryman. Fresh air, abundance of sunlight, clean water and clean quarters are necessary for success. The poultryman should watch his flock carefully, and on noting the first symptoms of sickness among any

of his birds should at once remove that bird to quarters where it cannot come in contact with any healthy birds. This bird should be treated according to the disease. The general remedy for all such birds is the axe. Neither does one gain anything by trying to cure deformed or diseased chicks.

#### LICE.

Lice probably exist in small numbers wherever there are fowls, but as long as fowls are healthy and active lice cannot increase rapidly enough to seriously annoy the birds. They can only become troublesome from gross neglect, either of the fowls or of their habitations. In the one case the remedy is some good common insecticide placed in the dust bath, with which may be mixed powdered tobacco or a little sulphur; in the other an energetic lime-washing of the houses and interior arrangements, with a free use of a solution of carbolic acid.

Lice in the poultry houses and on the fowls means loss of money through decreased egg production. The interior arrangements of the houses should be simple and convenient, so that spraying and disinfecting may be easily done, giving as little chance as possible for vermin to increase.

#### SCALY LEG.

This is caused by a mite which burrows under the scales of the feet and shanks. Wash every morning with strong carbolic soap and apply sulphur ointment at night. Scaly legs are usually accompanied by filth,

#### RATS.

The rat is the worst mammalian pest known to the poultryman. Its depredations everywhere result in losses amounting to thousands of dollars annually, and though thousands are killed, other thousands soon replace the slain. The most important step toward the suppression of the rat is to adopt some method to prevent it from increasing in numbers so rapidly. Restricted supplies of food means fewer rats. Their bill of fare includes seeds and grass of all kinds, flour, meal, eggs, chicks, young turkeys, ducklings, goslings and other foods. It has been found that it costs at least twenty-five cents every year to feed one rat, and this on the cheaper foods alone. The failure of efforts to exterminate this rodent has not been due to lack of effective methods so much as to negligence and the absence of concerted action.



FIG. 29.—A simple and inexpensive open air laying house.

The more important means of fighting rats are: (1.) Natural enemies of the rat. (2.) Rat-proof construction of buildings. (3.) Keeping food from rats. (4.) Driving away rats. (5.) Destroying rats. Trapping, if persistently followed, is one of the most effective ways of destroying rats. Another method is by the use of strychnine sulphate. The dry crystals may be inserted in small pieces of raw meat or toasted cheese, and these placed in rat runs and burrows.

The following method is recommended for poisoning rats where the rats are among chickens. Take two wooden boxes, one larger than the other, and each having two or more holes in the sides large enough to admit rats. The poisoned bait should be placed on the bottom and near the middle of the smaller box, and the larger box should then be inverted over the other. Rats have thus free access to the bait, but fowls are excluded.

#### COLDS.

Colds affect fowls variously, and if neglected often lead to something serious. Changeable weather and continuous damp weather often make colds epidemic in the early fall. A common cause of colds and distempers is closing the houses too close at night.

Simple remedies should be used at once; give aconite in the drinking water. A good remedy to keep on hand for colds is equal parts of cayenne pepper, ginger and mustard, mixed as stiff as possible in lard; then flour worked in to make a stiff dough. Form in small pellets and give by opening the mouth and dropping down the throat.

#### DIARRHOEA.

At present information pertaining to diarrhoea is rather indefinite, the latest investigations disclose two diseases under the one name, "Diarrhoea." The cases characterised by cheesy foci in the lungs are caused by the mold *aspergillus fumigatus*. The cases characterised by distended and cheesy ceca invariably show the presence of coecidia. This disease is receiving a great deal of attention from poultrymen and scientists in the East, though it seems to be practically unknown in this Province. The health of the flock and the cleanliness of the incubation quarters will determine to a large degree the prevalence (or not) of these diseases. The soil should never be allowed to become contaminated.

**EGG BOUND.**

Treatment is rarely successful. Give dose of castor oil, wash the vent with warm water and pass in a feather dipped in sweet oil.

**GAPES.**

This is caused by gape worms in the windpipe, which finally kill by either wasting or actual suffocation. Place the birds in a large box covered with a coarse cloth and dust air-slaked lime on the cloth. The lime breathed in by the birds causes the worms to relax their hold and they are coughed up. Destroy the worms.

**LEG WEAKNESS.**

In chicks it is often due to excessive heat in brooder. In mature stock it is generally due to forcing or to lack of bone-forming material. Discontinue high feeding, giving more bone meal, green bone or beef scraps.

**ROUP.**

In many sections of the Province roup may be expected to cause trouble, especially where the houses are of the closed type. A few years ago it was the most prevalent disease in Southern Ontario, but by the introduction of the fresh air house it has been controlled to a very great extent. It causes very little, if any, trouble on Vancouver Island, but it must be carefully watched and guarded against in some sections of the Province where there is a considerable rainfall. It is particularly prevalent in the fall and spring of the year. Do not allow the fowls to catch cold under any consideration, but keep them dry and comfortable and they will give good returns.

The views of poultry-raisers as to the origin of roup differ very much, the majority contending that it is a more or less infectious disease. In the majority of cases the first symptoms appear in the nostrils, while sometimes it may be localised in the eyes. It usually appears first in weak fowls as catarrh of the nose. A serous fluid may be observed at one or both nostrils. This secretion soon becomes streaked with grey; a slimy matter forms and dries quickly to dirty crusts, which often completely close the nostrils. The secretion decomposes and emits an offensive odour from the diseased membranes of the nostrils. The inflammation easily spreads to the mucous membrane of the mouth, pharynx and larynx; yet those parts may be the first seat of the infection.



FIG. 30.—Laying hens to do well must be contented. The hen that lays is the hen that pays.

When the disease affects the eyes there is often formed in the inner corner of the eye a vicious secretion. Soon the secretion is changed into a firm, smooth, yellowish-white, cheeselike body which fills up the whole eye. This cheesy mass may easily be removed, but the eye is soon completely filled again. Swellings occur in the membranes of the eye, mouth and larynx; oftentimes the cheesy mass develops in the mouth, forcing the mandibles apart, so that the bird is unable to eat or drink. The fowls thus infected become weak, separate themselves from the other birds and sit around with the head drawn close to the body. The eyes are kept shut; in fact, in many cases, the cheesy matter fills the eye, destroying the sight. The head is sometimes drawn under the wings, so that the feathers are smeared with secretions and some fall out. Usually the birds die, though they may live in this apathetic condition for a long time.

Healthy fowls may become affected if the diseased ones are allowed to run with them. It is usually brought into a flock by a diseased fowl from another place or in unhygienic locations, though it may appear without any preceding attack or importation of a diseased bird.

Poultry keepers know how predisposed chickens and all other fowls are to colds caused by sudden changes in the weather. They must be kept in as natural a condition as possible; hence the wisdom of the adoption of the fresh air house.

Experienced practical poultrymen do not doctor fowls which have roup; they kill and burn them.

Remedy.—For those who wish to try and save their birds the following remedies are given:—

Sulphate of copper,  $\frac{1}{2}$  grain; cayenne pepper, 1 grain; hydrastine,  $\frac{1}{2}$  grain; copaiba, 3 drops; Venetian turpentine,  $\frac{1}{4}$  section. Give in pill night and morning.

One ounce oil of sassafras; 1 ounce best Jamaica ginger; 1 ounce tincture of iron; 1 ounce alcohol;  $\frac{1}{2}$  ounce prickly fluid extract;  $\frac{1}{4}$  ounce oil of anise. Give in dose of from 15 drops to 1 teaspoonful to each gallon of drinking water.

A simple and fairly efficient remedy is swabbing the nostrils and throat out twice a day with a feather which has been dipped in coal oil. The same feather should not be used more than once.

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