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PROVINCE OF ALBERTA  
DEPARTMENT OF AGRICULTURE  
POULTRY BRANCH

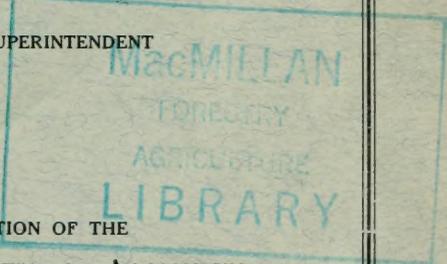


POULTRY BULLETIN No. 3

*used*

# SUCCESSFUL POULTRY RAISING

BY  
A. W. FOLEY, POULTRY SUPERINTENDENT



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HON. DUNCAN MARSHALL, MINISTER OF AGRICULTURE

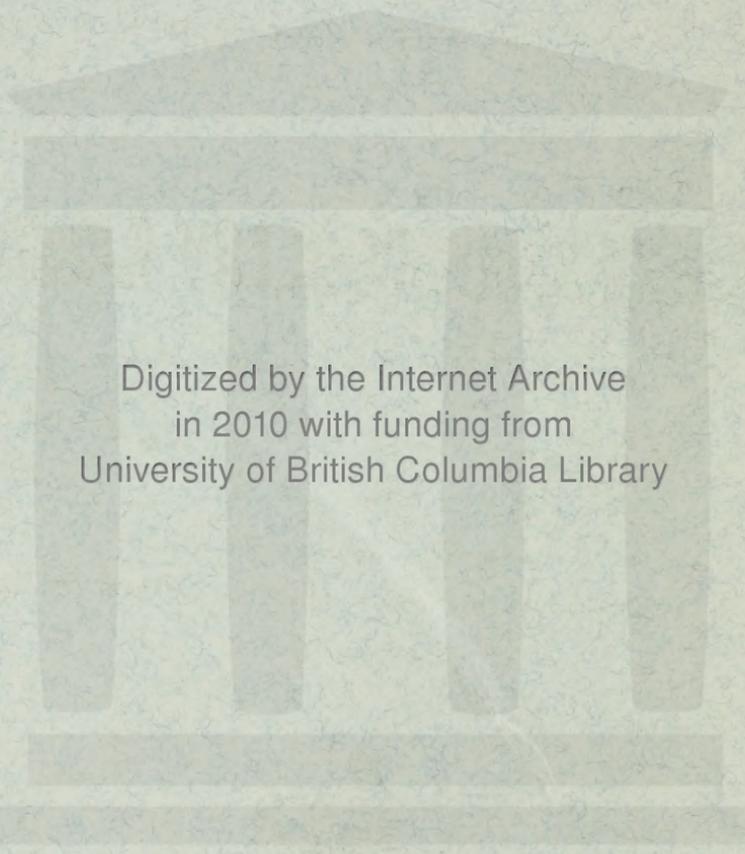
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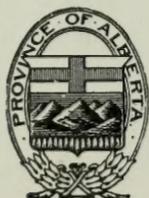
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## CONTENTS

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	PAGE
I. INTRODUCTION .....	3
II. ORIGIN AND DEVELOPMENT OF DOMESTIC POULTRY	4
III. THE POULTRY INDUSTRY .....	5
IV. POULTRY HOUSES AND FIXTURES .....	8
V. COMMERCIAL POULTRY PLANTS .....	17
VI. ESTABLISHING AND MAINTAINING A FLOCK.....	21
VII. STRAIN BUILDING FOR EGG PRODUCTION .....	26
VIII. HATCHING .....	31
IX. BROODING AND REARING .....	41
X. FATTENING .....	51
XI. KILLING AND MARKETING .....	56
XII. WINTER EGG PRODUCTION .....	62
XIII. POULTRY FOR EXHIBITION .....	68
XIV. TURKEYS .....	69
XV. DUCKS .....	72
XVI. GEESE .....	75
XVII. DISEASES AND PARASITES .....	76

# SUCCESSFUL POULTRY RAISING

BY A. W. FOLEY, POULTRY SUPERINTENDENT

## I.—INTRODUCTION.

The hearty reception given previous bulletins has been greatly appreciated, but the demand for them throughout Canada, the United States and from many countries the world over as well as our own province has exhausted the supply and a new bulletin is presented herewith.

Those features of the previous bulletins that are recognized throughout the poultry world as essential facts have been continued as a guide to the beginner in poultry raising. New and better methods are being introduced in all branches of farming and live stock raising. The same is particularly true of the poultry industry.

The new ideas presented in this bulletin are the result of practical observations and demonstrations and are presented not because the old have proved a failure, but for the reason that the new have proved their worth. The many new features will help to illustrate the text and show the advancement made in the poultry industry of the province.

It is sincerely hoped that this bulletin may prove as helpful to those interested in poultry raising as its predecessors.

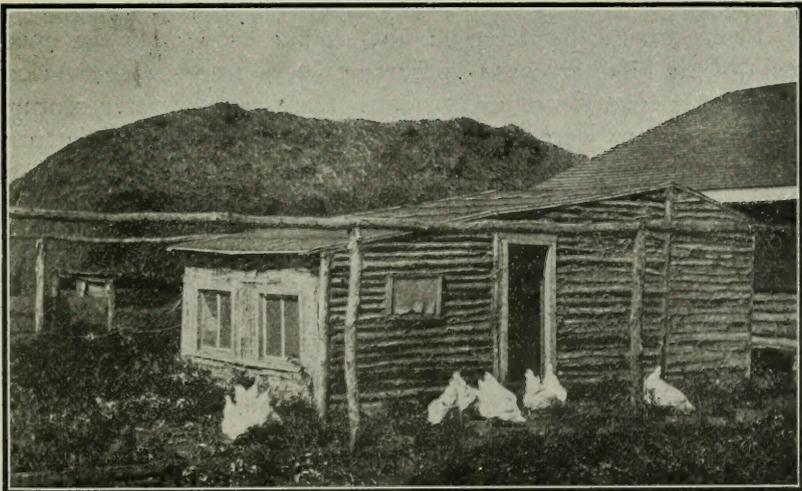


FIG. 1.—COSTLY HOUSES NOT NECESSARY. OTHER CONDITIONS ARE MORE ESSENTIAL TO SUCCESS.

## II.—ORIGIN AND DEVELOPMENT OF DOMESTIC POULTRY.

The domestic fowl is perhaps the oldest and most commonly known of all our farm live stock, yet few people have ever given a thought to the origin and development of the breeds they are familiar with or to the many breeds now in existence throughout the world. As the origin of domestic poultry has a marked influence on the success or failure of poultry raising in the present day it is thought advisable to give a brief outline of the same.

The origin of domestic poultry dates back some three thousand years or more and was brought about through the efforts of the Chinese and Egyptians of the early ages. Strange as it may seem domestication was largely the result of artificial incubation. The eggs of the jungle fowl were gathered and placed in ovens or incubators that held from 1,500 to as many as 150,000 eggs each. When the chicks were hatched they were distributed throughout the then known world by runners, who carried the baby chicks in wicker baskets. Artificial incubation and distribution of baby chicks is therefore not modern but a revival of the methods employed by these ancient poultrymen.

In the various countries where the wild chicks were domesticated they were required for specific purposes. In India cock fighting became a national sport and the inhabitants of that part of the world developed a breed of birds, whose fighting instincts are as pronounced today as they were centuries ago. In Asia birds for feast purposes were required with the result that the Asiatic breeds are large birds noted for their meat-producing qualities.

From Africa the domestic fowl found its way to the north shores of the Mediterranean in Europe where breeds were developed to supply eggs for religious fasts. Here century after century breeds of poultry were developed for a specific purpose—egg production, and, while the meat-producing side was neglected, in the European varieties today egg-producing qualities are most pronounced.

In America to the middle of the eighteenth century only European varieties were to be found. The poultry keepers of America, however, desired a more utility fowl than Europe produced, and in 1847 some Asiatic birds known as Cochin China were imported and crossed with European varieties. Through careful and persistent breeding by expert poultrymen the American breeds mentioned elsewhere in this bulletin have been developed. In these new breeds the meat-producing qualities of Asiatic varieties and the egg-producing qualities of European varieties are combined.

The knowledge of these facts should be of service to successful poultrymen, because of certain established laws in breeding. Like produces like, or a similarity of like; while another law, the law of reversion, is constantly at work. Remember that the present utility breeds trace back through the European and Asiatic breeds to the jungle fowl that laid only from 15 to 30 eggs in a season. Remember also that the law of reversion is counteracted only by careful selection year after year of the breeding stock having the desired type, characteristics and egg-producing qualities it is wished to perpetuate.

### III.—THE POULTRY INDUSTRY.

**MARKET CONDITIONS.**—Throughout the province, in fact all Western Canada, at all seasons of the year there is an almost unlimited demand for poultry products. This is indicated by the enormous importations from other countries which for Alberta alone amounted to 1,954,110 dozen in 1913 and 1,568,657 dozen in 1914. The importations from outside the Dominion for the four western provinces amounted to 10,562,190 dozen in 1913 and 8,294,672 dozen in 1914, while the total importations into Canada were 13,240,111 dozen in 1913, and 11,274,108 dozen in 1914. These features would indicate the enormous demand for eggs in western markets in excess of home production. It is estimated that the Canadian hen laid in 1914 145,000,000 dozen eggs. In the production of this amount the Alberta hen played a most insignificant part.

The same conditions prevail in dressed poultry, although the production of dressed poultry in Alberta has greatly increased of late. With the prices of dressed poultry ranging from 15c to 25c per pound for good quality, and eggs from 18c to 60c per dozen, there is every inducement in the matter of markets for a greater increase in the production of poultry products. During the winter months fresh eggs sell at from 50c to 60c per dozen. The lowest price is usually reached the latter part of April when they retail at about 20c per dozen. By the middle of May the price again rises, gradually increasing as the season advances.

At many points throughout the province it has been noted that the farmers themselves have for years been the largest purchasers of bacon, condensed milk, butter and eggs at the local stores. They have been so engrossed with the larger department of farming that they have lost sight of the opportunities afforded them in the good markets for food products.

Too many western farmers have been growing grain for eastern stockmen, and even those of other countries, to convert into bacon,

butter, cheese, poultry products, etc., to be shipped back to the western provinces for consumption. If farmers elsewhere after paying transportation charges and advanced prices for western grain find it profitable to produce these foods, surely it would be more profitable to the Alberta farmer, with grain at first cost and the market at his door, to do so. This demonstrates the advisability of turning the coarse products of the farm into finished products of high class quality, smaller in bulk and of highly increased market value. Not only does the producer receive much greater returns for his labour, but he keeps in circulation within the province large amounts of money that otherwise would be sent out to pay for the imported products.

As the province develops the market demands will also grow as a high percentage of the incoming population will for some time be consumers rather than producers. In all likelihood it will be a great many years before the province will produce sufficient eggs and poultry to meet its own requirements. Apart from this there need be no fear of over production for the future as there is a market demand in British Columbia and elsewhere for any surplus there may be. Owing to its geographical situation the province of British Columbia gives Alberta a natural outlet, and with the completion of additional trans-continental railroads this province will have access to one of the best markets of the Dominion, and through the Panama Canal to the markets of the world.

With satisfactory prices and markets, with grain at first cost, with climatic and other conditions so favourable, and with the province so well adapted to mixed farming, poultry keeping should be profitable to all who undertake it in a practical way. It should be doubly so to those making use of the latest scientific knowledge available today on poultry keeping.

The educational work of the poultry branch of the Department of Agriculture has created a demand for laying strains of the various utility breeds, and as a result there is practically an unlimited demand for breeding stock and eggs for hatching to stock the farms of the thousands of farmers already established here, and of the many thousands of new comers arriving every year to create new homes for themselves upon the land.

Besides offering such favourable opportunities to the tiller of the soil, poultry raising is an industry in which the dwellers in town may participate, because it is one which can be followed equally as successfully upon the confined limits of a town lot as upon the more extensive area available upon every farm.

CLIMATIC CONDITIONS.—There is no province in the Dominion where the climatic conditions are more favourable for the produc-

tion of poultry than Alberta. While the temperature drops rather low at times it does not prevent a satisfactory supply of eggs during the winter months, as will be shown later by actual records.

Poultry can endure quite low temperatures, when the climate is comparatively steady, much better than they can where the climatic changes are accompanied by quickly alternating wet and dry conditions. Rapidly changing conditions mean colds, roup, etc., with their attendant losses. In this respect Alberta, with its steady climatic conditions, with a large amount of dry weather, with its long hours of sunshine, presents ideal conditions for raising poultry of all kinds.

There is practically no rainfall until the hatching season is well advanced, which makes conditions favourable for the rearing of young chicks, ducks, geese and turkeys.

The absence of disease, resulting from favourable climatic conditions, is an item which has not been appreciated as it should be. When to this is added exceedingly favourable market conditions, one is surprised that poultry raising has not been more generally followed. At the same time, once these facts are known, as well as the best up-to-the-minute methods of rearing, feeding and fattening, there is certain to be a rapid advancement in the poultry industry. If this advance is made along right lines it will not be long before the province will take a leading place in this particular industry. The object of this bulletin is, therefore, to place before those engaged in poultry raising, whether for pleasure or profit, such advanced methods as experience has shown to be not only practicable but highly profitable.

Perhaps no industry lends itself so successfully to general adaptation as does that of raising poultry. It may be undertaken simply to furnish employment, or as a business, or as an investment. The object sought in undertaking it may be to supply the family needs, to follow the dictates of one's fancy, to win at exhibitions, or to produce superior birds from a strictly commercial standpoint.

The industry is easily divided into two subdivisions:

1. Poultry keeping for fancy and exhibition purposes;
2. Poultry keeping as a business enterprise.

While the fancy and exhibition side of the industry will prove highly remunerative for a few, yet the greater number of poultry keepers must find the commercial side much the more profitable as it is the more practical.

Just here a word of caution may be in order. While the returns from small flocks carefully handled show handsome profits, it does

not follow than when greatly increased numbers are kept an equal return per bird may be counted on. Many men having been successful with small flocks have lost fortunes by undertaking the poultry business on a large scale. Believing that since they were successful with a few they would be equally successful with large numbers, they increased their flocks so rapidly that they could not properly attend to the details necessary for the success of the business. A successful poultry business managed on a large scale must necessarily be the results of a gradual growth from small beginnings.

The capital required by the average farmer will be largely invested in a well built commodious house, with occasional outlays for the introduction of new blood and the procuring of additional incubators, brooders, etc. In fact many successful flocks have been built up with a minimum of outlay in actual money and in the very plainest of buildings. So far as capital goes the poultry industry affords great opportunities to every farmer,—the capital required being time, careful attention to details, and an enthusiastic love for the work rather than a great amount of money.

Commercial poultry farming, however, is an undertaking requiring entirely different consideration in the matter of capital and equipment, and will be dealt with elsewhere in this bulletin.

#### IV.—POULTRY HOUSES AND FIXTURES

Proper accommodation is an essential in profitable poultry raising that cannot be overlooked. While buildings may be of as elaborate construction as the purse and fancy of the owner dictate, still houses constructed of log, sod, baled straw, or even straw packed between a framework are capable of giving as satisfactory results when proper care is given to location, light, ventilation and sanitary conditions.

##### LOCATION OF HOUSE.

In locating a poultry house the following conditions should receive consideration:

*Allow for Growth.*—Arrange the general plan in such a way that extensions may be easily made when required.

*Convenience.*—Plan in such a way that the pens may be convenient to feed rooms, water, and other supplies.

*Dryness.*—If a dry situation cannot be obtained it is better to stop at once, or provide suitable drainage. The site selected for buildings and runs should have natural drainage. A gentle slope to the south or south-east is preferable. A subsoil of a gravelly nature

is most acceptable. The yards or range should be suitable for the growing of grass, alfalfa or other succulent food suitable for poultry.

#### ESSENTIALS OF A GOOD HOUSE.

*Floor.*—The floor of the house should be at least six inches above the general level of the ground in order to ensure dry quarters in case of excessive rain.

*Light.*—A liberal amount of light is necessary. Consequently the windows should be large enough to extend from within two feet of the floor to nearly the top of the front elevation, which should always be to the south. If a drop curtain is to be used in the front of the roosting quarters, it should be raised during the day to allow the sun to penetrate to the roosts and rear walls.

*Warmth. Artificial Heat Not Necessary.*—Many people have conceived the mistaken idea that artificial heat is necessary in winter to secure the highest results in egg production. Egg-laying strains associated with proper care and feeding have a greater influence upon winter egg production than the supplying of artificial heat. There is no difficulty in constructing a house that will be sufficiently warm to ensure good laying results. Under ordinary circumstances the scratching shed section of the house is sufficient protection for the fowl during the day, because the exercise gained in scratching for food keeps the bird in proper condition.

Winter egg production is more seriously affected by dampness and cold caused by the accumulation of frost on the walls and roof as a result of lack of ventilation. When the walls and roof are covered with frost conditions are then similar to the interior of a cold storage room, which are most undesirable. When a chinook or mild weather follows the frost turns to moisture, the house and litter become saturated with dampness, making the last state worse than the first. Disease and disaster follow.

Any of the low comb variety of poultry can stand severe cold when necessary with little or no danger of frozen combs, providing *the air is dry*. However, care should be taken to protect the male birds against frozen combs, and for this purpose they may be placed in a pen specially prepared for them.

*Sanitary Conditions.*—Cleanliness is equally as important as light and ventilation. Too frequently the droppings are allowed to accumulate for weeks and in many cases even months. In a well regulated house the dropboards should be cleaned off *daily* and the droppings removed, because when they are allowed to accumulate, foul gases arise and seriously affect the health of the birds. It is a good plan to spray the house once a week with a ten per cent. solution

of creolin. When this care is exercised much is accomplished in ensuring the flock against disease and vermin.

*Ventilation.*—One of the most serious conditions that has to be contended with in the housing of poultry is the accumulation of frost on the walls and roof of the house. This makes the house much colder and causes dampness, which is fatal to the health of poultry. This can only be overcome by a good system of ventilation.

To ensure safe ventilation, the air should enter slowly and circulate thoroughly through the house before passing out. This may be accomplished in two ways:

(1) By allowing the air to filter through straw placed under the roof; or,

(2) Through burlap or factory cotton used as a window at each end of the poultry house.

In this system of ventilation, the air filters through the straw or the fine meshes of the cotton so slowly that the moisture in the warm rising air is carried off without causing a draft.



FIG. 2.—POULTRY HOUSES VENTILATED THROUGH STRAW IN THE APEX.

The apex roof poultry house lends itself most readily to the system of ventilating through straw. Strips of board can be placed on the plate three or four inches apart and the apex partially filled with straw. In both ends of the apex an opening 18 inches square should be made to allow the circulation of air above the straw. Doors should be placed in these openings to protect the straw from

storms. At all other times the doors should be left open no matter how low the temperature, as by this means the moisture is taken from the straw and carried out of the house.

Where burlap or factory cotton is used the openings should be made in the ends of the house in a suitable place. Where the construction of a house is such that it is impracticable to make openings



FIG. 3.—POULTRY HOUSE SUITABLE FOR TOWN OR CITY LOT.

in the ends, good results may be obtained by removing a portion of the sash or even a pane of glass and replacing with cotton.

To secure satisfactory ventilation by use of windows, it is necessary to have two openings at opposite ends of the house to ensure a complete circulation of air. When the ventilation fails to remove the frost deposited on the inside of the house it is usually due to lack of sufficient circulation or because the outlet for the air is not high enough to allow the moisture in the air to escape before the frost condenses it.

*Plans of Desirable Houses.*—Having given a few hints as to the proper location of a poultry house and the necessary essentials thereof, it is an easy matter for anyone to plan a house to meet his particular requirements. For the convenience of those who desire an exterior design a number of styles of houses are illustrated. The exterior of any style of poultry house is largely a matter of taste in the general design.

A standard for dimensions of a pen may be 12 by 12 feet. These dimensions may be varied to accommodate different numbers of hens, allowing from 5 to 6 square feet per hen.

In constructing a poultry house it is wise to have a good foundation of cement. The sills may be of two thicknesses of 2 by 4

scantling lapped to break the joints. The front studding may be 8 feet long and the rear studding 4 1-2 feet. These dimensions may be varied to meet special requirements.

Various methods of siding up the walls may be followed:

(1) One plan that is considered satisfactory for all practical purposes is to put shiplap on the outside of the studding, with the planed side inward, cover with building paper and finish with drop siding.

(2) Another method is to put paper and shiplap on the inside of the rear and end walls and the underside of the rafters to the front of the dropboard as well as on the outside as above.

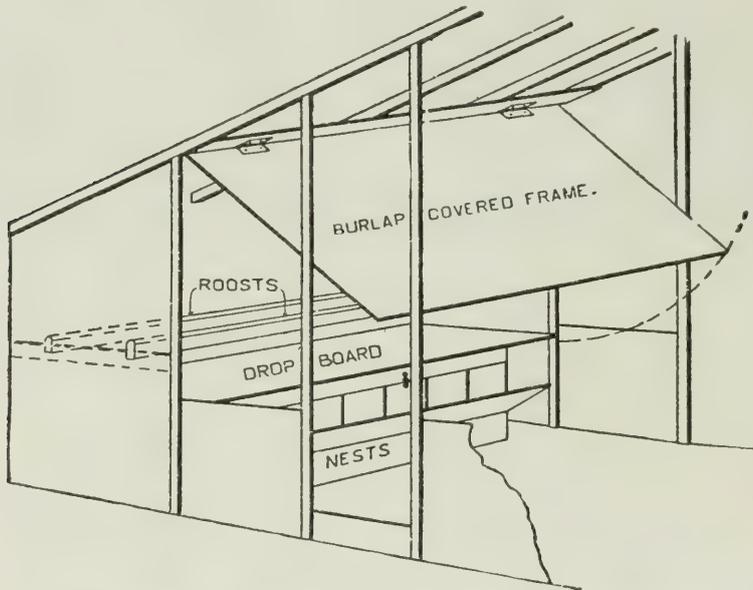


FIG. 4.—INTERIOR VIEW OF SINGLE STYLE OF POULTRY HOUSE, SHOWING POSITION OF NEST, DROPBOARD, AND BURLAP CURTAIN.

(3) The best and most economical house, one that has been adopted at the Provincial Poultry Plant, and now being constructed generally throughout the province, (Figs. 5 and 12) is made of good quality of dry drop-siding on the outside of the studding. The inside of the wall between the studs is lined with tar paper. Lath or poultry netting is then placed on the inside of the studs and rafters, and the space stuffed with dry straw and chaff. Stuffing this space adds warmth and prevents the accumulation of frost and dampness. As the straw filling is required only during the winter months it is advisable to remove it in the spring and renew each fall as a guard against the possibility of vermin.

## THE COTTON FRONT HOUSE.

During recent years considerable has been said in favour of the cotton front house, in which cotton replaces the glass formerly used in windows. In many cases the fronts are being constructed almost entirely of cotton as shown in Fig. 7. Several years of experiments conducted at the Provincial Poultry Plant has demonstrated that cotton is preferable to glass when only one or the other is being used. Many poultry raisers who were formerly sceptical of the using of cotton are now using it exclusively, believing they secure better ventilation and more healthy birds.

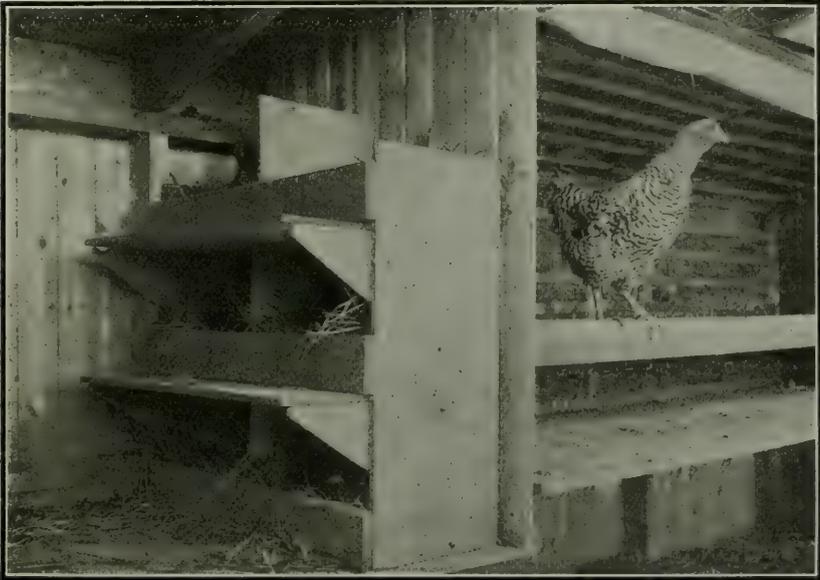


FIG. 5.—INTERIOR OF COTTON FRONT HOUSE, SHOWING ROOSTS, NESTS, DROPBOARD, DROP CURTAIN AND STRAW FILLING.

### SPECIFICATIONS FOR POULTRY HOUSE.

A few general ideas in poultry house construction are as follows:

*Sills.*—4-in. x 4-in. scantling or 2-in. x 4-in. scantling doubled with joints lapped.

*Studding and Rafters.*—2-in. x 4-in. placed 3-in. apart. Rafters should project 8 or 10 inches in front and rear to protect house from rain storms.

*Studding.*—7-in. high in front and 4-ft. 6-in. in rear.

*Plates.*—2-in. x 4-in. scantling where rafters are placed directly above studding.

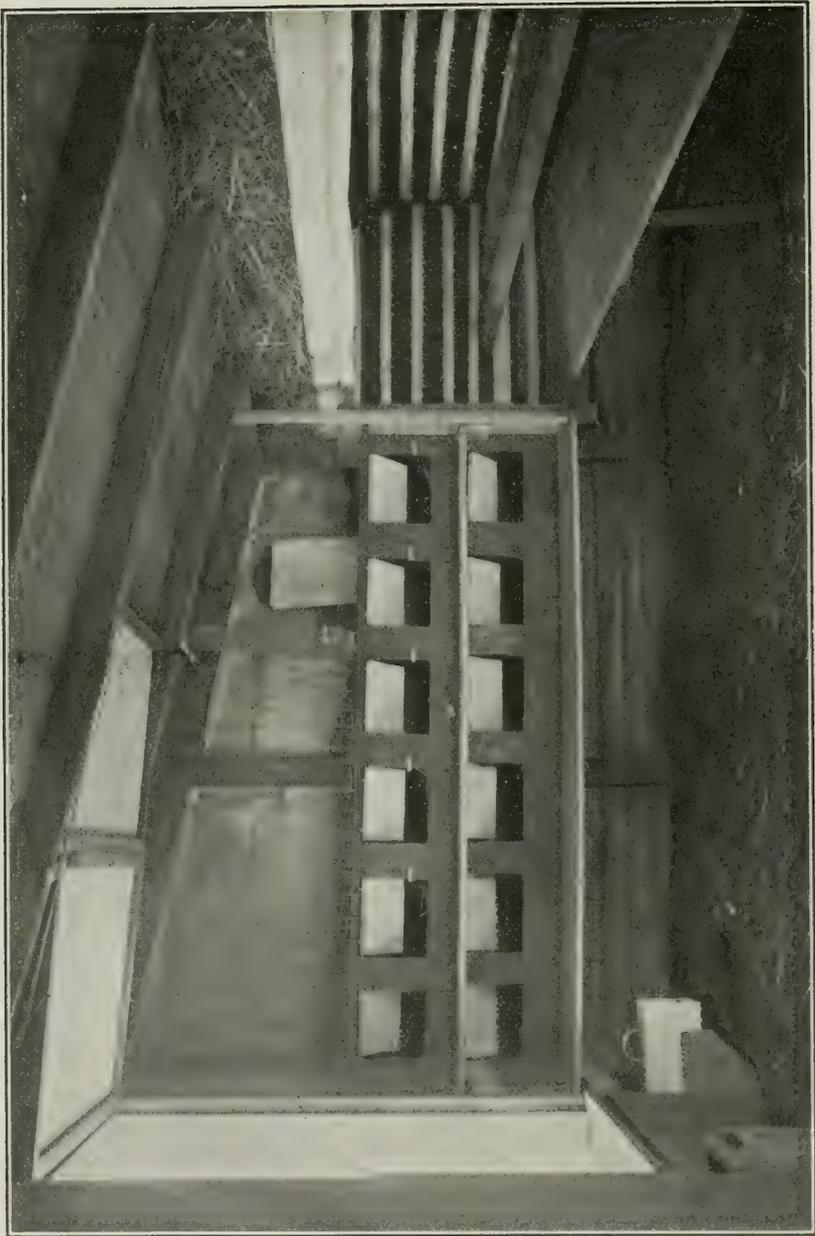


FIG. 6.—INTERIOR VIEW OF HOUSE IN WHICH RECORDS ON PAGES 30 AND 31 WERE MADE, SHOWING DROP-BOARD, ROOSTS, DROP CURTAIN, STRAW FILLING, TRAP-NESTS WITH MALE BIRD FEN ABOVE, DRINKING FOUNTAIN AND COTTON WINDOW.

*Door.*—In south or east side of house as a protection against prevailing winds.

*Windows or Openings.*—Of size desired, with bottom of same 20 inches above sill. The windows or openings may be made of either glass or cotton, and may be hinged to swing inward and upward. Poultry netting should be placed over openings to confine birds.

*Floor of House.*—Filled to top of sill with sand or dry earth.

*Roosts, Dropboards and Nests* may be constructed as shown in Figs. 6 and 8. The dropboards should be placed on a level 20

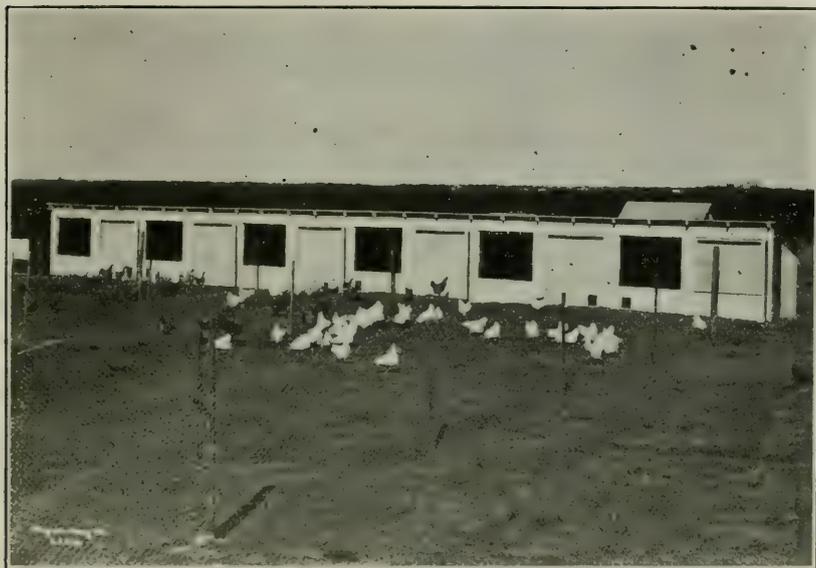


FIG. 7.—COTTON FRONT HOUSE AS USED AT PROVINCIAL POULTRY STATION.

inches above sills. The bottom of roosts 8 inches above dropboard. For single roost the dropboard may be 24 inches wide, and 34 inches wide for two roosts. When two roosts are used the inside one should be placed 10 inches from rear wall, and outside roost 10 inches from front of dropboard. Satisfactory roosts may be made by rounding the edge of a 2-in. x 4-in. scantling.

*Drop Curtain.*—The drop curtain may be made of burlap or cotton and is intended to extend from end to end of the pen in front of the roosts and to hang from the ceiling to the front edge of the dropboard. The curtain may be placed on a wooden frame (Fig. 4) and hinged to the ceiling, or the lower end tacked to a round pole and rolled up or down (Fig. 6) by fastening two ends of a strong cord to the ceiling at a suitable distance apart immediately behind

the curtain, passing the string around the pole and eye screws fastened to the ceiling in front of the curtain. The latter plan is more satisfactory.

*Removable Fixtures.*—The roosts, nest boxes, dropboards and in fact all interior fixtures, should be constructed and put up in such

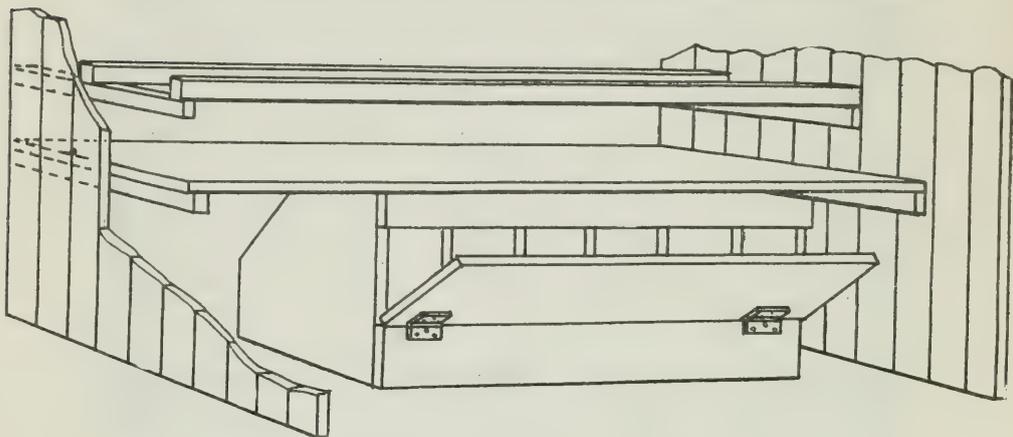


FIG. 8.—INTERIOR FIXTURES, SHOWING HOW ROOSTS, NESTS, AND DROP-BOARDS SHOULD BE CONSTRUCTED IN ORDER THAT THEY MAY BE EASILY REMOVED.

a way that they may be easily removed for cleaning and disinfection. Fig. 8 illustrates how they may be arranged with advantage in any house. The roosts should rest in sockets, and the drop boards should

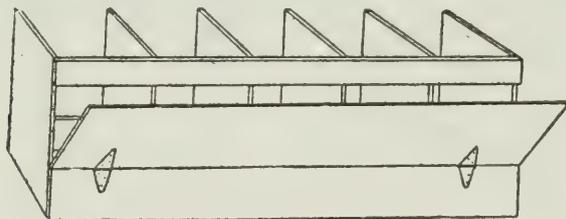


FIG. 9.—PLAN OF NEST BOX.

not be nailed in place, but simply rest on the cleats at the ends. Figs. 6 and 9 show the general plan of constructing a nest box which can be adapted to any situation whether under the dropboard or elsewhere.

Where it is desired to give the full floor space to the birds the nests can be arranged on the wall 18 inches from the ground instead of under the dropboard, as illustrated in Figs. 5 and 6.

## V.—COMMERCIAL POULTRY PLANTS.

The exceptionally good prices and extensive market demands in recent years for eggs, roasters, broilers, pure bred birds and eggs for breeding and hatching purposes have induced many to undertake poultry raising on a large scale. To those intending to undertake commercial poultry farming the following is worthy of consideration:

*Location of Plant.*—While it may be advisable to locate the plant near a city or consuming centre to take advantage as far as possible of retail prices it is at the same time unnecessary. To-day with rapid transportation in the matter of freight and express, the products of the farm may be placed on the market in a few hours, though the plant be situated in the country, town or village many miles away. In selecting a location, attention should be given to general convenience and water supply. It is also advisable to have the plant located by some public thoroughfare or railroad for the advantage in advertising.

*CAPITAL REQUIRED.*—The capital required to establish an up-to-date poultry plant is often underestimated. This results in plants being abandoned and poultry keeping pronounced a failure. It is somewhat difficult to give a close estimate of what it will cost even to establish a commercial poultry plant, as much will depend on the amount and price of land, the style of buildings to be erected, and the grade and price of lumber used. A safe estimate as to the cost of an up-to-date poultry plant, including land, buildings, equipment and stock may be made at from \$6 to \$10 per bird capacity of the plant.

*LAND REQUIRED.*—Moderately large plants are often successfully operated on ten acres of land, but where one thousand birds or more are kept it is advisable to have at least from twenty-five to fifty acres. Consideration must also be given to whether it is intended to grow the food, etc., required for the plant, in which case more land can be used to advantage.

*FREE RANGE.*—With commercial poultry plants as with smaller plants, free range is very important, as the birds are more cheaply reared and develop more quickly under natural conditions than on a limited range. The stock is more healthy and vigorous and should be in better condition for breeding purposes.

It is desirable to have the range so laid out that the ground can be cultivated occasionally to ensure it from becoming foul. It can be sown with alfalfa, clover, mangolds, or sugar beets. These are good succulent foods and will greatly reduce the cost of feed.

**SHADE FOR THE STOCK.**—The matter of shade should not be overlooked, as it is an important factor during the hot days of summer. Where there are no trees, it is desirable to plant groves and shelter belts as a protection against both sun and wind.

**TWO SYSTEMS OF HOUSING.**—One of two systems of housing may be used in commercial plants, i.e., continuous, or colony houses. Much may be said in favor of either system. The continuous house system has the advantage of housing the birds in a more compact manner making conditions more favorable for feeding and caring

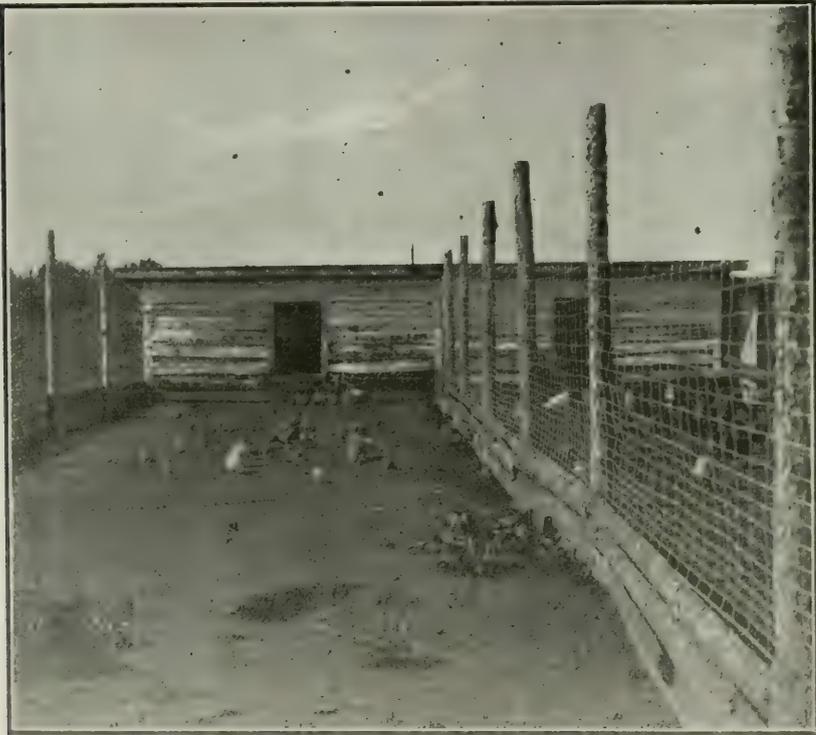


FIG. 10.—COSTLY HOUSES ARE NOT NECESSARY. A NEAT LOG HOUSE WHERE HENS AND CHICKENS ARE SUCCESSFULLY HOUSED.

for the breeding and laying stock. Usually the feed and store-room is located centrally and the house divided into pens of a width to suit the builder and outdoor wire runs made in front of the pens.

In the colony house system, the houses are made to hold from 50 to 100 birds each, and placed from ten to twenty rods apart. These houses are not divided into pens and no runs are required unless, perhaps, for special mating in the breeding season. When this system is used and only one breed kept, there is but a small outlay in the matter of divisional fences.

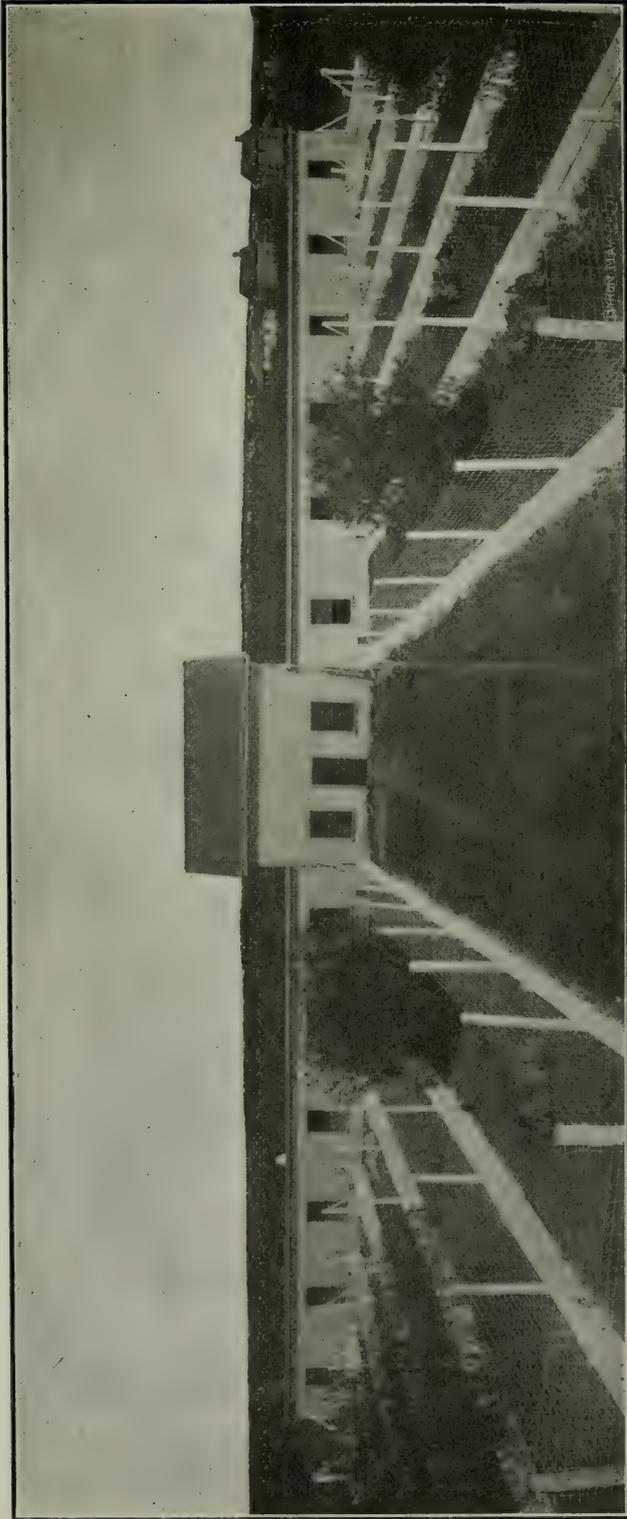


FIG. 11.—CONTINUOUS STYLE OF POULTRY HOUSE, SHOWING FEED AND SUPPLY ROOM IN CENTRE.

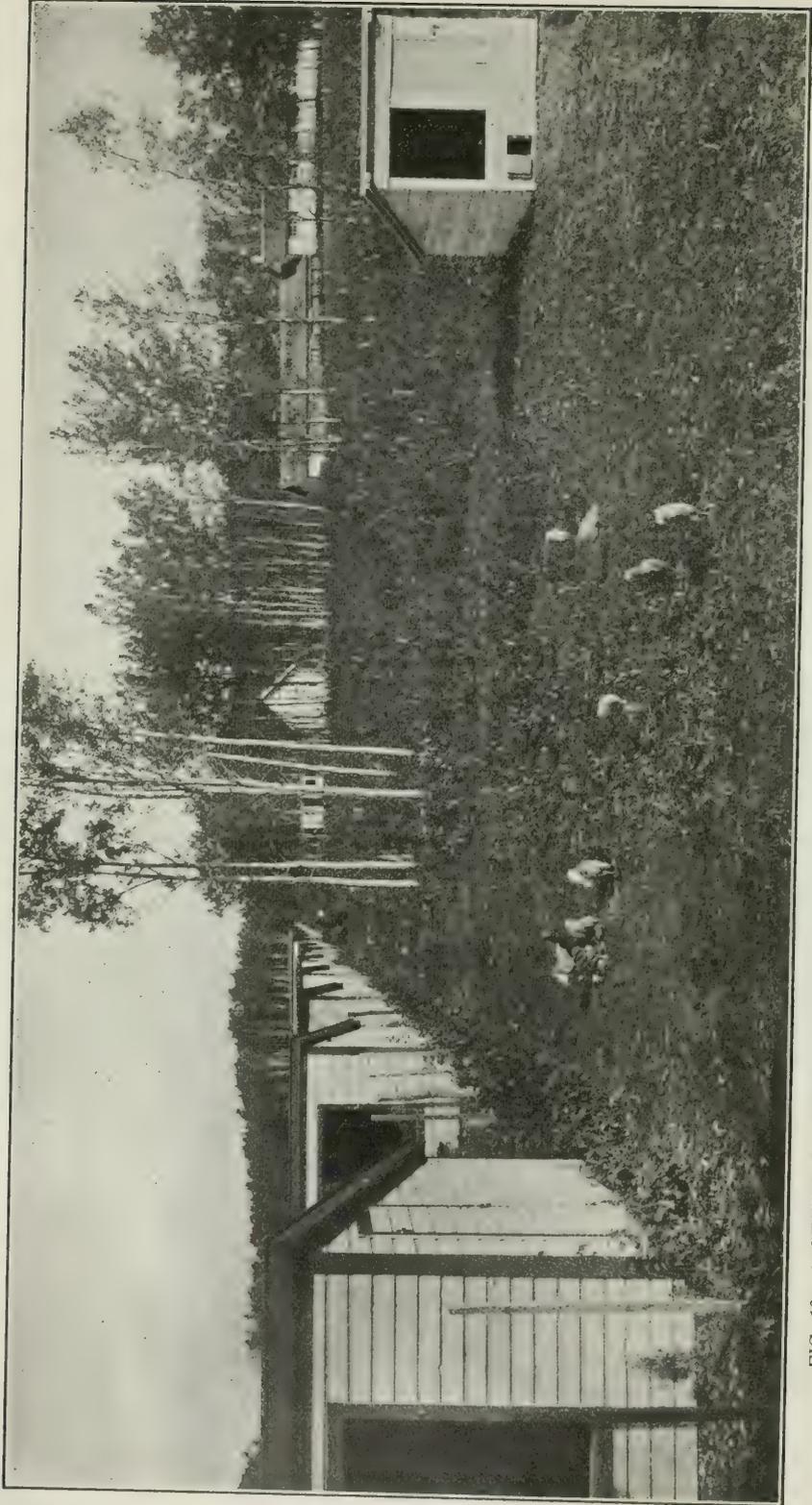


FIG. 12.—A GENERAL VIEW OF THE PROVINCIAL POULTRY PLANT, UNIVERSITY GROUNDS, EDMONTON, SHOWING BREEDING PENS AT LEFT, END VIEW OF FEED ROOM IN CENTRE, BROODING AND INCUBATOR HOUSES AT RIGHT, WITH A COLONY HOUSE FOR CHICKS IN THE FOREGROUND.

Colony houses may be so constructed that they can be drawn to a suitable location for convenience in attending the birds during the winter, and distributed about the field again for the spring and winter months.

**OTHER BUILDINGS.**—While the breeding houses require careful consideration to suit the ideas and requirements of the owner, there are other buildings that must be considered. In this connection, mention may be made of store house, feed room, carpenter shop, shipping room, incubator house, fattening shed, nursery, killing and plucking room and ice house for refrigerating purposes. Consideration should also be given to motive power and for this purpose a gasoline engine would answer. By placing such power in a convenient place it would make a labor saver in many ways.

## VI.—ESTABLISHING AND MAINTAINING A FLOCK.

**GETTING THE START.**—One of three ways may be used for the establishment of a flock.

*First.*—By introducing pure bred cockerels and using them to improve the flock already on hand. Where a flock has unlimited range a cockerel of the desired type should be secured for every fifteen hens. If, however, there are a number of hens in the flock that are undesirable for breeding purposes, it would be better to select a few of the most suitable, confine them in a separate pen, and mate them with a suitable cockerel. It is always preferable to select the eggs for hatching from a limited number of the most suitable for breeding purposes, rather than from all the layers indiscriminately. This method is not considered so desirable as either of the following.

*Second.*—By obtaining several settings of eggs from pure bred birds in April or May. The cockerels should be fattened in the fall and disposed of and the pure bred pullets retained for the following year's breeding pen.

*Third.*—By buying pure bred stock. A pure bred cockerel and a dozen or fifteen pullets might be purchased in the fall and should constitute the next year's breeding pen. Care, however, should be taken in the purchasing either of pure bred breeding stock, or of eggs for hatching purposes, to obtain them from flocks that have been bred for winter laying.

**CHOOSING A BREED.**—After having decided how to start, the next consideration is that of breed. Which is the best breed? This is a question constantly asked by the beginner, and one which, after

all, must be left to the individual to settle, since so much depends on the object with which the work is undertaken. If merely as a recreation, any breed, from the smallest bantam to the largest Cochin or Brahma, is equally suitable so long as it meets the fancy of the breeder. If the methods advocated elsewhere in this bulletin for selecting breeders for strain building and for the development

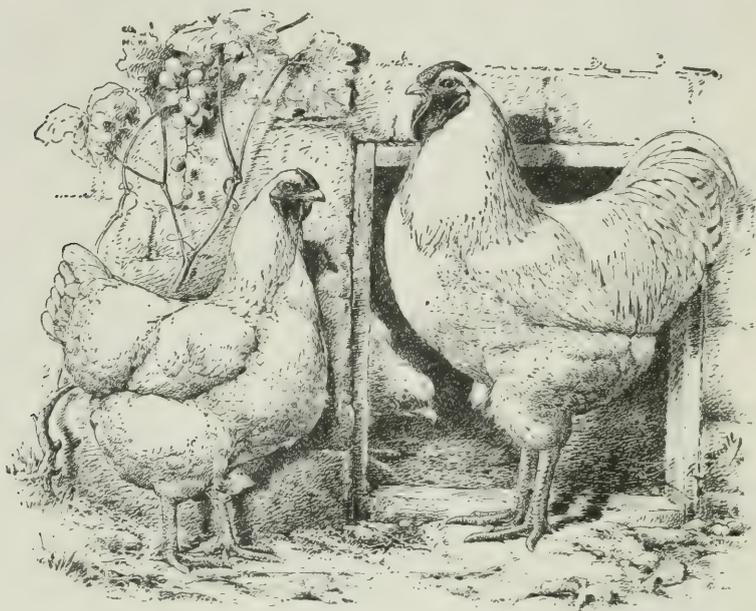


FIG. 13.—WHITE WYANDOTTES.

of the breed are followed, one will be well repaid by the progress made, no matter what the breed. Once the choice is made do not be persuaded to make a change else all work of improvement must count for naught.

Although for fancy breeding there may be no particular preference yet for commercial purposes certain breeds have been found more profitable than others. These are generally spoken of as the utility breeds.

#### POPULAR UTILITY BREEDS RECOMMENDED.

Plymouth Rocks.—Barred, White, Buff, Partridge, Silver Penciled, Columbia.

Wyandottes.—White, Buff, Black, Silver, Golden, Silver Penciled, Partridge, Columbia.

Orpingtons.—Buff, White, Black.

Rhode Island Reds.—Rose and Single Comb.

## STANDARD WEIGHTS OF BREEDS.

Breed.	Cock.	Hen.	Cockerel.	Pullet.
Plymouth Rocks -----	9½ lbs.	7½ lbs.	8 lbs.	6 lbs.
Wyandottes -----	8½ lbs.	6½ lbs.	7½ lbs.	5½ lbs.
Orpingtons -----	10 lbs.	8 lbs.	8½ lbs.	7 lbs.
Rhode Island Reds -----	8½ lbs.	6½ lbs.	7½ lbs.	5 lbs.

In the breeds recommended there are nineteen varieties with a wide scope in colour of plumage, from which to choose. Should one desire solid colour plumage three varieties have white or buff as a choice, two have black. Should there be a preference for parti-colour plumage an excellent choice is offered in the varieties mentioned. When selecting a breed or variety it is well to remember that the strain is of greater importance, and in making a choice preference should be given to the colour in plumage most desired.

While there are other breeds of poultry capable of giving satisfactory returns commercially these breeds are mentioned because they have both egg and meat-producing qualities, and are well adapted to the farm.

Figs. 13, 14, 15 and 16 are typical representatives of the above birds. It is possible to buy in these breeds, birds that are not satisfactory on account of their great size, heavy bone, length of leg or narrowness of body. For this reason it is important to have a definite conception of the type most suitable for the object for which they are to be kept.

Utility type fowls should conform to the following standard:

Body.—Broad, blocky and of medium length.

Breast.—Carried well forward, full and broad and of medium depth.

Breastbone.—Long, straight, not too deep and not pointed at the front.

Legs.—Short, stout, and set well apart, white or yellow in colour and without leg or toe feathers.

Head.—Medium in size, comb and wattles small.

Constitution.—Strong, healthy and vigorous as indicated by depth and width of body.

Plumage.—The colour of the plumage is not an important factor in connection with commercial poultry raising. In the interests of the breed chosen, however, every poultry keeper should give some consideration to the plumage so long as type is not interfered with. In any case close feathering is desirable.

Of the utility breeds previously mentioned there is practically no preference. They are all good. It becomes rather a question of strain than of breed, because more difference can be found between individuals of the same breed than between good representatives of the different breeds. The trap nest method of selecting birds has

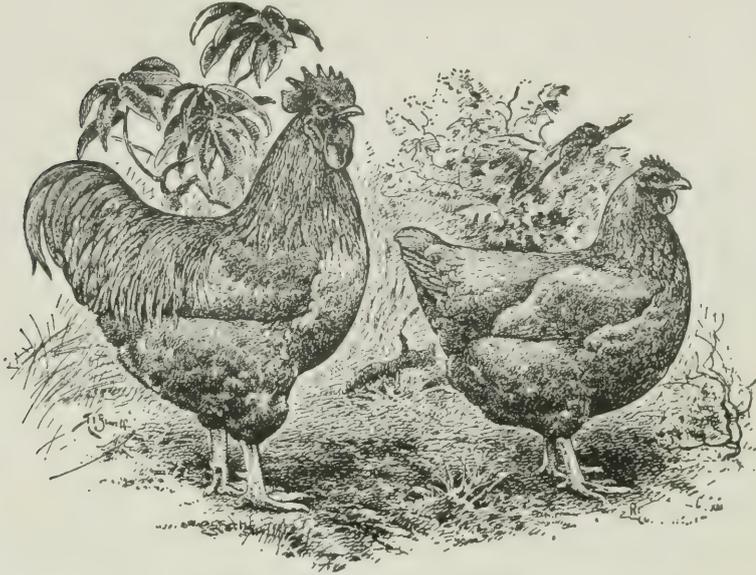


FIG. 14.—BUFF ORPINGTONS.

proven in a most unmistakable way that there are good and poor layers in any breed, and that the profits depend largely upon type, strain and selection.

**PURE BRED VS. SCRUBS.**—It is scarcely necessary to state that pure bred poultry of any variety, and particularly our commercial breeds, are the most profitable to keep. The tendency to revert is sufficiently strong in the pure breeds and in scrubs this tendency is so pronounced that it is almost impossible to breed successfully for the market type or for egg production.

When pure bred and scrub chickens are reared under similar conditions, the pure bred birds of the utility type make more rapid and economical gains in live weight than do the scrubs.

In crate fattening the pure bred chickens again made the greater gains. It has also been demonstrated that the cost of food per pound of gain was less with the pure bred chickens.

At the age of four months the pure bred chickens were fattened and ready for the market possessing a uniformity in quality and appearance unequalled by the others at any time.

At no age are scrub chickens as saleable as the pure breeds.

For meeting the demands of the higher class local markets or for export, scrub chickens are not satisfactory.

**LAWS OF BREEDING.**—The reason that scrubs always prove unsatisfactory may be better understood by considering the relation which they bear to certain laws of breeding. These laws hold good whether with plants or animals, whether with birds or beasts. The law of inheritance that “like begets like” means that certain of the characteristics of a parent are inherited by the offspring and the apparently contradictory law, the law of variation, that “like begets unlike” means that every offspring differs from its parent to some

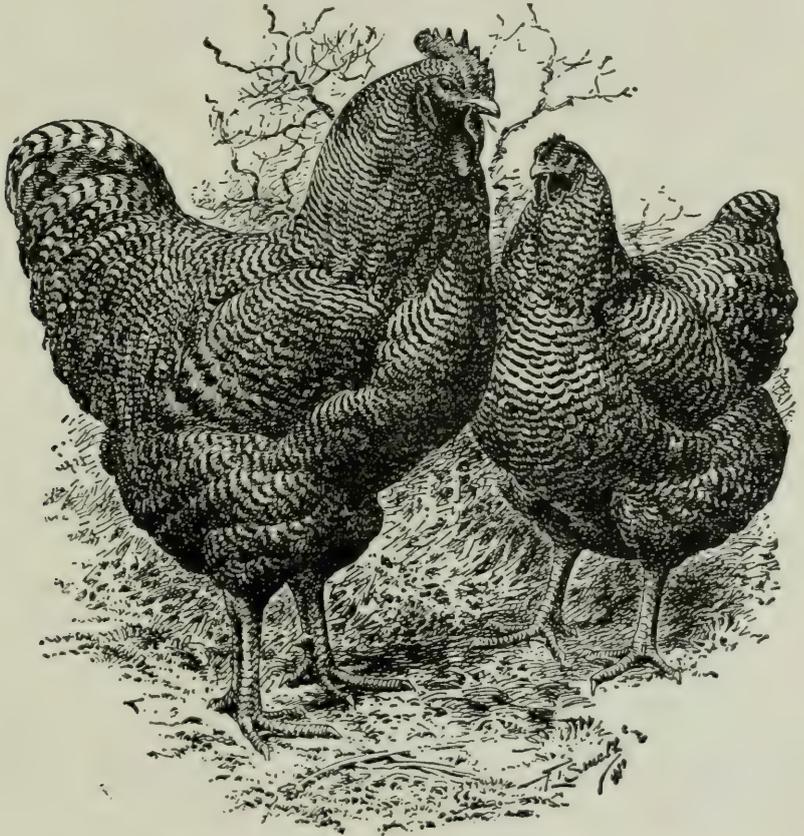


FIG. 15.—BARRED PLYMOUTH ROCKS.

extent. If a variety of fowl has been bred pure for a great number of generations and in every generation only those allowed to live which conform to a certain type, the resulting offspring are very likely to possess a uniformity of type and characteristics similar to that in the birds which have been used for breeding through the previous generations. A bird resulting from such a line of breeding

is prepotent, which implies that it has the power to imprint its own likeness upon its offspring. If two birds each of distinct lines of breeding be mated there is a conflict. The characteristics of each breed strive to assert themselves with the result that one or the other may not be in evidence; or the offspring may possess the characteristics of some remote ancestor. This is not so true of the first cross as it is of the succeeding ones but, in any case, the benefit of the long line of careful breeding is lost. Theories of the improvement of a flock by means of the introduction of the blood of another breed are disproved every time a cross is made. To breed pure is to mate birds of the same breed, and to mate crossbreeds means the production of scrubs, and to attempt successful poultry raising with scrubs results in a decided failure.

The law of selection is of the first importance to the pure bred breeder. By having a type fixed in his mind and by selecting for his



FIG. 16.—RHODE ISLAND REDS.

breeding pen only those individuals which conform most closely to that type, the breeder is causing each generation to become more prepotent in desirable characteristics, and he also finds that in each succeeding generation there are fewer culls.

## VII.—STRAIN BUILDING FOR EGG PRODUCTION.

While good houses, careful breeding, wholesome food and proper methods of feeding all play an important part in successful poultry raising and have an especial place in winter egg production, yet the writer is forced to the conclusion, after years of study, that careful selection of the prolific layers as breeders lies at the founda-

tion of true success in the poultry industry. A little study will convince anyone that there are good and poor layers in every flock no matter what the breed. By making a careful selection every year of the choicest birds as breeders for the next year's flock, the poultry man can see the result of his handiwork improving from year to year and the breed becoming better because he has played his part well in its development.

The average poultry raiser gives no attention to selection. When a hen becomes broody or the incubator ready to set, the eggs are gathered and placed under the hen or in the incubator. The operator has no idea whatever as to which hens laid the eggs set. As a rule it is those which lay early that want to set first with the result that the eggs incubated are from the poorest layers, with no tendency to winter laying. Should there be undesirable types, lack of constitution, or broody traits in the flock these characteristics are transmitted to the offspring and each year the undesirable qualities become more pronounced. In this way chance plays too important a part, and the poultryman who desires to make his flock most profitable cannot afford to take this chance.

**SELECTION NECESSARY.**—To improve the flock year by year it becomes necessary to eliminate the undesirable birds and breed from the best. Only birds showing constitution, vigor and type that is characteristic of the breed should have a place in the breeding pen. Still more important is the selection of only such birds as show pronounced egg producing qualities.

**SELECTION BY OBSERVATION.**—To the poultry keeper who has not the time nor the inclination to make a selection of his breeding stock by the use of trap nests, it is advisable to select the desired number required from those of his flock that are laying during the winter months. A regular leg band or a piece of wire can be placed round the leg of each desirable pullet so that they can be mated with a suitable cockerel. The eggs will be suitable for hatching purposes at from ten to fourteen days after the male bird has been placed in the pen.

*NOTE.*—*Trap nests have shown that the pullets which lay the earliest are invariably the best layers and excellent results may be obtained by selection by observation.*

**TRAP NEST SELECTION.**—The selection of the best layers is accomplished by the use of the trap nest, an automatic device by which, when the hen enters the nest she locks herself in. Each hen intended for trap nest work has attached to her leg a numbered leg band, and on removal from the nest by the attendant her number is noted on a monthly record sheet for this purpose. Fig. 17 shows a common type of leg band and Fig. 18 the same applied to the leg.

While selection by observation is better than chance it does not demonstrate which bird is the best layer or the number of eggs any individual bird lays. To secure accurate individual records the trap nest becomes a necessity. The trap nest becomes to the poultryman what the Babcock test is to the dairyman in that he can tabulate the exact number of eggs produced by every bird in the pen, and can readily select the most prolific layers to build up his laying strain.

*Trap Nests.*—While there are many home made styles of trap nests the one illustrated (Fig. 19) was devised many years ago and is recommended because of its being simple and easily constructed. The trap door should be  $7\frac{3}{4}$  inches wide and 7 inches deep to fit an opening 8 inches square. Small wire staples are driven into the top of the trap door and eye screws screwed into the framework above the door. The door is then hooked into position. This plan of hinging allows the door to swing outward to release the hen if desired. The trap consists of a piece of wire four inches long filed to a point at one end. A small eye is made at the other end and the wire attached to the side of the nest box with a screw or small nail.

The trap is set by raising the door and placing the pointed end



FIG. 17.—LEG BAND.

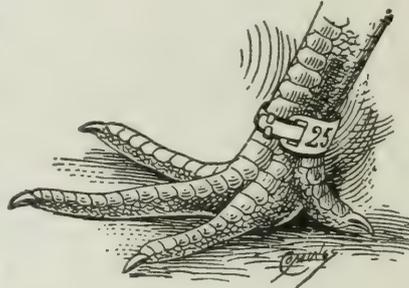


FIG. 18.—LEG BAND ATTACHED.

of the wire against it. The hen on entering the nest raises the door, which allows the wire to drop and the door to close. A stop should be placed on the frame of the opening to prevent the hen from pushing the door outward and escaping. The nest box may be 12 inches square in front and 16 inches deep. A board 4 inches wide should be placed in front at the bottom to contain the straw for the nest.

*Objection to Trap Nests.*—Objection is sometimes taken to the use of trap nests owing to the necessity of visiting the pen several times each day. The trap nests, however, are an advantage in winter in pens where a goodly number of eggs are being laid. Where trap nests are used it is not necessary to visit the nests as often as the open nests to gather the eggs as the hen remaining on the nest keeps the egg warm. In cold weather it would be liable to freeze if not gathered immediately. Those who instal traps find the work interesting as well as profitable, and consider themselves well repaid in the results obtained.

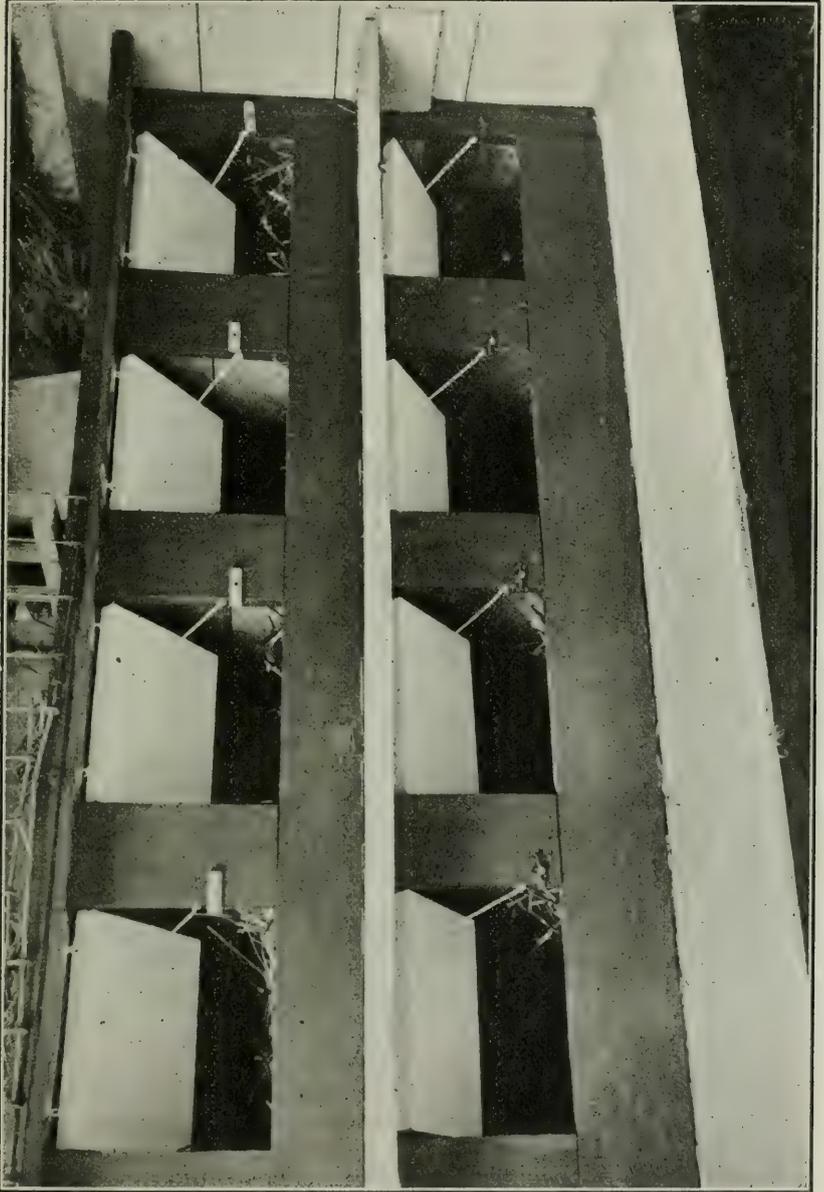


FIG. 19.—ILLUSTRATION OF TRAP NESTS.

## EGG RECORD AT EDMONTON, ALTA.

Breed: White Wyandottes—Month: January, 1913.

Hen No.	1	2	3	4	5	6	7	8	9	10	11	12
Date.												
1. -----	1	--	1	1	1	1	1	1	--	1	1	--
2. -----	1	1	1	1	1	1	--	1	1	1	1	1
3. -----	1	1	--	1	1	1	1	1	--	--	1	--
4. -----	--	1	1	--	1	--	1	1	1	--	1	1
5. -----	1	1	1	1	1	1	1	1	1	--	1	1
6. -----	1	--	1	1	1	1	--	1	1	1	1	--
7. -----	1	1	--	1	1	1	1	1	--	1	--	1
8. -----	1	1	1	--	1	--	1	1	1	1	1	1
9. -----	--	--	--	1	1	1	--	1	1	1	1	1
10. -----	1	1	1	1	1	1	1	--	1	1	1	1
11. -----	1	1	--	--	1	1	1	1	1	--	1	1
12. -----	1	1	--	1	--	--	--	1	1	--	1	--
13. -----	1	--	1	1	1	1	1	--	--	1	1	1
14. -----	--	1	--	1	1	1	1	1	--	1	1	1
15. -----	1	1	1	1	1	1	1	1	1	1	1	--
16. -----	--	--	1	--	1	1	--	1	1	--	--	1
17. -----	1	--	1	1	1	--	1	1	1	1	--	1
18. -----	--	1	--	1	1	1	1	--	--	--	1	1
19. -----	1	1	--	1	--	1	--	1	1	1	1	1
20. -----	1	--	--	--	1	1	1	1	1	1	1	1
21. -----	--	1	1	1	1	--	1	--	--	--	1	--
22. -----	1	1	1	1	--	1	1	1	--	1	1	--
23. -----	1	1	--	1	1	--	1	1	1	--	--	1
24. -----	1	1	1	--	1	1	1	1	1	--	1	1
25. -----	--	1	1	1	1	--	1	--	--	1	1	1
26. -----	1	--	1	--	--	1	--	1	--	1	--	1
27. -----	--	1	--	1	1	--	1	1	1	--	1	1
28. -----	1	--	1	--	1	1	1	--	--	1	1	1
29. -----	--	1	--	1	1	--	1	1	--	1	1	1
30. -----	1	1	1	1	1	1	1	1	1	1	1	--
31. -----	1	--	--	1	1	--	1	--	--	--	--	1
Total for Jan. '13	22	21	18	23	27	20	24	24	17	19	25	23
Total for Jan. '14	1	7	7	8	6	6	6	6	7	2	12	5
Total for Feb. '14	1	1	9	2	10	4	1	12	13	1	2	2
Total for Mar. '14	4	9	21	17	18	9	16	19	15	13	20	12
Total for April '14	2	9	17	21	13	5	16	12	14	16	12	18
Total 4 mos. 1914	8	26	54	48	47	24	39	49	49	32	46	37

The above record was made by a pen of birds belonging to the Poultry Superintendent and illustrates the relative value of pullets and year old hens as winter layers. The record shows the laying results of the birds as pullets for the month of January 1913, and the records for the months of January, February, March and April, 1914, for the same birds as year old hens.

EGG RECORD AT EDMONTON, ALTA.

Breed: White Wyandottes—Month: January, 1914.

Hen No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
Date.																						
1.			1					1		1		1	1	1	1	1	1	1	1	1	1	
2.	1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	
3.		1	1	1			1	1	1	1	1	1	1	1	1	1		1	1	1	1	1
4.		1		1		1	1	1		1		1	1				1			1		
5.	1					1		1	1	1	1				1	1	1	1	1	1	1	1
6.		1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1
7.	1	1		1	1	1		1	1	1	1	1		1		1	1	1		1		1
8.	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
9.	1	1	1	1	1		1	1	1	1						1		1		1	1	1
10.		1	1	1	1	1	1	1		1	1	1	1	1			1		1	1	1	1
11.	1	1		1	1		1	1		1	1			1		1	1	1	1	1	1	1
12.	1	1	1	1	1	1		1		1		1		1		1	1	1	1	1	1	1
13.	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
14.			1	1	1	1	1	1		1	1					1				1		1
15.	1	1	1	1	1	1		1	1	1		1		1	1	1	1	1	1	1	1	1
16.		1	1	1	1		1	1	1	1		1	1	1		1	1	1	1	1	1	1
17.	1		1		1	1	1	1		1	1	1	1			1	1	1	1	1	1	1
18.		1	1	1		1		1	1			1		1	1	1	1	1	1	1	1	1
19.		1		1	1		1				1		1	1	1		1	1	1	1	1	1
20.	1		1	1	1	1	1	1						1	1	1	1	1	1	1	1	1
21.	1		1		1			1		1		1	1		1	1	1	1	1	1	1	1
22.	1	1		1		1	1	1					1	1	1	1	1	1	1	1	1	1
23.	1	1	1	1		1		1		1		1	1		1	1	1	1	1	1	1	1
24.		1	1	1	1	1	1	1	1		1		1	1	1	1	1	1	1	1	1	1
25.	1												1	1	1	1	1	1	1	1	1	1
26.	1	1	1			1	1	1		1		1		1		1	1	1	1	1	1	1
27.			1	1	1					1		1		1		1	1	1	1	1	1	1
28.		1		1	1		1	1		1		1	1	1	1	1	1	1	1	1	1	1
29.	1	1		1	1	1		1				1	1	1	1	1	1	1	1	1	1	1
30.		1	1	1		1	1	1		1		1	1	1	1	1	1	1	1	1	1	1
31.		1		1		1		1	1			1	1	1	1	1	1	1	1	1	1	1
Total	17	22	20	25	20	20	20	22	15	14	20	11	18	23	13	20	25	16	20	13	25	

Record of a pen of pullets hatched from eggs laid by hens whose records appear on page 30.

It is, however, unnecessary to continue the trapping throughout the year unless one desires to secure a yearly record. It has been found that the winter months are sufficient to give the poultryman a general idea as to his best layers. At this season of the year the poultryman usually has considerable leisure time that might be well spent in the hen house becoming acquainted with the individual merits of the hens, particularly if they are giving satisfactory returns.

VIII.—HATCHING.

SELECTING THE BREEDERS.—During the winter months it may have been necessary to have undesirable birds in the pens with the breeding stock, but on the approach of the breeding season the flock should be separated, discarding all but those having the requirements that it is desired to perpetuate in the flock.

**SEPARATE THE MALES FROM THE FEMALES.**—Male birds should never be allowed to run with the hens at any time other than the time necessary to secure eggs for hatching. The cockerels should be separated from the pullets during the early fall and those selected to head the pens should have separate winter quarters and be given special attention to keep them in good condition.

**HOUSING THE MALE BIRDS IN WINTER.**—Special attention should be given to the housing of the male birds. Having larger combs than the females they require warmer quarters. While a bird whose comb has been frozen during the winter may be a good breeder the chances of securing good stock from such bird are greater when he has not had to suffer the experience of a frozen comb.

**CARE OF THE BREEDING STOCK.**—While the poultry keeper should exercise the greatest care over his flock in the matter of housing and feeding during the breeding season, the same should apply to birds intended for breeders right from the time they are hatched until they are a year old. At this age they should be fully matured and capable of producing eggs suitable for hatching purposes if cared for and fed as recommended elsewhere in this bulletin.

**MATING THE PENS.**—The pens should not be mated until ten days or two weeks before the eggs are required for hatching. It is strongly recommended by some breeders that two male birds be kept for each pen and that they be placed in the pens on alternate days, a suitable coop being constructed in the pen in which to keep the bird not in use. It is further contended by many breeders that a greater percentage of fertile eggs can be secured when a comparatively few females are mated with a male.

**GATHERING THE EGGS.**—The eggs should be gathered as often as necessary to ensure them from being chilled in the early season and later against undesirable odours and heat. It has been found that 70 degrees of heat will start the germ to incubate. This more or less seriously affects the eggs for hatching.

**KEEPING EGGS FOR INCUBATION.**—The better way is to gather the eggs while still warm and place them in a dry and well-ventilated room where the temperature stands at about 60 degrees. The operator will find that he will have a more uniform hatch if the eggs saved are not more than from three to five days old. In this connection it is well to remember that after the formation of an egg is completed it remains in the hen's body from twelve to eighteen hours before being laid and that during this period incubation is in progress. Incubation is therefore retarded from the time the egg is laid until it again comes under incubation heat, the germ gradually becomes weaker.

SELECTING EGGS FOR INCUBATION.—In securing eggs for incubation, care should be taken to select only those of the colour characteristic of the breed to which they belong. Double yolked, mis-shaped and generally deformed eggs should be discarded. Thin shelled eggs, or those with a mottled appearance should also be discarded.

#### NATURAL INCUBATION.

When setting hens it is desirable to move them to a separate pen or house where other hens cannot lay in their nests or otherwise disturb them. By following this method annoyance and disappointment from disturbed nests and broken eggs is largely overcome. It is advisable to move the broody hens at night as they are more liable to take readily to the nest and their new quarters. Suitable nests should be provided about 14 inches square made of clean, dry straw or chaff, and made saucer shaped to receive the eggs.

When possible two or more hens should be set at the same time. This method simplifies the care in rearing, as one hen can brood the chicks of two hatches and the one system of feeding the young chicks can be adopted. Special care should be taken that the setting hens are entirely free from lice. Before setting thoroughly dust them with some louse powder or flour of sulphur. It is best to repeat this treatment ten days after the hens have been set to further ensure them from vermin. A dust bath composed of fine ashes and road dust placed in a box in direct sunlight is also advisable.

Broody hens should at all times have before them plenty of clean, wholesome food, with fresh water and grit.

When setting a number of hens at the same time their eggs should be tested for fertility about the 7th day of incubation, and the infertile eggs removed. When this has been done less hens will be required to cover the fertile eggs, and the remaining hens may be reset or their broodiness broken up and returned to the laying quarters.

The eggs should again be tested on the 15th or 16th day, removing any in which the chicks have died.

At the end of the 19th day it is well to withhold further feed and the hen kept quietly on the nest and disturbed as little as possible. Good mothers will not leave the nest at this time unless disturbed or induced to, as they hear the chicks in the shell. On the 21st day the egg shells and unhatched eggs may be removed and the hen and chicks left quietly in the nest for another twenty-four or thirty-six hours at least, as at this time warmth is more essential to the baby chicks than feed.

The food for chicks in rearing with the hen may be of the same nature and fed in the same way as that recommended in artificial rearing. If weather conditions are favourable the hen and her brood may be placed in an outdoor coop such as shown in Fig. 33 and the chicks confined to a limited range until they become familiar with the coop and surroundings, when, if desired, both hen and chicks may be allowed freedom of range.

### ARTIFICIAL INCUBATION.

More chicks can be hatched at one time by means of the incubator, and, for a given number of eggs, the incubator requires much less attention than does the necessary number of hatching hens.

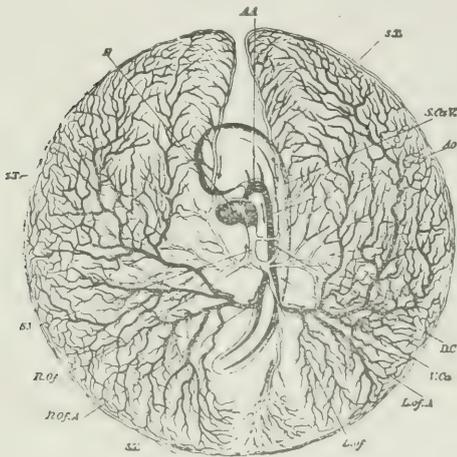


FIG. 20.—DIAGRAM OF THE CIRCULATION OF THE YOLK-SACK AT THE END OF THE THIRD DAY OF INCUBATION.

Pullets required for winter laying should be hatched during the months of April and May, thus the incubator becomes a necessity, as often the poultry keeper is unable to secure the requisite number of broody hens at this season.

The incubator is a necessity because under advanced methods of poultry farming the poultryman requires to renew his flock each year. Thus the man with a hundred hens

would require to hatch each year 300 chickens, because a reasonably large percentage of the chickens will be cockerels and of the remaining pullets a number will not possess the characteristics of good layers. These with the cockerels should be crate fed at a suitable age and marketed. In attempting to hatch 300 chickens by natural means, the poultry farmer would find the task too great because he would be unable to secure a sufficient number of broody hens at the proper time to successfully hatch this number.

To attempt to replenish a large flock yearly by natural incubation is not to be considered and will prove unprofitable from the fact that the hens should be laying for the three weeks occupied in incubation. Then, too, by setting eggs laid by hens of a broody strain, you are building up broody rather than laying strains.

*Selecting an Incubator.*—In buying an incubator the purchaser should first consider the size of machine that is suitable to accomplish

the work necessary for the flock kept. Incubators are manufactured in sizes ranging from 60 to 360 egg capacity.

There are many makes of incubators on the market to-day that are giving satisfactory hatches. When they fail the difficulty can usually be traced to some deficiency in the flock, such as inbreeding, breeding from immature stock, disease, unsanitary quarters or the care of the eggs and the handling of the incubator.

*Location of Incubator.*—The incubator should be operated in a well ventilated room, preferably one that is unheated and affected as little as possible by foreign heat. A well-ventilated cellar or an ordinary living room unheated.

*Setting the Machine Up.*—Most manufacturers of incubators send out illustrated directions with each machine for putting it together, and any one of average intelligence should find no difficulty in setting the machine up ready for operation. Care should be taken to have it stand on a floor or foundation that has little or no vibration. The incubator should also be perfectly level as determined by a spirit level.

*Disinfect the Incubator.*—The incubator should be disinfected after each hatch or immediately before placing the eggs in the machine. A suitable solution for this purpose may be made by mixing one part creolin with ten parts water. The interior of the incubator, including the egg trays, should be thoroughly washed with this solution and the eggs placed in the machine at once.

*Operating an Incubator.*—Before starting an incubator the operator should study carefully the directions sent out by the manufacturer and follow them as closely as possible. After the operator has become familiar with the management and has run the machine for two or three days, the eggs may be placed in position and incubation started. From the second until the 19th day the eggs should be removed from the incubator and turned every twelve hours. They should be inter-changed at each turning,—the eggs in the middle of the egg-chamber being moved to the outside, that any variation in the temperature of the egg-chamber be equally distributed to all the eggs.

If the thermometer is suspended in the machine on a level with the eggs, the incubator should be operated at a temperature of about 102 degrees until the tenth day, and at 103 degrees from the tenth until the eggs begin to hatch, and during the hatching time at a temperature of from 104 degrees to 106 degrees. Where large hatches have been obtained, the thermometer has sometimes registered during the last stage as high as 107 degrees.

Cooling the eggs may be commenced on the fourth or fifth day. The length of time during which the eggs are to be cooled depends

largely on the temperature of the incubating room. In the early part of the season when the weather is cool, five or ten minutes may be sufficient. Later, if the weather is warm, the eggs may be cooled for

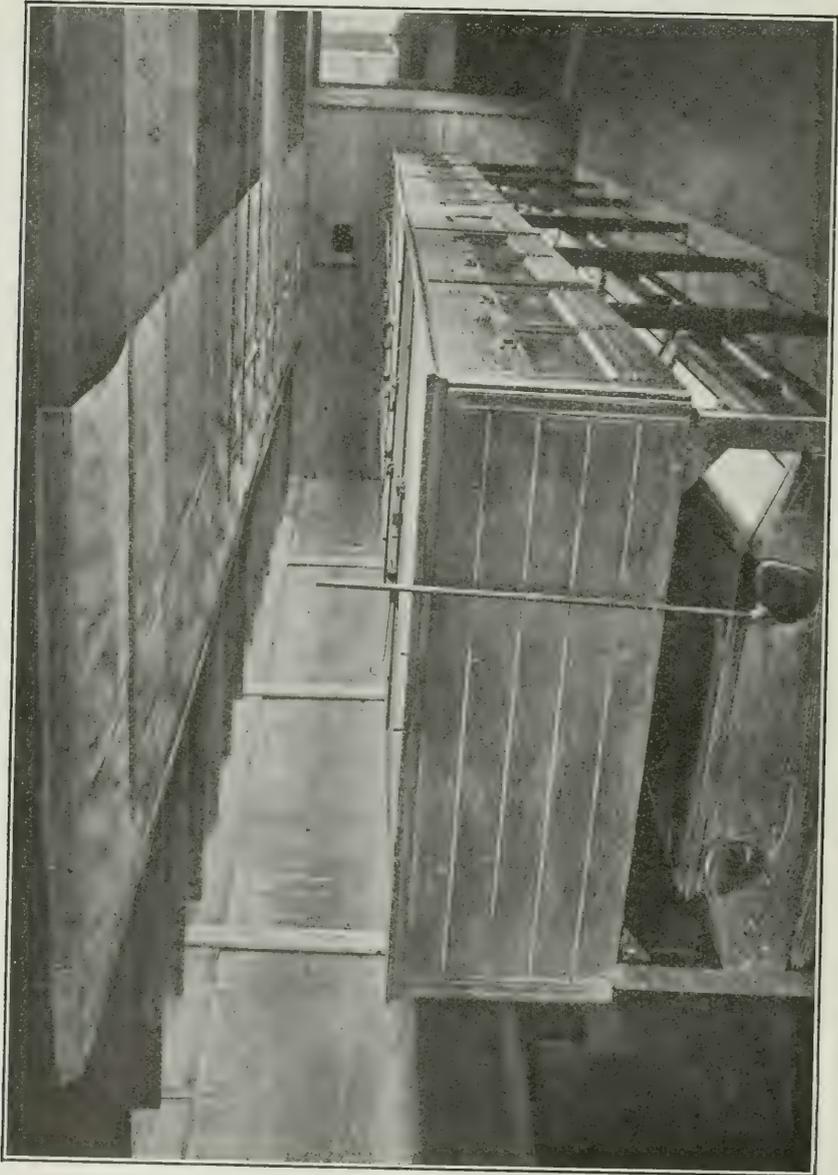


FIG. 21.—MAMMOTH INCUBATOR, 3,600 EGG CAPACITY, PROVINCIAL POULTRY PLANT.

a longer period until the seventeenth day when the cooling should cease. The turning of the eggs may continue until the chicks begin to pip.

Ventilation is required to supply fresh air for the chicks in the machine and to remove the carbon dioxide given off by the chicks

during incubation. With those machines that force fresh, warm air through the egg chamber, more air will be forced when it is operated in a cool room than in a warm room. The quantity of air forced through the machine in a cool room is usually sufficient to remove the carbon dioxide from the egg-chamber and little ventilation other than the cooling will be required. When the incubator is operated in a warm room, the amount of fresh air necessary to maintain the temperature of the machine is limited. In warm weather the lamp of the incubator can often be removed for several hours at a time. Under these conditions abundance of fresh air should be supplied to the incubating room or the vitality of the hatch will be deteriorated as a result.

While moisture is sometimes recommended, it is generally conceded that it is not necessary in the hatching of eggs. When the machine is running under warm, dry conditions the ventilators should not be opened as there will be too great an evaporation from the eggs.

In operating incubators many persons pay particular attention to the size of the air cell, attempting to regulate the hatch by manipulating the ventilators. Often the operator attributes an unsatisfactory hatch to the fact that the air cell was either too large or too small. In the writer's opinion it is useless to attempt to secure a good hatch by enlarging or reducing the size of the air cell, as the air cell is caused by the albumen being absorbed by the chick during incubation. The size of the air cell is regulated by the amount of heat. When a strong heat is applied the chick develops rapidly, increasing the size of the air cell, while a less amount of heat retards the absorbing of albumen by the chick and at the same time the development of the air cell.

The person who operates the incubator should do so in a systematic way, and at stated intervals. A certain hour should be chosen for turning the eggs, and attending to the lamps, thus avoiding mistakes and neglects that have sometimes occurred to the detriment of the hatch.

*Taking off the Hatch.*—Before finally closing the machine preparatory for the parting of the chicks from the shell, it is well to place a piece of factory cotton or some other cloth in the bottom of the incubator, so that when the hatch is over, the cloth may be removed from the machine. In this way the egg chamber may be kept clean and free from foul odours that accumulate during the hatching process.

It is of the utmost importance that the temperature of the machine and the egg chamber should remain constant during the final stage. After about the nineteenth day the door should not be

opened under any circumstances until the hatch is off. The opening of the door allows the air to enter the machine, resulting in a rapid evaporation of the moisture in the incubator, and as a result many chicks just pipped will stick in the shell. All ventilators should also be closed at this period. It is better to sacrifice a few chicks that appear to be in distress rather than to sacrifice many others by opening the door.

Under normal conditions, by the end of the twenty-first day, the chicks will all be hatched that are worthy of consideration. The trays of unhatched eggs and the shells should then be removed from the incubator.

The chicks should not be removed from the incubator for at least 36 hours after hatching. After the hatch is over and the trays

and shells removed, the ventilators should be opened, and abundance of fresh air supplied while the chicks are still in the incubator.



FIG. 22.—COOLING THE EGGS BY TOUCH RATHER THAN TIME.

When the chicks are twenty-four hours old, a handful of chick grit may be scattered on the nursery floor of the incubator. Twelve hours later, the first feed may be given them in the same way.

During the time the chicks remain in the incubator, the operator should see that his brooder is in working order and heated to about 90 degrees preparatory to receiving the chicks.

To identify strains and ages a good plan is to secure a toe punch and when the chicks are hatched to punch the web between the toes on either the right or left foot and between the first and second or second and third toes as desired. By careful calculation you can in this way make fifteen different identification marks. Keep a toe-mark record and the ages of the different birds can be readily obtained at any time.

#### TESTING THE EGGS.

All eggs that are undergoing incubation whether under hens or in incubators should be examined at least twice during the hatch by means of the tester. When testing the eggs from under hens they may be gathered in a suitable receptacle and taken to the house.

Care should be taken to guard against chilling in cold weather. By making the tests at night there is little danger of disturbing the hens.

An egg tester usually accompanies an incubator, but to those who may not have one Fig. 24 illustrates a simple home made tester, 12 inches square and 18 inches high. A couple of half-inch holes may be bored near the bottom of each side of the box for the purpose of supplying air to the lamp. On top of the box a 3-inch hole should be cut to allow for the escape of the fumes of the lamp. On the front side of the box and on a level with the flame of the lamp a 3-inch hole also should be cut. Over this hole a piece of felt or heavy cloth is tacked. A small oval hole is cut in the felt against which the egg is laid.



FIG. 23.—CHICK AT FIFTH DAY OF INCUBATION, SHOWING ALLANTOIS, OR TEMPORARY LUNG THROUGH WHICH THE CHICK BREATHES DURING INCUBATION.

In order to use the tester, it should be placed over a lamp in a dark room and the egg held against the hole in the felt. In this way the contents of the egg can be readily seen. Where electric light is

available a satisfactory egg tester may be made by enclosing the electric bulb in a cardboard box.

From the seventh to the ninth days the fertile eggs with live germs will have a dark spot, the germ, in the larger end with the veins radiating from it, making a spider-like appearance, as shown in Fig. 20. These eggs should be replaced in the machine, and those clear or infertile

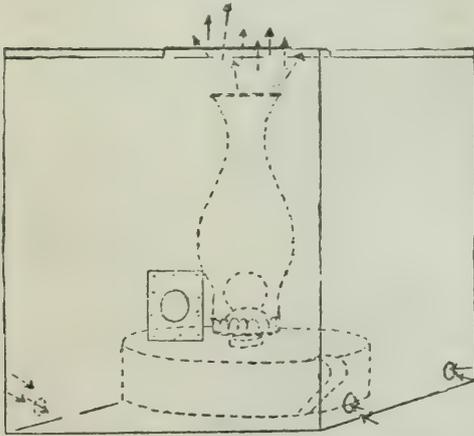


FIG. 24.—HOME MADE EGG TESTER.

removed. Eggs showing a red ring, or eggs showing a dark spot without blood vessels, or clouded eggs, should also be removed. Testing should take place the sixteenth to eighteenth day. At this stage of incubation a live chick will darken all the egg with the exception of the air-cell. If the egg is closely watched a movement

of the chick can often be detected. The operator will in a short time be able to detect dead germs that in his first experience in testing he would have been doubtful of.

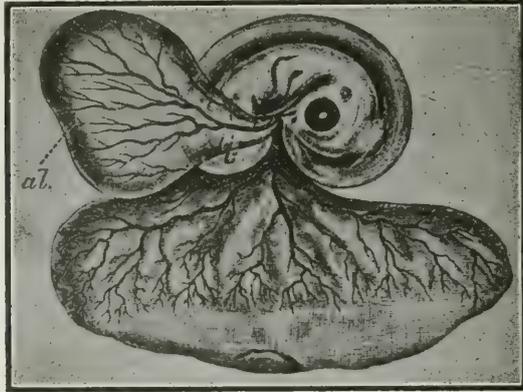


FIG. 25.—SEVENTH DAY, SHOWING ALLANTOIS MORE DEVELOPED.

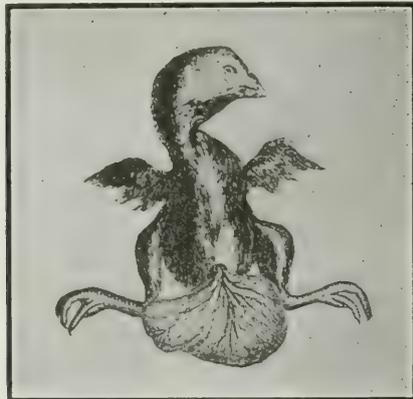


FIG. 26.—FINAL STAGE OF INCUBATION—ABSORBING THE YOLK-SACK.

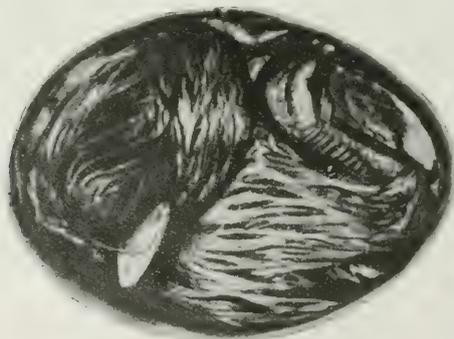


FIG. 27.—CHICK READY TO BREAK THE SHELL.

## IX.—BROODING AND REARING.

For brooding and rearing the combined brooder and colony house is recommended. It will be found more efficient and less expensive to build than the ordinary outdoor brooders and coops usually found among poultry raisers.

*Advantages of Colony Brooder Houses.*—The colony brooder house has the advantage of the outdoor brooder or coop in cold, rough, stormy or rainy weather, as when these conditions prevail the attendant can enter the brooder house and attend to his chicks, lamps, etc., conveniently, regardless of weather conditions. These houses are sufficiently large that a colony or brooder lot of chicks have plenty of room for a week or ten days without having to go outside if weather conditions are unfavourable. Not only are the colony brooder houses more satisfactory in which to operate brooders, but broody hens and their chicks have much better accommodation under similar weather conditions, as a house will easily accommodate three or four broody hens and fifty or sixty chicks.

Later when the chicks are sufficiently large not to require the brooder or hens they may be removed and the chicks remain in possession until fall, when the houses and chicks may be transferred to the grain fields or other range if desired.

*Construction of Colony Brooder Houses.*—A convenient size in constructing brooder houses is 6 ft. x 8 ft. floor space. Under the floor about 18 inches from the outer edges are placed runners, which may be made by 2 in. x 4 in. scantling beveled at the front ends. A hole is bored through the scantling at the beveled end whereby clevises and chain may be attached to move the brooder house when desired. 2 in. x 4 in. scantling is nailed upon the upper and outer edge of floor and the house built thereon. The front studding may be 6 ft. high and the rear studding 4 ft. As this style of a house is light in weight, 2 in. x 2 in. material answers very well for studding and rafters. The walls are then sided up with shiplap or other suitable siding and the roof enclosed with sheeting or shiplap and covered with shingles or roofing material.



FIG. 28.—TESTING EGGS.

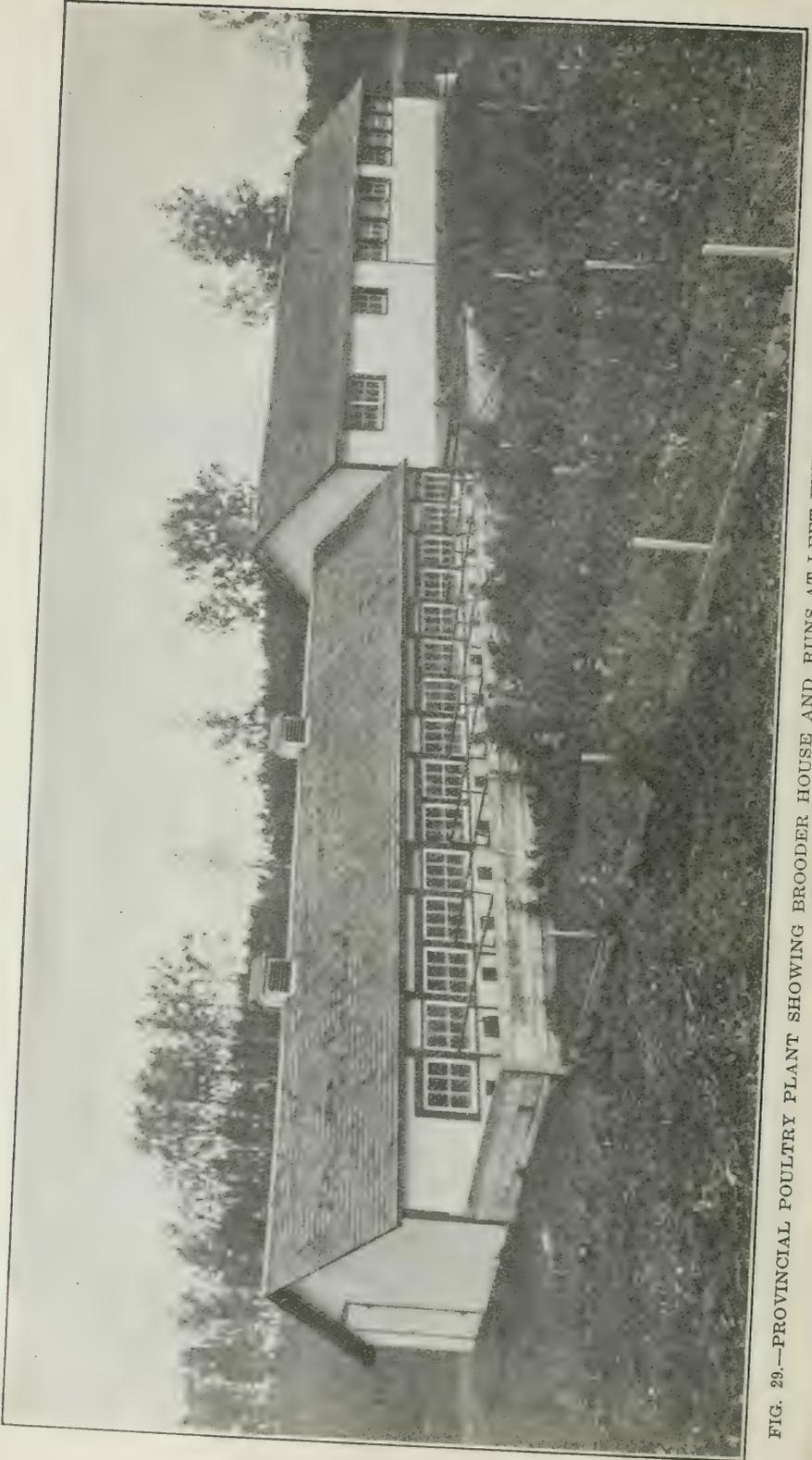


FIG. 29.—PROVINCIAL POULTRY PLANT SHOWING BROODER HOUSE AND RUNS AT LEFT WITH OFFICE, WORKSHOP AND INCUBATOR CELLAR BENEATH AT RIGHT.

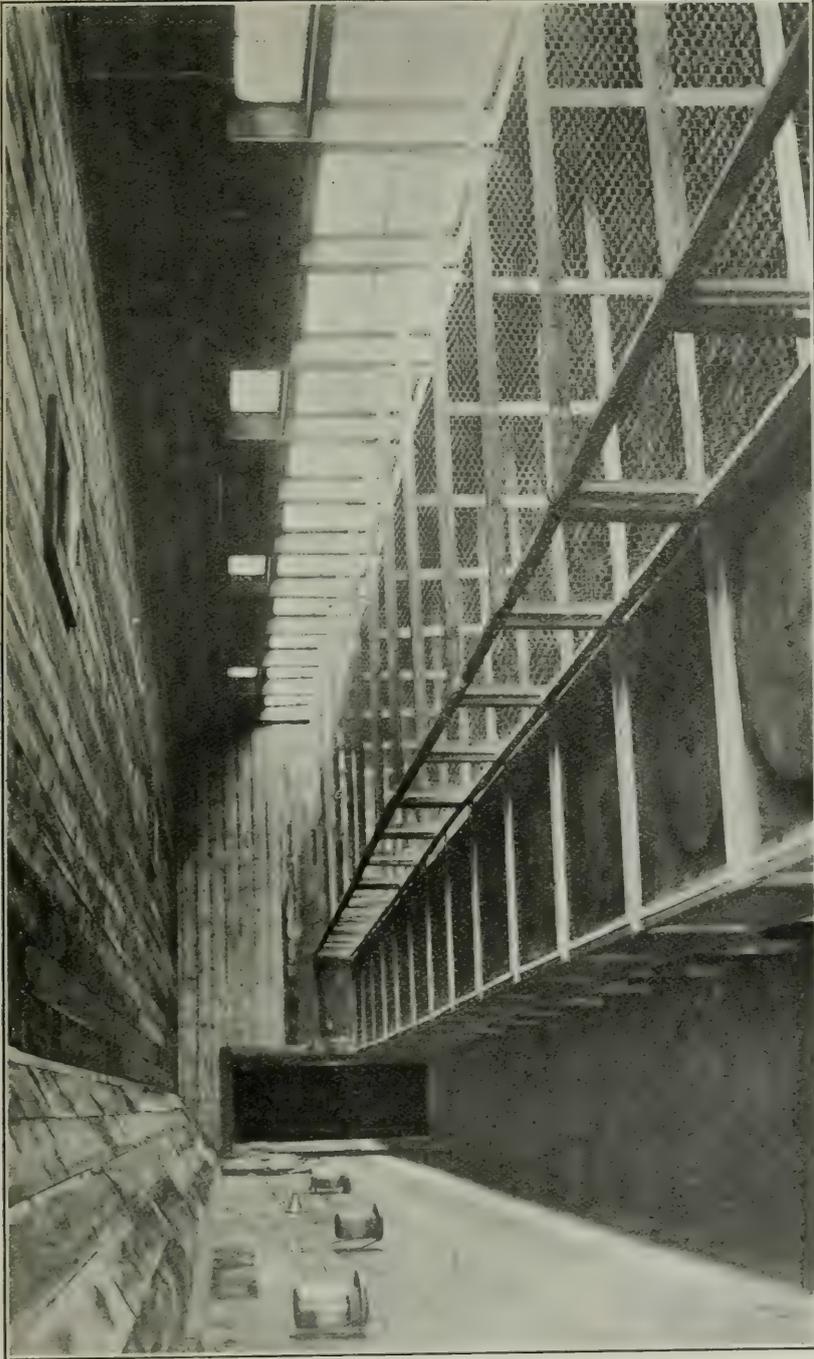


FIG. 30.—PROVINCIAL POULTRY PLANT. INTERIOR OF BROODER HOUSE. HERE THE CHICKS ARE CARED FOR UNTIL PLACED IN OUTDOOR BROODERS, FIGS. 31 AND 32.

The fronts may be enclosed with wire and cotton as illustrated in Figs. 31 and 32, an entrance door being made in the front or side as desired. A small door 6 in. x 8 in. should also be made as an entrance and exit for the chicks.

*Brooders.*—The brooders are placed in a convenient part of the brooder house, usually the north-west corner. Indoor brooders are used in these houses, and the indoor brooders manufactured by the various incubator companies on the market are usually of a uniform size, there is ample room for both brooder and chicks.

When hens only are used for brooding they may be suitably housed in coops as illustrated in Figs. 33 and 34. These coops should



FIG. 31.—A STYLE OF BROODER HOUSE EXTENSIVELY USED AT THE PROVINCIAL STATION.

have board floors to ensure the chicks against dampness. It is also advisable to hinge the roof of the coop as a means of entrance to more readily feed the chicks, and to clean out the coops. The doors and openings should be made to fasten so as to protect the chicks from animals of prey during the night. Suitable runs should be made in front of the coops with boards or one-inch mesh poultry wire, where the chicks should be confined until sufficiently strong to be allowed a greater range.

*Preparing for the Chicks.*—During the thirty-six hours that the chicks are left in the nest or incubator the attendant should see that the brooder or coop is made ready to receive them. The brooder or coop should be thoroughly cleaned and disinfected. In the case

of the brooder the lamp and wick should be overhauled and the brooder heated to a temperature of 95 degrees ready for the chicks.

*Removing the Chicks.*—When the chicks are being moved to the coop or brooder they should be placed in a suitable box and covered with cloth to protect them in transit. Very often serious results follow the careless and thoughtless way some operators remove their chicks. At this age coming from a high temperature to outdoor conditions a chill may result that seriously affects the delicate internal organs and to a great extent destroys the vitality of the chicks either for future egg production or for market.

When chicks are placed in the brooder, care should be taken to see that they all go under the hover and are allowed to remain there



FIG. 32.—SHANTY BROODER HOUSES IN WHICH THE FIRST EXPERIMENTS IN COLD HOUSES AND CURTAIN FRONTS WERE MADE.

quietly for an hour or two until they understand that the hover is the source of their heat supply.

While the thermometer may at first be used to register the heat of the brooder, the attendant will in short time become familiar with the necessary temperature by placing the hand under the hover.

The attendant should observe the actions of the chicks. If they crowd together under the hover it is an indication that the brooder is not supplying sufficient heat, and therefore likely to cause serious trouble. On the other hand if the chicks are crowding to the corners it may be understood that the brooder is too hot and in need of ventilation.

*The First Feed.*—The chicks may now be given their first feed by scattering it on the floor, and usually they are attracted by the

falling food. After they have eaten a sufficient quantity they should again be placed under the hover.

In artificial rearing special attention should be given in making sure that the chicks return under the hover as soon as they have finished their feed. It is very necessary at this stage that they have the desired heat. If they remain out in the run they will readily chill, particularly in the early season, in which case diarrhoea and a high death rate is almost sure to follow.

The object of the operator should be to see that the chicks learn their source of heat supply, and the patience used for the first few days in teaching them to return to the hover is amply repaid in strong healthy chicks.

*Special Care During Danger Period.*—For the first ten or twelve days, known as the danger period, special attention should be given the baby chicks, not only in the matter of warmth and comfort, but in the feeding as well. If by careful handling the chicks pass through this period successfully there is little danger in the future where ordinary care is exercised. For the first few days the chicks should be fed sparingly rather than overfed, as at this time the digestive system is occupied in assimilating the unabsorbed yolk, which is the food supplied by nature to start the chicks off right.

By feeding the baby chicks too much or too soon the delicate system has to absorb the yolk and at the same time digest the food fed. Only chicks with an exceptionally strong constitution can with-

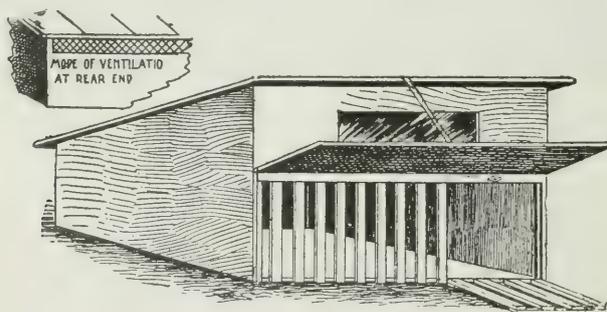


FIG. 33.—COOP FOR HEN AND BROOD.

stand this treatment. The weaker ones become affected with diarrhoea, leg weakness or other chick ailments and many deaths follow.

*Feeding Young Chicks.*—Young chicks may be fed stale bread crumbled, rolled oats, pinhead oatmeal or commercial chick food. Hard boiled eggs may also be fed mixed with other food or fed sparingly after the chicks are five days old. A supply of fresh water should be provided also.

*Water Can.*—An automatic drinking vessel, Fig. 35, may be purchased or made by a local tinsmith that is much more sanitary and satisfactory than when a dish is used. A drinking fountain may be made of an empty tomato or similar can. With a nail punch a hole  $\frac{3}{8}$  of an inch from the open end, fill with water, place a saucer on top of the can and invert. If the can is air tight it will not overflow, insuring a steady supply of water until empty.

*Growing Eggs as Well as Chicks.*—It is well to remember that as you grow the chicks the eggs in the ova form are developed at

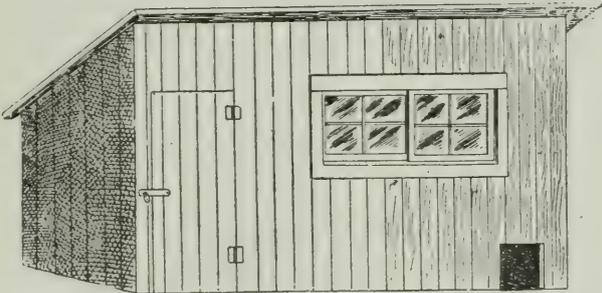


FIG. 34.—SIMPLE COLONY COOP, 6 FT. LONG, 3 FT. WIDE,  $3\frac{1}{2}$  FT. HIGH IN FRONT, AND  $2\frac{1}{2}$  FT. HIGH AT THE REAR.

the same time, hence the advisability of feeding foods necessary for egg production as described elsewhere in this bulletin.

*Changing the Feed.*—Having fed the chicks two or three weeks as suggested the more expensive form of food may be gradually withdrawn and coarser food substituted. The foods now may consist of cracked wheat, ground oats, preferably with the coarser hulls removed. Bran is one of the important foods and with chick grit and shell forming material should be constantly within reach of the chicks. These foods may be placed in hoppers as illustrated in Figs. 35 and 36.

Green food, animal food or milk is also necessary and should be provided. In feeding milk, skim milk or buttermilk is found equally as good as whole milk. When feeding milk it should be fed either sweet or sour rather than sweet one day and sour the next. Special care is necessary that the vessels in which the milk is fed are kept thoroughly clean. When chicks have drank all the milk they wish it is advisable to remove the balance from the pen.

*Milk Substitute.*—When there is a lack of milk supply commercial animal food may be fed in the form of meat meal or beef scraps. These meats are specially prepared and are not affected by warm weather.

*The Range.*—The most successful way of rearing chicks is to confine them to limited range until they become familiar with their

house or coop and surroundings. When this is accomplished they may then be given free range over a restricted area, as it is not advisable to give unlimited range to go where they choose. When the colony coops (Figs. 31 and 32) are placed a few rods apart

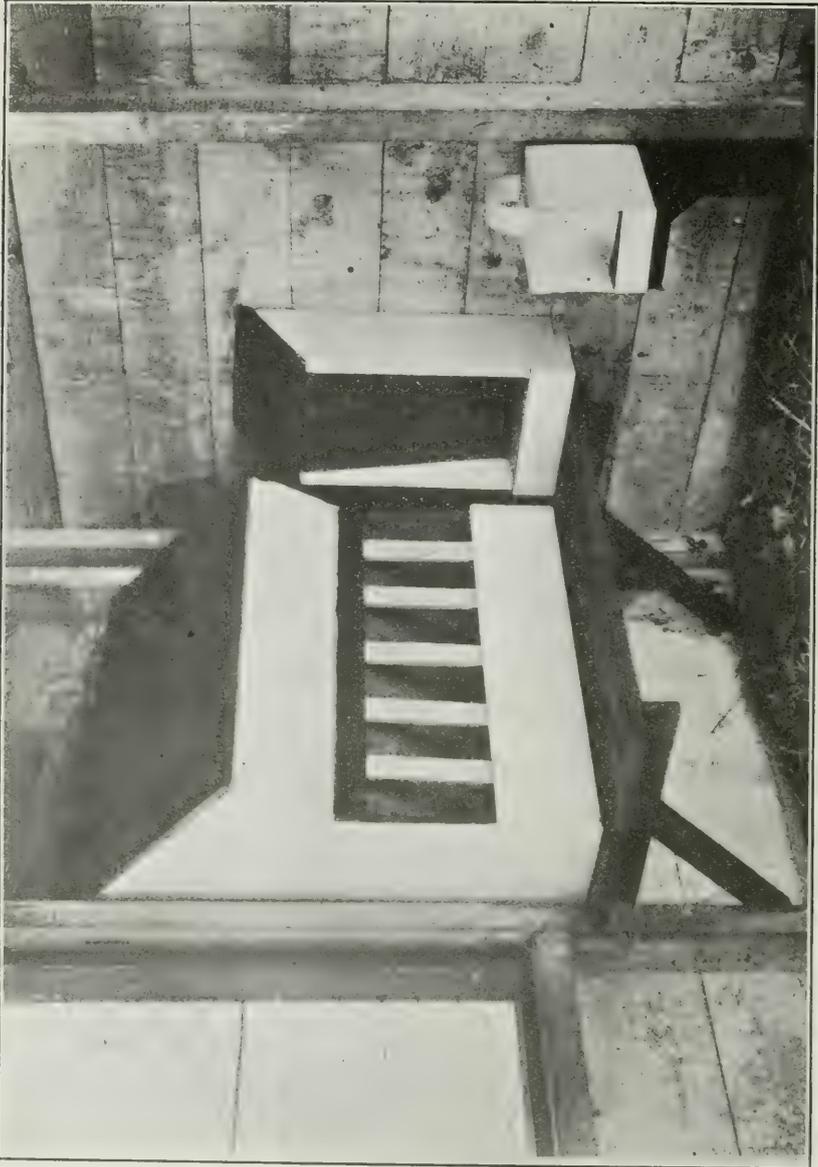


FIG. 35.—A CONVENIENT ARRANGEMENT OF SELF-FEEDING HOPPER, GRIT BOX AND AUTOMATIC DRINKING CAN.

hundreds of chickens may be given liberal range and almost invariably each brood will return to its own colony house or coop.

*Provision for Green Feed.*—The range should be provided with a liberal supply of green grass for the chicks. Where grass range

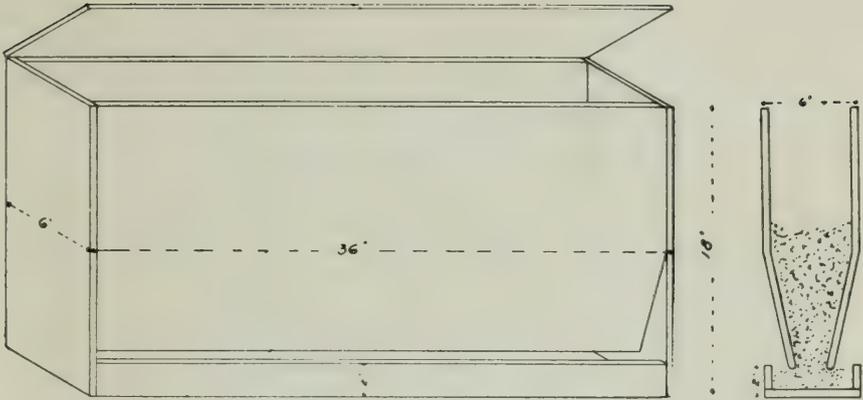


FIG. 36.—SELF-FEEDING HOPPER.

is not available the land should be cultivated and sown to alfalfa, rape or grain at intervals to secure an abundant supply during the summer months. Later when the supply of grass feed is exhausted mangels, turnips, or sugar beets make an exceptionally good substitute. The unused portion may be stored and fed throughout the winter.

*Sanitary Conditions in Rearing.*—It is very necessary in rearing chicks that special attention be given to sanitary conditions in the brooders and coops. Nothing in this connection should be taken

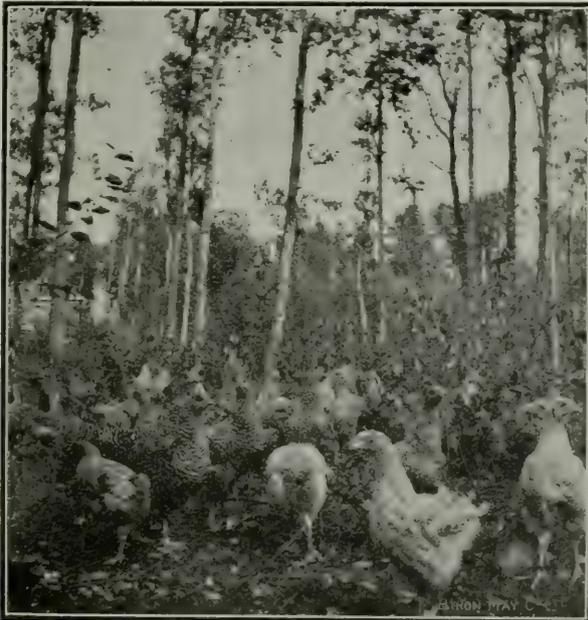


FIG. 37.—SHADE NECESSARY—THE CHICKS ENJOY A COOL SHADY SPOT.

for granted. Disease and vermin develop through unsanitary conditions and the wise poultryman will clean out his coops systematically and often. Once each week the brooders, coops and houses should be disinfected as a precaution against disease.

*Soft Feeding Discarded.*—The system of feeding soft sloppy foods of late years has been largely discarded. To feed in this manner requires more care in sanitation than is practised by the average poultry raiser. Mash, however, may be fed occasionally to advantage by way of variety, particularly when milk is used. Care, however, should be taken to see that the vessels in which the mash is fed are kept clean and sanitary in every respect.

*Dry Feeding and Self Feeding Hoppers.*—Dry mash feeding has of late years been adopted and the results found most satisfac-



FIG. 38.—PROTECT YOUR POULTRY WITH GOOD FENCING.

tory. This system allows the introduction and use of the self-feeding hopper. (See Figs. 35 and 36.) Hoppers may be constructed in any desirable size, and in such a manner that the chicks or fowl may secure the feed from one or both sides of the hopper. Self-feeding hoppers are not only sanitary, but are labour-saving as well, as a considerable supply of such foods as bran, meal, grit, charcoal, oyster shell and beef scraps may be kept before the birds at all times, requiring only occasional attention in filling. The hoppers should be placed in the houses or coops or other convenient places protected from rain and unfavourable weather conditions.

*S'ade.*—It is important that chicks should have abundance of shade during the summer weather. They have been known to die by hundreds from apparently unaccountable causes, when as a matter

of fact it was due to the excessive heat of the sun. If possible the runs should be among trees or bushes, and in the absence of these, artificial shade should be employed.

## X.—FATTENING.

A visit to almost any store handling poultry will demonstrate that a large amount of the dressed poultry offered for sale is poorly fleshed and equally poorly dressed. This is not because the demand for poultry is small but through ignorance of the best method of fattening and dressing birds. The fact is that in but few cases have the birds received any particular attention in the way of preparing them for market. Of recent years it has been demonstrated that poultry should be specially fattened in much the same way as beef, mutton or pork, in order to produce the best results. It is just as reasonable to confine poultry when being fattened as the larger animals. The simplest method of doing this is by the crate feeding system outlined below, but many a farmer can obtain improved results, if the birds intended for sale were only confined in a suitable shed with clean floor, good ventilation, and such foods as would be fed were the birds being fattened in crates. The crate system is much the better plan, however, and it is advisable to adopt it whenever possible.

*The Crate Feeding System.*—During the past few years the crate feeding of chickens for market has been introduced from England, and has made substantial progress in Canada, because it has proved to be the most satisfactory means of preparing poultry for market. The work of fattening is readily conducted in the crates. The gain in live weight made by the birds ranges from one to three pounds per chicken during the fattening period.

Crated chickens command an increased price per pound because they supply a much larger percentage of meat than when lean. The flesh is also more tender and palatable because it is produced by the wholesome food that is of necessity fed during the fattening period. The confining of the birds in crates also tends to render the muscular tissue less tough, and in properly fattened birds there should be an almost entire absence of such tissue.

As stated elsewhere in this bulletin, the type of bird that is capable of producing the best results in egg production is also the best type of bird to produce flesh in the fattening crate.

*Market Requirements.*—Fatted chickens whether prepared for the Canadian or the British consumer should conform to the following market requirements:

**Breast.**—The shape of the breast should be long and broad, so that when the chicken is dressed the breast will present a plump, meated appearance. The breast meat is the best part of the chicken. Large chickens with prominent breast bones cannot be satisfactorily fattened and they do not produce a good marketable appearance no matter how well fleshed.

**Legs.**—The legs should be as short as possible, indicating the low, blocky type. The meat on the leg is largely composed of sinews

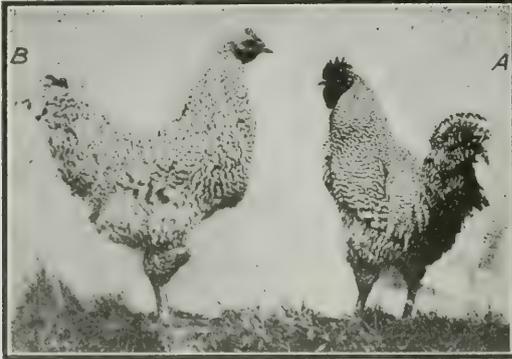


FIG. 39.—DESIRABLE AND UNDESIRABLE TYPE OF MALE BIRD.

and therefore inferior. Hence the leg should form as small a proportion of the weight as possible. Feathered, scaly, or dark coloured shanks are objectionable, as well as any development of spurs.

**Flesh.**—The colour of the flesh should be white and the grain fine, indicating that the bird has been crate fed. Finely ground oats mixed with sour milk, skim milk or butter-milk, the ration recom-



FIG. 40.—HEADS OF BIRDS SHOWN IN FIG. 39.

mended, produces this white fine-grained flesh. Feeding corn-meal instead of oatmeal has a tendency to produce a yellow flesh which is not desirable.

**Bone and Offal.**—The bone should be small and the bird well fasted, as the minimum of bone and offal are two important factors in the best grade of marketable chickens.

Weight.—The weight of dressed fatted chickens preferred is about four pounds. Plump, crate-fed chickens up to the weight of five pounds are more readily disposed of than larger ones.

The marketing of lean chickens allows but a small profit to the producer and is decidedly unsatisfactory to the poultry dealer. It is more unsatisfactory still to the consumer because the offal and waste amounts to forty to sixty per cent. of the live weight, thus making it expensive eating even though purchased at a low price per pound.

In recent years a large demand has sprung up for broilers and roasters, and the poultry farmer who is producing early chickens and catering to this trade will find it a very profitable one. The weight of broilers runs from one and one-quarter to two and a half pounds each, and that of roasters from three to four pounds each.

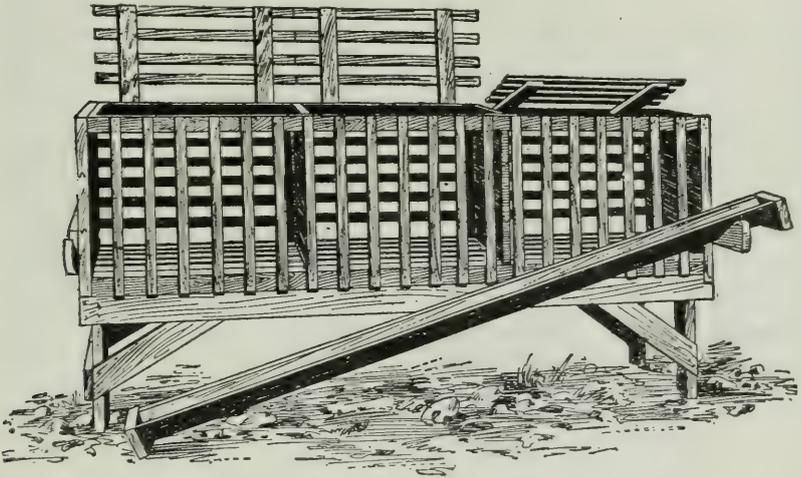


FIG. 41.—FATTENING CRATE.

In order to have the chickens plump and well fleshed for the market when they are at the most profitable age, they should be placed in the fattening crates when they are between three and four months old. It is not meant by this that the chickens cannot be fattened profitably when they are more than four months old. Suitable market chickens will show gains in the crate at any age, but the most profitable gains are made by birds weighing  $3\frac{1}{2}$  to 4 lbs.

*Construction of Fattening Crates.*—The fattening crates are 6 feet long, 16 inches wide and 20 inches high, inside measurements. Each crate is divided by two tight wooden partitions into three compartments, and each compartment holds four birds. The frame pieces are two inches wide and seven-eighths inches thick. This frame, see Fig. 41, is covered with slats placed lengthwise on three sides,—bottom, back and top,—and perpendicular in front. The

slats for the bottom are  $\frac{7}{8}$ -inch wide and  $\frac{5}{8}$ -inch thick; the back, top and front slats are the same width, but only  $\frac{3}{8}$  of an inch thick. The spaces between the slats in front are two inches wide to enable the chicken to feed from the trough. The bottom slats are  $1\frac{1}{2}$  inches apart, with the exception of the space at the back of the crate, which is  $2\frac{1}{4}$  inches wide. The bottom slats are always placed upon the top of the cross pieces of the frame. This is done to prevent any injury to the chickens' feet should crate be moved and placed on the ground when full of birds. The back slats are placed lengthwise  $1\frac{1}{2}$  inches apart, and the top slats are also placed lengthwise 2 inches apart. Two strips should be nailed under the top slats near



FIG. 42.—DESIRABLE TYPE OF BIRD FOR FATTENING CRATE.



FIG. 43.—UNDESIRABLE TYPE.

the ends of each division and hinged to the framework. When the slats are sawn above the partitions, doors are formed for putting in birds.

The crates are placed on stands 16 inches from the ground and the droppings from the chickens received on sand or other absorbent material. A light "V" shaped trough  $2\frac{1}{2}$  inches inside is placed in front of each crate, and is carried on two brackets nailed to the ends of the crate. The bottom of the trough should be 4 inches above the bottom of the crate and the upper inside edge 2 inches from the crate.

#### FATTENING.

In fattening for the market it is always advisable to use the fattening crate described in this bulletin. If only a small number of chickens are to be fattened, packing boxes of suitable dimensions can be adapted for the purpose. The open top of the box should become

the bottom of the crate, and one side should be removed for the front. Laths should be nailed up and down the front and lengthwise on the bottom to form the floor. The laths should be placed the same distance apart as recommended in the construction of the regular fattening crate. A board should be loosened in the top of the box to remove the birds, and a feed trough arranged in front.

In *warm* weather the crate should be placed outdoors in a sheltered place.

In *unsettled* weather it is advisable to construct a rough board shelter above the crate so as to shed the rain; or the fattening should be carried on inside a shed or barn.

During *cold* weather the crates should be placed in a warm building. Abundant ventilation is required at all times.

*Killing Lice*.—Before the birds are put into crates they should be well dusted with sulphur, or any good louse killer, to kill any lice on them. They should be treated again three days before they are killed.

*Feather Plucking*.—Birds that are fattening in crates sometimes pluck the feathers from one another. This habit is caused by irritation at the roots of the feathers, and results either from over-heated blood or parasites. The remedy is to remove the chickens that do the plucking and feed the others more skim milk, or add animal food and vegetable matter to the fattening ration.

If the trouble is caused by parasites, they will be found in the white powdery matter at the base of the quill. A sulphur and lard ointment should be applied to the affected parts.

*Feeding*.—It is necessary to feed the birds lightly the first few days they are in crates, not feeding all they will consume. The food should be given twice a day, and after the birds have eaten what they require the balance should be removed and the troughs turned over. Fresh water should be supplied daily, and grit two or three times a week.

*Fattening Rations*.—A satisfactory fattening ration is one that is palatable and that will produce a white-coloured flesh. Oats, finely ground, or with the coarser hulls sifted out, have proved the best grain for fattening and should form the basis of all the grain mixtures. The most suitable meals for fattening are ground oats, buckwheat, barley, and low grade flour.

Satisfactory fattening rations:

- (1) Finely ground oats.
- (2) Two parts finely ground oats, one part fine shorts.
- (3) Two parts finely ground oats, one part ground barley, one part fine shorts.

(4) Two parts finely ground oats, one part fine shorts, one part low grade flour.

(5) Equal parts ground oats, barley, fine shorts, and low grade flour.

The meal should be mixed to a thin porridge with sour milk, skim milk, or buttermilk. On the average, 10 pounds of meal require from 12 to 15 pounds of milk.

When sufficient skim milk or buttermilk cannot be obtained for mixing the mashes, a quantity of meat meal, blood meal, or beef scraps and raw vegetables should be added to the fattening ration. A good proportion is one part of the meat meal to fifteen of oatmeal.

The birds should remain in the fattening crates for a period not exceeding 24 days. Some birds will fatten more readily than others and should therefore be removed from the crate and killed as soon as they are ready. During the last week it is well to feed a little beef tallow, shaved into the trough or melted and mixed in the mash. About a pound of tallow to 50 or 60 chickens per day is a fair allowance.

## XI.—KILLING AND MARKETING.

The methods of killing poultry are many and various. The old one of "chopping the heads off" is perhaps the most ancient and the one in most common use at the present day. Wringing the neck, stretching the neck and piercing the neck are others that are in common vogue, but all these must be set aside and give place to the

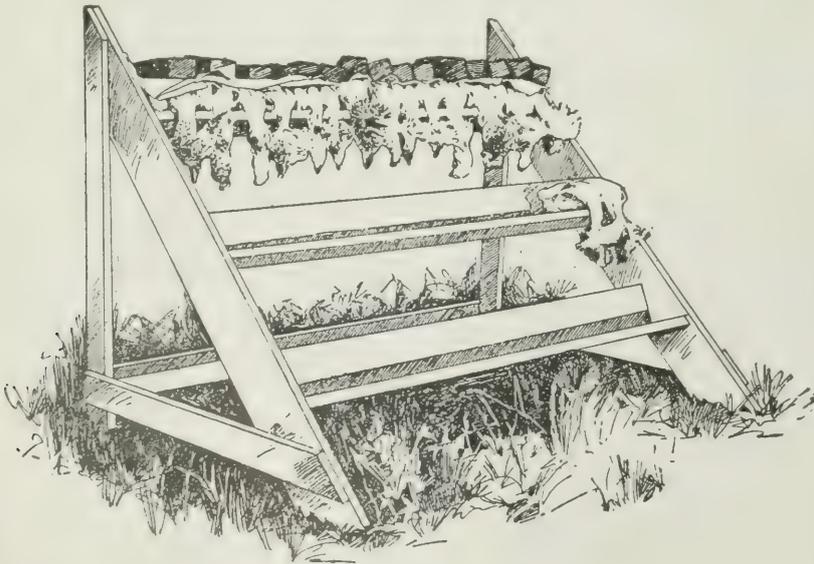


FIG. 44.—SHAPING FRAME.

cleaner, neater and more scientific method of bleeding in the mouth. Decapitation leaves the neck exposed and leads to early decomposition, besides the blood is liable to be scattered on the operator and surroundings. Wringing and stretching the neck allows the blood to accumulate in the neck, where it is likely to decompose and cause

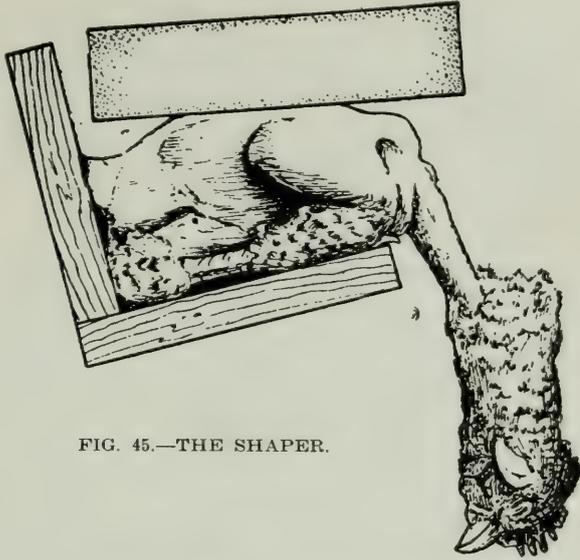


FIG. 45.—THE SHAPER.

the flesh to spoil sooner than it otherwise would. Bleeding the bird in the mouth removes all the blood from the body, while at the same time it leaves no unsightly wound and gives no chance for spreading blood upon whatever the bird touches. If the operation is performed properly all the blood is drained from the body, leaving the flesh of a white colour. If this operation is improperly done the outside of the bird will turn red or show blood spots.

*Fasting.*—The birds should be fasted for 24 hours before killing. This prevents food remaining in the crop and intestines, which would decompose and spoil the flavour of the meat. Several hours after the last feed allow the birds all the water they can drink. They should then have a complete fast until after they are killed.

*Bleeding.*—Secure a stout cord to the ceiling of the killing room and attach to the end, which should extend down as low as the operator's shoulder, a piece of iron, preferably a large burr. When ready for killing, the birds may be suspended on this cord by simply giving the cord one wrap around the legs, pass it over itself and allow the burr to drop. Hung in this way it is impossible for the bird to become detached, and it can be more readily bled while suspended.

To bleed, place the left arm over the bird, grasp the bird by the neck near the head, with the thumb on the throat. By a gentle

pressure of the thumb force the mouth open, exposing the arteries on each side of the mouth. With the right hand insert the knife as far back into the mouth as possible, then draw it forward with the cutting edge against the side of the head. Reverse the knife and repeat the operation on the other side of the mouth. When care is exercised the arteries will be severed at the junction of the upper and lower jaw. Next pierce the brain by passing the knife through the roof of the mouth towards the top of the head and give it a half turn. Both arteries must be severed in order to insure complete bleeding, and complete bleeding is the only means to prevent the flesh from turning red. The successful piercing of the brain is characterized by a peculiar flutter throughout the body. The plucking is much more easily done if the killing has been properly performed.

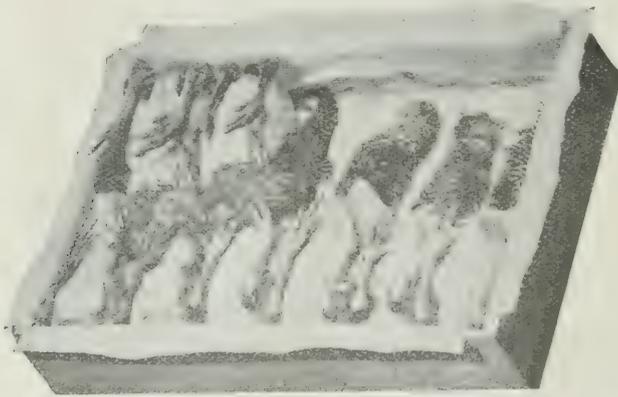


FIG. 46.—SHOWING THE FIRST ROW OF BIRDS PLACED IN A SHIPPING CASE.

To catch the blood and save the annoyance of its being scattered about, attach a small vessel such as a tomato can or small lard pail to the mouth. To do this stretch a wire tightly across the top of the can and to the middle of it attach a two-inch wire hook which is to be hooked into the mouth of the bird, allowing the pail to be thus suspended below the head.

*Plucking.*—The plucking should commence as soon as the killing operation is completed. With the back of the bird towards the operator hold the wings with one hand and pull the long feathers with the other. Next treat the tail in the same manner. With the thumb and forefinger around each shank remove the feathers from the thighs by bringing the hands towards the body. With both hands roll the feathers from the back, beginning at the tail and following down past the wings and around to the breast, and by turning the bird do the same to the other side. With both hands form a ring of the thumbs and forefingers around the neck at the body and strip

the feathers from the neck to within about three inches of the head. By this time the bleeding should be finished. Remove the pail from the mouth, take down the bird, and remove the pin feathers with a blunt edged knife and the bird is ready for the shaping frame.

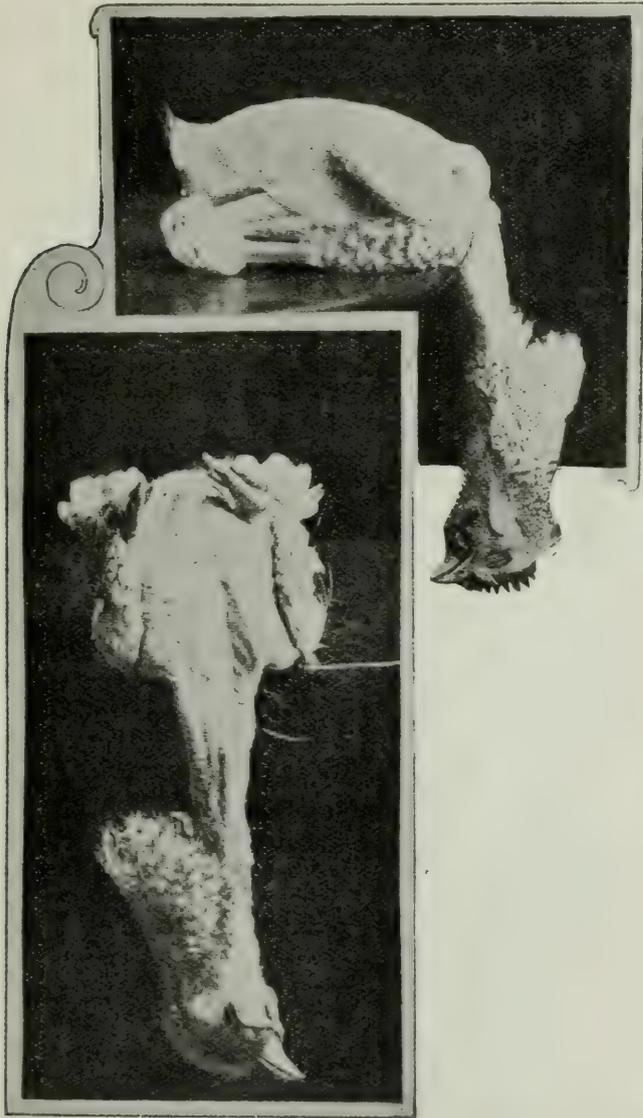


FIG. 47.—TWO VIEWS SHOWING BACK AND BREAST OF PROPERLY SHAPED, FLESHED BIRD.

*Shaping.*—Birds fattened for market should be properly shaped. This gives them a compact, plump appearance, and the returns received are greater than when they are shipped in a rough, unprepared condition. The shaper (Fig. 45) is made by nailing two  $\frac{7}{8}$ -inch by

6-inch planed boards together at right angles, so as to form a trough. This trough can be made 6 feet long and nailed into a frame as shown in Fig. 44, or 12 feet long with ends on it, and placed on the top of two barrels. The shaper should be inclined slightly backwards.

As soon as the bird is plucked, place its legs alongside the breast. With its breast downward, force it into the angle of the shaper, cover with paper and place a brick on the back to hold the body down and one against it to hold it in position. Fig. 47 shows the back and

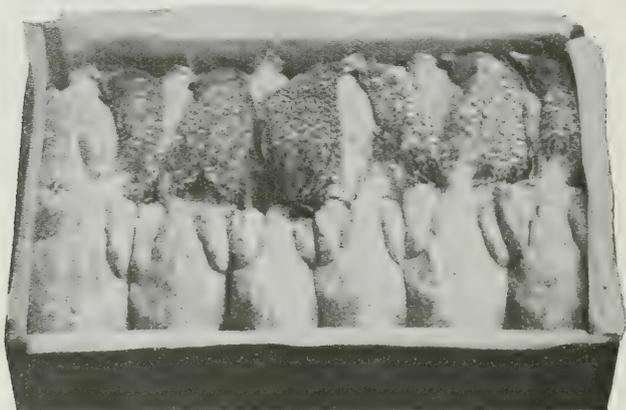


FIG. 48.—SHIPPING CASE READY FOR COVER.

breast of a properly shaped bird. Continue the process as the other birds are plucked, placing each in the shaper against the last, and moving the lower brick along to hold the row in position. Care should be exercised to shape and cool the birds in as low a temperature as possible so long as they do not freeze. The time required to cool the birds varies with the season, but from six to twelve hours are usually sufficient.

*Packing.*—When thoroughly cooled the birds are placed in shipping cases. These are made of basswood or spruce with the corners lock-jointed and they vary in size to accommodate the different weights of birds.

The box should be lined with parchment paper, a sheet of 18 inches by 26 inches being placed on the bottom, another 10 by 26 inches on each side and a third 10 by 18 inches on each end. Allow about four inches of paper to extend over the edges of the box.

The first row of birds are laid along one side of the bottom with backs down and heads extended across, as shown in Fig. 46. The second row are laid with breasts down and heads extended across between the birds of the first row. Fig. 48 shows the case packed ready for closing. Notice that in this illustration the backs of both

rows of birds are shown. This is a method frequently followed but by placing the birds as described above the case looks the same no matter which side is opened. Place a sheet of parchment paper 18 by 26 inches over the birds, tuck in the edges, fold the extended edges of the papers of the side and nail down the cover.

To prevent the development of mould in warm weather dip the last sheet of parchment paper in a 5 per cent. solution of formalin. On one end of the shipping case should be stencilled the name and address of the shipper, the number of birds and whether they are chickens or fowl. When packed the box should be weighed and the net weight plainly marked.

**MARKETING POULTRY.**—The foregoing directions for killing and packing poultry apply generally, but there are epicures who want something special, and oftentimes it is a paying proposition to cater to their whims. Some call for the birds alive, while others call for them not only killed and plucked but drawn.

*Shipping Crate.*—Where poultry is marketed alive Fig. 49 shows the construction of a very desirable shipping crate. It is made of half-inch lumber or lath in the bottom, with the sides, ends and top closed with lath  $1\frac{1}{2}$  inches apart. The centre lath on top is made to slide so as to put in the birds. The illustration shows that the crate has been made of woven picket fencing. The wires are not necessary if otherwise strongly constructed. The crate is divided into two compartments in order to prevent crowding. Each compartment is intended to hold from 12 to 15 birds.

*Compulsory Regulations.*—On investigation by the Canadian Society for the Prevention of Cruelty to Animals it was found that

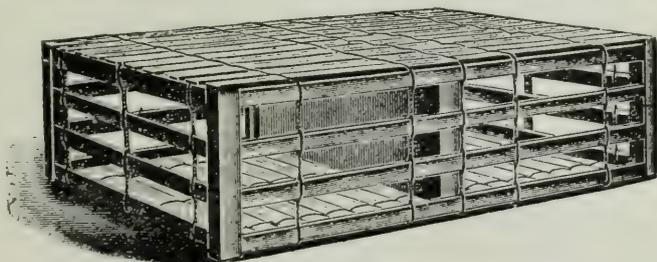


FIG. 49.—CRATE FOR SHIPPING LIVE POULTRY.

many fowls received broken wings or legs and in many cases were killed outright, owing to faulty or poorly constructed shipping crates.

As a result regulations were approved of by the Dominion Railway Commission, and the express companies now positively refuse to accept for shipment coops which do not conform to the following regulations:

Coops containing live poultry for market or consumption must have sides, ends and tops slatted. Tops with slats more than  $1\frac{1}{2}$  inches apart must be protected by wire netting.

Coops containing chickens or ducks must not be less than 12 inches, nor greater than 16 inches in height for each tier of birds. Coops containing turkeys or geese must not be less than 16 inches, nor more than 22 inches in height for each tier.

Coops must not exceed 30 inches in width and 48 inches in length.

Shipments of live poultry in broken or weak-jointed coops and coops not conforming to the above measurements must be refused. Returned empty crates must be cleaned and dead birds removed therefrom before they will be received for transportation.

Disregard of the regulations renders the shipment liable to seizure and the shipper to prosecution by the society.

## XII.—WINTER EGG PRODUCTION.

Successful poultry farming is divided into two distinct industries in two different seasons,—the summer for the production of meat or market poultry and the winter for the production of eggs. The question of producing for the market has been dealt with in the foregoing chapters. The high price paid for eggs during the winter should be an incentive to produce the largest number possible during that season of the year. To secure this the winter conditions should conform as nearly as possible to those of the summer. Under these circumstances egg production becomes an easy attainment. When the pullet becomes fully developed she will lay if she is of the right strain and fed the proper ration for egg production, as eggs are the product of the surplus food eaten.

### SELECTING THE LAYING STOCK.

The greatest care should be exercised in selecting the birds intended for laying stock because the pullets that are to be the winter layers will also be the breeding stock in the hatching season.

In addition to the care that has been exercised in selecting and mating the breeding stock winter egg production is influenced very largely by the care and attention given to the growing pullets during the summer months. Pullets for winter laying should have attained full growth before winter sets in because after the cold weather comes there is little opportunity for them to complete their growth unless in the hands of a skillful feeder. Eggs from immature pullets will not secure for the poultry keeper satisfactory results.

(NOTE.—Trap nest experiments that have come under the writer's personal observation have proved that where healthy, strong, well-developed pullets and male birds have been used as breeders the results in incubation have proved equally as good as those from older birds, and in some cases even better.)

*Pullets as Layers.*—That April and May hatched pullets are more prolific layers has been fully demonstrated by experiments, which have shown, as before stated, that ten pullets lay as many eggs as seventeen year-olds or as twenty-four two-year-olds.

*Advantage of Pullets.*—By preparing pullets for winter egg-production the poultry keeper not only secures a much larger return during the first year but also secures it in the winter season when the highest prices are obtainable. It is readily seen, therefore, that eggs are produced during the first year at the least possible cost. The profits from hens are largely offset by the extra cost incurred in their keep (which may be reckoned at \$1 per year), and the extra number required to secure the same results.

*Type to Select.*—Select only the active, vigorous pullets of the low-set, deep-breasted type, with broad well-rounded head, and bright intelligent eye, and as nearly as possible to the requirements of the Standard of Perfection for the breed represented. Some idea of the desirable type may be learned from Figs. 42 and 47, and the type to avoid by Figs. 39 and 43.

*Type to Avoid.*—Avoid the long leg, the lack of symmetry, the long flat head and dull uninterested eye. These are positive indications that the bird is lacking in constitution and breed characteristics, all important factors in the laying pen or the fattening crate.

*Time to Select.*—Pullets intended for winter laying should be placed in their winter quarters in the early fall before the weather has shown any material change in temperature. The pullets will thus have sufficient time to become accustomed to their confined conditions before they commence laying. When the change from summer to winter quarters is made the pullets should receive very considerate attention for the first few days, as the change of condition from free range to confinement is likely to make them discontented, unless surroundings and food are of a most inviting nature.

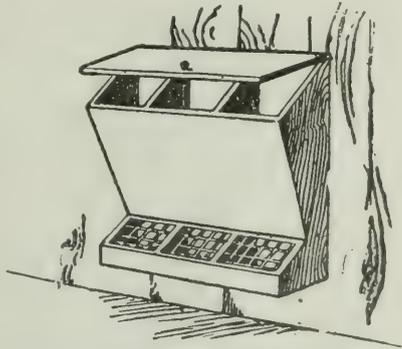


FIG. 50.—SUITABLE STYLE OF BOX FOR GRIT, SHELL AND DRY MASH.

### ESSENTIALS TO SUCCESSFUL PRODUCTION OF WINTER EGGS.—

In summer on free range the flock is able to secure sufficient exercise and a right proportion of the different kinds of food. It is necessary therefore to imitate these conditions as much as possible during the winter months.

*Shell Forming Material.*—Lime for shell forming material is necessary in egg production. Some idea of the extent of the need is obtained from the fact that an average flock of 150 hens will produce annually 137 lbs. of egg shell. The grains fed all supply a portion of this lime, but the supply is too small in proportion to the number of eggs a hen is capable of producing. By supplying shell forming material separately eggs may be more readily secured as the hen is not required to extract the lime from the food, but allows the digestive system to extract from the grains the elements necessary to make the meat of the egg.

Oyster shell is the food most suitable in shell making. Old plaster may be used as a substitute. Egg shells may be saved, broken up fine and fed in a hopper or box. Dry bones may also be broken up and fed. The habit of egg eating by hens is often due to the lack of a supply of shell forming material, and unless it has become chronic the feeding of oyster shell will remedy the habit at once.

*Succulent Food.*—Green food is also necessary under confinement of winter quarters, 64.7 per cent. of the egg is water and composed largely of the water found in succulent foods. This may be supplied in the form of mangels, turnips, sugar beets, cabbage, clover, alfalfa or lawn clippings. Sprouted grain is also an excellent green food. Ordinary green feed such as is harvested for other live stock answers very well, when the above mentioned green goods cannot be readily secured.

*Meat Supply.*—When the birds are on range they are usually able to secure for themselves in worms, bugs and grubs the necessary supply of animal food. Under winter conditions the supply is limited and it becomes necessary then to supply the meat ration in some other form. The necessary animal food may be supplied by meat scraps from the table, or beef heads, or liver may be fed either raw or boiled. Green bones also become a highly desirable food when a bone grinder is used to prepare it. Prepared meat rations are manufactured and supplied through poultry supply houses, in the form of meat meal, blood meal and beef scraps. These may be fed dry or mixed with mash.

*Skim milk.*—Skim milk (preferably well soured) and buttermilk have high feeding values. Skim milk should be supplied to

laying hens whenever it can be obtained at reasonable prices. Fig. 51 shows a protected trough suitable for feeding milk in winter quarters.

*Grains.*—Wheat is the best all round grain ration that can be fed. Whole wheat should be fed in clean straw litter six or eight inches deep. In this way the hens are kept exercised by scratching the wheat out of the straw. Oats and barley may be fed occasionally by way of variety. The better way to feed oats and barley is in ground form and placed in hoppers on the wall. Bran is also an important food that should be kept constantly before the hens. The

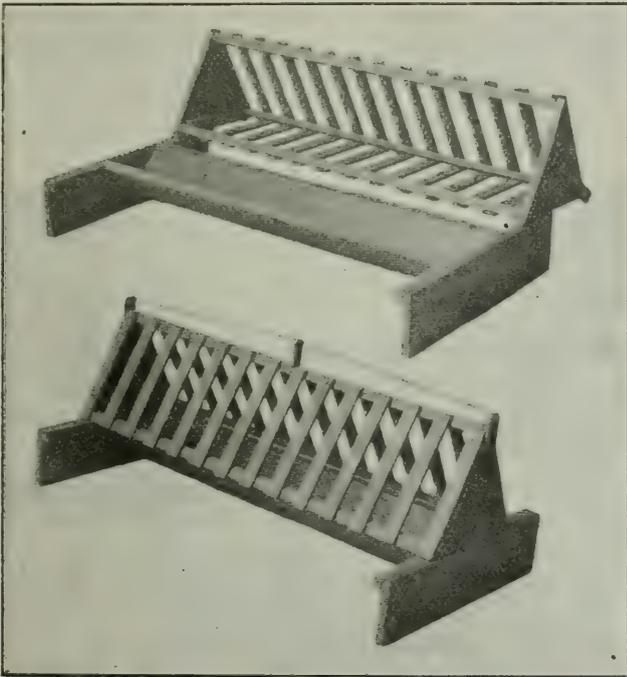


FIG. 51.—PROTECTED FEED TROUGH.

feeding for egg production becomes greatly simplified when bran, ground oats, and barley, as well as oyster shell and grit are fed in hoppers and kept within reach of the hens.

Wet mashes are not advised as a regular feed but may be fed occasionally by way of variety. An occasional feed of boiled whole wheat is relished by the birds.

*Water.*—Plenty of pure fresh water should be supplied daily. An automatic drinking fountain (Fig. 35) is the most sanitary way of supplying water. In cold weather when the water is liable to freeze quickly the difficulty may be overcome by heating the water. The fountain being air tight, excepting the space from which

the hens secure the supply, the water remains warm sufficiently long for the hens to get enough. The can, however, should be emptied of any remaining water daily to insure it from being broken by frost.

*Study the Flock.*—The wise poultryman will study the wants of his flock constantly observing their likes and dislikes. Should they seem to tire of any particular ration try something else that may prove appetizing to them as hens appear to enjoy a change of food occasionally.

Keep the flock contented and busy. Give them plenty of fresh air. Never allow them to become too poor or too fat. Keep them free from vermin, and the drop boards and the roosts clean. Remove a bird out of condition to quiet quarters where it will not be worried, and treat it as required for its special case. At once detect in the flock any defect and immediately take steps to remedy it.

### MARKETING EGGS.

Keeping hens for summer egg production is antiquated. According to present advanced methods in poultry raising chickens are hatched in the spring, the hens are fattened and killed in June or July and the spring hatched pullets ~~by~~ throughout the autumn, winter and spring months. In this way the eggs are produced at a time when they command the highest price owing to the limited supply at that season of the year, and the advanced poultryman has no surplus supply of eggs in summer when an over supply would trouble him and when they are cheapest.

As well as endeavouring to supply the eggs at a time when they are in greatest demand the poultryman must get into touch with the best market. The price depends very much upon the way the eggs are presented for sale. The following considerations, therefore, are worthy of note:

*Freshness.*—Be sure that the eggs are fresh. This is only made possible by gathering them every day and marketing them frequently.

*Cleanliness.*—A dirty egg looks bad and of two lots one dirty and the other clean, the dirty lot sells much more slowly. Washing eggs that have dirty spots brings a sufficiently higher price and quicker demand to pay for the trouble.

*Uniformity.*—The cook likes to get eggs of one size and colour and the larger the better. It behoves the poultryman therefore to endeavour to satisfy the whim. This is done by having but one breed having it pure and using only eggs that are large and uniform in shape and colour for incubation.

*Label the Eggs.*—The man who supplies fresh, clean, uniform and large eggs regularly, soon finds that his product is in more than

ordinary demand, and it is to his interests to increase that demand. He can do so by stamping each egg that is up to the standard with his name. His reputation will then grow in proportion to his adherence to the standard which he desires to establish.

By producing only a first class article, by having the name neatly and prominently attached and by protecting it with a trade mark, the products of any poultryman will come into greater and greater demand and command ever increasing prices.

*Influence of the Male.*—In building up the laying strain the poultryman must give consideration to the birds that are to head the pens. The male birds should be the offspring of females of good laying strains. The male bird has a greater influence in strain breeding than the average breeder gives him credit for and too often strains do not develop to the satisfaction of the breeder because no consideration is given to the egg-producing qualities of the ancestry of the male bird used.

Besides selecting males from egg-laying strains further care should be exercised to see that the birds selected possess the blocky build so essential in the fattening crate.

Fig. 42 illustrates a desirable type of bird to place at the head of a flock or in the fattening crate. Note the breadth and depth of breast. Fig. 39 illustrates an undesirable type of bird either as a flock header or for the fattening crate. Note the lack of breast and could he be seen from the front it is certain that his legs would be close together and his whole appearance indicative of narrowness and lack of constitution.

*Shut up the Males.*—Do not allow the male birds to run with the flock at any other time than the breeding season as they are not in any way conducive to egg production. The better way is to kill and market them immediately after the breeding season is over. The infertile egg is a better egg for the market and its keeping qualities decidedly superior as there is no germ to produce the addled or rotten egg complained of by consumers, which in the fertile egg is the result of contact with heat ranging from 70 to 95 degrees—a temperature high enough to start incubation. The infertile egg is not affected in this way. It is not desirable to allow the cockerels to remain with the pullets after they have reached an age suitable for the fattening crate. At this time they should either be placed in the fattening crates or confined to runs where they will not come in contact with the pullets.

In the foregoing paragraphs an attempt has been made to outline a plan of action which should enable any beginner or poultry raiser to thoroughly establish a flock. Having decided upon what investment he will make, and the method to pursue in building up

the breed selected the plan of strain building suggested is one which is to be highly commended. If the desirable qualities possessed by any breed of fowl are to be perpetuated and improved, it must be done by selection, and this selection is best accomplished by knowing what the individual birds do in the way of producing eggs and responding to the feed in the fattening crate. It is only possible to perpetuate and intensify these qualities by adopting a system of selection such as suggested in the section dealing with strain building. If a poultry breeder will follow this line it is possible for him to build up a superior class of fowl which should not only be profitable to himself, but a greater advantage to the country as well.

### XIII.—POULTRY FOR EXHIBITION.

While it is not the intention of the writer to deal particularly with exhibition poultry there are many no doubt who, having succeeded with utility poultry, desire to breed and develop birds for exhibition purposes. To such a brief reference to the subject may be of interest.

*Care in Breeding.*—As birds in the show room are judged by the American Standard of Perfection it becomes necessary to mate birds having as nearly as possible the requirements of this Standard. It is, therefore, necessary for the breeder to be thoroughly familiar with the standard characteristics of the breed to secure the best results.

*Breeding Winners.*—Breeding winners for the show room is not an easy task and many disappointments are in store for the exhibitor until he has developed or purchased a strain of exhibition stock capable of reproducing the qualities of or an improvement over the original stock.

*General Requirements.*—The general requirements in breeding for exhibition purposes are similar to the methods advocated generally throughout this bulletin. While particular attention is given to the fancy points required by the Standard, more credit is due the exhibitor who combines the utility and fancy qualities in his exhibition stock.

*Selecting Birds for the Show Room.*—When selecting birds for the show room, each bird should be examined for defects. Many of which can be remedied by the breeder during the rearing. Special attention should be given to disqualifying points to save humiliation and disappointment as such are sure to be detected by a competent judge.

*Preparing Birds for the Show Room.*—Birds intended for the show room should be placed in suitable coops and fed carefully to

produce the desired weight as nearly as possible, as over weight is as undesirable as under weight.

During the conditioning process the birds should be handled so that they will not be excited when being handled by the judge. They should also be trained to pose and show themselves to the best advantage.

*Grooming Show Birds.*—The experienced exhibitor makes a careful study of his birds paying particular attention to their weak points. The unfavourable position or carriage of sickle tails or wing feathers, the comb, wattles, lobes, beak, legs or feet, are groomed or trained in a manner that will improve or in a large measure overcome defects.

*Washing the Birds.*—Two or three days before the show the birds should be washed. First place them in a tub of warm water and thoroughly soak the feathers, then wash them, using some pure soap. The dirt can readily be loosened by means of a sponge or with the hands with little damage to the feathers, if reasonable care is exercised. The legs and feet should also receive attention and for this purpose an ordinary nail brush is useful. The birds should next be placed in clean warm water and the soap thoroughly rinsed from the feathers. When washing birds with white feathers, a little blueing in the rinsing water will greatly improve the colour.

*Drying the Birds.*—On removing the birds from the rinsing water they should first be drained of the water in the feathers, then placed in a clean dry coop in a warm place and allowed to dry. Judgment should be used in the amount of heat supplied, as too little or too much will be harmful to the health of the bird. When the birds are properly dried the feathers will fluff out and present a good appearance. Clean dry straw should be put in the coops in which the birds are placed and care exercised to see that the coops are clean so that the plumage is not soiled before the birds are placed on exhibition.

#### XIV.—TURKEYS.

The turkey, a more recent addition to our domestic fowl, is of American origin. The first reference made to this fowl was by Cortez in his conquest of Mexico, who on his march to Cempoalla found large numbers of the wild birds. In 1519 he forwarded the first specimens to his emperor, Charles V of Spain with other products of the new world. This consignment fell into the hands of Francis I, having been captured by a French privateer. Three years later another consignment reached Spain safely. History tells us that the turkey made its first appearance in England in 1524, five years after Cortez made his first shipment to Spain.

Wild turkeys were found in large numbers in Mexico, the Central American States and the great interior plain of North America. Their northern haunts and breeding grounds until recent years being as far north as the state of Michigan and south western Ontario.

In the early days of its discovery and domestication in Europe it was considered an ornamental fowl similar to the peacock of India and was found only on the lawns of the rich on account of the high values placed on specimens. The Hebrew merchants of Spain who were dealers in ornamental fowl saw in this large,

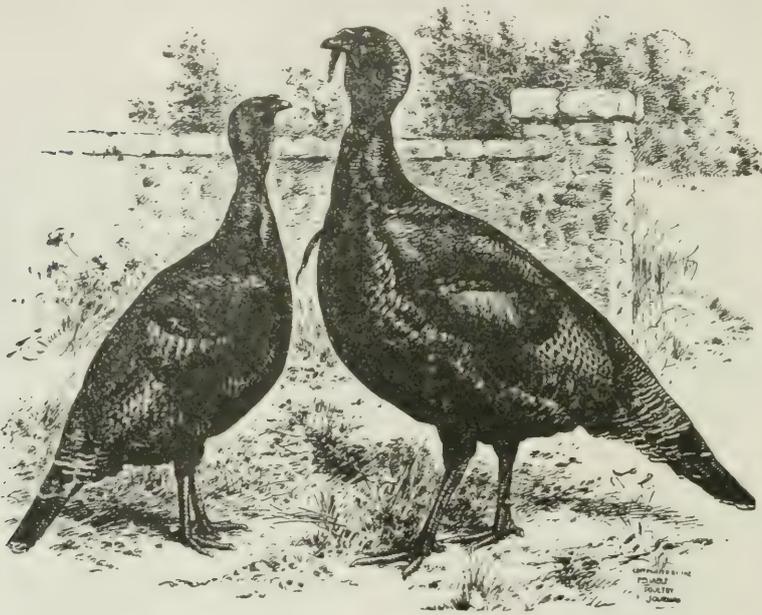


FIG. 52.

beautiful American bird with brilliant plumage and graceful habits a rival to the peacock and became dealers in the American importations.

Etymologists are agreed that the origin of the name given to this fowl was due to the Hebrew word *tukki* meaning peacock, and transformed to the English language as turkey.

Three varieties of wild turkeys were found, the Mexican, North American and Honduras. The latter is a native of the tropics and is said to have a plumage equal in brilliancy to that of the peacock. The Honduras has so far baffled all attempts at domestication or rearing outside its natural haunts, and the domestic turkeys of the present day are the result of crossing and inter-crossing the Mexican and North American varieties.

## STANDARD BREEDS AND WEIGHTS.

Breed.	Cock.	Hen.	Cockerel.	Pullet.
Bronze -----	36 lbs.	20 lbs.	25 lbs.	16 lbs.
Narragansett -----	30 lbs.	18 lbs.	20 lbs.	12 lbs.
White Holland -----	28 lbs.	18 lbs.	20 lbs.	14 lbs.
Black -----	27 lbs.	18 lbs.	18 lbs.	12 lbs.
Buff -----	27 lbs.	18 lbs.	18 lbs.	12 lbs.
Slate -----	27 lbs.	18 lbs.	18 lbs.	12 lbs.
Bourbon Red -----	30 lbs.	18 lbs.	22 lbs.	14 lbs.

While any of the standard bred varieties of turkeys are profitable it is generally conceded that the Bronze, White Holland and Black are the most popular in this country as they are hardy birds and suitable to the more rigorous conditions found outside their native haunts. Of these three varieties the Bronze is the most popular and most numerous.

Contrary to the general belief turkeys are easily and readily bred and reared when the requirements for successful raising are observed.

*Provide Suitable Houses.*—Suitable houses should be provided observing such requirements as light, ventilation and sanitary conditions. The treatment to be observed in housing and handling turkeys generally is similar to that recommended elsewhere in this bulletin for other domestic poultry.

*Most Suitable Breeding Stock.*—Only strong, healthy vigorous birds should be used. They do not reach maturity until they are three years old and it is therefore advisable to use two and three year old stock in preference to younger birds for breeding purposes. This should be observed particularly in the case of the male bird. A change of male birds is advisable when his offspring are used as breeding stock.

*Care of Breeding Stock.*—When only a few are kept they may be housed and fed with the other fowl. Where there are sufficient numbers to warrant it is advisable to house them separately. The feed and manner of feeding may be similar to that of other fowl, care being taken to see that the birds have plenty of exercise so that they do not become over fat.

As the laying season approaches the wild instinct of the turkey hen returns and there is a desire on her part to steal away and make her nest in some out of the way hidden place. At this time it is advisable to have suitable nests prepared and accustom the hens to laying in their proper nests. This may be accomplished by confining them to their house during the morning until they have selected their nests.

*Incubating the Eggs.*—When the breeding stock has been properly cared for turkey eggs incubate satisfactorily, twenty-eight days being necessary for hatching. Incubators may be used successfully or the eggs set under turkey hens or ordinary hens. Turkeys usually lay from twenty to thirty eggs before becoming broody, and therefore incubators or hens are advisable, in order to have the eggs for hatching as fresh as possible.

*Rearing the Poults.*—The young poults (as turkey chicks are called), when hatched may be housed and cared for in a manner similar to other chicks. In the wild state they live largely on insects and green food, therefore animal food or milk and green food can constitute a good portion of their feed. Care, however, must be taken that the young poults are kept in sanitary quarters and free from head or body lice. When young they should be kept in a limited run and entirely free from dampness. When their run is in long grass the poults should be confined after a rain storm or heavy fall of dew until the grass becomes dry. As the young stock grow they may be given more liberal range and allowed on the grain fields in the fall. Suitable housing should be provided for young turkeys at all times and when young taught to return to their houses at night and enclosed. When this method is followed the losses from animals of prey are reduced to a minimum.

*Fleshing for Market.*—As the season for marketing approaches the turkeys should be confined to a more limited range and fed three or four times a day for three weeks on a mixture of finely ground oats and fine shorts mixed with skim milk or buttermilk, giving at each feed only such quantities as they will readily eat.

*Killing.*—Killing, plucking, and preparing turkeys for market should be in a manner similar to that recommended elsewhere in this bulletin.

## XV.—DUCKS.

Duck raising is a branch of the poultry industry that in recent years has grown rapidly throughout the province and considered a profitable undertaking.

*Housing Ducks.*—Ducks should be housed separately from the other fowl. It is also advisable not to allow them to run at large with other poultry. Houses suitable for ducks need not be as large as those intended for turkeys or hens. But little interior fixtures are necessary other than a feed trough. The floor of the house, however, should always be covered with good, clean, dry straw. Light, ventilation and sanitary conditions are equally as necessary.

## COMMERCIAL BREEDS OF DUCKS AND STANDARD WEIGHTS.

Breed.	Adult Drake.	Adult Duck.	Young Drake.	Young Duck.
Pekin -----	9 lbs.	8 lbs.	8 lbs.	7 lbs.
Aylesbury -----	9 lbs.	8 lbs.	8 lbs.	7 lbs.
Rouen -----	9 lbs.	8 lbs.	8 lbs.	7 lbs.
Cayuga -----	8 lbs.	7 lbs.	7 lbs.	6 lbs.
Crested White -----	7 lbs.	6 lbs.	6 lbs.	5 lbs.
Muscovy -----	10 lbs.	7 lbs.	8 lbs.	6 lbs.
Indian Runner -----	4½ lbs.	4 lbs.	-----	-----

All of the breeds mentioned may be considered good for market purposes with the exception of the Indian Runner Duck. This breed is a rather small duck and is noted more particularly for its egg-producing qualities, many of the strains being capable of laying as many eggs as the ordinary domestic fowl.

*Breeding Pens.*—Success is more readily obtained where the breeding pens contain not more than from twenty to twenty-five

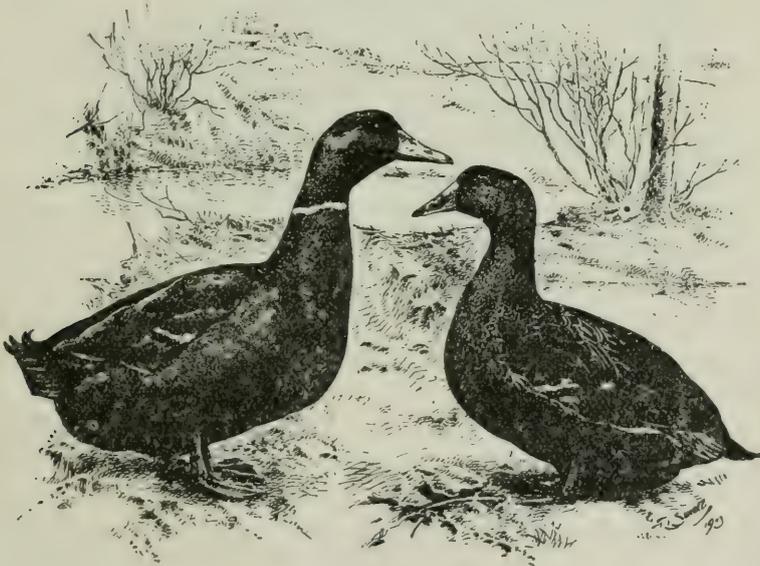


FIG. 53.

ducks, allowing one drake for each four or five females to insure good fertility in eggs.

*Feeding Breeding Ducks.*—Breeding or stock ducks may be given liberal range and will under favourable conditions secure at will a good share of their living during the summer months. In their wild state ducks feed largely on animal food and green food.

Under domestication it has been found that they thrive well on similar foods. Ducks do not thrive well when fed exclusively on whole grain, unless during the summer and allowed liberal range.

*Winter Feeding.*—In winter they may be given a feed of whole grain daily at noon in straw with plenty of succulent and animal food or milk. A soft mash composed of ground oats, bran and fine shorts should be given morning and evening.

*Water.*—Ducks, either young or old, should at all times have plenty of clean, fresh water. While breeding stock may have access to a pond or lake it is advisable not to allow young ducks intended for market to have water other than that supplied. Care should be taken that the troughs containing water are sufficiently deep to allow the ducks to immerse the whole of their bills in the water, as often their nostrils become filled with mud or clay which if allowed to harden is liable to kill them by suffocation.

*Rations for Ducklings.*—From one to four weeks old feed four parts wheat bran, one part oatmeal, one part low grade flour or fine shorts, a sprinkling of grit and 1-16 part of beef scrap soaked or scalded before mixing, plenty of green feed. Feed three or four times per day.

Ducklings from four to six weeks old should be fed three parts bran, one part fine shorts, beef scrap and green feed, oyster shell and grit.

Ducklings from six to eight weeks old or until ready for market feed equal parts of ground wheat, bran, finely ground oats, and fine shorts, increase the beef scrap to 10 per cent.

Ducks are hardy and grow rapidly, but contrary to the general impression will not thrive under wet conditions and require to be protected from rains.

When they are six or seven weeks old they should be confined to limited grass range and made ready for market. When properly fed they should be grown and ready for market by the time they are nine or ten weeks old to secure the greatest profit. It is advisable to have them ready for market at this time as they usually moult at 12 weeks old and it is unprofitable to carry market ducks through this moult.

## XVI.—GEESE.

The breeding of geese calls for different treatment to that of ducks. Geese require more liberal range and very little grain for food. In winter they may be housed in a shed or outbuilding that shelters them from wind and severe storms. At this time they may be fed largely on cabbage, pulped mangels, turnips, sugar beets or other succulent foods with a little bran and whole grain.

During the summer months little or no grain is necessary provided the geese have ample range in green pasture as they will thrive and do well on ordinary green grass pasture.

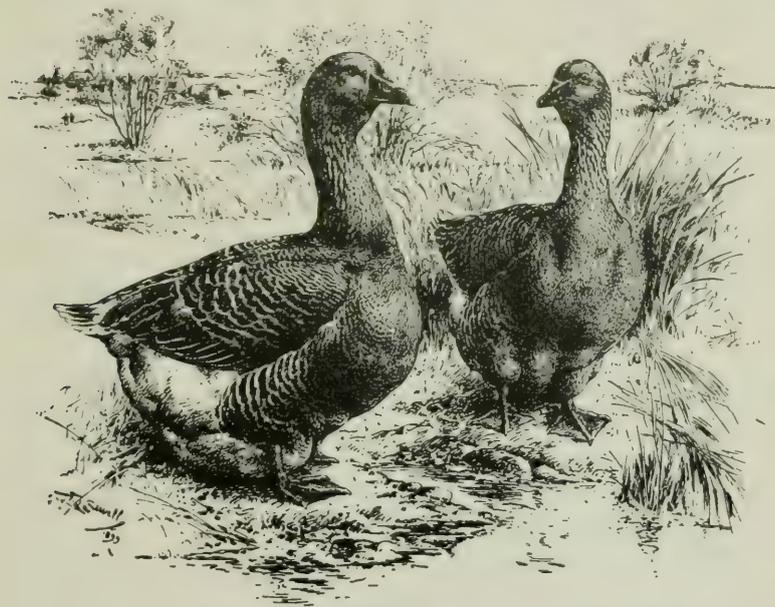


FIG. 54.

*Standard Breeds of Geese.*—The following are standard breeds: Toulouse, Embden, African, Chinese, Egyptian, and Wild or Canadian.

*Popular Breeds.*—Of these breeds the Toulouse, Embden and African are considered the best for commercial purposes owing to their being large with early maturing qualities.

*Mating and Breeding.*—For breeding purposes there should be one male to not more than two or three females. Geese are considered best for breeding purposes ranging in age from two to ten years.

*Rearing the Goslings.*—While the goslings grow and do well on green grass it is advisable to feed them a mash ration twice a day similar to that fed to young ducks.

## XVII.—DISEASES AND PARASITES.

The poultryman who makes constitution of first consideration as a characteristic of his breeding stock, who makes cleanliness his watch-word and who guards his flock against dampness and drafts is not likely to be much troubled with disease. Almost every sickness may be traced to one or another of the following causes: Weak constitution; poor food; foul, damp or drafty quarters; and a lack of exercise, sunshine and air. When the birds are strong and the quarters clean and bright, if disease occurs it is almost sure to be due to an infection introduced from a neighboring poultry yard or through birds brought in from shows or other outside places. It is of first importance, therefore, to attend to the prevention of disease.

### PREVENTION.

*Cleanliness.*—Clean the drop boards frequently enough to prevent decomposition and consequent foul odours within the building. It is necessary that this be more frequent in the summer than in the winter, and while the droppings might accumulate for a week in cold weather without any untoward results, in summer they require daily attention.

The same general principle applies to the floor. If the litter is deep and dry and the floor dry it may not require changing more than once a month. But the water and any wet foods that may be given, must be fed in such a way that they do not become scattered in the litter, for when the litter becomes damp then fermentation begins and disease follows.

The water tank and feeding troughs sometimes become sour. When such occurs scald them and have a care to feed no more than will be eaten up clean.

When the yards are so situated that they cannot be plowed and sown to clover or alfalfa or other succulent foods, they should be scraped every spring and fall and the refuse taken away. The ground may be sprinkled with unslacked lime and sprayed with water.

*Disinfection.*—House cleaning comes to a poultry keeper as well as to the house keeper. Twice a year the fixtures in a poultry building should be removed and all parts,—roosts, drop boards, nest boxes ceiling, floor and walls,—disinfected by the use of a spray pump, or a white-wash brush. A suitable mixture for spraying is a two per cent. solution of carbolic acid. Creolin, chloride of mercury and some of the patented preparations are used sometimes with equally as good results. A very thorough disinfection is sometimes accomplished by putting a pan of live coals in the house, adding

sulphur and closing all openings to the buildings for a few hours. Care must be taken that the fire is not within reach of any combustible material and that the building becomes well aired before the fowls are admitted.

*Fresh Air and Sunshine.*—The germs of most diseases can not live in fresh air nor in strong light. The poultryman can make use of this principle by having plenty of windows in his poultry houses and by placing them in such positions as to allow the direct sunshine to penetrate to every corner at some hour of the day. In the admission of fresh air care must be taken to avoid drafts because drafts give the birds colds. When colds occur the vitality is lowered and the bird is more susceptible to attacks of disease.

*Exercise.*—It is a well known principle that a liberal amount of exercise, but not sufficient to weary the body, produces the most healthy condition, and that inactivity tends to degeneration and weakness of constitution. In summer on free range or in large yards the question of exercise may be left to the birds; but in winter when the range is limited exercise must be induced, and the most satisfactory means is by feeding the grain foods in the litter thus necessitating a considerable amount of scratching.

*Separation.*—When a bird becomes ill separate it from the rest of the flock. By so doing the spread of an infectious disease may be averted.

Notwithstanding the fact that disease can generally be traced to some form of carelessness or mismanagement, birds become ill under the most careful management and apparently perfect cleanliness. In such circumstances it behoves the poultryman to treat his patients and forestall, if possible, a scourge. An outline of the symptoms and treatment of a few of the more common diseases is herewith given:

**HEAD AND LUNG TROUBLES.**—Under this come colds, roup, diphtheria, bronchitis and tuberculosis and they can almost invariably be traced to damp, filthy, dark or drafty quarters.

*Roup.*—This disease may usually be determined by the presence of a rattling noise and foul smell associated with the breathing. A discharge from the nostrils is usually present, and the eyes are sometimes swollen and watery. It is highly contagious and the affected birds should be isolated at once and the building, and particularly the drinking vessels disinfected. If the affected birds are not very valuable, the most satisfactory treatment is to kill them and burn the bodies. If the birds are valuable, prepare a two per cent. solution of permanganate of potash and hold the bird's head in it until the

solution is taken up into the head by breathing. Syringing the nostrils outward through the roof of the mouth with the solution usually effects a speedy cure.

*Colds and Diphtheria.*—These appear to the unprofessional eye as stages or forms of roup and may be treated in the same manner.

*Tuberculosis.*—This disease is detected in birds by much the same symptoms as in man or in cattle. It is usually associated with lack of thrift. The birds are poor in flesh, languid, and are not eager for their food. The lungs, liver and other organs show peculiar white spots, and the comb and face are pale in colour. The cure is so uncertain and unsatisfactory that it is usually better to kill the birds and burn the bodies, then disinfect the buildings. If general in the flock, the entire flock should be discarded and entirely new blood introduced.

**DIGESTIVE TROUBLES.**—These arise from over feeding, improper methods of feeding or unwholesome foods, and include indigestion, diarrhoea, sour and swelled crops, costiveness, etc.

*Indigestion in Chicks.*—When a chick is hatched it has in its body the yolk of the egg, which serves to keep it alive for several days. In fact chicks have lived for ten days without any food whatever. It is therefore plain that until sufficient time has elapsed for this yolk to become absorbed it is unwise to feed the chick. The cause of so many chicks dying in the early stages of rearing is that they have been fed too soon after a hatching. They have taken food into their crops that they cannot digest. Young wild birds of the poultry kind are not troubled in this way because they do not get their food until they are able to leave the nest and then they are fed little and often. The only treatment for this trouble is its prevention.

Other digestive troubles are not of much consequence in this province; but there are troubles other than indigestion which are directly traceable to the feeding.

*Cholera.*—All classes of fowl are subject to this disease which is a contagious and deadly form of diarrhoea. It may be distinguished by the yellow droppings in the early stage and a green color as the disease advances.

It is useless to attempt a cure. Birds showing symptoms of the disease should be killed and their bodies burned. Eradication may be accomplished by fumigating and disinfecting.

#### PARASITES.

The same conditions that induce disease are most favourable for lice and mites. They thrive in filth and gain a greater foothold as the body of the bird becomes weakened. Although some lice

may be found on most flocks, yet with clean, light, healthy surroundings they are in such small numbers as to be scarcely worth consideration. To be on the safe side it is necessary to exercise some precautionary measures which vary for the particular case.

*Body Lice*.—There are several varieties of lice which trouble poultry, as anyone may easily see if he examines birds at the head, below the vent, and the quills of the wings. Besides those which are peculiar to different parts of the bird there are two varieties of wandering lice, which may be found on any part of the birds or on the roosts. A good dust bath is of first importance for the treatment of lice and this should consist of light, friable earth. The fowls should be dusted with a powder containing a high percentage of finely ground tobacco or any one of the preparations on the market for killing lice. To dust a bird effectively it should be suspended by the feet with one hand and the powder sprinkled on while the feathers are thus open.

*Roost Lice*.—The roost lice feed on the birds at night, returning to the crevices of the roosts and walls during the day. Dust baths do not reach them and they can only be reached by treating their hiding places with solutions. An effective solution for the roosts, walls and other fixtures is kerosene emulsion, or any of the spraying solutions mentioned in this bulletin, or a solution of carbolic acid. These solutions do not destroy the eggs, consequently treatment, to be effective, must be repeated every few days for a couple of weeks, so as to catch the young as they are hatched.

*Scaly Leg*.—Poultry kept in dirty houses are often troubled with coarse scales on the legs. These are due to the presence of mites, which have burrowed beneath the scales. They are air breathing insects and the treatment consists of depriving them of air. This is done by applying a mixture of equal parts of sulphur and lard two or three times. It is a simple remedy and an efficacious one. A free application of an ointment made by mixing a teaspoonful of coal oil with a teacupful of lard is recommended. Another method is to dip the legs in a solution of naphthalene flakes in coal oil. Dippings repeated daily for three or four days usually work a cure.





