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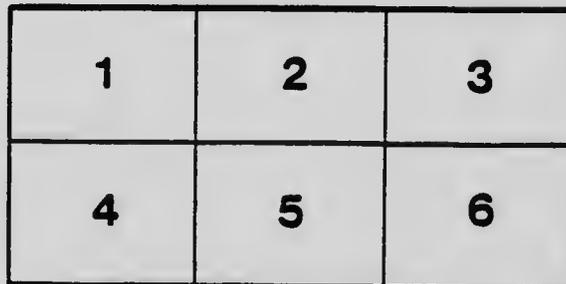
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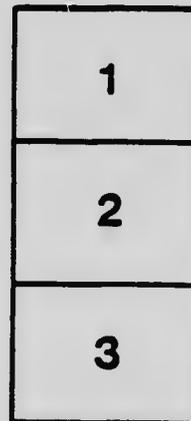
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POULTRY BRANCH

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POULTRY BULLETIN No. 2

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**PRACTICAL POULTRY KEEPING**

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PUBLISHED BY THE DIRECTION OF THE  
HON. DUNCAN MARSHALL, MINISTER OF AGRICULTURE.

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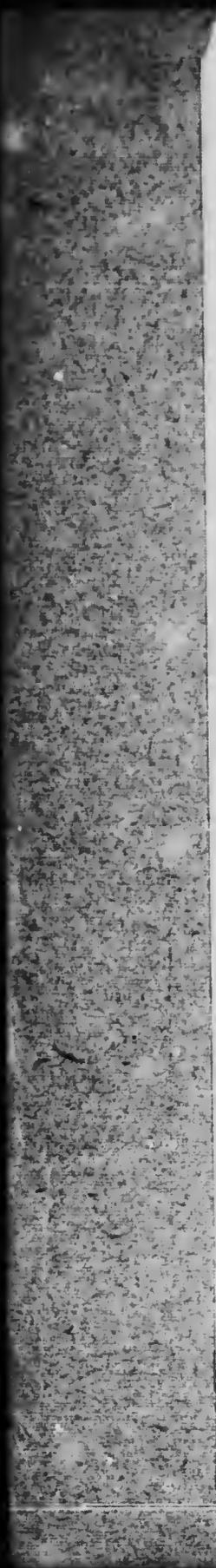
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1911



EDMONTON, May 1st, 1911.

HON. DUNCAN MARSHALL,  
*Minister of Agriculture,*  
Edmonton, Alberta.

SIR,—I beg to transmit herewith Poultry Bulletin No. 2, entitled "Practical Poultry Keeping," by Mr. A. W. Foley, Superintendent of the Poultry Branch of the Department, and to recommend that it be printed for publication.

I have the honour to be, Sir,

Your obedient servant,

GEO. HARCOURT,  
*Deputy Minister.*

## INDEX.

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	Page
I. The Poultry Industry.....	6
II. Poultry Houses and Fixtures.....	8
III. Commercial Poultry Plants.....	22
IV. Establishing and Developing a Flock.....	26
V. Strain Building for Egg Production.....	30
VI. Hatching .....	38
VII. Brooding and Rearing.....	46
VIII. Fattening .....	57
IX. Killing and Marketing.....	62
X. Winter Egg Production.....	66
XI. Poultry for Exhibition.....	74
XII. Diseases and Parasites.....	75

# PRACTICAL POULTRY KEEPING.

By A. W. FOLEY, POULTRY SUPERINTENDENT.

## INTRODUCTION.

The kind reception given Poultry Bulletin No. 1, "Advanced Methods of Poultry Farming," and the forward strides which the industry has made in the province since it was written, has led the writer to revise it and to incorporate the latest available and authoritative information on the subject as it relates to the province.

In preparing this bulletin, much of the information that appeared in "Advanced Methods of Poultry Farming" has been used. New phases of the industry have been taken up and it is hoped that the information presented will be of service to many throughout the province whether undertaking poultry raising commercially, for exhibition purposes, or as a pastime.



Fig. 1.—COSTLY HOUSES NOT NECESSARY. POULTRY HOUSE CONSTRUCTED OF POLES AND CLAY IN WHICH ONE OF THE BEST RECORDS FOR WINTER LAYING IN ALBERTA WAS OBTAINED.

Page

6

8

22

26

30

38

46

57

62

66

74

75

## 1.—THE POULTRY INDUSTRY.

Throughout the Province of Alberta, 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 that are made annually from the eastern provinces, the United States, and even from Australia. 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 market for a greater interest in the production of poultry products. During the winter months of 1909 and 1910, fresh eggs were selling at from 50c to 60c per dozen. The lowest price was reached the last week of April and the first week of May, when they retailed at 20c per dozen. By the middle of May the price had again risen 5c per dozen, gradually increasing as the season advanced. It is estimated that the Canadian hen laid 125,000,000 dozen eggs in 1910. In the production of this amount, the Alberta hen plays a most insignificant part. The same will apply to the supply of dressed poultry.

On investigation at many points throughout the province, it is found that in some districts the farmers themselves are the largest purchasers of bacon, condensed milk, butter and eggs at the local stores. They are so engrossed with the larger departments of farming that they lose sight of the market demands for food products. The western farmers are growing the grain for the farmers of the eastern province to convert into bacon, butter, cheese, and poultry products, and ship these back to the farmer and other citizens of the western province to consume. If this is profitable to the eastern producers who have to pay transportation and a considerable advance on the price that the Alberta grain grower receives, how much more profitable should it be to the Alberta farmer who has the grain at first cost and the market at his door. This surely demonstrates the advisability of turning the coarse products of the farm into finished products of high value easily placed on the market and thus securing a large portion of the highly increased market value which the double freight charges now cause.

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 for the future as there is a market demand in British Columbia for any surplus there may be. In 1909 the importation of poultry products to this province amounted to \$2,447,500, which was increased in 1910 by more than a half million dollars. Owing to the geographical situation of the province of British Columbia it is the natural outlet, and with the completion of the transcontinental railroads now under construction this province will have access to the best markets of the Dominion. 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 to-day 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 production 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 that when greatly increased numbers are kept an equivalent 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 result 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 an entirely different consideration in the matter of capital and equipment and will be dealt with elsewhere in this bulletin.

## II.—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 or mud 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 are worthy of 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 conveniently reached for feed rooms and water supply.

*Dryness.*—If a dry situation cannot be obtained it is better to stop at once or provide suitable drainage. The site selected for building 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 should be suitable for the growing of grass or alfalfa as green food.

**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 insure 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. 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 insuring 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 insure 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 through the fine meshes of the cotton so slowly that the moisture in the rising air is carried off without causing a draft.



Fig. 2.—POULTRY HOUSES AT ALIX, 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 roof 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, for by this means the moisture is taken from the straw and carried off from 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 in the ends, good results may be obtained by removing a portion of the roof 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 insure a complete circulation of air. When the ventilation fails to remove the moisture 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 therefor, 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.



Fig. 3.—POULTRY HOUSE SHOWING LIGHT AND VENTILATION THROUGH ROOF.

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.

(3) Finished on the outside as in No. 1 satisfactory results have been obtained by nailing lath on the inside of the studding and rafters and stuffing the space with chaff and straw, as shown in Fig. 4.

(4) A house may be constructed of one thickness of any siding material with cotton front as illustrated in Fig. 11. Elsewhere will be found temperature records of different houses thus constructed and in use at the Provincial Poultry Station.

In a number of experiments conducted at the Provincial Poultry Station, Edmonton, with differently constructed houses, there was no



Fig. 4.—INTERIOR OF CURTAIN FRONT HOUSE, SHOWING  
NESTS, DROP BOARD, DROP CURTAIN AND STRAW FILLING

apparent difference in results that would warrant any particular  
of construction. It may be said, however, that the health  
appearance so desirable in a flock was most apparent in the house  
constructed of one thickness of lumber and with a cotton front.



Fig. 5.—GENERAL PLAN OF SINGLE STYLE OF POULTRY HOUSE

This style is in general use all over the continent and many  
of them are giving entire satisfaction in the province. It is, with  
the most economical and practical for the average breeder to build  
is simple in construction, requires less material than the double  
and admits the sunlight to the roosts and rear wall. This house has  
the shanty roof pattern, the front studding being 8 ft., and  
6 ins. The manner of construction in general is similar to the  
double style, excepting that the single house should be paper  
boarded with tongued and grooved lumber on the inside of the  
throughout.

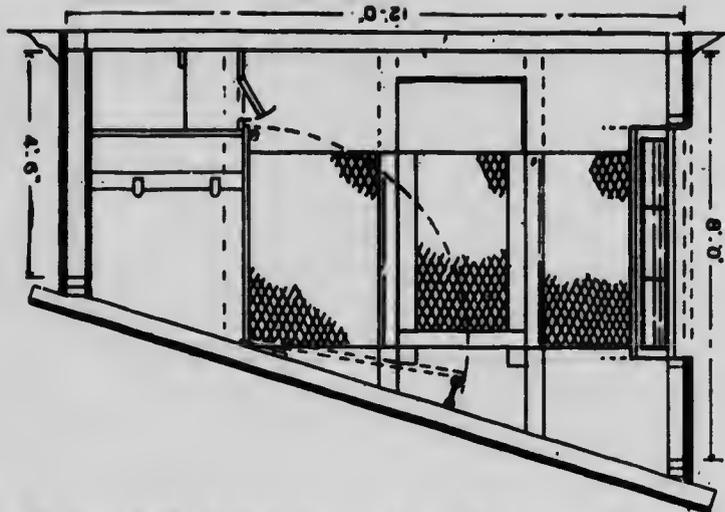


Fig. 6.—CROSS SECTION OF SINGLE STYLE OF POULTRY HOUSE.

The partition doors in this house are placed about 3 ft. from the front, as shown in Fig. 6. That part of the partition between the roosting quarters should be made of tongued and grooved lumber to the roof, and the ceiling should be boarded with the same material. A frame covered with burlap can be hinged in front of the roosting quarters (Fig. 7), as a means of extra protection in case of severe weather. This house is usually made 12 ft. in width, and the pens from 10 to 12 ft. long, accommodating from 25 to 30 hens. Fig 8 shows the floor plan.

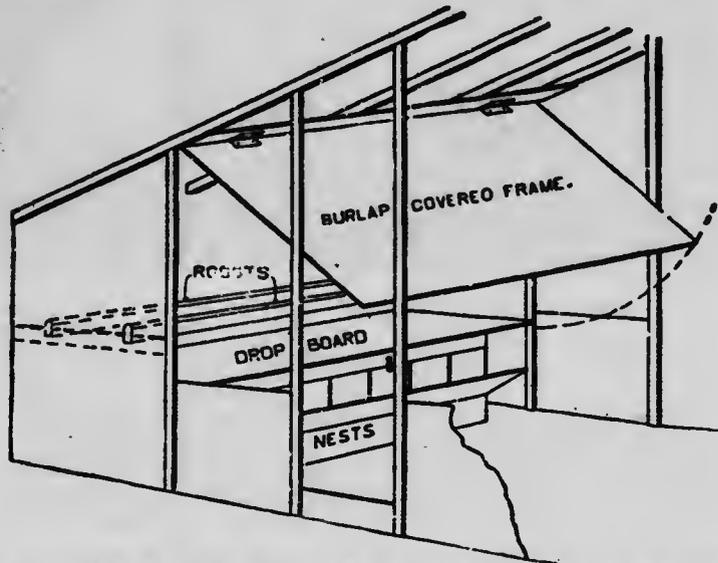


Fig. 7.—INTERIOR VIEW OF SINGLE STYLE OF POULTRY HOUSE, SHOWING POSITION OF NEST, DROP BOARD, AND BURLAP CURTAIN.

SHOWING ROOSTS,  
RAW FILLING.

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POULTRY HOUSE.

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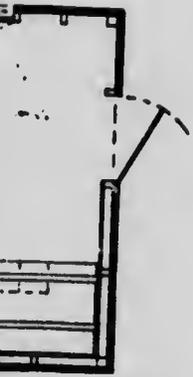
Fig. 8.—FLOOR PLAN OF SINGLE STYLE OF POULTRY HOUSE.

Houses have been built in the province with only one ply of paper on the outside of the studding and these have proved satisfactory. One of these houses was built with the studding set so that a strip of paper would just cover the width between studs, the paper being put on vertically. When the boards were on, a couple of lath were put over the paper on the inside between each pair of studs to hold it in place and prevent any bulging.



Fig. 9.—DOUBLE STYLE OF POULTRY HOUSE WITH LOFT, AND SCRATCHING SHEDS IN CENTRE, SHOWING SCRATCHING SHEDS ENCLOSED WITH COTTON AND WIRE.

On the inside of the studs the paper was put on in the same way, *i.e.*, vertically instead of horizontally. Though the house built in this way has given every satisfaction for two winters, whether it will continue to do so remains to be seen. The secret of the success of this method probably lies in the care that was taken in putting on the paper. The paper was carefully closed, no tears were made in the paper, and the enclosure was tight so that an actual dead air space existed in the wall when completed.



POULTRY HOUSE.

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Fig. 10.—POULTRY HOUSE SUITABLE FOR TOWN OR CITY LOT.

**THE CURTAIN FRONT HOUSE.**—During recent years considerable has been said in favour of the curtain front house. For the past two years experiments with houses of this construction have been conducted at the Provincial Poultry Station and have proved so satisfactory that a house 8 feet wide and 72 feet long was erected.

This house was also constructed as an experiment in producing a cheap house as it consists of one thickness of V-joint lumber throughout. Experiments are also being made with different methods of venti-

Fig. 11.—COTTON FRONT HOUSE IN USE AT PROVINCIAL POULTRY  
STATION, EDMONTON.

lation and for this purpose the house is divided into three divisions of two pens each.

The general plan of this house is as follows:

Front studding 6 feet 4 inches. Rear studding 4 feet 6 inches. Pen partitions 19 feet apart. The roosts and drop boards are constructed as illustrated on page 19, but the nests instead of being under the drop board are placed at the end of the roosts on the rear wall, two feet from the ground, three nests deep. By this arrangement the birds have the full floor space of the pen as illustrated in Fig. 4.

The front is boarded 18 inches from the ground and above this cotton is used on frames as illustrated. These frames are hinged to swing inward, and are fastened to the ceiling when open. The openings are covered with poultry netting to enclose the birds.

**EXPERIMENTS IN HOUSING.**—During the winter of 1910-11 extensive experiments were made with the object of ascertaining the temperatures of the different styles of houses. These experiments will be of special interest to poultry raisers of Canada. They are at least unique in that they were made at the most northerly poultry experiment station in the Dominion.

The houses in which the records were taken were constructed as follows:

Fig. 16 was constructed with clapboard and paper on the inside of studding and clapboard, paper and drop siding on the outside.

Fig. 11 of one thickness of V-joint lumber with cotton front.

Fig. 12 of one thickness of V-joint lumber with glass window.

Fig. 13 of one thickness of V-joint lumber with cotton window.



Fig. 12.—COLONY HOUSE,  
GLASS WINDOW.

Fig. 13.—COLONY HOUSE,  
COTTON WINDOW.

In each of these houses a drop curtain was used in front of the roosts.

For comparison of these different houses during cold weather the maximum and minimum reading of the thermometer for January the 13th, the coldest day of the winter may be used. The maximum reading was 20 degrees below zero while the minimum was 55 below zero.

The house illustrated in Fig. 16 recorded a maximum of 7 and a minimum of 18 degrees below zero, while house illustrated in Fig. 11 recorded a maximum of 11 and a minimum of 18 below, which was slightly in favour of the cotton house.

Figs. 12 and 13 represent two houses constructed exactly alike with the exception that Fig. 13 has a cotton window, while Fig. 12 has a glass window. On the above date the house with the glass window recorded a maximum of 2 degrees below zero and a minimum of 40 degrees below zero, while the house with the cotton window recorded a maximum of 4 and a minimum of 26 below zero. In comparing the temperature of these houses there was thus a difference of 6 degrees in the maximum and 14 degrees in the minimum in favour of the house with the cotton window.

It may be noted, however, that during the mild weather of early spring towards the end of February there were at times a slight difference in favour of the house with the glass window. This was no doubt due to the fact that the sun's rays penetrated the glass and warmed the pen.

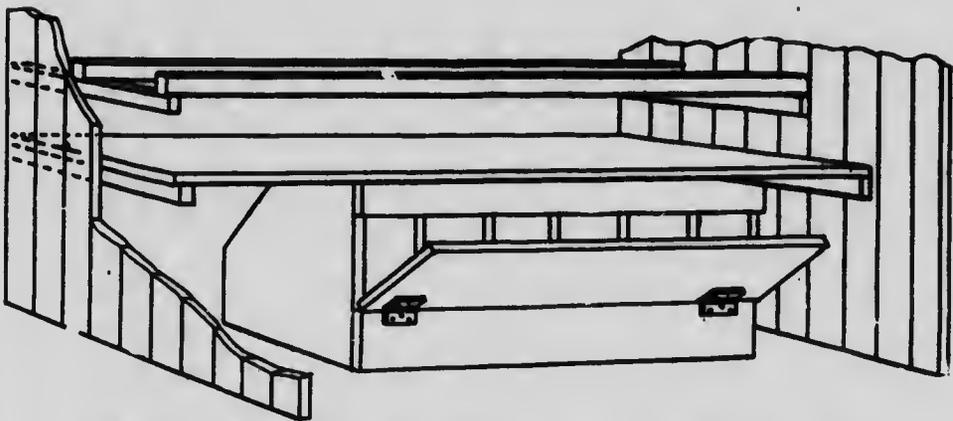


Fig. 14.—INTERIOR FIXTURES, SHOWING HOW ROOSTS, NESTS, AND DROP BOARDS SHOULD BE CONSTRUCTED IN ORDER THAT THEY MAY BE EASILY REMOVED.

REMOVABLE FIXTURES.—The roosts, nest boxes, drop boards and in fact all interior fixtures, should be constructed and put up in such a way that they may be easily removed for cleaning and disinfection. Fig. 14 illustrates how they may be arranged with advantage in any house. The roosts should rest in sockets, and the drop boards s

not be nailed in place, but simply rest on the cleats at the ends. Fig. 11 shows the general plan of constructing a nest box which can be adapted to any situation whether under the drop-board 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 Fig. 4.

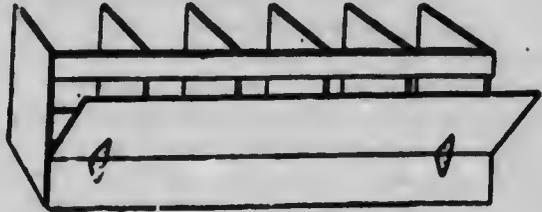


Fig. 15.—PLAN OF NEST BOX.

TABLE OF TEMPERATURES FOR THE VARIOUS STYLES OF HOUSES  
WINTER 1910-11.

For the last half of the month of December:

Date	Outside		House No. 10		House No. 11		House No. 12		House No. 13	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
15	..	..	42	34	46	38	40	30	40	28
16	..	..	56	36	43	36	46	31	45	27
17	..	..	43	34	49	39	46	26	38	26
18	..	..	..	..	..	..	..	..	..	..
19	46	35	45	40	43	40	40	23	42	35
20	..	..	..	..	..	..	..	..	..	..
21	-8	26	37	40	52	34	51	30	43	31
22	28	10	35	34	33	13	34	14	34	18
23	20	6	36	20	22	20	23	15	26	18
24	36	14	36	20	40	23	33	22	38	20
25	38	16	40	20	44	26	42	24	40	26
26	36	10	38	22	40	20	40	20	40	20
27	40	0	40	20	36	13	38	19	36	10
28	18	-3	26	15	25	6	20	3	40	10
29	6	6	26	5	4	2	20	2	18	-5
30	3	-11	18	10	12	6	10	0	6	-4
31	4	-24	16	4	2	1	10	-3	0	-9

TABLE OF TEMPERATURES FOR THE VARIOUS STYLES OF HOUSES  
WINTER 1910-11.

For the month of January:

Date	Outside		House No. 10		House No. 11		House No. 12		House No. 13	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	-16	-43	6	-6	13	-16	2	-26	2	-25
2	30	-33	20	-4	22	-14	22	-22	20	-22
3	46	15	40	20	50	16	40	20	40	20
4	48	6	32	26	41	24	24	20	24	64
5	44	-11	67	66	39	26	27	24	26	22
6	22	-10	69	61	64	24	40	24	40	24
7	26	17	22	25	66	22	22	24	20	22
8	22	-10	20	22	26	6	20	6	29	4
9	-3	-22	1	0	6	-6	11	-12	10	-20
10	-17	-32	1	-6	24	-15	0	-16	-3	-16
11	-22	-42	17	-2	15	-10	11	-16	2	-20
12	-22	-44	17	-10	11	-12	11	-26	12	-26
13	-20	-55	7	-16	11	-12	4	-26	-2	-40
14	0	-42	20	-11	27	-20	21	-27	17	-2
15	6	-20	20	4	22	-2	16	-7	12	-11
16	-2	-17	12	7	22	-2	7	-5	10	-4
17	6	-17	27	15	27	0	10	-6	14	-6
18	-1	-20	27	2	25	-5	10	-12	10	-10
19	-6	-16	20	2	12	1	6	-4	14	-6
20	10	-22	20	-2	16	0	12	-5	16	-6
21	10	-16	64	14	12	2	17	-1	24	-2
22	22	-4	22	17	24	11	25	6	25	6
23	22	1	60	10	20	2	69	19	60	16
24	6	-16	60	4	11	6	14	-6	12	-10
25	-12	-61	11	6	14	2	6	-12	0	-12
26	-15	-26	15	6	16	-6	4	-14	6	-16
27	-10	-40	6	-12	4	-2	0	-22	0	-66
28	-5	-15	6	0	12	1	14	-4	14	-6
29	64	-25	64	-6	25	6	60	-10	22	-12
30	62	-6	60	10	20	22	60	-12	22	10
31	0	-65	61	-4	66	-1	15	-16	10	-17

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TABLE OF TEMPERATURES FOR THE VARIOUS STYLES OF HOUSES  
WINTER 1910-11.

For the month of February:

Date	Outside		House No. 16		House No. 11		House No. 13		House No. 12	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	14	-15	16	-6	18	5	12	-6	8	-12
2	-2	-44	8	-8	16	-20	6	-22	8	40
3	15	-5	20	6	30	2	28	-6	32	-4
4	18	-4	31	16	23	12	26	6	29	2
5	..	..	..	..	..	..	..	..	..	..
6	20	-24	34	4	40	-2	30	-12	32	-14
7	38	-10	84	10	38	6	32	-3	36	-4
8	30	6	40	24	41	21	38	15	41	16
9	38	0	37	21	87	15	32	4	35	0
10	36	0	40	20	44	15	44	6	44	10
11	46	-4	37	22	38	18	34	4	34	0
12	26	6	42	23	48	18	44	8	44	10
13	30	9	40	24	40	22	36	10	36	10
14	82	-2	40	23	46	22	47	14	46	10
15	22	-5	40	26	38	22	42	8	34	8
16	19	-22	32	20	34	14	28	0	32	-40
17	24	-22	34	8	32	0	33	-14	34	-12
18	27	-4	32	7	40	0	38	-12	40	2
19	28	-6	42	14	38	10	44	0	38	-2
20	26	-2	40	20	41	14	38	-2	33	4
21	30	-4	38	10	40	14	36	2	32	6
22	48	4	44	13	42	14	44	0	44	4
23	43	2	50	23	55	14	55	6	42	12
24	36	20	50	22	54	40	47	34	50	35
25	25	7	47	22	46	21	42	23	46	30
26	35	-4	34	22	27	23	34	12	35	17
27	44	-4	42	15	42	15	52	0	47	5
28	44	11	49	18	55	16	49	16	52	20

TABLE OF TEMPERATURES FOR THE VARIOUS STYLES OF HOUSES  
WINTER 1910-11.

For the month of March:

Date	Outside		House No. 16		House No. 11		House No. 13		House No. 12	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	50	8	59	25	66	23	61	13	62	18
2	39	22	48	37	47	33	43	27	48	33
3	36	15	42	30	46	28	38	20	40	24
4	28	15	46	30	54	28	44	20	45	22
5	30	9	40	22	42	20	40	12	44	16
6	36	10	46	22	41	22	40	14	44	16
7	26	8	38	23	33	21	37	20	40	17
8	42	6	34	20	36	20	34	10	34	16
9	32	11	37	25	40	23	40	16	36	20
10	54	15	52	23	62	28	60	18	56	20
11	41	-5	42	18	50	16	44	2	42	4
12	55	18	51	27	56	28	55	20	53	23
13	57	28	56	36	61	37	58	30	58	34
14	32	13	42	21	48	24	42	17	44	17
15	38	23	52	43	54	40	53	40	54	40
16	51	28	58	38	58	26	45	30	46	35
17	56	35	56	27	52	36	58	22	55	25
18	52	37	48	36	46	33	50	32	50	35
19	60	38	62	43	53	38	64	40	65	42
20	62	24	64	37	68	38	62	28	64	34

### III.—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 product 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 a better condition for breeding purposes.

It is desirable to have the range so laid out that the ground can be cultivated occasionally to insure 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 favour of either system. The continuous house system has the advantage of housing the birds in a more compact manner, making conditions more favourable for feeding and caring for the breeding and laying stock. Usually the feed and store room is located



Fig. 16.—CONTINUOUS HOUSE—PROVINCIAL POULTRY STATION, EDMONTON, SHOWING FEED ROOM IN CENTRE AND LOFT ABOVE. THE INCUBATOR AND NURSERY ARE LOCATED IMMEDIATELY BEHIND.

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Fig. 17.—COLONY HOUSE SYSTEM IN USE AT MACDONALD COLLEGE, QUE.

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.

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.



Fig. 18.—COSTLY HOUSES ARE NOT NECESSARY. A NEAT LOG HOUSE AT SPRUCE GROVE, WHERE HENS AND CHICKENS ARE SUCCESSFULLY HOUSED.

**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 labour saver in many ways.

#### IV.—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.

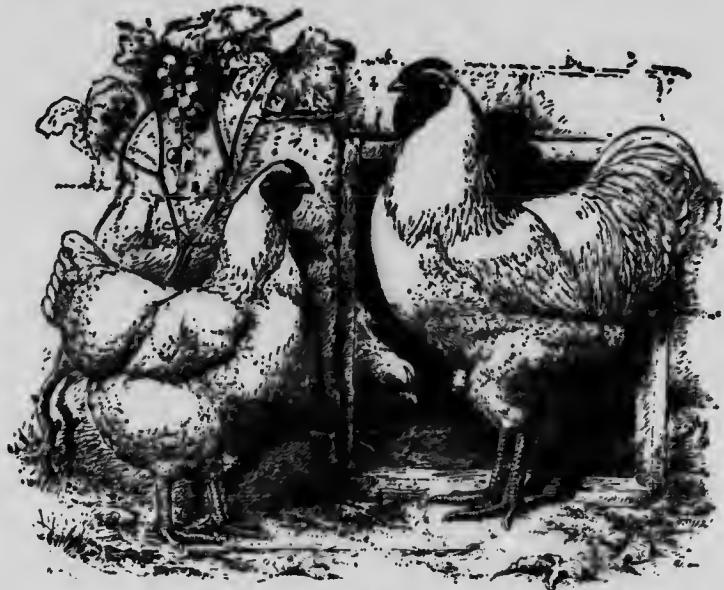


Fig. 19.—WHITE WYANDOTTES.

**CHOOSING A BREED.**—After having decided how to start, the next consideration is that of breed. Which is the best breed? This is

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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 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.

#### UTILITY BREEDS RECOMMENDED.

Plymouth Rocks—Barred, Buff, White and Partridge.

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

Orpingtons—Buff, Black and White.

Rhode Island Reds.

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



Fig. 20.—BUFF ORPINGTONS.

Figs 19, 20, 21 and 22 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

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Fig. 21.—BARRED PLYMOUTH ROCKS.

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 to the front.

Legs.—Short, stout, and set well apart, white or yellow 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 different breeds. The trap nest method of selecting birds has been 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 BREED 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 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 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 breeder. By having a type fixed in his mind and by selecting for his 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.

## V.—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 foundation 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.

**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 the 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. 23 shows a common type of leg band and Fig. 24 the same applied to the leg.



Fig. 22.—RHODE ISLAND REDS.

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Fig. 23.—LEG BAND.



Fig. 24.—LEG BAND ATTACHED.

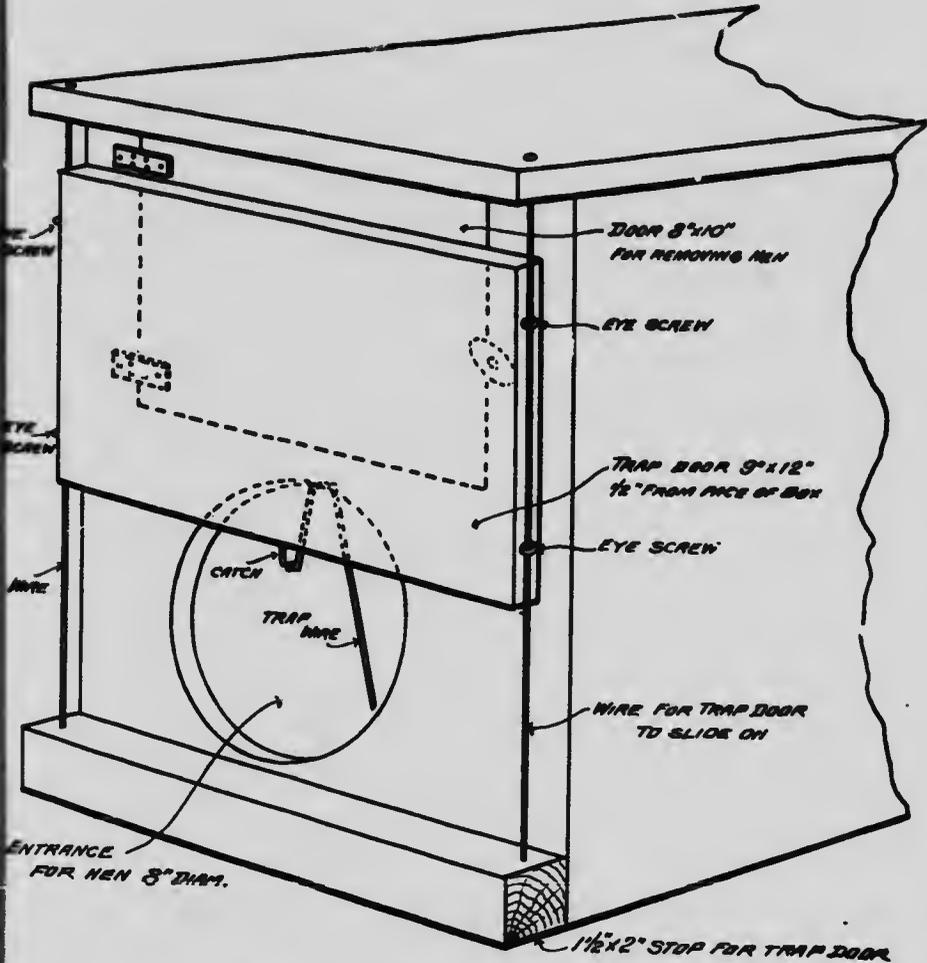


Fig. 25.—THE FOLLY TRAP NEST.

*Foley Trap Nest.*—This style of trap nest (Fig. 25) is made as follows:

The front of the nest box should be 14 inches wide and 20 inches high; 2 inches from the bottom a circular hole 8 inches in diameter is cut. A door is placed at the top 8 by 10 inches square by which the hen is removed. The trap consists of a board 10 inches square, with an eye-screw on each side. The door slides up and down on a No. 9 wire passing through the screw-eyes of the trap door.

This trap may be more easily made by substituting a groove for the eye-screws and wires. In making a single nest a strip one inch wide should be placed on a horizontal strip one-quarter inch wider than the thickness of the trap door making the groove in the form of an "L." When a number of nests are being made together, the face strip should be 2 inches wide forming a T, making a groove for the ends of two doors. A nail bent in the shape of an "L" and filed flat on the bottom side is driven into the centre of the bottom of the trap door with the bottom part of the "L" projecting toward the inside of the box. About one inch above the middle of the entrance a hole is bored large enough to admit a No. 9 wire that is bent as shown. The top side of the bent piece of wire upon which the nail of the trap door rests is also filed flat, and the trap is set by placing the "L" shaped nail of the trap door on the wire as illustrated. The wire hangs on the inside of the nest box as shown. The hen in passing through the entrance on either side of the wire moves it enough to release the trap door and lock herself in. The length of this nest may be from 16 to 20 inches.

*The Maine Trap Nest.*—This trap nest has been used with satisfaction at a number of poultry stations. It is very simple, inexpensive and easy to attend and certain in its action.

It is a box-like structure, 28 inches long, 13 inches wide, and 11 inches deep, inside measurements. Fig. 26 shows the frame work and general plan of the nest, while Fig. 27 shows the trap set ready for use. A division board with a circular opening 7 1-2 inches in diameter is placed across the box, 12 inches from the rear and 15 inches from the front. The rear section is the nest proper. Instead of a tight door at the entrance, a light frame of 1 by 1 1-2 inch stuff is covered with wire netting of a 1 inch mesh. The door is 10 inches square and does not fill the entire entrance, a space of two inches being left at the bottom and one inch at the top with a good margin at each side to avoid friction. It is hinged at the top and swings into the box. The hinges are placed on the front of the top of the door rather than at the centre or rear, the better to secure complete closing action. The trap consists of one piece of stiff wire about three-sixteenths of an inch in diameter and 22 inches long. This piece of wire is shaped so that a section of it, 11 inches long, rests directly across the circular opening in the division board and is held in place by two clamps, one on either side of the circular opening. The clamps fit loosely and the slots are long enough to allow the wire to work up and down about six inches, without much friction. The next section of wire is 8 inches long, and is bent so that it is at right angles with the 11 inch section and passes along

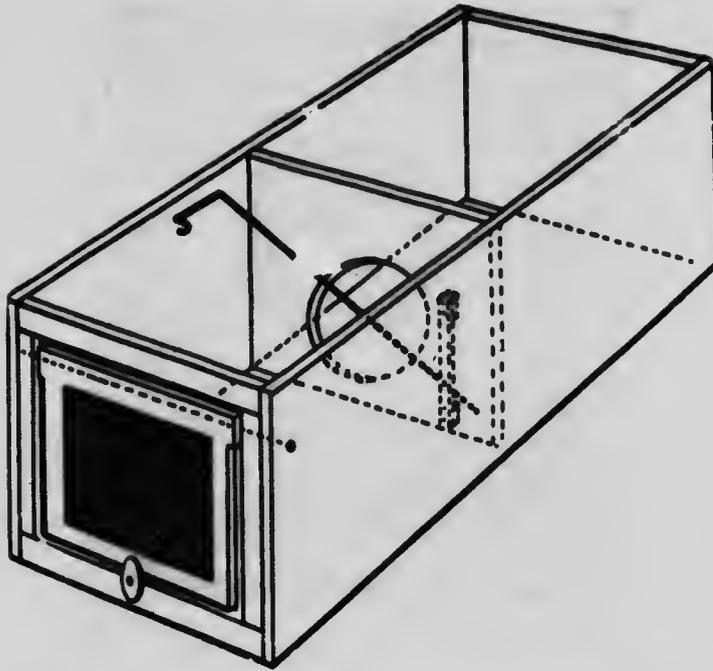


Fig. 26.—FRAME WORK OF THE MAINE TRAP NEST.

the side of the box 11 inches above the floor toward the entrance door, and is fastened strongly to the wall by staples, but yet loosely enough that the wire can roll easily. The remaining section of the wire, which is three inches long, is bent toward the centre of the box, with an upward inclination, so that it supports the door when the latter is open. The end of the wire is turned over smoothly forming a notch into which the door may slip when opened.

As the hen passes under the open door and then through the circular opening to the nest, she raises herself so that her keel may pass over the lower part of the division board. In doing so her back presses against the horizontal wire and lifts it enough that the end supporting the door slides from under it. The door swings down and passes a wire spring (near the bottom of the box at the entrance), which locks it and prevents the hen from escaping and the others from entering. A strong button can be attached to the centre of the box at the bottom of the outside to hold the door in position when closed. By turning the button the door can then be swung outward to release the bird.

While the trap nests herewith illustrated are simple in construction, there are many other styles that are equally effective. There are many traps in use to-day of local invention and no difficulty should be experienced in inventing some simple device that will prove satisfactory.

**VISITING THE TRAP NESTS.**—It is advisable to visit the traps three or four times daily to release the birds that have laid. These visits

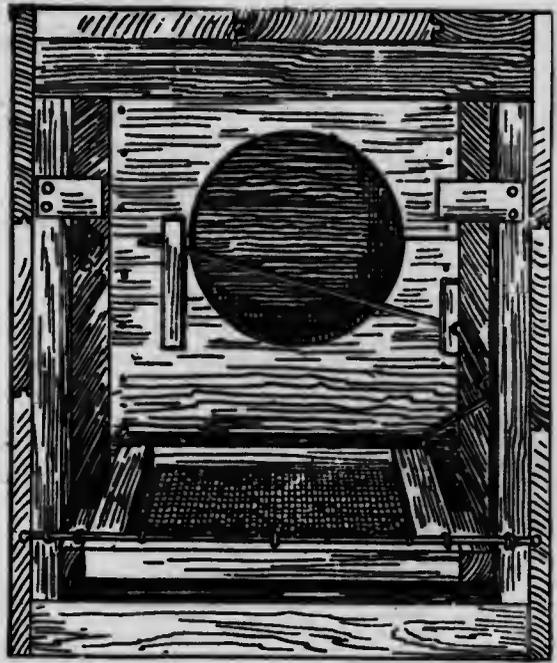


Fig. 27.—MAINE TRAP NEST SET READY FOR USE.

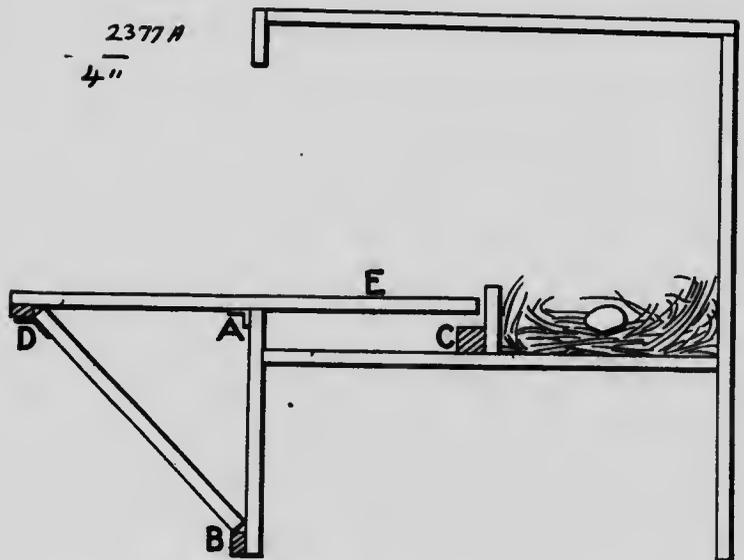


Fig. 28.—A HOME-MADE TRAP NEST OF SIMPLE DESIGN.

can usually be timed to occur when feeding or watering the birds. In the winter time it is necessary to gather the eggs often owing to the danger of their being frosted if allowed to remain too long in the nests.

**OBJECTION TO TRAP NESTS.**—Objection is sometimes taken to the use of trap nests owing to the necessity of visiting the pens several times each day. It is, however, unnecessary to continue the trapping throughout the year as the winter months are sufficient to give the poultryman a general idea as to which are his best layers and at this season of the year most poultrymen have considerable leisure time that might be profitably spent in the hen house if his hens are giving satisfactory laying returns.

### ALBERTA EGG RECORDS.

As an illustration of trap nest work the record of a pen of Buff Orpingtons at the Provincial Poultry Station for the winter months is herewith given. This record for four winter months is no doubt better than the average returns from the poultry of the province, but it shows what can be done when attention is given to the matter of feed. The eggs from which these pullets were hatched were purchased from different Orpington breeders throughout the province and may reasonably be considered representative of the poultry in Alberta.

It will be noticed in the record for the month of January that no two hens laid the same number of eggs and that the number ranged from 2 to 17 eggs. It will also be noted that the temperature of the pen dropped very low at times, giving a range from 28 degrees above zero to 18 degrees below zero, and that during the month at no time was the temperature above freezing point. The conclusion to be drawn is that when a record of this kind is made from birds where no particular attention was paid to develop laying strains, a much greater number of eggs could be produced during the winter months if more attention were given to breeding, and to feeding for egg production.

During the four winter months the records of the various hens varied to as great an extent as during the month of January, *i.e.*, from 5 to 61 eggs. It will also be noted that the pullets that laid during January laid the most eggs during the test. While the records of a few of these birds may be considered fairly good and much above the average in Alberta, it is far from what is possible.

Reference to the Dominion census of 1901 shows that the average number of eggs laid per hen during the year was 90, while the average in Alberta was but 40. That we are far from securing the best results possible may be understood by referring to an egg record made at Hawkesbury Agricultural College, New South Wales, where a pen of Black Orpington hens averaged 243 eggs during the year. This is an exceptionally good pen record. A press report of the 1909 session of the American Poultry Association at Niagara Falls shows that new individual records have been established in that a Barred Rock hen is reported as laying 285 eggs in one year. This is followed by a White Leghorn with 279 to her credit.

While it may be the work of a lifetime to produce such layers as these it is a certainty that if more attention were given to the little details the average poultryman will be abundantly repaid in egg supply. In poultry raising it is the attention to details apparently insignificant which plays an important part in filling the egg basket.

## EGG RECORD.

PROVINCIAL POULTRY STATION AT EDMONTON, ALTA.

Pen No. 7. Breed, Buff Orpingtons. Month, January, 1909.

Hen No.	572	18	67	12	2	3	24	46	47	8	14	20	22	293	T'ls	Temp. of Pen.
1	1															18a
2	1	1	1													8a
3	1	1														10a
4	1															8b
5			1													15b
6		1		1	1	1	1	1	1							3b
7				1	1	1		1	1	1	1					18b
8		1			1		1			1		1				4b
9				1	1					1	1	1				8b
10	1	1		1	1	1	1	1		1	1	1				4a
11	1			1	1	1						1				10a
12	1			1		1	1		1							6a
13				1					1			1				0
14				1	1				1	1	1					15b
15	1						1	1	1				1			0
16				1	1			1	1	1						6a
17	1			1	1											12a
18	1			1												15a
19									1							24a
20				1	1		1					1				20a
21	1			1								1				22a
22									1			1				16a
23				1	1											2b
24	1			1	1		1									5a
25													1			10a
26	1			1	1											20a
27	1				1								1			28a
28				1			1									15a
29	1				1			1	1				1			2a
30				1	1					1						15a
31	1						1		1				1			
T'ls	16	5	2	17	16	4	9	5	13	7	4	7	5	110		



## VI.—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 insure 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.



Fig. 29.—TESTING EGGS.

**NATURAL INCUBATION.**—While the incubator is recommended as being the most practical system of incubation, there will always be many farmers and others with small flocks who for lack of capital or a desire to pay special attention to their poultry prefer natural incubation. It is the good old-fashioned way and most excellent results can be obtained with practically no expense.

When setting a hen she should be well dusted with some louse killing powder to ensure her being free from vermin. This should be done a couple of times before the eggs are placed under her. During the incubation the hen should be fed a sufficient quantity of clean wholesome food and plenty of drinking water.

The eggs should be tested the seventh day in the same way as those in incubators, removing the infertile and those in which dead germs appear. If a number of hens are set at the same time the fertile eggs, after testing, can be rearranged under the hens necessary to cover them and the remainder of the hens reset. At the end of the second week of incubation it might be well to again give the hen a light dusting of insect powder to insure her being free from lice when the chicks hatch. The nests should be examined every day to see that they are in good condition and remove any eggs that may be broken. If the nests have become foul, the straw or other material used should be replaced.

The eggs should again be tested on the 14th or 15th day removing any in which the chicks have died. After the 19th day food should be

withheld from the hen as the chicks begin to pip on the 20th day and the hen will not likely want to leave the nest at this time; besides, it is desirable that she should not.

With the natural as with the artificial incubation it is well to allow the chicks to remain quietly in the nest for from 24 to 36 hours, when both hen and chicks may be fed.

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. 43 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.

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 is satisfactory. Care, however, should be taken that the position of the incubator is such that it will not come directly in the line of any draft, nor where the rays of the sun can fall on it.

*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 interchanged 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 tempera-

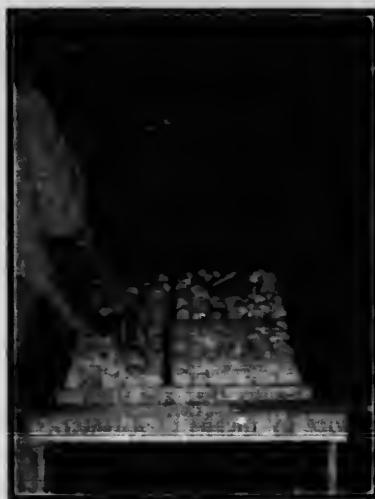


Fig. 30.—COOLING THE EGGS BY TOUCH RATHER THAN TIME.

ture 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 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, other than those of the water fowl. 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.

*Testing the Eggs.*—All eggs that are undergoing incubation should be examined at least twice by means of a tester. The first test should be made at about the seventh day. An egg tester usually accompanies an incubator but to those who may not have one Fig. 31 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

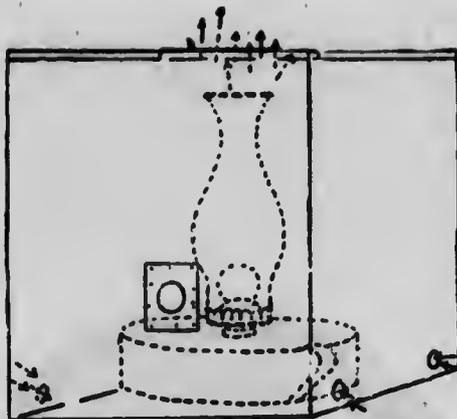


Fig. 31.—HOME MADE EGG TESTER.

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.

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. In a room that is not too cold, the egg-tray and eggs may be removed from the incubator, and the cooling conducted while the eggs are being tested.

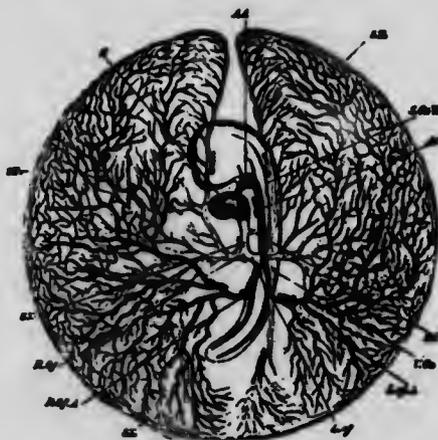


Fig. 32.—DIAGRAM OF THE CIRCULATION OF THE YOLK-SACK AT THE END OF THE THIRD DAY OF INCUBATION.

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 radiat-

ing from it, making a spider-like appearance, as shown in Fig. 33. These eggs should be replaced in the machine, and those clear or infertile 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. 33.—CHICK AT FIFTH DAY OF INCUBATION, SHOWING ALLANTOIS, OR TEMPORARY LUNG THROUGH WHICH THE CHICK BREATHES DURING INCUBATION.

*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. 34.—SEVENTH DAY, SHOWING ALLANTOIS MORE DEVELOPED.



Fig. 35.—FINAL STAGE OF INCUBATION—ABSORBING THE YOLK-SACK.



Fig. 36.—CHICK READY TO BREAK THE SHELL.

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.

## VII.—BROODING AND REARING.

For brooding and rearing chicks the combined brooder and colony coop is recommended. It will be found more efficient and less expensive than using outdoor brooders and coops. Three suitable styles are herewith submitted.

**BROODER HOUSES.**—*The "A" Shaped Style.*—The floor space of the house is 6 feet by 8 feet. Under the floor, about 18 inches from the outer edges are placed runners, which may be made of 2 by 4 inch scantling bevelled at the front ends as shown in the illustration. A hole is bored in both scantlings at the bevelled ends whereby clevises and chain may be attached to move the brooder house from place to place. On the outer edges of the floor scantling is nailed to which the rafters 2 by 2 inches and 8 feet long are attached. The shiplap is nailed to the rafters as shown in Fig. 40.

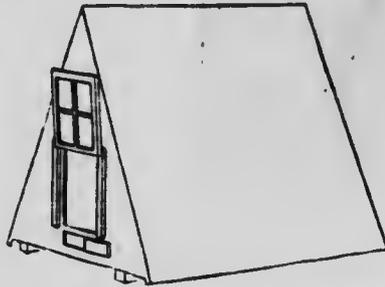


Fig. 37.—"A" SHAPED BROODER HOUSE AND COLONY COOP.

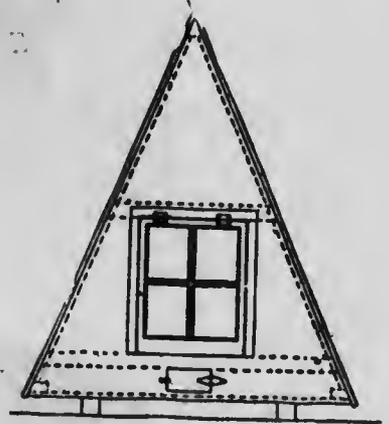


Fig. 38.—FRONT VIEW OF "A" SHAPED BROODER HOUSE AND COLONY COOP, SHOWING WINDOW HINGED TO TOP AND SMALL DOOR FOR CHICKS.

Fig. 37 shows how the front of the house is finished. The window is hinged at the top and a small door underneath for the chicks' entrance completes it. Fig. 39 shows a large entrance door in the rear. The general plan of this house is so simple that anyone can follow the idea and make it of any size desired, using other material as found necessary.

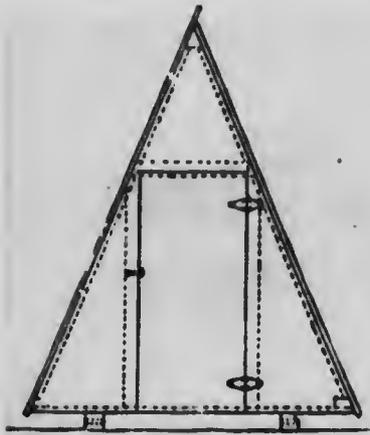


Fig. 39.—REAR VIEW OF "A" SHAPED BROODER HOUSE AND COLONY COOP SHOWING ENTRANCE

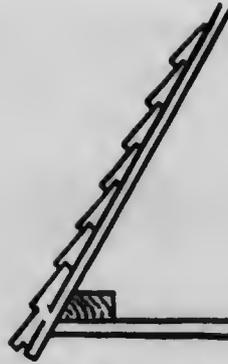


Fig. 40.—SHOWING JUNCTION OF RAFTER AND SCANTLING AS WELL AS METHOD OF PUTTING ON SHIP-LAP OR SIDING ON "A" SHAPED BROODER HOUSE OR COLONY COOP.

An 8-inch circular hole should be cut near the roof in front and rear ends of the colony coop to allow for circulation of air and ventilation.

*Advantages of Brooder House.*—The brooder house and colony coop has the advantage of the out-door brooder in cold, rough, stormy or rainy weather as when these conditions prevail the attendant can enter the brooder house and attend to the lamps and chicks without any inconvenience. The chicks have ample room in the house for weeks if necessary. When the chicks are old enough not to require artificial heat the brooder can be removed, the chicks remaining in the same house throughout the season.



Fig. 41.—SIMPLE COLONY COOP, 6 FT. LONG 3 FT. WIDE, 3½ FT. HIGH IN FRONT, AND 2½ FT. HIGH AT THE REAR.

Where the outdoor brooder is used and the chicks do not require artificial heat, they should be removed to a colony coop as previously described, or a colony coop, as shown in Fig. 41. The dimensions of



Fig. 42.—SHANTY BROODER HOUSES IN WHICH THE FIRST EXPERIMENTS IN COLD HOUSES AND CURTAIN FRONTS WERE MADE.

this coop are 6 ft. long, 3 ft. wide, 3 1-2 ft. high at front and 2 1-2 ft. high at rear. A window or wire screen should be placed in the front for light and ventilation. An opening 6 by 8 inches should be made for the chicks. A door can be made in the front as a means of entrance, although it is preferable to hinge the top and use it as a door.

*The Shanty Style.*—In constructing brooder house as shown in Fig. 42, the floor is made the same as for the "A" shaped brooder house, i.e., 6 ft. by 8 ft. with runners beneath. The rear studding is 4 ft. and front 5 ft. 6 inches. A stud may be placed in the center of the end opposite the door and 2 ft. 6 inches from the front in the end where the door is. This door can be made 4 ft. 6 inches high. The studding and rafters can be of 2 by 2 material using four pieces of rafters. The house may be sided up with shiplap or drop siding as preferred, and shingles or roofing paper used for the roof. As shown in the illustration the frame work of the window is covered with factory cotton and

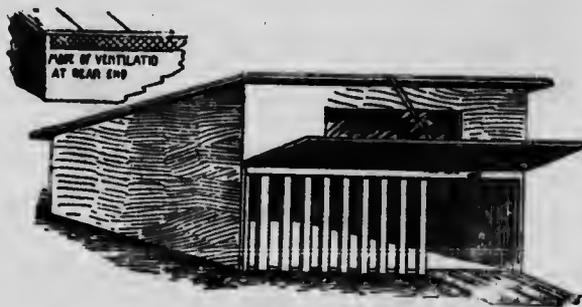


Fig. 43.—COOP FOR HEN AND BROOD.

hinged at the top. This has proved most satisfactory, as it supplies fresh air to the chicks without causing a draft. A small door 6 by 8 inches should be made at the front of the house to allow the chicks to pass in and out. This style of house can be constructed as cheaply as the "A" shaped house, and has a much larger interior space. While it is designed as a brooder house it can be used as a house for fattening. It can also be used as a colony house for breeding stock, and although it is a cold house pullets housed in them at the Provincial Poultry Station laid during the winter.

*The Brooder.*—Fig. 45 gives a general view of the indoor brooder recommended for the "A" style of house. The brooder box should be 30 by 36 by 10 inches which gives a capacity for 60 chicks. The brooder should stand on legs 8 or 10 inches from the floor.

The heater made of tin or galvanized iron, consists of a circular drum 20 inches across and 2 inches in thickness. Within this drum is a shield or cone the shape of an inverted umbrella, attached to the upper portion of the heater by strips of tin and rivets. The centre of the cone, as shown by dotted lines in Fig. 45 should be about one-half inch above the bottom of the heater drum, and centred directly over the hole through which the heat is supplied by the lamp. The escape pipe, 1 inch in diameter, is in the centre of the upper side of the drum, and of sufficient length to reach above the door at the top of the brooder. A pipe carrying the heat direct from the lamp to the heater is constructed as shown in Fig. 45. This pipe may be 3 inches in diameter from the lamp to the elbow and tapering to two inches where it becomes attached to the heater drum. As a means of supplying fresh warm



Fig. 44.—ANOTHER STYLE OF BROODER HOUSE EXTENSIVELY USED AT THE PROVINCIAL STATION.

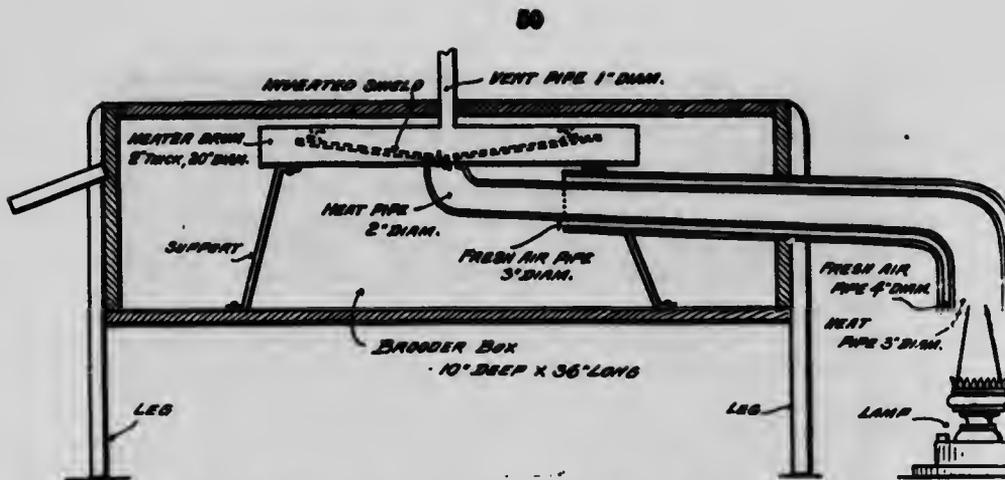


Fig. 45.—GENERAL VIEW OF INDOOR BROODER FOR "A" SHAPED BROODER HOUSE AND COLONY COOP.

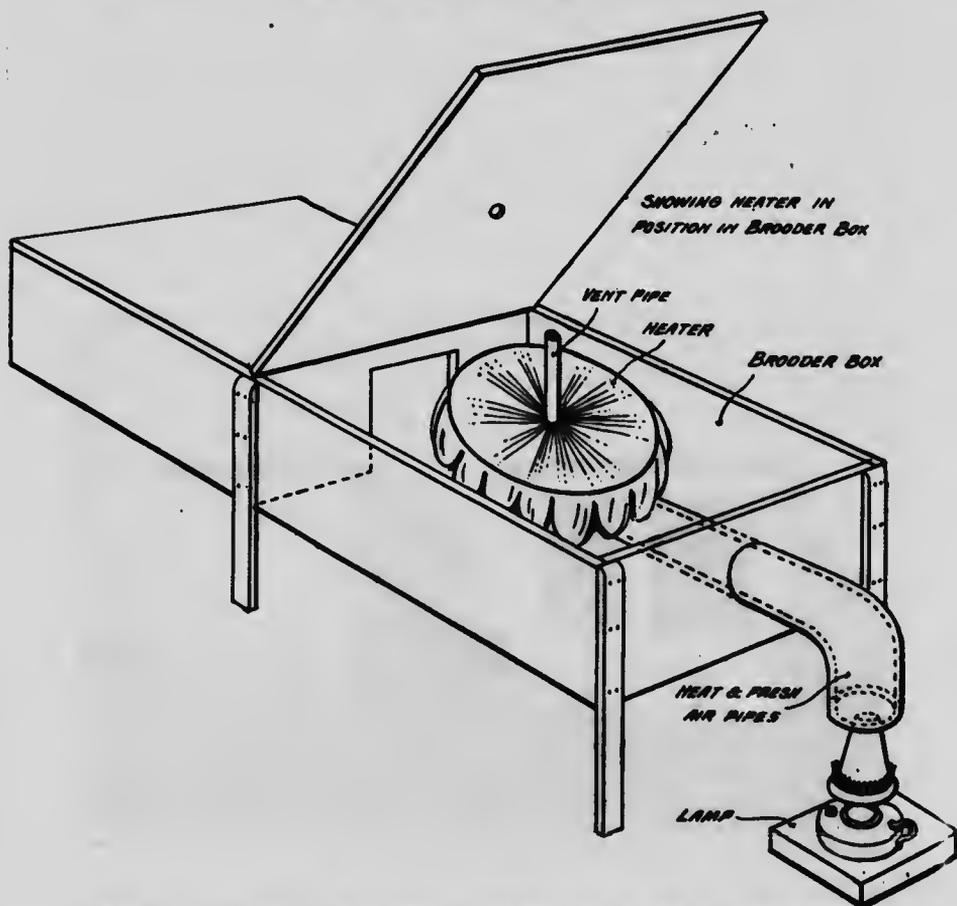


Fig. 46.—SHOWING POSITION OF HOVER AND HEATER IN THE BROODER



air to the interior of the brooder, a second pipe is made surrounding the inner one, being 5 inches in diameter from the lamp to the elbow and from the elbow to within 3 or 4 inches of the centre of the heater drum, reduced to 3 inches. This outer pipe can be held in position by being riveted to the inner one. The lamp is then placed under the pipe at the rear of the brooder, as shown in Fig. 46. The chimney should extend an inch into the pipe to insure the heat from the lamp being carried through the heater and radiated to the chickens. The base of the lamp should be set on a board of suitable thickness to allow the chimney to enter properly into the heating pipe.

*Removing the Chicks to the Brooder.*—In removing the chicks from the incubator to the brooder the operator should be very careful that coming from a high temperature they do not in any way become chilled in transmission. Very often serious results have followed the thoughtless and careless way in which some poultry men undertake to remove their chicks, as the slightest chill at this stage is apt to seriously affect the internal organs, and to a great extent destroy the vitality either for egg production or for the fattening crate.

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 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.

For the first few days the food may consist of oatmeal, either rolled or cracked, stale bread crumbs, cracked wheat, or any of the reliable prepared chick foods now on the market. Care should be taken that the chicks have a liberal supply of clean, fresh water and grit constantly before them.



*Water.*—For a drinking vessel an old tomato can may be used. Punch a 3-8 inch hole on one side about an inch from the open end. A saucer in the form of a pan an inch and a half deep and an inch and a half wider than the can, may be taken and the combination worked as an automatic fountain by first filling the can and placing the saucer on top and then inverting both.

On the second day the chicks may be allowed out in the brooder run for a short time and then fed within the brooder by way of teaching them to return to the hover. By doing this a few times they will soon understand where to find the hover when they are wanting heat. Just as soon as the chicks know when and how to return to the hover they should be allowed in the outdoor run, if the weather conditions are favourable, as outdoor air is conducive to health and vigour.

*The Range.*—The most successful way of rearing is to confine the chicks to the run with 10 inch boards set on edge, and as soon as they have developed enough to fly over this board they should be allowed free range. When the colony coops (Fig. 51) are placed a few rods apart, hundreds of chickens can be reared in this way and almost invariably each brood will return from the range to its own brooder house.

The brooder houses herewith illustrated make a serviceable colony coop when the brooder is removed. The chicks can remain in these houses till ready for the fattening crate or winter quarters.



Fig. 47.—SHADE NECESSARY—THE CHICKS ENJOY A COOL SHADY SPOT

*Shade.*—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.

As soon as the chicks have been allowed free range, the grains should be similar to those fed to grown fowl.

**DRY FEEDING AND HOPPER SYSTEMS.**—During recent years a system of dry feeding for young chicks has been introduced by advanced poultry farmers, and it has proved most successful. In this system, the chicks receive nothing but dry food throughout the growing period. For the first week or ten days the prepared chick foods are fed; after which cracked wheat and other grains are used for a few weeks. When the chicks are two months old the ground or cracked grains may be gradually discontinued, and when three months old whole grain may be fed entirely. In connection with dry feeding, care must be taken that the chicks have a constant supply of fresh drinking water.

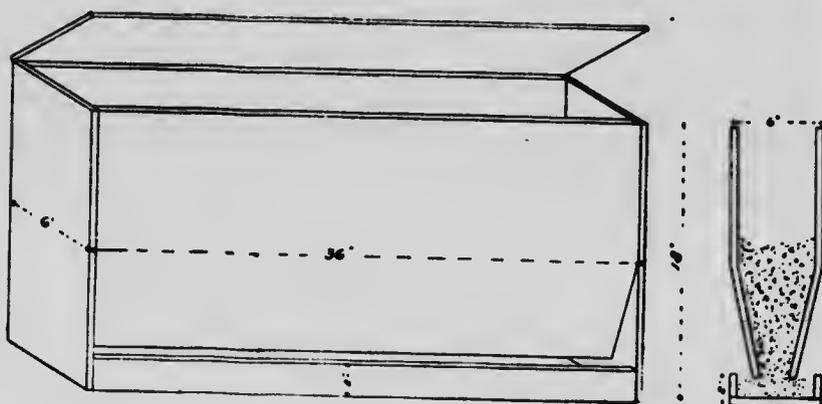


Fig. 48.—SELF-FEEDING HOPPER.

*Self Feeding Hopper.*—Dry feeding allows the introduction of the self-feeding hopper, which has proved to be very successful in rearing chicks as well as a great labour-saving device. The self-feeding hopper, Fig. 48, may be constructed of any desirable size and in such a manner that the grain or meal falls into the feeding trough as it is devoured by the chicks. The hopper is made of half-inch lumber of the following dimensions: 6 ins. wide, 36 ins. long and 18 ins. high.

A hopper this size contains about a bushel of feed and may be placed in the brooder house. Hopper feeding is a great labour saver as by this system the birds instead of being fed two or three times a day have a continuous supply before them. The hoppers require refilling once every two or three weeks depending on the size of the hopper and the number of chicks in the run.

Under this system of feeding, chicks have averaged 8 oz. at one month old, 18 oz. at two months old, and 3 1-2 lbs. at three months old. This means that at three months it is possible to produce chickens of a weight suitable for the fattening crate.

With trap nest selection and this system of hopper feeding, the writer produced pullets that commenced to lay when three months and three weeks old.

*Cold Brooder.*—During the past year or so the cold brooder system of rearing has received considerable attention by various poultry breeders in the province. This system is highly spoken of as being satisfactory in every respect. The principle upon which the cold brooder is operated is that a limited number of chicks are placed in a small box, such as an ordinary soap box, in the bottom of which is placed chaff, shaped like an ordinary hen's nest. Above the chicks is placed a frame covered with cotton batten or other cloth capable of retaining heat. This covering is allowed to sag sufficiently to follow the shape of the nest and in such a way that it covers the backs of the chicks. In this way the chicks generate their own heat, which is retained within the box or brooder. Care, however, must be taken that the chicks are supplied with sufficient fresh air. The ventilation of the brooder should be so arranged that it does not prevent the retaining of the necessary heat. When this system of rearing is followed it is well to place the brooder in a reasonably warm building until the operator becomes familiar with the system and the conditions under which the brooder can be successfully operated.

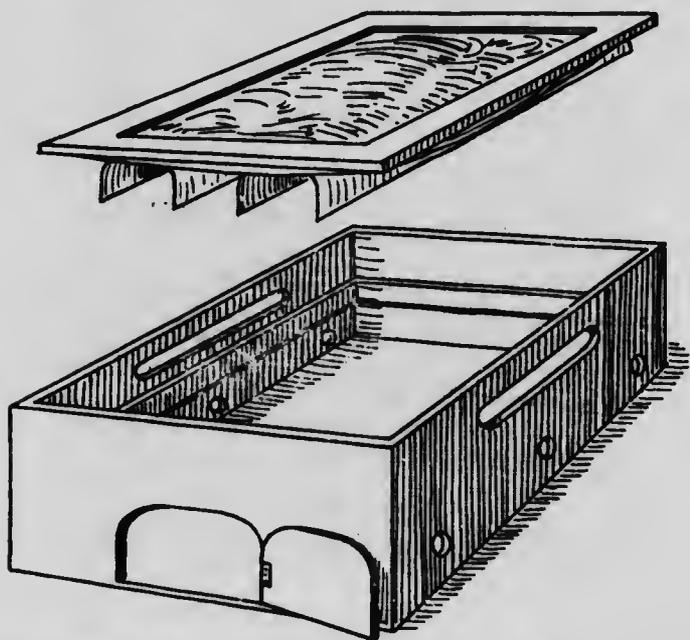


Fig. 49.—DESIGN OF COLD BROODER USED AT PROVINCIAL POULTRY STATION.

The cold brooders used in connection with the Provincial Poultry Station are 18 inches by 20 inches and 8 inches deep. In front of the brooder is a door 4 by 6 inches, and on each side of the brooder, 2 1-2 inches from the bottom and at equal distances apart three one-inch holes were bored for ventilation. Two inches below the top of the box and on the same side as the auger holes a strip 1 inch by 8 inches is



Fig. 50.—PROTECT YOUR POULTRY WITH GOOD FENCING.

cut out and the opening covered with cotton. The top of the box consisted of a light wooden frame covered with cotton which is bagged or sagged to take the shape of the nest. Over this is placed three or four thicknesses of batten, the number depending on the weather. The bottom of the brooder was filled with chaff to within 2 1-2 inches from the cotton, the object being to have space only for one chick deep to prevent them from crowding on top of each other. To further prevent crowding the chicks are separated by three or four strips of cloth fastened to the cotton as shown in Fig. 49. These strips should be put in so that they run lengthwise, *i.e.*, the 20-inch way of the brooder. About forty chicks were placed in each brooder and kept there for two or three weeks. When they became too large for this brooder, they were divided and placed in larger brooders of the same pattern. These larger brooders are placed in the regular colony brooder houses.



Fig. 51.—REARING CHICKENS NEAR EDMONTON.



Fig. 52.—A CORNER OF THE COLD BROODER ABOVE THE INCUBATOR ROOM  
AT THE PROVINCIAL POULTRY STATION, EDMONTON.

The chicks taken from the incubator are placed in these runs where they get sunlight and heat through the windows. When room is required for younger chicks these are transferred to similar runs at the rear, where they are kept a few days before placing in the colony houses illustrated on pages 46, 47, 48 and 49. The runs are detachable that the floors may be easily cleaned. Ventilation is secured by the windows hinged at the bottom and protected at the sides with cotton to prevent a direct draught on the chicks.

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



Fig. 53.—DESIRABLE AND UNDESIRABLE TYPE OF MALE BIRD.



Fig. 54.—HEADS OF BIRDS SHOWN IN FIG. 53.

**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 recommended, 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.

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 1-2 lbs 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. 55, is covered with slats placed lengthwise on three sides,—bottom, back and top,—and perpendicular in front. The slats for the bottom are 7-8 inch wide and 5-8 inch thick; the back, top and front slats are the



Fig. 55.—FATTENING CRATE.

same width but only 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 1-2 inches apart, with the exception of the space at the back of the crate, which is 2 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 the crate be moved and placed on the ground when full of birds. The back slats are placed lengthwise 1 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 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 1-2 inches inside is placed in front of each crate, and is carried on two brackets nailed to the ends



Fig. 56.—DESIRABLE TYPE OF BIRD FOR FATTENING CRATE.



Fig. 57.—UNDESIRABLE TYPE.

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.

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 pluck-

ing 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 Mixtures of Meal:

- (1) Ground oats (coarse hulls removed).
- (2) Siftings from rolled oats (no hulling dust should be included)
- (3) Two parts ground oats, two parts ground buckwheat, one part corn.
- (4) Equal parts of ground oats, ground barley and ground buckwheat.
- (5) Two parts of ground barley, two parts of low grade flour and one part of wheat bran.

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 one pound of tallow to 50 or 60 chickens per day is a fair allowance.

## IX.—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 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 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

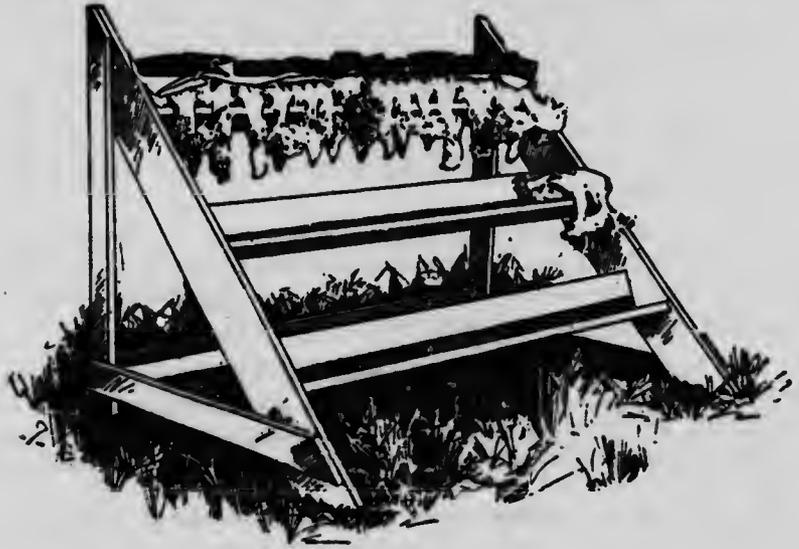


Fig. 58.—SHAPING FRAME.

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 so as to sever first one of the arteries then the other. 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.

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



Fig. 59.—THE SHAPER.

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.

*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. 59) is made by nailing two 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. 58, 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. 65 shows the back and 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.



Fig. 60.—SHOWING THE FIRST ROW OF BIRDS PLACED IN A SHIPPING CASE.



Fig. 61.—SHIPPING CASE READY FOR COVER.

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. 60. The second row are laid with breasts down and heads extended across between the birds of the first row. Fig. 61 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.



Fig. 62.—CRATE FOR SHIPPING LIVE POULTRY.

**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. 62 shows the construction of a very desirable shipping crate. It is 4 feet long, 2 feet wide and 14 inches high, and made of half-inch lumber or lath in the bottom, with the sides, ends and top closed with lath three 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.

## X.—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



Fig. 63.—GRIT BOX.

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 Fig. 53 and 56, and the type to avoid by Fig. 57.

*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.

**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.

**Oyster Shell.**—The lime of the oyster shell is a necessity in egg production. Some idea of the need of the shell supply can be obtained from the fact that an ordinary flock of 150 hens will produce, annually in egg shell, 137 pounds of clear chalk. The habit of egg eating is the result of a craving for shell forming material and unless it becomes chronic the feeding of oyster shell will at once remedy the evil. Fig. 63 shows a handy self-feeding box for oyster shell, grit, or meat meal which can be attached to the wall of the poultry house.

**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.

**Vegetables and Green Food.**—Owing to the confinement of winter quarters, the birds are unable to obtain their supply of green or succulent foods. This may be supplied by mangolds, turnips, cabbage, green clover or alfalfa. The latter is strongly recommended when properly saved and may be fed either whole or cut, raw or boiled.

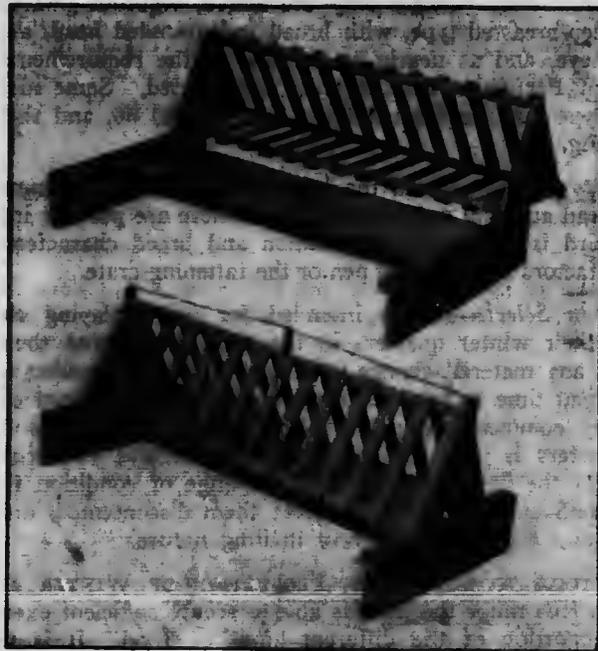


Fig. 64.—PROTECTED FEED TROUGH.

*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. 64 shows a protected trough suitable for feeding milk in winter quarters.

*Water.*—Plenty of pure, fresh water is indispensable for perfect health. Laying hens especially require an abundant supply on account of the great percentage of it in eggs,—from 64 to 65 per cent. The drinking vessels should be placed on a shelf where they will not become contaminated with litter.

*Grains.*—The local cost of the different varieties of grain should determine what is to be fed. The animal food given should supply the greater part of the protein or nitrogenous portion of the ration whether the fowls are at liberty or confined. Other foods therefore are required more for maintaining the heat of the fowl's body and it would not be profitable on this account to purchase expensive grains. It is preferable to feed a number of grains rather than to limit the selection to one or two kinds, as poultry like change and will thrive best on a variety of food stuffs. Mash is not recommended except in limited quantities, and for this ground buckwheat, ground corn and ground oats are the grains that are most preferred.

(NOTE.—The wise poultry keeper will study the wants of his flock constantly, noting their general condition. He will keep the birds in a contented condition by supplying them with comfortable quarters at all times).

Give them plenty of pure fresh air.

Change the food if they are not eating with their accustomed heartiness.

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 lay 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 endeavoring 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 pre-

sented 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 endeavor 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 and the date on which it was laid. 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.

**SELECTION OF BREEDERS WHEN TRAP NESTS ARE NOT USED.**—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 readily selected when the hatching season arrives, at which time 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 breeding pen.

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.

*Influence of the Male.*—In building up the laying strains the poultry man 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. 53 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. 54 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.



Fig. 65.—TWO VIEWS SHOWING BACK AND BREAST OF PROPERLY SHAPED FLESHED BIRD.

*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.

*Line Breeding.*—The system of breeding outlined under the head of strain building will give results as satisfactory as the average poultry.

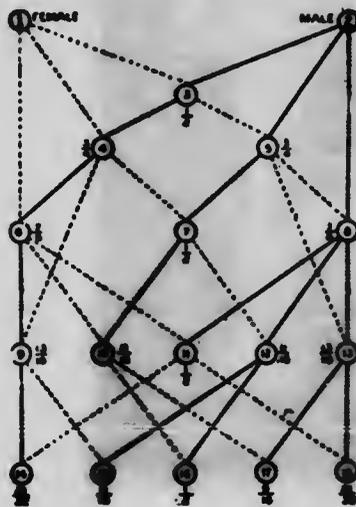


Fig. 66.—LINE BREEDING CHART.

man desires, however, it has its drawbacks and disadvantages in that the introduction of new blood often brings undesirable characteristics that have a tendency to counteract the ideal for which the breeder is striving.

For the benefit of those who may desire to strain build in a more scientific way permission has been secured from Mr. I. K. Felch, Nantucket, Mass., to use a line breeding chart originated by him some years ago. This line of breeding is being successfully used by poultry breeders the world over. While this chart was produced particularly for the breeding of poultry it may be successfully applied to all kinds of live stock breeding where it is desired to preserve or develop certain qualities of the flock or herd.

In line breeding with this chart it is desirable that the male and female of the foundation stock be unrelated and possessing as far as possible the qualities that the breeder wishes to develop. By mating the foundation stock offspring is produced represented as (2) having one-half the blood of the original stock. By mating a cockerel of (2) back to the female parent and a pullet of the same flock back to the male parent offspring is produced as in (3) and (4) that on the one hand have three-fourths of the blood of the female parent and one-quarter the blood of the male, while on the other hand a family containing three-fourths of the blood of the male parent and one-quarter of the female is produced.

Continuing in this line a cockerel is mated from (3) back to the original female or in other words a grandson to the grandmother thus producing (5) and by opposite mating (7) in which case there is produced in (5) offspring containing seven-eighths of the female blood and one-eighth of the male and in (7) offspring containing seven-eighths of the male and one-eighth of the female. Again by mating a pullet from (3) with a cockerel from (5) the offspring (8) is produced having thirteen-sixteenths of the female blood and three-sixteenths of the original male blood.

It is contended by some English breeders that after reducing to one-eighth the blood of the original mating that blood to all intents and purposes becomes ineffective, thus by the third or fourth generation there has been developed two distinct lines from the original stock, which may again be subdivided as shown in (9), (11), (14) and (16).

If during this process of line breeding certain desirable characteristics on either side are being lost or for other reasons it is desired to return as nearly as possible to the original it can be accomplished by mating birds from (3) and (4) producing (6) which contains one-half the blood of each of the original stock. The same can be accomplished by mating (5) and (7) or (8) and (12), (9) and (11), or any offspring having an equal proportion of the blood of the original parents.

In line breeding it becomes necessary to exercise great care in selecting the most desirable specimens to build up the strains. Birds that lack the desired requirements or have not the vitality and constitution should not be used under any circumstances. Natural selection,

or the law of the survival of the fittest, has to be substituted in the selection made by the breeder, that the best qualities may predominate and reproduce their like.

## XI.—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 this subject may be of interest.

**CARE OF 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 unfavorable 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.

## XII.—DISEASES, INJURIES AND PARASITES.

The poultryman who makes constitution of first consideration as a characteristic of his breeding stock, who makes cleanliness his watchword 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 lie 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 mouth and nostrils is another means of accomplishing the same end. This treatment repeated once a day for two or three days usually effects a 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.

*Soft Eggs.*—Caused by over feeding and an absence of lime. The treatment consists in cutting down the amount of food and adding oyster shell or other lime substances to the ration. Increase the exercise.

*Egg Eating Habit.*—Caused by a craving for shell forming material. Feeding plenty of oyster shell or a suitable substitute will remedy the evil.

*Leg Weakness.*—The birds have developed too much fat for the strength of bone and are unable to carry themselves about. It is usually associated with small quarters and over feeding. The remedy to a great extent consists in the removal of the cause. Put the birds on earth runs and supply plenty of grit and green food.

*INJURIES.*—Certain classes of injuries are so common to the birds of some flocks that it is difficult to determine whether they are not actually inherited deformities. Many of them, however, can be traced to defects in houses and fixtures.

***Crooked Breast Bone.***—There is no bone in the body of a chick just hatched, but the material which is to develop into bone is a pliable substance called gristle and is very subject to injury. The best authorities state that crooked breast bone is hereditary and no doubt it is and only those birds with straight breasts should be used in the breeding pen; but many of the crooks are the result of injuries and care should be taken to see that the entrances to the brooder houses are by inclined planes rather than by steps. If chickens have to climb over the sharp edge of a stick of timber such as a door sill, they are likely to injure the breast and cause the developing bone to become crooked.

***Bumble Foot.***—If the roosts are high or the floor hard the birds are likely to hurt their feet in alighting from the roosts. The injury occurs in the centre of the foot and appears as a hard lump with a core. The remedy consists in lancing the lump and removing the core, care being taken to wash the wound with an antiseptic wash, such as a five per cent. solution of carbolic acid. According to the plans as described in this bulletin, the roosts should not be more than thirty inches from the floor and at that height bumble foot should not occur.

**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.

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